Poster Session Proceedings

American Association for Agricultural Education
National Conference
Raleigh, North Carolina
May 15 – 18, 2023

Poster Chair:

Buddy McKendree, Michigan State University

Poster Submission Manager:

Gaea Hock, Kansas State University

Reviewers:

Special thanks to Dr. Gaea Hock, poster submission manager, and Dr. Mike Spiess for all their guidance and efforts with the submission and review process. The following people generously and professionally donated their time to review poster abstracts. Without their commitment, the poster session would not be possible.

Name	Institution
Abraham, Elizabeth	University of Minnesota
Ahn, Jaehyun	Texas A&M College of Agriculture and Life Sciences
Anderson, Ryan	Texas State University
Bellah, Kimberly	National FFA Organization
Benge, Matthew	University of Florida
Bennett, Jennifer	Colorado State University
Blythe, Jessica	West Virginia University
Burrows, Michelle	Utah State University
Bush, Sarah	University of Florida
Chumbley, Boot	Texas A&M University Kingsville
Claflin, Kellie	Ohio State
Colclasure, Blake	Doane University
Coleman, Bradley	Oklahoma State University
Conner, Nathan	University of Nebraska-Lincoln

Disberger, Brandie	Kansas State University
Doerfert, David	Texas Tech University
Dooley, Kim	Texas A&M University
Easterly III, R. G. (Tre)	University of Florida
Eck, Christopher	Oklahoma State University
Edwards, Stephen	University of Mount Olive
Epps, Rebekah	The University of Kentucky
Figland, Whitney	Louisiana State University
Fischer, Laura	Texas Tech University
Ford, Jillian	North Carolina State University
Frazier, David	Tarleton State University
Gonzalez, Amy	Oregon State University
Granberry, Tyler	University of Tennessee - Knoxville
Gregg, Colby	The Ohio State University
Greig, Jamie	The University of Tennessee Knoxville
Hancock, Garrett	Auburn
Harbstreit, Steven	Kansas State University
Hasselquist, Laura	South Dakota State University
Hatch, Chelsea	Texas Tech University
Igo, Carl	Montana State University
Ikendi, Samuel	University of California - Merced
Irlbeck, Erica	Texas Tech University
James, KaCee	Kansas State University
Lawver, Rebecca	Utah State University
Layne, Logan	Virginia Tech
Leman, Amy	University of Illinois at Urbana-Champaign
Letot, Carson	Penn State University
Lu, Peng	Texas A&M University
Manuel, Emily	Oklahoma State University
Marsh, Kayla	Oklahoma State University
McCubbins, OP	Mississippi State University
McHugh, Sallie	Abraham Baldwin Agricultural College
Meyers, Courtney	Texas Tech University
Miller, Amelia	Utah State University
Miller, Kimberley	California State Polytechnic University, Pomona
Milliken, Brett	Virginia Tech
Moore, Austin	Abraham Baldwin Agricultural College
Morgan, Joy	North Carolina State University
Mosley, Chaney	Middle Tennessee State University
Mott, Rebecca	University of Missouri
Nelson, Bryanna	Purdue University

Orton, Ginger	Texas Tech University
Parker , Hannah	The Ohio State University
Paulsen, Thomas H.	Morningside University
Perdue, Emily	West Virginia University Service
Powers deGruy, Rexanna	Dairy MAX
Price, Tyler J.	Oklahoma State University
Pulley, Justin	Tarleton State University
Qu, Shuyang	Iowa State University
Radhakrishna, Rama	Purdue University
Rampold, Shelli	University of Tennessee
Rank, Bryan	Arkansas Tech University
Rankin, Kristopher	Oklahoma State University
Ray, Nicole	Fresno State University
Richards, Jennifer	University of Tennessee
Rinehart, Kameron	Texas Tech University
Roberts, Richie	Louisiana State University
Russell, Mark	Purdue
Ruth, Taylor	University of Nebraska-Lincoln
Scherer, Hannah	Virginia Tech
Settle, Quisto	Oklahoma State University
Sewell, Emily	Oklahoma State University
Solomonson, Jay	Illinois State University
Sprayberry, Sarah	Texas A&M
Stewart, Josh	Oregon State University
Strong, Robert	Texas A&M University
Thoron, Andrew	Abraham Baldwin Agricultural College
Toombs, Jessica	California State University, Chico
Traini, Haley	Oregon State University
Tummons, John	University of Missouri
Waaswa, Andrew	North Carolina State University
Warner, Wendy	North Carolina State University
Wells, Trent	Southern Arkansas University
Westfall-Rudd, Donna	Virginia Tech
White, Shayne	Texas Tech University
Williams, Robert	Texas A&M University - Commerce
Wu, Yu-Lun	Ohio State University
Yarber, Karli	University of Arkansas
Young, Heather	University of Florida

2023 National AAAE Poster Sessions

Top 10 – Innovative Idea

A Point-less Class: Ungrading in a Graduate Leadership Course
Haley Q. Traini, Kelsey J. Joseph, Jonathan J. Velez
Oregon State University

Applying the Experiential Learning Cycle Through Service Learning Projects
Jillian C. Ford, Misty D. Lambert
North Carolina State University

Escaping a Lecture: Utilizing a Digital Escape Room to Introduce the SAE for All Model
Jillian C. Ford, Misty D. Lambert
North Carolina State University

Facilitating an Early Field Experience via a Regional Career and Technical Education Outreach Event for Underrepresented Students
Trent Wells
Southern Arkansas University

Incorporating Industry Mentors into Leadership Courses
Natalie Vaz, Hayley Traini, and Jonathan Velez
Oregon State University

"Putting Myself in my Employer's Shoes:" Implementing Target User Personas for Personal Portfolio Website Creation in the Agricultural Communications Classroom
Kindle Catching & Laura M. Fischer
Texas Tech University

The Art and Science of Agriculture: Building Preservice Teachers' Capacity to Engage in Interdisciplinary Education
Jessica Myschisin, Kevin Curry, Jr.
The Pennsylvania State University

Under/Grad Research: Establishing a Ph.D. Research Mentoring Program
Amanda M. Bowling, Hannah C. Parker, Erica D. Summerfield, Colby Gregg, Annie Specht
The Ohio State University

Voice and Choice: Learning Expression Choice Boards for Learning Reflection
Nicole Ray, Robert Strong
Fresno State University, Texas A&M

Youth Mental Health First Aid Certification: Providing Resources for Preservice Teachers
Caryn Filson
The Ohio State University

Innovative Idea

A Cross-disciplinary Approach to Agricultural Literacy at the Middle School Level: "Growing" Interest in Social Studies & Science Students
K. Dale Layfield, Paul Johnson, Joe Brandt, Cameron Ramsey, Audie L. Cherry, Joseph L. Donaldson, Christopher J. Eck, and Beatrice Bailey
Clemson University, Dutchman Creek Middle School, Rock Hill ATC, North Carolina State University, and Oklahoma State University

A Model for Cannabis Education: A Land Grant Tribal College and Private University Partnership
Blake Colclasure
Doane University

A New Model for Scholarship Dissemination in Agricultural Communication, Education, Extension, and Leadership
Grady Roberts, Amy Harder, Jimmy Lindner, Robert Strong
University of Florida, University of Connecticut, Auburn University, Texas A&M University

A Picture is Worth a Thousand Words: Using Photovoice Reflection Assignments to Build Cultural Competency
Cari A. Cearley, Tyler J. Price, Lauren L. Cline, M. Craig Edwards
Oklahoma State University

Adapting the 5E Instructional Method to a Foundational Agricultural Communications Course
Victoria U. Beasley, Molly A. West, Emoni White, Tyler Granberry
University of Tennessee - Knoxville

Agricultural Education on the Move Training Day
John D. Tummons, Rebecca L. Mott, Heather Fletcher, Natalie Koch, Max Hagaman
University of Missouri

An Inaugural Career Development Event in Sustainable Agriculture
Clanci Richardson, Robert Williams, Maggie Salem, William Doss
Texas A&M University - Commerce; University of Arkansas

Art, Ag, & Action: Developing Campus Partnerships for Inquiry-Based Learning in Agricultural Literacy
Carson Letot; Jessica Myschisin; Rachel Duke
The Pennsylvania State University

Bringing History to Life: Creation of Supplemental Curriculum to Illuminate NFA History within School-Based Agricultural Education Programs
Jeanette T. Furlong & Nathan A. Smith
Oklahoma State University

Building Professional Collaboration and Identity Through Pre-service Agricultural Education Teacher Professional Development
Trent Wells; Christopher M. Estepp
Southern Arkansas University; University of Arkansas

Caring Cards: A Peer-to-Peer Mental Health Intervention in Agricultural Communities
Katrina Clontz, Dr. Carolyn Oldham, Dr. Stacy Vincent, Kelly McFarland
University of Kentucky

Communicating agriculture to the public: A conference for high school agriculture students
Max Hagaman, Rebecca Mott, John Tummons, Cord Jenkins, Jaelyn Peckman, Jon Simonsen
University of Missouri

Cultivating Collaborative Action: National Supply and Demand Data Sharing
Daniel Foster, Amy Smith, Rebecca Lawver, & Mike Spiess
The Pennsylvania State University, University of Minnesota, Utah State University, California State University - Chico

Cultivating the Next Generation of Educators Through an Online Ag Ed CDE
Cheyenne Hoppes, Hannah Houk Gordon, Wendy Warner, Mary Kate Morgan Lanier
North Carolina State University

Cultural Awareness and Support for Safety Education: Integrating Inclusive Research Design
Taija Jackson, Michael Pate, Becki Lawver, Dustin Perry, & Scott Smalley
Utah State University, Utah State University, Utah State University, Montana State University, & Iowa State University

Developing a Competency Based Registered Apprenticeship for Military Veterans
Sara Kidd; Angel Cruz, PhD; Joseph L. Donaldson, PhD
North Carolina State University

Developing a Sheep Marketing Educational Website for Educators and Novice Producers
Sarah Thies and Dr. Neil Knobloch
Purdue University

Developing an Agricultural Mechanics Academy
Brittney Heibel, Ryan Anderson, & Doug Morrish
Texas State University

Developing College of Agriculture Students to Become Civic Leaders
Kameron Rinehart, Dr. Jason Headrick, and Alexa Salinas
Texas Tech University

Developing Transformational Student Learner Outcomes Through Artificial Intelligence
Jennifer Richards, Brent Lamons, Tyler Granberry, Jamie Greig, Shelli Rampold, Molly West, Victoria Beasley, Carrie Stephens, and Christopher Stripling
University of Tennessee

Engaging and Educating Agricultural Educators through In-State Study Experiences
Nikki Miller, Joy Morgan, Wendy Warner, Travis Park, and Misty Lambert
North Carolina State University

Enhancing Collaborative Learning in Agricultural Communication Internship Courses through the TPACK Model
Shuyang Qu, Chuanli Zhou, & Hang Shi
Iowa State University

Expanding Youth Knowledge and Skills in Lawnmower Safety
Forrest Lang, Dr. Dee Jepsen
The Ohio State University

Experiential Agricultural Literacy: Focus on Commodities Elementary School Curriculum
Kelly Gill and Amy Leman
University of Illinois at Urbana-Champaign

Experiential Learning Through Podcasting: Creating Opportunity for Advanced Pedagogy
Jason Headrick
Texas Tech University

Fab it Up: Involving Pre-service Teachers in an In-service Teacher Professional Development Experience
Trent Wells; P. Ryan Saucier
Southern Arkansas University; Sam Houston State University

How Can Agricultural Education Scholars Compete with Other Fields h-index's? Answer: Reporting Their Field Citation Ratios
Robert Strong, Bruce Herbert, James Lindner
Texas A&M University, Auburn University

Implementing a Women of Welding Camp for Secondary Female Students
Lourdez Garza, Kenedy Kornegay, Ryan Anderson, & Bradley Borges
Texas State University

Incorporating a MakerSpace Project into an Introduction to Agricultural Engineering Course
Brittney Heibel, Bradley Borges, & Ryan Anderson
Texas State University

Increasing Access to Undergraduate Research
Logan Layne, Donna Westfall-Rudd, Ph.D., Hannah Sunderman, Ph.D.
Virginia Tech

Innovative Idea: Using Agricultural Literacy to develop a Community of Practice for SBAE Students
Jennifer E. Bennett, Kellie Enns, Nathan Clark
Colorado State University

Integrating Agriscience: Using Hands-on Teaching to Develop Hands-on Teachers
Jennifer Brown, Dr. Kristin Stair
Louisiana State University

Integrating NFA History into School-Based Agricultural Education
Susan L. Jones, Wendy J. Warner
North Carolina State University

Learn – Plan – Do: A Reflection Tool for Teacher Induction Professional Development
Lavyne Rada, Amy Smith, Brad Greiman
University of Minnesota

Mock Roof Project for Installation of Demonstration Solar Array by University Students
Jonathan Link, Edward Franklin, Robert Torres, Quinton Molina
University of Arizona, Tucson

Oh Deer! A Lesson in Data Visualization and Mathematical Thinking
Kendrick L. Spencer, D. Brett Milliken
Virginia Tech, Virginia Tech

Providing Agriculture Training to Veterans: The VAEAP Project in the Southwest
Edward Franklin, Ursual Schuh, Trent Teegerstrom, Jing Luo, Sofia Montes
University of Arizona, Tucson

Recruitment Road Trip: Partnering with FFA Evergreen Tour for Teach Ag Workshops
Kaitlynn R. Davis, Kaitlyn O. Wright, Anna J. Warner
Washington State University

Reflections on Data Collection Methods in Elementary Agriculture Education: Do large cash incentives matter?
Maria Helm, Nicholas Fuhrman, Jason Peake
UGA ALEC, UGA Warnell

Service-Learning through CDEs for Preservice Teachers
Emily O. Manuel; Robert Terry, Jr.; Nathan A. Smith
Oklahoma State University

Still life with school supplies: Teaching agricultural photography through Kolb's Experiential Learning Model
Rachel Hendrix, Lucas Moreland, Emily Perdue
West Virginia University

Student Engagement in a Place-Based Educational Experience to Enhance Ag Literacy
Bryanna Nelson, Hui-Hui Wang, Neil Knobloch, Bryan Hains
Purdue University, University of Kentucky

Student-Centered One-Health Modules: Digital Science Curriculum to Address Complex Interdisciplinary Issues
Julie Harlin, Theresa Murphrey, Torri Whitaker, Nicola Ritter, Christine Budke, Hank Walker
Texas A&M University

Supporting All Youth: Developing a Training Curriculum for Youth Development Organizations to Better Connect with LGBTQ+ Youth
Kevin Treadway, Jennifer Richards, Shelli Rampold, Daniel Collins, Craig Pickett, Carrie Stephens
University of Tennessee

Supporting International Graduate Students Through Participation in Graduate Peer Mentoring Programs
Abasiama-Arit Aniche, Andrew Waaswa, Joy Morgan
North Carolina State University

Teaching Studios: Combining Content & Pedagogy in Early Degree Coursework
Jessica M. Blythe, Kirsten Stephan, Danielle Grant, Rachel Hendrix, & Aaron Giorgi
West Virginia University

The Growth in Leadership Skills and Development of Fellowship through Literacy.
Rachelle Andreatt, Joy Morgan, Wendy Warner, Rachel Vann, Travis Park, Brent Jennings
North Carolina State University

Tools for Another Time: Using a Weekend Course to Build Teacher Efficacy in Training Career Development Events in School-Based Agricultural Education
Tyler J. Price and Jon W. Ramsey
Oklahoma State University

Using a Head-to-Head Electrical Troubleshooting Championship Contest to Improve Student Engagement and Knowledge
Bradley Borges & Ryan Anderson
Texas State University

Using a Strawberry DNA Challenge to Explore the Needs of Students with Disabilities
Saralyn Smith and Dr. Kristin Stair
Louisiana State University

Using Agriculture Education as a Holistic Health Approach: An Innovative Model for Navigating the Transition from Military to Civilian Life
Alyssa Spence; Robert Elliot, Roberta Bellamy, PhD
NC State University

Using an FFA Officer Leadership Curriculum to Develop Leadership Skills in Middle School Agriculture Students
Rebekah L. Wright, Jennifer K. Richards, Shelli D. Rampold, Tyler Granberry, Christopher Stripling
University of Tennessee - Knoxville

Using LinkedIn for an End-of-term Synthesizing Portfolio Project
Garrett Brogan; Dr. Allison L. Dunn
Texas A&M University

Using Progressive Career Dinner Events to Promote Career Readiness and Opportunities
Joy Morgan, Andrew Waaswa
North Carolina State University

Using Simulation to Teach Livestock Management Practices in an Undergraduate Agricultural Science Course
Randy H. Burnett, Trent Wells
Southern Arkansas University

Using the FEW-Nexus to Engage Middle Grade Students in Reasoning about Local Socio-Ecological Systems Issues
Kendrick Spencer, Hannah H. Scherer, Amy Azano, Rachelle Kuehl, Michelle Rasheed, Malle Schilling, Heather Wright,
Virginia Tech, Virginia Tech, Virginia Tech, Virginia Tech, University of South Carolina Aken, Virginia Tech, Gardner-Webb Univeristy

Using the Six America's Short SurveY (SASSY) to Teach Audience Segmentation
Ginger Orton, Dr. Laura Fischer
Texas Tech University

Using videos to disseminate information to extension agents and the general public
Colleen Gariton, Matt Benge, Damilola Ajayi
University of Florida

VR Graduate Seminars: Where Pants Are Optional but Engagement Is Encouraged
Jamie Greig and Harrison Falcofsky
The University of Tennessee Knoxville

We're Going Where? Creating an Interactive Virtual Tour of an Agricultural Facility
Kylie Harlan, Courtney Meyers, Erica Irlbeck, Lindsay Kennedy, Muntazar Monsur
Texas Tech University

What's a PPAT? Coaching Strategies for Pedagogical Assessment Success
Emily O. Manuel; Jeanette T. Furlong; Jon W. Ramsey; Nathan A. Smith
Oklahoma State University

Who wants to bring agriculture into their classrooms? An online professional development program
Shannon K. Allen, Josey M. Webb, Carley C. Morrison, Stephanie M. Lemley, Allyson, K. Moore
Mississippi State University

Top 10 – Research

Analyzing Race and Ethnicity Trends of Program Completers in Agricultural Education
Daniel Foster, Amy Smith, Mike Spiess, Rebecca Lawver
The Pennsylvania State University, University of Minnesota, California State University - Chico, Utah State University

Are Two Better Than One? An Evaluation of Team Teaching in Teacher Preparation
Grace Dooley, Alyssa Glover, Sallie McHugh, Farish Mulkey
Abraham Baldwin Agricultural College

Budding Knowledge: Consumers' Information Needs Related to Agricultural Hemp
Anuradha Choudhary, Abigail Durheim, Raquel Taylor, Kasey Harmon, Dr. Taylor Ruth, Dr. Nathan Conner, and Dr. Blake Colclasure
University of Nebraska-Lincoln; Doane University

Identifying the Topic Areas Presented in Feature Stories on the Australian Broadcasting Corporation's Landline
Dr. Courtney Meyers
Texas Tech University

Is Cooperative Extension Prepared to Promote Precision Agriculture Technologies?
Chin-Ling Lee, Robert Strong, Gary Briers, Theresa Murphrey
Texas A&M University

Predicting Adopters and Non-Adopters of Precision Agriculture Technologies
Dr. Patteron HIlaire, Dr. Kirk A. Swortzel, Dr. Michael E. Newman, Dr. Michael S. Cox
Mississippi Forestry Commission, Mississippi State University

Social Network Analysis of an Agricultural Leadership Program
Laura L. Greenhaw & Matthew Gold
University of Florida

Statistical Power in the Journal of Agricultural Education, 2012 - 2022
Henry Akwah, Christopher M. Estepp, Donald M. Johnson
University of Arkansas

Successful Teaching Methods for Middle School Agricultural Education in Kansas
Ali Herbel, Dr. Gaea Hock, Dr. Brandie Disberger, Dr. Lori Goodson
Kansas State University

The value in trust: An exploration of personal values in relation to trust in science
Erica Summerfield, Dr. Cara Lawson, Dr. Laura Fischer
The Ohio State University, Texas Tech University

Research

A Content Analysis of North Central Farm and Ranch Stress Assistance Center Resources
Quentin Carlyle, Rebecca Mott, Kim Keller, Abby Loesing, Kraysen Leonard
University of Missouri

A current view from Taiwan's extensionists for future professional development
Pin-Hsueh Lee
Texas Tech University

A Historical Analysis of the Kansas State Agricultural College and its Influence on the Development of K-State Research and Extension
KaCee James
Kansas State University

A Meta-Analysis of Agricultural Literacy Programs for Youth and Adults
Sarah Sprayberry, Robert Strong, Theresa Murphrey
Texas A&M University

An Analysis of Secondary Students' Understanding of Farmer Suicide Drivers Following a State-Wide Essay Competition
Kelly McFarland, Katrina A. Clontz, Stacy K. Vincent
University of Kentucky

An Exploration of Expert Opinion on Animal Welfare and Ethics
Shayne White, Dr. Laura Fischer, Dr. Christy Bratcher
Texas Tech University

An Inquiry Into Preflections on Students' Participation in Global Service-Learning
Samuel Ikendi
University of California - Merced

An Interdisciplinary Approach to Experiential Learning in Cybersecurity and Agriculture Through Workforce Development
Kellie Johnson, Dr.Tiffany Drape, Dr. Joseph Oaks, Dr. Joseph Simpson, Dr. Anne M. Brown, Dr. Donna Westfall-Rudd, and Dr. Susan Duncan
Virginia Tech

Analyzing Graduate Student Member Benefits and Challenges within Agricultural Education, Communication, and Leadership Professional Organizations
Kameron Rinehart, Kristine Schechinger, Dr. Jason Headrick, Dr. Courtney Gibson
Texas Tech University

Analyzing the Sources of Knowledge and Pedagogical Content Knowledge of SBAE Teachers by Licensure Type
Matthew J. Wood, Tyson J. Sorensen
Utah State University

Assessing Preservice SBAE Teacher Needs for Working with English Language Learners
Maggie Pfeiffer Salem and Will Doss
Texas A&M University-Commerce and University of Arkansas

Beer Me: Investigating Midwest Craft Brewery Demand for Locally Grown Hops
Grace Dowding, Kate Bruns, Nate Hostetler, Brett Meyer, & Dr. Blake Colclasure
Doane University

Community Education for Behavioral Change Towards Food and Nutrition Security
Samuel Ikendi, Francis Owusu, and Dorothy Masinde
University of California - Merced and Iowa State University

Comparison of Sampling Methods in Survey Research: An Exploratory Study
Brooke L. Thiel, Christopher J. Eck, and Kellie Clafflin
North Dakota State University, Oklahoma State Universtiy, The Ohio State University

Comparison of Self-Efficacy Toward Technical Skills and Motivation to Teach Content Prior to and After Three Agricultural Systems and Technology Courses
Kristopher R. L. Rankin III & Nathan A. Smith
Oklahoma State University

Compliance with Safe Food Handling Practices: What Influences Intention in U.S. Households?
Dharmendra Kalauni, Laura Warner, Arati Joshi, Ashley McLeod-Morin & Sandra Anderson
University of Florida

Conceptions of the Agriculture Industry: How Students Draw Agricultural Professionals
Sarah Dodoo, Kelly Gill, Amy Leman, Ruth Kaggwa, Lisa Walsh, Kristine Callis-Duehl
University of Illinois at Urbana-Champaign

Costs Associated with Work-Life Balance as Perceived by Preservice School-Based Agricultural Education Teachers
Jessica M. Toombs
California State University, Chico

Creating Climate Change and Adaptation Awareness through International Agricultural Study Tours
Andrew Waaswa, Joy Morgan
North Carolina State University

Defining Fidelity in the Curriculum for Agricultural Science Education (CASE)
Scott Smalley Mark Hainline
Iowa State University

Describing the Relationship between Trust in Science and Support for Climate Change Policy
Maci Loving, Kindle Catching, Laura Fischer, and Cara Lawson
Texas Tech University & The Ohio State University

Developing Future Educators through an Educationally Purposeful High Impact Experience: A Phenomenological Examination
Gavin Voelckers, Audie Cherry, Kasee Smith, Jeremy Falk, Daniel Foster, Melanie Foster
University of Idaho, Clemson, Penn State

Development and Validation of a Middle School Agricultural Literacy Instrument: Grades 6-8
Rose Judd-Murray and Michelle S. Burrows
Utah State University

Does a One Size Fits All Approach Work?: Comparing the Professional Development Needs of Alternatively Certified and Traditionally Certified SBAE Teachers
Matthew J. Wood, Tyson J. Sorensen
Utah State University

Eco-Friendly Products: Do I Really Know Them?
Sidney Schnor & Fallys Masambuka-Kanchewa
IOWA STATE UNIVERSITY

Effective SAE Implementation: Evaluating Agricultural Educator's Competence in Integrating SAE and AET in the Classroom
William Norris; Don Edgar
New Mexico State University

Effective Teaching Practices According to Elementary Agriculture Educators: A Modified Delphi Approach
Maria Helm, Nicholas Fuhrman, Jason Peake
UGA ALEC, UGA Warnell

Evaluating Hispanic Students' Sense of Belonging in a College of Agriculture
Dr. Jason Headrick, Kameron Rinehart, Hannah Ford
Texas Tech University

Evaluating Self-Assessed Versus CWI Welding Scores by Gender
Rhett Sykora, Ryan Anderson, Marshall Swafford, & Bradley Borges
Texas State University

Evaluating the Preparation of Pre-Service School-Based Agricultural Education Teachers in Laboratory-Based Courses
Kevin Sanders Mark Hainline Scott Smalley
Iowa State University

Evaluation of Welding Assessment Scores Using Triangulation
Rhett Sykora, Ryan Anderson, Marshall Swafford, & Bradley Borges
Texas State University

Examining College Students' Trust in Sources for Scientific Information
Ginger Orton, Dr. Laura M. Fischer, Mary Katelynn Butler Horton, Skylar Elmore
Texas Tech University

Examining the Lives Experiences of Hispanic Agriculture Teachers
Sam Rodriguez, Christian Wandeler
CSU Fresno

Exploring Generational Perceptions Toward Sustainable Agricultural Foods & Products
Kylie Farmer, Laura M. Fischer, Ginger Orton, & Cara Lawson
Texas Tech University & The Ohio State University

Exploring Rural Georgia Residents' Extension Needs for Improving Food Access
Kristin E. Gibson, Catherine E. Sanders, Tatevik Markosyan, Allison R. Byrd, Alexa J. Lamm
University of Georgia

Exploring SBAE Teacher Professional Development Experiences: A National Study
Aaron J. Giorgi, Kayla Y. Giorgi, Tyler J. Price, Quisto Settle
West Virginia University, Oklahoma State University

Exploring Student Perceptions of an Asynchronous Oral Communication Course
Emoni S. White, Christopher T. Stripling, Victoria U. Beasley, & Molly A. West
The University of Tennessee

Exploring Teachers' Intent to Use Inquiry-Based Learning in the Classroom After a Prolonged Professional Development
Kasey Harmon, Dr. Taylor Ruth, Dr. Nathan Conner, Dr. Bryan Reiling, & Dr. Christopher Stripling
University of Nebraska-Lincoln; University of Tennessee, Knoxville

Exploring the Public's Perception of Beef Sustainability: Implications for Values-Based Messaging
McKenna Pavelock, Laura M. Fischer, Ginger Orton, & Cara Lawson
Texas Tech University & The Ohio State University

Exploring the Role of Positive Emotions in Leadership Learning
Haley Q. Traini, Katherine McKee, Dave Rosch, Jennifer Smist, & Robert Klein
Oregon State University, University of Illinois, North Carolina State University

Exploring the Types of Career Advancement Support Florida Early Career Extension Agents Receive from their Mentors
Matt Benge, Karlibeth Leitheiser
University of Florida

Food As a Community: Network Analysis and The Des Moines Community
Morgan Bradley, Samuel Ikendi, Jane Rongerude, and Monica Haddad
Appalachian Sustainable Development – Virginia, University of California – Merced, and Iowa State University

Food as Lived Experience: A Photovoice with High School Youth
Morgan Bradley, Samuel Ikendi, Jane Rongerude, and Monica Haddad
Appalachian Sustainable Development – Virginia, University of California – Merced, and Iowa State University

Growing Ag Teachers: What is Our Yield?
Amy Smith, Daniel Foster, Rebecca Lawver, Mike Spiess
University of Minnesota, The Pennsylvania State University, Utah State University, California State University - Chico

Identifying Conflict Styles of Agriculture Students at an HSI
Steven Boot Chumbley, Eugenio Conklin & Ben Turner
Texas A&M University-Kingsville

Identifying Laboratory Instruction and Teaching Concerns of Illinois Agriculture Teachers
Faith Still, Blake Uchijil, Steven Still
Southern Illinois University

Influence of Social Events on Academic Learning of Global Service-Learning Alumni
Samuel Ikendi, Michael Retallick, and Gail Nonnecke
University of California – Merced and Iowa State University

Institutional Representation at AAAE Conferences
Christopher M. Estepp, Sarah F. James, Lauren L. Cline, Will Doss, Donald M. Johnson
University of Arkansas, Oklahoma State University

Interns' & Supervisors' Perception of Professional Growth Through Internship Programs
Joshue Lewis & Erica Irlbeck
Texas Tech University

It Renewed My Faith in Humanity: Alumni's Perception of Global Servicing-Learning
Samuel Ikendi, Michael Retallick, and Gail Nonnecke
University of California - Merced and Iowa State University

Likert Versus Cronbach's Psychometric Thresholds: Reducing Error and Maximizing
Agricultural Education’s Scholarship Impacts
Robert Strong James Lindner, Clare Hancock, Nicole Ray, Bruce Herbert, Karissa Palmer
Texas A&M University, Auburn University, Fresno State University

Metal Fabrication Equipment Adequacy and Competence to Teach of Kansas Agricultural Educators
Jacob Rutledge, Gaea Hock, Jonathan Ulmer, Jason Ellis
Kansas State University

Mind Mapping the Curricular Planning Process for Florida School Based Agricultural Education Teachers
Jason Dossett, R.G. (Tre) Easterly III, Sadie Hundemer, JC Bunch
University of Florida

Modeling Determinants of Residential Water Conservation Behaviors to Inform Agricultural Education Programs
Kristin E. Gibson, Allison R. Byrd, Alexa J. Lamm, Kevan W. Lamm, Jessica Holt
University of Georgia

Novice agriculture teacher content knowledge
John D. Tummons, Logan Fullerton
University of Missouri

Perceptions of science communication by professional communicators
John Clemmons & Quisto Settle
Oklahoma State University

Post-Pandemic Extension Needs of Floridians
Amy Harder, Karlibeth Leitheiser, Matthew Gold
University of Connecticut, University of Florida

Preparing Agricultural Education Majors for Racially Diverse Classrooms: Students' Experiences During a Service-Learning Project for Black Youth
Richie Roberts, Jacob Englin, Benita Komungeru
Louisiana State University

Principals' Perceptions of and Perceived Barriers to Implementing Agricultural Literacy in Pennsylvania Grades K-8
Madisen Plunkert, Dr. Kevin Curry Jr.
Penn State

Professional Development Needs of SBAE Teachers Regarding Suicide and Suicide Interventions
Kristin Stair, Rebekah Epps, Eric Rubenstein, O.P. McCubbins, Chaney Mosley, Dale Layfield, Jon Ramsey, Chris Haynes, Jason Davis, Carla Jagger, Don Johnson, Christopher Clemons, Edly Santiago, and Andy Seibel
Louisiana State University, University of Kentucky, University of Georgia, Mississippi State University, Middle Tennessee State University, Clemson University, Oklahoma State University, Tarleton State University, University of Mount Olive, University of

Random Forest Algorithms for County-level Supplemental Nutrition Assistance Program (SNAP) Classifications
Jaehyun Ahn
Texas A&M College of Agriculture and Life Sciences

Student Perceptions of Influence Emerging from Agricultural Influencer Instagram Posts
Hannah Culak, David Doerfert, Shelby Shank, Jason Headrick, Laura Fischer
Texas Tech University

Students' Perceived Importance of the Three-Component Model in Pennsylvania SBAE Programs
Jessica Myschisin, Kevin Curry, Jr.
The Pennsylvania State University

Talking about Diddly Squat: A Content Analysis of Tweets about Clarkson's Farm
Kellie Claflin, Gaea Hock, Nellie Hill, Annie R. Specht
Ohio State, Kansas State

Tasks Associated with Teaching School-Based Agricultural Education
Ryan W. Best, Dr. J. Shane Robinson, Dr. Robert Terry, Jr., Dr. M. Craig Edwards, Dr. Ki Lynn Cole
Oklahoma State University

Teaching Soft Skills in Agricultural Education: Best Practices
Bryce Groves, Theresa P. Murphrey
Texas A&M University

The Rural Health and Safety Education Program: Exploring Rural Communities' Need for Behavioral Health Programming
Aaron Golson
University of Georgia

Trends in Research on American Consumers' Motivations for Purchasing Eco-friendly Products
Daniel Ayisi Nyarko, Sidney Schnor and Fallys Masambuka-Kanchewa
IOWA STATE UNIVERSITY

Undefined: In Search for a Definition of Blended Learning in SBAE
D. Brett Milliken and Haley Q. Traini
Virginia Tech and Oregon State Univeristy

Use of Experiential Learning to Support Climate Change Adoption
Andrew Waaswa, Abasiama-Arit Aniche, Joy Morgan
North Carolina State University

Using Students' Preferred Gender Pronouns in School-Based Agricultural Education: Preservice Teachers' Perceived Knowledge and Preparedness – Phase II
Tyler J. Price, M. Craig Edwards
Oklahoma State University

What are Students' Perceptions Regarding Using a Flipped Classroom to Deliver Agricultural Mechanics Course Instruction?
Jay K. Solomonson; Trent Wells
Illinois State University; Southern Arkansas University

What Do They Value? Predicting U.S. Consumers' Attitude Toward Gene-Editing
Jean A. Parrella, Holli R. Leggette, Peng Lu, Gary Wingenbach, Matt Baker, Rafael Landaverde, Nathaniel Jackson
Texas A&M University

What is the Perceived Ability of Agriculture Teachers to Achieve Positive Work-Life Integration During the School Year
Jay K. Solomonson, Lucas D. Maxwell, Michael Barrowclough
Illinois State University

What Types of Social Support Do Early Career SBAE Teachers Find Most Beneficial?
Amy Leman, Jay Solomonson, Claire Smith
University of Illinois at Urbana-Champaign; Illinois State University

Who Are They? The Internal Factors Associated with the Science Communication Identities of Extension Professionals
Klae O'Brien, Carrie N. Baker, Jean Parrella, Sarah A. Bush, Kattlyn Wolf, Maggie Elliott
University of Idaho, University of Florida, and Texas A&M University

A Point-less Class: Ungrading in a Graduate Leadership Course

Haley Q. Traini, Kelsey J. Joseph, and Jonathan J. Velez
108 Strand Ag Hall
Oregon State University
Corvallis, OR 97331
541-737-2661
Haley.Traini@oregonstate.edu
KJ.Joseph@oregonstate.edu
Jonathan.Velez@oregonstate.edu

A Point-less Class: Ungrading in a Graduate Leadership Course

Introduction

Thoughtless compliance, arbitrary deadlines, anxiety, grade grubbing, point chasing. We, the instructional designers, aimed to avoid these and other grade-related behaviors when developing a graduate distance-based team and organizational leadership course at Oregon State University (OSU) during the summer of 2021. We envisioned a course that emphasized metacognition, application, peer support, and intrinsic motivation as opposed to a learning environment where students chased deadlines, pandered to instructor ideologies, and cut corners in the name of point accumulation. Our search for pedagogical practices that would achieve this vision led us to the concept of *ungrading*, a movement in education that emphasizes student self-evaluation, formative feedback from the instructor, peer feedback, and dialogue with students about their learning progress (Kohn, 2011; Kohn & Blum, 2020; Ungrading Pedagogy, n.d.). Ungrading can foster healthy self-esteem in students, create more engaged and responsible students, increase metacognition, reduce grade-related anxieties, and lessen the negative effects of power dynamics in the classroom (Kohn & Blum, 2020; Sackstein, 2015). Instructors may use ungrading to different degrees, ranging from implementing more self-assessment in assignments to removing letter grades or point values altogether (Sackstein, 2015; Ungrading Pedagogy, n.d.). At OSU, we chose to develop a course in which there were zero points, yet students received, through self-evaluation, a letter grade at the end of the term.

How it Works

We included ungrading elements through all aspects of the course, including how and when students completed work, their interactions with peers and instructors, feedback methods, and assessments. Similar to other courses, students completed weekly discussions. Their assignments included a menu of weekly application activities called “To Try Activities”. These activities were exercises related to the content of the week that encouraged the application of learning. We also created a discussion space to share the results and impacts of their To Try Activity implementation. We asked students to complete seven of the 40+ offered To Try activities by the end of the term. For the culminating project, students worked in small groups to create a contextualized primer on team leadership. We provided clear instructions and expectations, along with descriptions of how we conceptualized rigor for all coursework.

Most submissions were “graded” as complete/incomplete. Written feedback on course submissions was largely conversational, yet also offered evaluative feedback when necessary to reiterate submission expectations (e.g., reminding students to cite the text when appropriate). We asked students to complete a midterm and end-of-term self-assessment to evaluate their progress in the course. Both self-assessments asked students to reflect on their learning journey, identify coursework they were especially proud of, the degree to which they met the course expectations (e.g., completed all discussions), and what letter grade they believed they earned. For each submitted assignment, we communicated that their final grade was negotiated; if we did not agree with the student’s self-evaluation, we could offer an alternative grade and/or begin a conversation with the student about their learning.

Results to Date/Implications

The course was offered during the spring of 2022 and included ten students pursuing various graduate degrees. Students submitted coursework prior to the suggested deadline, 99.2% of the time on all assignments. Five students assigned themselves a "B" on the midterm self-assessment and five assigned themselves an "A". All students assigned themselves an "A" on the end-of-term self-assessment. We agreed with their determinations given the evidence they provided and their work throughout the term.

We received overwhelmingly positive feedback from students about the course design and grading philosophy from informal comments and their end-of-term reflections. Students appreciated the flexible deadlines, the menu of application activities, and the opportunity to reflect on their learning. One student commented, "I feel like I am constantly doing homework for this class, but it takes the form of thinking critically about situations and analyzing my work teams and environments instead of unhelpful "busy" work." Another student reflected, "I am thankful for this grading philosophy because it has reminded me what education is really about, if I am truly absorbing the information for the sake of my own learning and growth, and I believe that I am".

Future Plans/Advice to Others

Implementing ungrading required a paradigm shift for course designers, instructors, and students. We realized that much of our communication with and feedback to students was centered on a grade (e.g., why points were deducted). Adjusting to feedback that is more conversational was a challenge. Ungrading was also an adjustment for students, specifically the open due dates. We recommend anyone wishing to implement ungrading clearly communicate expectations on the grading philosophy as a whole as well as for each assignment. We found posting written and video explanations of the grading philosophy effective. We also encouraged students to connect with us if they felt the policy induced more anxiety or if they were ever worried about their progress in the course. Unless you plan to develop a course from scratch, we recommend small, incremental changes to incorporate ungrading. This might include self-evaluative elements, moving to a "complete/incomplete" format, or incorporating more student choice into assignments. It is important to remember, however, that ungrading does not mean "anything goes", rigor is lost, or all students get an "A". Rather, it is a rethinking of how we assign value to student learning and the student's participation in that process. We will continue to use ungrading in this leadership course as well as explore ungrading practices in other leadership courses at OSU.

Cost/Resources Needed

As ungrading is pedagogical, cost and resources are minimal. However, for this project, we received a $5,000 grant from the university to develop the course. Our department chair also offered two faculty several weeks of summer salary support to develop the curriculum. Resources and ideas from ungrading came from websites and books checked out from the university library.

References

Kohn, A. (2011). The case against grades. *Educational Leadership*, *69*(3), 28-33.

Kohn, A., & Blum, S. D. (2020). *Ungrading: Why Rating Students Undermines Learning (and What to Do Instead)*. West Virginia University Press.

Sackstein (2015). *Hacking assessment10 ways to go gradeless in a traditional grades school*. Times 10 Publications.

Ungrading pedagogy (n.d.). Lafayette University Center for the Integration of Teaching, Learning, and Scholarship. Retrieved July 1, 2022 from https://citls.lafayette.edu/what-is-ungrading/

Applying the Experiential Learning Cycle Through Service Learning Projects

Jillian C. Ford and Misty D. Lambert
North Carolina State University

NCSU Box 7607
Raleigh, NC 27695-7607
(919) 515-2707
jrcasey2@ncsu.edu
mdlamber@ncsu.edu

Introduction and Need for Innovation

The National Council for Agricultural Education (n.d.) considers Supervised Agricultural Experience (SAE) the work-based learning portion of the three-component model of School-Based Agricultural Education (SBAE). Due to its importance in a complete SBAE program, undergraduate Agricultural Education students at North Carolina State University are required to complete an experiential learning course that focuses on using Kolb's (2015) Experiential Learning Theory (ELT) to implement SAEs in SBAE programs. In 2015, a new SAE model was adopted, SAE for All, which introduced Service Learning (SL) as a new SAE category for students to choose from (National Council for Agricultural Education, 2015). In this context, SL is considered to be when "students are involved in the development of a needs assessment, planning the goals, objectives and budget, implementation of the activity, promotion, and evaluation/reflection of a chosen project" (National Council for Agricultural Education, 2015, pp. 3-4).

Instructors for the experiential learning course noticed their students struggled to understand the difference between community service and SL as well as how their assignments could be applied to their future SBAE programs. Therefore, in the fall 2022 semester, instructors introduced service learning by modeling SAE facilitation and recordkeeping that aligns with Kolb's (2015) ELT cycle by requiring students to complete a service learning project (SLP) during the course.

How it Works

Instructors modified the Service Learning Plan Template available in the Service Learning Independent Student Guide (National Council for Agricultural Education, 2018) and established expectations and due dates for the project to fit into the 15-week course.

Week 1 - Instructors introduced SL and assigned the SLP, specifying that it could be completed individually or in groups up to four. Project expectations were shared along with due dates. Time was provided for students to brainstorm ideas using a community needs assessment worksheet.
Week 2 - Students self-identified who was working together and their initial project ideas.
Week 3 - Students set up their profiles in the AET and began weekly journals about their project. Journals continued through completion of the project.
Week 5 - Completed SLP Plan was submitted. Instructors reviewed and prepared feedback.
Week 6 - Instructors held individual SLP Plan meetings, resulting in a need to update plans.
Week 7 - Instructors held a second round of SLP Plan meetings for students that had to make major updates to their plans.
Week 12 - Final project completion date and completed single experience AET report due.
Week 13 - Students presented posters about their projects to judges consisting of instructors, departmental faculty and state Ag Ed staff.

Results to Date

Eight SLPs were completed by the 12 students in the class, including one group of four and one pair. SLPs varied across student interests and included a canned food drive, landscaping project, yard sale fundraiser for a community member's medical bills, bake sale for a local animal shelter, Operation Paperback book drive, creation of a plastic yarn sleeping mat, resume workshop, and an American Sign Language workshop. Half of the projects were completed in the students' hometowns while the other half impacted the community around the university.

All students were able to move through the four stages of the experiential learning cycle (Kolb, 2015). We saw students engage in active experimentation as they researched and planned their SLP. From there, students gained concrete experience through implementation of their chosen SLP and engagement with the recordkeeping system. We did require weekly reflections on their SLP and consider the final poster project to also be a component of their reflective observation. During the final poster session, we asked students to engage in abstract conceptualization both through the questions asked during the poster session and through their final report and poster themselves. All students were asked what they would do differently and how we should adjust the assignment to better support students in the future. Lastly, we moved all students to active experimentation as they engaged in thinking about how they would incorporate SLPs in their own SBAE program.

Future plans and Advice to Others

Instructors intend to continue requiring students to complete a SLP as part of their experiential learning course with a few changes. The SLP Plan template will be revised into a more user-friendly version. When introducing the assignment, exact rubrics will be provided and possible funding ideas will be highlighted. Students requested an opportunity to practice their poster presentations in class to share their projects with each other. Students also requested that the poster presentation component be formatted as a friendly competition.

For others interested in incorporating a similar project into their courses, consider preparing some possible local ideas and community partners. Try to organize the project so students must identify their projects and prepare plans as early as possible to allow students the most time to implement their SLP. Try to wrap up the SLP several weeks before the end of the semester to help alleviate potential student stress from deadline overlap with other courses.

Costs and Resources Needed

Incorporating a SLP into a course can be done at little to no cost. If a program has funding, items such as poster printing, grants for SLPs, and refreshments and prizes for the poster presentation could be purchased. To implement a SLP, instructors will need to dedicate time before the course to prepare the assignment and specific expectations. Instructors should also plan to incorporate time into the course regularly for administration of the SLP. It is highly recommended that instructors are aware of the required state SAE record book and require students to maintain records for their SLPs utilizing this tool.

References

Kolb, D. A. (2015). *Experiential learning: Experiences as the source of learning and development (2nd ed.).* Pearson Education, Inc.

National Council for Agricultural Education. (n.d.). *Agricultural Education.* https://thecouncil.ffa.org/ageducation/

National Council for Agricultural Education. (2015, March 31). *Philosophy and guiding principles for execution of the supervised agricultural experience component of the total school based agricultural education program.* Supervised Agricultural Experience (SAE) Philosophy and Guiding Principles. https://ffa.app.box.com/s/i8ntesw8zsajaxxdnj5cle6zaf0a6za3

National Council for Agricultural Education. (2018). *Student edition - SAE for All immersion SAE independent learning guide.* https://ffa.app.box.com/s/oeelnvqwg7kxofy6s7ceifaqnwq5jzk4

Escaping a Lecture: Utilizing a Digital Escape Room to Introduce the SAE for All Model

Jillian C. Ford and Misty D. Lambert
North Carolina State University

NCSU Box 7607
Raleigh, NC 27695-7607
(919) 515-2707
jrcasey2@ncsu.edu
mdlamber@ncsu.edu

Introduction and Need for Innovation

The experiential learning course for pre-service and alternatively certified school-based agricultural education (SBAE) teachers at North Carolina State University focuses heavily on the work-based learning component of SBAE, known as Supervised Agricultural Experience (SAE). The current model, SAE for All (The National Council for Agricultural Education, n.d.), has been introduced early in the semester since its adoption by The National Council for Agricultural Education. This initial introduction has included a lecture and a worksheet where students explored the SAE for All Teacher Guide (The National Council for Agricultural Education, 2017). For the fall 2022 semester, the instructors wanted to be more intentional in having students move through the stages of the experiential learning cycle (Kolb, 2015). After seeing a presentation at the North American Colleges and Teachers of Agriculture conference (Riedel, 2022) and in an effort to also differentiate instruction (Tomlinson & Strickland, 2005) and introduce gamification (Reiners & Wood, 2015) to their students, the instructors chose to introduce the SAE for All model through a digital escape room built in Google Slides.

How it Works

The digital escape room was created in Google Slides and began with a relatable scenario followed by a “room” where students had to find the embedded hyperlinks. The links led to a Google Form to enter the secret code to “unlock” the door and to six puzzles in separate Google Slides. Each puzzle was related to the SAE for All model or content found in the SAE for All Teacher Guide. The puzzles were designed to challenge students to identify information about SAE for All and then decode the answer from the puzzle that would be used as a “key” to escape the room. The puzzles were numbered and had to be entered chronologically into the Google Form “lock” in order to enter the next piece of the passcode to “unlock” the door.

The escape room was used with two sections of this course in fall of 2022. The in-person section contained 12 undergraduate students and the online section contained 26 students that were a mixture of undergraduate and graduate pre-service and current SBAE teachers. The activity was first used with the in-person section to answer questions and address any issues for students to successfully “escape”. This strategy worked well, allowing instructors to clarify and fix several small items prior to assigning it to the online section. The following week, the digital escape room was assigned to the online section, where students had one week to complete it.

Results to Date and Implications

Out of the 38 combined students, 36 completed the activity and “escaped” the room. Several weeks after the assignment was completed, the instructors surveyed the students using an anonymous Google Form, receiving feedback from 26, which was mostly positive.

When asked for positives, many students indicated that they enjoyed being able to do puzzles and the change from their typical college classwork. One student from the online section shared that they enjoyed “The puzzle activity and the creativity of the activities.” noting that “It is nice to step away from typical papers and discussion posts.” Another stated, “I'm personally not very techy so the Google interactive escape room was a cool element. I liked how it was like pieces to a puzzle.” Many shared that they would love to learn how to make a digital escape room to use with their students. One participant shared, “I really enjoyed the activity and it gave me a great idea that I can incorporate in my future classroom. I thought it was fun and engaging and very memorable!"

When asked about areas of improvement, students from both sections identified that they did not like the additional step of having to "make a copy" of the puzzle documents to be able to edit and decode the answers. Several participants from both sections indicated that a specific puzzle tripped them up and it needed more clarification on the instruction page. Since the in-person class was only given 30 minutes of class time to work, several students shared that it felt time consuming because they were unable to finish it during class. One student suggested, "Maybe make it a little bit shorter considering how short class time is or doing it over 2 class periods." One student that did not successfully "escape" the room shared they chose to not finish the activity stating, "I also did not like that you could not submit the next puzzle on the Google Form without having the correct answer. I ended up leaving it incomplete even though I did have some answers because I could not move on and add what I understood for partial credit."

Future Plans and Advice to Others

Overall, this activity was well received by students and the instructors plan to continue to use this activity in the future and incorporate digital escape rooms into their other courses. This digital escape room was an effective way to familiarize students with the SAE for All model for both in-person and online classes. As the instructors reflect on this experience and the feedback from their students, offering training on how to make an escape room could be a useful topic in a teaching methods course or in a seminar during student teaching.

For others considering incorporating digital escape rooms into your courses, be sure to give yourself plenty of time to build it. To start, consider watching some YouTube videos or reading blogs from secondary teachers for ideas and best practices for the mechanics of a digital escape room. Think through the learning objectives you want your students to achieve through their completion of the digital escape room, then plan ahead by designing the questions and puzzles before building the actual escape room and lock. When designing puzzles and clues, be as specific as possible without giving away the answers. When setting up the puzzles within different Google Slides or Google Docs consider changing the share settings to "force copy" so students can automatically edit the files instead of having to "make a copy" themselves. When you have finished building your digital escape room, consider having someone with limited knowledge of the topic complete it prior to having students attempt it to gauge how long it may take your students to complete and to identify potential barriers for completion. When implementing a digital escape room with an in-person course, be prepared to provide encouragement when students initially push back against the challenge.

Costs and Resources Needed

The major resource needed to build a digital escape room is time. While the initial input of time can be significant, it took the instructors over ten hours to build the activity, once it is established it should not need a significant time investment in the future. Students will need a general understanding of escape rooms and Google Workspace to avoid unnecessary questions and frustrations during the activity.

References

Kolb, D. A. (2015). *Experiential learning: Experiences as the source of learning and development (2nd ed.).* Pearson Education, Inc.

Reiners, T., & Wood, L. C. (2015). *Gamification in education and business.* Springer International Publishing.

Riedel, J. (2022). Engaging learners through digital escape rooms. *Abstracts from the 68th Annual NACTA Conference, 66*(1), 28. https://assets.swoogo.com/uploads/1879239-62ac7e146fdf3.pdf

The National Council for Agricultural Education. (2017). *SAE for All Teacher Guide.* https://ffa.app.box.com/s/exollg1x7q2lntun3su2mdufw07wiklf

The National Council for Agricultural Education. (n.d.). *Supervised agricultural experience (SAE) philosophy and guiding principles.* https://thecouncil.ffa.org/sae/

Tomlinson, C. A., & Strickland, C. A. (2005). *Differentiation in practice: A resource guide for differentiating curriculum grades 9-12*. Association for Supervision and Curriculum Development.

Facilitating an Early Field Experience via a Regional Career and Technical Education Outreach Event for Underrepresented Students

Trent Wells, Ph.D.
Southern Arkansas University
Department of Agriculture
Agriculture (AGR) 208
Magnolia, AR 71753
ktwells@saumag.edu

Facilitating an Early Field Experience via a Regional Career and Technical Education Outreach Event for Underrepresented Students

Introduction

Agricultural teacher education programs should provide opportunities for pre-service teachers to develop and hone their knowledge and skills (Wells et al., 2018; Whittington, 2005). Because the list of technical skills that early-career teachers should have is quite lengthy and diverse (Albritton & Roberts, 2020), it is vital that there exist practical opportunities for pre-service teachers to grow and develop into well-prepared, competent professionals. Early field experiences (EFE) are used to help expose pre-service teachers to the realities of teaching public school students while allowing them opportunities to refine their teaching-related knowledge and skills (Wells et al., 2018). Perhaps the implementation of an EFE that combines pre-service teachers honing both their technical skills and teaching skills while serving the needs of underrepresented high school students would be pragmatic.

Project Phases / How it Works

Females are often underrepresented in many areas of Career and Technical Education (CTE) programming (Hamilton et al., 2015). Thus, therein lies an opportunity to collaborate with others to help address this issue. During the Spring 2021 semester, I began collaborating with personnel at a local educational cooperative who were pursuing state-level grant funds to help develop female high school students' interest in technical careers (e.g., welder, electrician, etc.) and CTE more broadly. They sought to partner with educational institutions across Arkansas to help deliver engaging, hands-on experiences in different areas of CTE to female students enrolled in high schools throughout the region via a series of one-day, on-campus events. As part of Southern Arkansas University's (SAU) contribution to the project, we concluded that such experiences could be delivered by well-prepared, technically-competent pre-service teachers. Using this approach to deliver the event's activities provided a practical opportunity to address the need for pre-service teachers to engage in an in-depth, high-quality EFE while serving underrepresented students.

Upon receiving confirmation that the grant was funded, I began working with a team of 14 carefully-selected pre-service teachers to plan for the specific activities that would be conducted during the event. Serving as the event coordinator, I recruited each pre-service teacher based on their individual background, expertise, and interest regarding teaching technical skills. Ten of these pre-service teachers were female and four were male. Considering the human capital, facilities, consumable materials, tools, and equipment that I had available in comparison to the available funds for SAU's portion of the project ($12,000.00), I consulted with the pre-service teachers and the educational cooperative personnel to determine the most suitable activities to develop. When viewing all of the aforementioned factors holistically, we concluded that the following six agricultural mechanics activities would help to both address the scope and intent of the grant-funded project and facilitate a high-quality EFE for the 14 pre-service teachers: (1) wiring electrical circuits, (2) using a plasma cutter, (3) using an oxy-acetylene torch, (4) using an arc welder, (5) using woodworking equipment, and (6) performing routine vehicle maintenance procedures.

Various event stakeholders undertook numerous planning activities. The educational cooperative personnel were responsible for both disseminating information about the event to high schools throughout the region and handling event registration. They submitted all registration information to me for processing and student activity scheduling. I consulted with various SAU personnel to: (1) arrange for campus ambassadors to lead students through their event rotation activities, (2) procure meeting room, classroom, and laboratory spaces, and (3) provide lunch for the pre-service teachers and the high school students, teachers, and counselors who were on-campus that day. In October 2021, I worked with each pre-service teacher to help them: (1) identify suitable learning objectives for high school students, (2) plan the specific activities that they would be leading, (3) prepare their teaching areas, and (4) procure the necessary safety items and consumable materials for their respective activities. The event took place in the SAU Agricultural Education Facility (AEF) Shop on Friday, November 5, 2021 and directly served 80 high school students. Each high school student participated in three activity rotations based on their self-reported activity interests. Each activity rotation was facilitated by at least two pre-service teachers and lasted for approximately 45 minutes. Fifteen minutes was allocated between each rotation to allow the pre-service teachers time to prepare for the next incoming group of high school students.

Implications, Future Plans, and Advice to Others

After the event concluded, I met with all 14 pre-service teachers to debrief and discuss their experiences related to the event activities. They shared myriad positive comments about their work preparing for and delivering their respective teaching activities and consistently indicated that despite the struggles they encountered (e.g., student disinterest in particular activities, unexpected issues when using a piece of equipment, etc.), they enjoyed the process of teaching high school students. They expressed ideas about how to improve upon their own skills for teaching technical subject matter. They also shared suggestions for improving the event's layout and indicated that they would be interested in helping to facilitate the event again in the future, all of which engaged them in the reflective component of EFE, which is critical for their continued evolution into competent, prepared, and effective teachers (Wells et al., 2018). I plan to continue hosting this event each academic year as the availability of state-level grant funds permits. I plan to continue working with the appropriate aforementioned stakeholders to successfully deliver this event. I recommend that other agricultural teacher educators explore opportunities to use events like this one as EFE activities for their pre-service teachers. Anecdotal evidence suggests that doing so helps to better inform pre-service teachers about their own career decisions while making direct impacts on underrepresented high school students.

Costs

To support this event and its aligned EFE activities, it cost approximately $12,000.00 to procure the additional tools, equipment, and consumable materials beyond what was already available in the SAU AEF Shop. I wish to note that many of the items purchased to support the event activities (e.g., 10 new welding helmets, two new welding machines, etc.) will likewise support future iterations of the event and facilitate agricultural mechanics instruction for pre-service teachers at SAU. The impact of these funds will have lasting results. Beyond monetary expenditures, time was the most significant investment.

References

Albritton, M. C., & Roberts, T. G. (2020). Agricultural technical skills needed by entry level agriculture teachers: A modified Delphi study. *Journal of Agricultural Education, 61*(1), 140-151. https://doi.org/10.5032/jae.2020.01140

Hamilton, A. F., Malin, J., & Hackmann, D. (2015). Racial/ethnic and gender equity patterns in Illinois high school career and technical education coursework. *Journal of Career and Technical Education Research, 30*(1), 29-52. https://files.eric.ed.gov/fulltext/EJ1085015.pdf

Wells, T., Smalley, S. W., & Rank, B. D. (2018). Early field experience course students' perceptions of school-based agricultural education laboratory environments. *Journal of Agricultural Education, 59*(3), 243-257. https://doi.org/10.5032/jae.2018.03243

Whittington, M. S. (2005). The presidential address to the Association for Career and Technical Education Research: Using standards to reform teacher preparation in career and technical education: A successful reformation. *Career and Technical Education Research, 30*(2), 89-99. https://www.ctc.ca.gov/docs/default-source/educator-prep/cte-files/cte-research-presidential-address.pdf

Incorporating Industry Mentors Into Leadership Courses

Natalie Vaz
Oregon State University
108 Strand Hall
Corvallis, OR 97331
541-737-2661
natalie.vaz@oregonstate.edu

Haley Traini
Oregon State University
130A Strand Hall
Corvallis, OR 97331
541-737-2661
haley.traini@oregonstate.edu

Jonathan
Oregon State University
130A Strand Hall
Corvallis, OR 97331
541-737-2661
haley.traini@oregonstate.edu

Incorporating Industry Mentors Into Leadership Courses

Introduction/Need for Innovation

Mentoring has become more extensive in higher education, acting as a useful interventional tool to improve student experiences at the university level (Cornelius et al., 2016). The definition of a mentor varies across literature, however, the term frequently emphasizes how an individual works with a student to guide them on their career path, while offering professional development and experience (Clayton et al., 2013). The proactive engagement between students and mentors strengthens learning and increases student success and retention (Cornelius et al., 2016). Mentoring undergraduate students can be designed to supply students with both psychological support and academic advice (Lunsford et at., 2017). Research highlights that mentoring positively affects student outcomes. Student outcomes include a greater sense of belonging, an increase in capacity for socially responsible leadership, strategic learning strategies, and self-confidence in professional abilities (Lunsford et al., 2016).

How it Works

In an effort to foster engagement in leadership education within the Oregon State College of Agricultural Sciences and build a community of belonging, we built in an industry mentor component to a new two-credit leadership course for freshman and incoming transfer students in the College of Agricultural Sciences. A primary goal for this course was to create a pipeline for continued leadership education and engagement while helping new students transition to Oregon State University. We worked with academic departments to identify professionals in various agriculture and natural resource industries who would be willing to serve as mentors. Once industry mentors were selected, we, the instructors of the course, assigned 3-4 students to each mentor, organizing groups based upon the student's declared majors and the industry mentors educational and career experiences. Our intent was to provide the students with a mentor of similar career interests in order to facilitate conversations that included mutuality in both shared relationship excitement and experiential empathy (Lester et al., 2019).

Upon the completion of assigning the mentor-student groups, and prior to the start of the course, we communicated with the industry mentors via email about the expectations for the mentoring experience and times they would visit the class virtually. The mentors committed to three, 50-minute sessions throughout the term. During these sessions, the mentees were assigned a designated quiet space to log into Zoom and connect with their mentors. Each mentor connection was fairly unstructured; we encouraged students to learn about their mentor, ask questions in regard to their leadership journey, and solicit advice on how to navigate their college and career transitions and opportunities. Also, students were encouraged to ask their mentors about their leadership experiences, specifically in regards to the five practices of exemplary leadership that served as an outline for the course curriculum (model the way, inspire a shared vision, enable others to act, challenge the process, encourage the heart) (Kouzes & Posner, 2018).

Results to Date/Implications

We solicited feedback from both the 8 mentors and 29 mentees about their experiences, through informal focus group interviews. These interviews served as an opportunity for the participants to reflect on their mentorship experience as well as provide future recommendations related to the mentoring process. Mentors were posed with the following question, *what did you find valuable about the designated meeting times with your mentees?* Responses indicated that mentors found great value in the mentoring process and that it was rewarding to be given the opportunity to participate in servant leadership. They found their connections to be beneficial for the students, as they were able to share personal experiences and perspectives related to their leadership journeys. They were hopeful that their stories and advice would be impactful to students' future decisions, as they navigate where they are headed in their own leadership voyage. The response below summarized a majority of the feedback from the mentors:

> I find a lot of value in reaching out and having interactions with people that are in their undergraduate programs. It was nice to just be able to connect with them and I hope that I have been able to serve as a role model or a point of contact in the industry and have students be able to ask questions and to hear from us. We had some nice discussions, and it was a positive experience. I really enjoyed my discussions with the students.

The students were posed with the following question, *what did you find valuable about the designated meeting times with your mentors?* Responses represented an admiration for the personal real-life stories that their mentors so vulnerably shared. The students found their stories related to failure and trial and error to not only be inspiring, but also reassuring. Students also found value in being able to learn about their mentors' different points of views and perspectives on challenges that they have navigated within their leadership experiences. Students have a greater understanding for the importance of having a growth mindset throughout their leadership journey. The response below summarized a majority of the feedback from the mentees:

> I'm glad that we have been able to have these industry mentors to talk with and learn about their real-life experiences out in the workforce using leadership. It's always interesting to listen to their take on leadership practices and be able understand different perspectives in regards to all things that encompass leadership.

Future Plans/Advice to Others

We plan to continue utilizing industry mentors in future sections of this course. It is recommended that you allow for additional and longer mentoring sessions. Many of the mentors mentioned the challenge of hearing and seeing all students during the meetings as each student group shared one laptop. In the future, we will encourage each student to bring their own device to better facilitate “face-to-face” interactions. We will also explore the options to connect in person versus remote, although that will depend on if mentors are local. Last, we found connecting with the mentors was a unique way to build connections between our college and the agriculture and natural resource industry. In the future, we plan to think of innovative ways to nurture these relationships to better serve our students and college.

Costs/Resources Needed

There are no monetary expenses required to carry out the implementation of our idea. However, it is important to mention that this execution does take time to organize. This time is dedicated to obtaining a mentor list, selecting mentors, communication with mentors (via email and potentially telephone), and assigning mentors to students with similar majors. Additionally, it is important to note that in order to facilitate this idea, a highly suggested resource would include an alumni database with contact information, allowing instructors from educational organizations to connect with their alumni.

References

Clayton, J. K., Sanzo, K. L., & Myran, S. (2013). Understanding mentoring in leadership development: Perspectives of district administrators and aspiring leaders. *Journal of Research on Leadership Education*, *8*(1), 77-96.

Cornelius, V., Wood, L., & Lai, J. (2016). Implementation and evaluation of a formal academic-peer-mentoring programme in higher education. *Active Learning in Higher Education*, *17*(3), 193-205.

Kouzes, J. M., & Posner, B. Z. (2018). *The student leadership challenge*. John Wiley & Sons.

Lester, A. M., Goodloe, C. L., Johnson, H. E., & Deutsch, N. L. (2019). Understanding mutuality: Unpacking relational processes in youth mentoring relationships. *Journal of community psychology*, *47*(1), 147-162.

Lunsford, L. G., Crisp, G., Dolan, E. L., & Wuetherick, B. (2017). Mentoring in higher education. *The SAGE handbook of mentoring*, *20*, 316-334.

"Putting Myself in my Employer's Shoes:" Implementing Target User Personas for Personal Portfolio Website Creation in the Agricultural Communications Classroom

Kindle Catching
Graduate Student
Department of Agricultural Education and Communications
Texas Tech University
Kindle.catching@ttu.edu

Laura Fischer, Ph.D.
Assistant Professor
Department of Agricultural Education and Communications
Texas Tech University
Laura.fischer@ttu.edu

"Putting Myself in my Employer's Shoes:" Implementing Target User Personas for Personal Portfolio Website Creation in the Agricultural Communications Classroom

Introduction & Need for Innovation

Emerging agricultural communications professionals need to be prepared with the skills required for effective web design when going into the workforce (Irlbeck & Akers, 2009; Leal, 2016). To create an impactful website, a target audience should be identified to address the user's needs (Fenton & Lee, 2014). However, students often struggle with defining who an audience is for their websites, specifically a personal professional portfolio site. When the target audience is not specified, web designers can put out limitless content with no boundaries that ultimately drive the user away (Miaskiewicz & Kozar, 2011; Rhoades et al., 2007). One way agricultural communicators can tailor their website content is through understanding their audience and creating a user persona. A user persona has been defined as an idealized representation of a person that represents the needs of a larger audience (Faller, 2019). User personas give the creator an opportunity to give life to the website's potential user and develop a product that successfully meets their needs (Maze, n.d.).

Within the industry, practitioners have shown the need for creating user persona profiles that outline key motivations, demographics, concerns, and expectations that are shown on a persona (Faller, 2019). To fulfill this need, an assignment was created for students to create user personas to highlight their motivations and behaviors to inform the content that they should develop. By conducting research and creating a persona, website creation can be more strategic by having specific needs addressed to produce an effective product for the user's desires (Canziba, 2018).

How it Works

Throughout the semester, students in an agricultural communications web design course are tasked with developing a personal professional portfolio site. In one activity, students were asked to think critically about potential users for their portfolio site (i.e., potential employers) and develop a user persona that exemplifies a potential employer. To do so, students were first tasked with finding and submitting a job description for their 'dream' job or internship. Then, students were tasked with conducting research to further understand the type of people who may hire them into this role including general demographic information, behaviors, motivations, frustrations, and needs for a potential hire (i.e., professional interests, skills needed to fulfill this role, problems that need solving, etc). After considering these ideas, students were asked to develop a visual user persona demonstrating a hypothetical person that might hire them after graduation or for an internship. Students were expected to create a one-page visual outlining a user whose goals and characteristics represented the needs of their future employers through pictures, icons, and graphics. After, students were asked to reflect about how this activity helped them to learn about potential users for their site through the following questions: 1) how did this exercise help you to think about what a potential employer would need to view on your website, 2) what are essential pieces of content that you could place on your site?, 3) what is one word that you would like your persona to walk away from your website with, and 4) how does it relate to your overall goal?

Results to Date/Implication

The reflection required at the end of this assignment provided the results for this abstract. It was found that the formation of a user persona was a constructive step in the website creation process, allowing students to critically think about who their target audience is. This activity also empowered students to choose a theme to convey through the content placed on their site.

Students suggested this assignment allowed them to *put themselves in their employer's shoes* as a recurring theme. One student mentioned, "This exercise required me to put myself in my employer's shoes, which proved beneficial." Another student indicated, "I was able to conduct research that showed what an employer is really looking for rather than what I think they're looking for." Students also expressed how important it is to *understand their user's needs to create their content accordingly.* One student stated, "Knowing these things about a future employer would allow you a leg up by catering to the specific user through their specific interests and age." Furthermore, students indicated how creating a persona for their potential employer made them *more aware of what the overall goal of their website should be.* They said, "This exercise caused me to think more intentionally about the ultimate purpose of my portfolio website and shifted my experience from what I want to include on my website to what my employer needs to see on my website." Finally, students chose one word that they would like their persona to walk away from their website with. Emergent words included confident and genuine. One student said, "I want them to have confidence in me as an individual as well as confidence in their decision to hire me for the position." Another student stated, "I hope that through my site people are able to see my relationship-oriented values and my passion for working and serving others."

Future Plans/Advice to Others

Identifying and understanding the target audience is an important step when teaching students how to build an effective online personal portfolio or other websites. Instructors should highlight this portion of the web design process by providing lecture material focused on audience analysis and developing user personas. We recommend instructors give students examples of potential job/internship descriptions and persona templates with vivid details that can be developed in Canva or Adobe software. Templates should include details such as the students' potential job title along with pain points and motivations of the user that portray a clear picture of their needs. Additionally, instructors should plan ample time for students to complete two personas so that they can gain an appreciation for the multiple types of users who may be visiting their site.

Cost/Resources

Implementing this assignment for students is free and does not require any additional external resources. Students should already be equipped with the essential materials needed to conduct research for job descriptions to meet professional goals and design a persona for a potential employer, such as laptops and internet access. However, plenty of time should be allotted for instructors and students to work through any questions and for students to think critically about their projects.

References

Canziba. (2018). *Hands-on UX design for developers: Design, prototype, and implement compelling user experiences from scratch* (1st edition). Packt.

Faller, P. (2019). Putting personas to work in UX design: What they are and why they're important. *Adobe XD.* https://xd.adobe.com/ideas/process/user-research/putting-personas-to-work-in-ux-design/

Fenton, N., & Lee, K.K. (2014). *Nicely Said: Writing for the web with style and purpose.* Peachpit Press.

Irlbeck, E.G., & Akers, C. (2009). Employers' perceptions of recent agricultural communications graduates' workplace habits and communications skills. *Journal of Agricultural Education*, *50*(4), 63-71. https://doi.org/10.5032/jae.2009.04063

Leal, A. (2016). *Career readiness of agricultural communication baccalaureate graduates: A three-tiered perspective* (Publication No. 10299002) [Doctoral dissertation, University of Florida]. ProQuest Dissertations Publishing. https://www.proquest.com/dissertations-theses/career-readiness-agricultural-communication/docview/1847946845/se-2

Miaskiewicz, T., & Kozar, K. A. (2011). Personas and user-centered design: How can personas benefit product design processes? *Design Studies*, *32*(5), 417-430. https://doi.org/10.1016/j.destud.2011.03.003

Rhoades, E., Chodil, K., & Irani, T. (2007). Effective first impressions online: A case study of working with industry professionals to analyze web site usability. *Journal of Applied Communications*, *91*(1). https://doi.org/10.4148/1051-0834.1256

Maze (n.d.) User personas: Your guide to building personas for UX. https://maze.co/guides/user-personas/

The Art and Science of Agriculture: Building Preservice Teachers' Capacity to Engage in Interdisciplinary Education

Jessica Myschisin
The Pennsylvania State University
724-859-9954
jrm7133@psu.edu

Kevin Wylie Curry, Jr.
Assistant Professor
The Pennsylvania State University
814-863-7069
kxc554@psu.edu

Department of Agricultural Economics, Sociology, and Education
211 Ferguson Building
University Park, PA 16802

The Art and Science of Agriculture: Building Preservice Teachers' Capacity to Engage in Interdisciplinary Education

Introduction

The interdisciplinary approach has evolved as an important and challenging technique used by educators in the modern education curriculum (Jones, 2010). Interdisciplinary techniques synthesize multiple disciplines and generate teams of teachers and students to advance critical thinking, communication, creativity, and pedagogy (Jones, 2010). One successful approach to interdisciplinarity involves the combination of the rigors of science with the creativity of art (Colucci-Gray et al., 2017; Jeffries & Jeffries, 2022). Merging the disciplines of art and science have increased innovation among teachers and students, improved students' cognitive scores, and motivated students to further pursue the study of science (Colucci-Gray et al., 2017; Jeffries & Jeffries, 2022). Arts integration encourages greater understanding across disciplines and supports authentic experiences that engage students (National Art Education Association, 2021). Arts integration also provides multiple modes of learning, while fostering creativity and personal interpretation of topics and ideas (National Art Education Association, 2021). To increase arts integration and enhance interdisciplinary education, preservice teachers should be provided opportunities to explore the possibilities for integrating curriculum, encouraging student inquiry, and reflecting on pedagogical practices (Pool et al., 2011).

How It Works

All students enrolled in the Agricultural Education major at The Pennsylvania State University are required to participate in a pre-internship seminar prior to their semester-long student teaching experience. During the pre-internship seminar, the preservice agricultural education teachers engage in a variety of workshops, covering topics such as financial literacy and innovative teaching methods. At the most recent pre-internship seminar in January of 2023, a graduate student at The Pennsylvania State University led a workshop pertaining to arts integration. The arts integration workshop was designed to have the current preservice agricultural education teachers (1) identify ways to integrate art into their teaching and (2) explore the benefits of arts integration. The workshop utilized a presentation and various hands-on activities to introduce important content and engage the workshop participants.

The first part of the workshop prompted participants to consider and identify similarities between the disciplines of science, specifically the agricultural sciences, and art. The workshop participants discussed how science and art promote inquiry, exploration, discovery, analysis, and invention. In the second portion of the workshop, the participants were provided images of eight different items, such as cyanotype paper and a microscope, and were tasked with using those items to design an arts-based activity that could be implemented into an agricultural education lesson. The graduate student leading the workshop shared examples with participants, demonstrating how they could utilize different materials to integrate art-related projects and activities into their teaching. The most critical part of the workshop provided participants the opportunity to develop arts-based project ideas that they could implement during their student teaching experience or in their future career as an agricultural educator. The participants were provided a unit topic, such as sustainable landscaping or woodworking, and were asked to develop a lesson that integrates art. All of the participants worked with a partner and were required to include lesson objectives, align their lesson with the Agriculture, Food and Natural Resources (AFNR) Career Cluster Content Standards and the Common Core State Standards, and incorporate either a fundraising or community component. Each group had the opportunity to share their lesson with the other participants. The arts integration workshop concluded with a discussion centered around the benefits of arts integration, the importance of interdisciplinary education, and the resources that are available to help educators integrate art into their teaching.

Results to Date

A total of twelve preservice agricultural education teachers from The Pennsylvania State University participated in the arts integration workshop during their pre-internship seminar. The positive verbal feedback communicated by the participants and the positive evaluation survey results indicated that the workshop was both educational and engaging. According to the evaluation survey results, all twelve participants indicated that they found the workshop useful for their professional objectives. Additionally, all twelve participants indicated that they are likely to implement the techniques learnt during the workshop in their student teaching experiences. Similarly, eleven of the twelve participants indicated that they are likely to implement the techniques learnt during the workshop in their future careers. The workshop participants stated that they learned how arts integration can enhance creativity, increase interdisciplinary education, promote partnerships and collaboration, and help educators reach broader audiences. All the participants stated that a similar workshop or activity should be organized for future cohorts of preservice agricultural education teachers. Overall, the arts integration workshop offered participants the opportunity to explore the benefits of integrating art into their agricultural education curriculum and provided them the space to develop lesson plans and project ideas that promote interdisciplinary education.

Future Plans

The positive feedback provided by the participants and their suggestion to organize and deliver a similar workshop for future cohorts of preservice agricultural education teachers has initiated the planning of future arts-related workshops and activities. By providing similar workshops during future pre-internship seminars, future agricultural education teachers can hopefully understand the benefits of arts integration, incorporate art into their curriculum, and demonstrate effective strategies for interdisciplinary teaching and learning. Future qualitative research could be conducted to determine if the workshop participants incorporated any arts-integration activities or lessons into their student teaching experiences or careers.

Costs/Resources Needed

The graduate student who led the arts integration workshop invested a considerable amount of time and energy into the design, preparation, and delivery of the workshop. The only required resources necessary for the workshop included a Microsoft PowerPoint presentation, paper, and pencils. However, each participant was also provided a sheet of cyanotype paper at the conclusion of the workshop for experimentation purposes. The cost of all workshop supplies totaled approximately $30.

References

Colucci-Gray, L., Trowsdale, J., Cooke, C. F., Davies, R., Burnard, P., & Gray, D. S. (2017). Reviewing the potential and challenges of developing STEAM education through creative pedagogies for 21st learning: how can school curricula be broadened towards a more responsive, dynamic, and inclusive form of education?.

Jefferies, L.R., Jefferies, S.S. (2022). Biochemistry and Art: Incorporating Drawings, Paintings, Music, and Media into Teaching Biological Science. In: Pelaez, N.J., Gardner, S.M., Anderson, T.R. (eds) Trends in Teaching Experimentation in the Life Sciences. Contributions from Biology Education Research. Springer, Cham. https://doi.org/10.1007/978-3-030-98592-9_23

Jones, C. (2010). Interdisciplinary approach – Advantages, disadvantages, and the future benefits of interdisciplinary studies. *ESSAI*, *7*(26), 76-81. https://dc.cod.edu/essai/vol7/iss1/26

National Art Education Association. (2021). *NAEA position statement on arts integration*. https://www.arteducators.org/advocacy-policy/articles/499-naea-position-statement-on-arts-integration#:~:text=Arts%20integration%20builds%20greater%20understanding,interpretation%20of%20ideas%20and%20topics.

Pool, J., Dittrich, C., & Pool, K. (2011). Arts integration in teacher preparation: Teaching the teachers. *Journal for Learning through the Arts*, *7*(1).

Under/Grad Research: Establishing a Ph.D. Research Mentoring Program

Amanda M. Bowling, Assistant Professor
bowling.175@osu.edu

Hannah C. Parker, Ph.D. Student
parker.1654@osu.edu

Erica D. Summerfield, Ph.D. Student
summerfield.18@osu.edu

Colby Gregg, Ph.D. Candidate
gregg.186@osu.edu

Annie Specht, Associate Professor
specht.21@osu.edu

The Ohio State University
Department of Agricultural Communication, Education, and Leadership
200 Agricultural Administration Building
2120 Fyffe Road, Columbus, OH 43210
614-292-6909

Introduction/Need for Innovation or Idea

Students who conduct an undergraduate research project can experience numerous benefits including increased faculty and student interactions, academic confidence, understanding and awareness of the subject area, understanding of and efficacy in the research process, and awareness of what graduate school is like (Adedokun et al., 2013; Bowman & Holmes, 2017; Russell et al., 2007). However, very few students in the Department of Agricultural Communication, Education, and Leadership (ACEL) at The Ohio State University pursue undergraduate research experiences.

Research can be a novel and complex concept for undergraduates and often the mentorship of undergraduate researchers falls to the academic/research faculty advisor. In their analysis of best practices for undergraduate-research mentors, Shanahan et al. (2015) identified developing the mentorship skills of graduate students as a key undertaking for faculty members engaged in the practice. Like faculty mentors, graduate students can create a sense of community within their research groups, model the characteristics of successful researchers, and help undergraduates make deeper connections through the research process (Shanahan et al., 2015). Additionally, Dolan and Johnson (2009) found that graduate/postdoctoral research mentors experienced an increase in research productivity, mentoring and/or communication skills, and in their understanding of being a scientist in academia. As potential future faculty members, doctoral students are ideal candidates to engage in undergraduate-research mentorship (Anekstein & Vereen, 2018).

To help increase the number of undergraduate students conducting research and lessen faculty workload when mentoring undergraduate researchers, the ACEL Ph.D. Research Mentoring Program was created. Through this program, undergraduate researchers were able to add another mentor to their research team. The mentorship program also provided ACEL Ph.D. students the opportunity to enhance their research skills through teaching and mentoring with the potential to reduce the workload of faculty advisors.

How It Works

The ACEL Ph.D. Research Mentoring Program was intended for Ph.D. students who did not have a paid research assistantship that might have included working with undergraduate students. Through this program doctoral students could mentor undergraduate students as they conceptualized, conducted, and disseminated a research project.

The doctoral student would mentor the undergraduate researcher in conjunction with the undergraduate student's faculty/research advisor. The faculty/research advisor and Ph.D. student would work together to determine what the mentor responsibilities would comprise based on the needs of the undergraduate student(s) and the research team dynamics. No formal guidelines were established through the program to dictate what the mentor responsibilities should consist of to allow for flexibility and autonomy of the research team.

The Ph.D. student was responsible for notifying the department's Undergraduate Research Coordinator when the research team was formed. The Ph.D. student also notified the coordinator, through a signed form, when the research was to be disseminated/completed. At the completion or dissemination point the Ph.D. was provided a $200 stipend for their mentorship.

Results to Date/Implications

To date, three Ph.D. students mentored six undergraduate researchers through project completion. The mentored undergraduate research projects have resulted in one university-wide, three college-wide, one state-wide, one regional presentation, and one national conference accepted poster.

Taking an active role in the mentoring process provided experiential learning opportunities that supported and built upon the Ph.D. students' prior research knowledge and experiences. They were able to guide the undergraduates as they reviewed literature to form the research problem, aligned their research problem with theory, and designed methods to address the study's purpose. The Ph.D. students also trained and supervised their mentees through data collection and analysis to help the undergraduate students summarize their findings, implications, and recommendations. Additionally, the Ph.D. students gained a better understanding of the research advising and mentoring process, which might better prepare them for future careers in academia. The doctoral students were able to work through establishing rapport with undergraduate researchers, fulfilling a variety of roles including coach and motivator. Further, the Ph.D. students worked through setting individual and team expectations, managing project deadlines, coordinating research meetings, and providing feedback on research progress. The Ph.D. students gained a better appreciation for the advising process through the ACEL Ph.D. Research Mentoring Program as noted through reflective conversations between the Ph.D. students and their graduate advisers. Of note, one Ph.D. student said that "I feel like I was able to create expectations for myself as an advisor" when reflecting on the benefits they took away from serving as a mentor. Finally, the program helped reduce the workload of faculty advisors. Faculty advisors still provided guidance throughout the research process, but the time required of them was greatly reduced as the Ph.D. students took the lead on advising the undergraduate researchers.

Future Plans/Advice to Others

The ACEL department plans to continue supporting undergraduate researchers' mentorship through a team approach that includes both faculty and doctoral students. We currently have two Ph.D. students mentoring two undergraduate researchers on two separate projects. As departments consider providing research mentorship opportunities to Ph.D. students, we recommend developing a formal mentorship program to connect interested Ph.D. students to this opportunity to form a research team and mentor an undergraduate researcher while also being compensated. Further, early in the mentorship process, we recommend that the team establish a meeting schedule and the roles and responsibilities of all team members. In establishing the meeting schedule, we recommend that specific time be dedicated to discussing mentoring strategies, research methods and design, and the project progress between the faculty member and Ph.D. student.

Cost/Resources Needed

Ph.D. mentors were awarded a $200 stipend at the dissemination point or completion of the research project as part of the ACEL Ph.D. Research Mentoring Program. While a monetary incentive is not necessary, we deemed it appropriate to compensate the doctoral students for their time and guidance.

References

Adedokun, O. A., Bessenbacher, A. B., Parker, L. C., Kirkham, L. L., & Burgess, W. D. (2013). Research skills and STEM undergraduate research students' aspirations for research careers: Mediating effects of research self-efficacy. *Journal of Research in Science teaching*, *50*(8), 940-951.

Anekstein, A. M., & Vereen, L. G. (2018). Research Mentorship: Implications for the Preparation of Doctoral Students. *Journal of Counselor Preparation and Supervision, 11*(2). Retrieved from https://digitalcommons.sacredheart.edu/jcps/vol11/iss2/6

Bowman, N. A., & Holmes, J. M. (2018). Getting off to a good start? First-year undergraduate research experiences and student outcomes. *Higher Education*, *76*(1), 17-33.

Dolan, E., & Johnson, D. (2009). Toward a holistic view of undergraduate research experiences: An exploratory study of impact on graduate/postdoctoral mentors. *Journal of Science Education and Technology, 18*, 487–500. https://doi.org/10.1007/s10956-009-9165-3

Russell, S. H., Hancock, M. P., & McCullough, J. (2007). Benefits of undergraduate research experiences. *Science, 316,* 548-549.

Shanahan, J. O., Ackley-Holbrook, E., Hall, E., Stewart, K., & Walkington, H. (2015). Ten salient practices of undergraduate research mentors: A review of the literature. *Mentoring & Tutoring: Partnership in Learning*, *23*(5) 359–376. http://dx.doi.org/10.1080/13611267.2015.1126162

Voice and Choice: Learning Expression Choice Boards for Learning Reflection

Nicole Ray
Fresno State University
Department of Animal Sciences and Ag Education
2415 E. San Ramon Ave. M/S AS 75
Fresno, CA 93740-8033
(559) 901-8516
nicoleray@mail.fresnostate.edu

Robert Strong, Jr.
Texas A&M University
Department of Agricultural Leadership, Education, and Communications
Agriculture and Life Sciences Bldg Suite 267
College Station, TX 77843-2116
(979) 845-1139
robert.strongjr@ag.tamu.edu

Voice and Choice: Learning Expression Choice Boards for Learning Reflection

Introduction/Need for innovation

Learning expression choice boards can be part of transformational learning experiences when employed as a vehicle for application following reflection, learning, and class discussion (Mezirow & Taylor, 2009; Schnepfleitner & Ferreira, 2021). The intention to implement learning expression choice boards was representative of two goals. Goal 1: provide an opportunity for post-secondary preservice teachers to engage in weekly reflection on their learning in a way that honors them as individuals while still meeting instructors' learning outcomes. Goal 2: expose preservice teachers to universal design for learning (UDL) methodology to promote implementation of UDL in their future classrooms. The innovative idea aligns with priority 4, meeting student needs and interests, of the *AAAE National Research Agenda* (Edgar et al., 2016).

Learner variability can be a barrier for designing and implementing meaningful learning experiences in coursework in post-secondary education (Ambrose et al., 2010). Roumell (2019) indicated learner variability can be accounted for through sources including individuals' unique experiences, preferences, and expectations of each individual**.** UDL can be viewed as a proactive approach to designing learning experiences with universal access for all learners (Fornauf & Erickson, 2020). Cook and Rao (2018) reported UDL guidelines provide a set of flexible options and scaffolds to ensure access for all learners.

Learning expression choice boards align with UDLs multiple means of engagement. Choice Boards complement learners' self-concept and consideration of learners' life experiences (Knowles et al., 2015), and are considered a universal design by CAST (2018). Choice Boards are representative of UDL checkpoint 7.1, as the expressions board allows students to identify the media they'd like to use to express their learning. Further, it provides learners the opportunity to connect what they've learned to their life, which is supportive of UDL Checkpoint 7.2. Because learners determine the way they'd like to express their learning, they get to determine what scaffolds or tools they'd need to support their success as suggested in UDL Checkpoint 8.2.

How it works

Instructors that are interested in implementing learning expression choice boards for students' reflection can do so by completing: *Step 1*: Instructors identify learning objectives, as well as desired prompts or reflection relating to the objective. *Step 2*: Students are provided with a list of options to choose from to express their learning based on the learning objectives. Examples of options might include, but are not limited to writing (RAFT writing, children's books, Q&A, newsletters), graphic design (infographics, brochures, vision boards with explanations), sketch notes, productions (video or audio recordings, public service announcements, TikToks), or propose another format to be approved by the instructor. *Step 3*: Students identify (or propose an option not listed) that allows them to express their learning in a way that aligns with the learning objective for the assignment. *Step 4*: Instructors provide feedback based on a rubric.

Learners were expected to answer two or more of the questions relating to their learning in the course topics for the week: 1) How do I connect the key points from this week? Why? 2) How can I apply what's been learned to my life now and/or my future career? Why? 3) What resonated with you? Why? 4) What affirmed your thinking? Why? 5) What questions or challenges do you have to the topics covered? Why?

Results to date/Implications

Goal 1) In a face-to-face undergraduate course of preservice teachers (*N*=59), learners were expected to reflect each week by creating an artifact of their choosing based on the provided learning expression choice board. The artifact (or digital link) was uploaded to the learning management system for instructor review. Learning expression reflection assignments were scored on a single point rubric by the instructor; those assignments that did not meet the criteria for success, were returned to students with feedback for resubmission.

Student feedback on choice boards was positive. It was noted by the instructor that initially students choose narrative type reflections, but as the semester went on, students began to get more creative with how they expressed their learning, and many tested different ways. The expression boards provided insight into students' perceptions of course content and teaching methods. The data suggested adapting future lessons to best meet students' needs. Allowing students to express themselves in a method of their choosing provided opportunities to learn more about students as individuals which helped to develop a better teacher student relationship.

Goal 2) In anonymous Qualtrics survey, members of the class (*n*=56) were asked to indicate their level of agreement on a four-point Likert scale: 1 = *strongly disagree*, 2 = *disagree*, 3 = *agree*, and 4 = *strongly agree*. Given the statement "if I were to pursue teaching, I would try using learning expression choice boards in my classroom," 90% of the respondents reported that they agreed/strongly agreed with the statement. An ANOVA test was used to compare the intention to try choice boards and the demographic variables of class standing, transfer student status, high school dual enrollment, intended student teaching date, gender association, and GPA ($p > .05$).

Future plans/Advice

Instructors must have clear expectations of the content of the artifact, and should make the success criteria known through their rubric. Further, they must determine the types of artifacts which might be acceptable for the context of the course (see How it Works section for examples). While Canvas was used as a means of submission, alternatively Google Folders could serve as a means of sharing artifacts and creating portfolios shared between instructors and students (Ray & Strong, 2016). Finally, instructors should provide examples of different artifact types and provide opportunities for students to consider how their preferences and strengths might best be showcased. Given the participants' intention to try this innovation in their future classrooms, in combination with teachers' perceived usefulness of online networks for their professional learning (Ray et al., 2022), researchers and practitioners should consider leveraging online networks to diffuse and study the innovation with practicing and preservice teachers.

Costs/Resources

There are no direct costs associated with implementing the learning expression choice board in an existing course. Indirect costs relate to the time instructors would need to develop their acceptable formats, samples and corresponding prompts/learning questions; time to do so could be valued as a percentage of their daily rate based on hours to complete the task (varies by individual). It could be estimated as less than four hours of work.

References

Ambrose, S. A., Bridges, M. W., DiPietro, M., Lovett, M. C., & Norman, M. K. (2010). *How learning works: Seven research-based principles for smart teaching*. John Wiley & Sons.

CAST. (2018). *Universal Design for Learning Guidelines version 2.2*. https://udlguidelines.cast.org/

Cook, S. C., & Rao, K. (2018). Systematically applying UDL to effective practices for students with learning disabilities. *Learning Disability Quarterly, 41*(3), 179–191. https://doi.org/10.1177/0731948717749936

Craig, S. L., Smith, S. J., & Frey, B. B. (2022). Professional development with universal design for learning: Supporting teachers as learners to increase the implementation of UDL. *Professional Development in Education*, *48*(1), 22–37.

Edgar, D. W., Retallick, M. S., & Jones, D. (2016). Research Priority 4: Meaningful, Engaged Learning in All Environments. In Roberts, T.G., Harder, A. & Brashears, M.T. (Eds.). *American Association for Agricultural Education national research agenda: 2016-2020*. Department of Agricultural Education and Communication.

Fornauf, B. S., & Erickson, J. D. (2020). Toward an inclusive pedagogy through Universal Design for Learning in higher education: A review of the literature. *Journal of Postsecondary Education and Disability*, *33*(2), 183.

Knowles, M. S., Holton, E. F., & Swanson, R. A. (2015). *The adult learner: The definitive classic in adult education and human resource development* (8th ed.). Routledge.

Mezirow, J., & Taylor, E. W. (2009). *Transformative learning in practice: Insights from community, workplace, and higher education*. John Wiley & Sons.

Ray, N., & Strong, R. (2016). Move feedback and student learning to the forefront with Doctopus. *The Agricultural Education Magazine, 88*(6), 18-19. https://www.naae.org/profdevelopment/magazine/current_issue/May_Jun_2016.pdf

Ray, N., Strong, R., & Meyers, C. (2022). Measuring the perceived usefulness of social media professional learning networks to elevate agricultural development. *Advancements in Agricultural Development*, *3*(4), 43–56. https://doi.org/10.37433/aad.v3i4.275

Roumell, E. A. (2019). Priming adult learners for learning transfer: Beyond content and delivery. *Adult Learning*, *30*(1), 15–22.

Schnepfleitner, F. M., & Ferreira, M. P. (2021). Transformative learning theory–Is it time to add a fourth core element? *Journal of Educational Studies and Multidisciplinary Approaches*, *1*(1), 40–49.

Wakefield, M. (2018). *UDL and the learning brain*. CAST. http://www.cast.org/products-services/resources/2018/udl-learning-brain-neuroscience

Youth Mental Health First Aid Certification: Providing Resources for Preservice Teachers

Dr. Caryn Filson
The Ohio State University
200 Agricultural Administration Building
2120 Fyffe Road
Columbus, OH 43210
614-292-6909
Filson.5@osu.edu

Introduction/Need for Idea

Youth in the United States are experiencing mental illness more frequently and severely than in the past. This is coupled with a low rate of help-seeking and treatment resulting from factors such as stigma related to mental illness (McLain, 2021). Lack of mental health literacy could be one reason the stigmatization of mental illness is so pervasive and why help seeking behaviors are low among those who need it most. Mental health literacy is defined by Wei et al. (2013) as "[Encompassing] knowledge and skills that address the biological, psychological and social aspects of mental health." Mental health literacy programs have positive results when it comes to increased literacy and more positive attitudes toward mental health, building a case for these types of programs (McLain, 2021). Teachers who are well-educated on mental health topics can support student understanding related to mental health disorders, symptoms, and intervention programs (Miller et al., 2019). Given the growing need for mental health literacy, the lack of mental health education in preservice curriculums, and the unique relationships students develop with school-based agriscience education teachers, a Youth Mental Health First Aid certification program was implemented with preservice teachers entering the student teaching field experience at The Ohio State University. The objective of the certification was to utilize an existing resource to better prepare preservice teachers to manage mental health situations involving middle and high school students and to build preservice teacher confidence levels to act appropriately in a mental health crisis.

How it Works

Mental Health First Aid (MHFA) is a national curriculum created in 2000 and adopted in the United States in 2008 by the National Council, Maryland Department of Health and Mental Hygiene, and the Missouri Department of Mental Health. The curriculum is a public education program that teaches participants how to recognize signs and symptoms that suggest a potential mental health challenge. The curriculum has four courses: Youth Mental Health First Aid (YMHFA), Adult Mental Health First Aid (MHFA), Teen, and Workplace (National Council for Mental Wellbeing, 2023). The youth program teaches participants to recognize signs and symptoms of mental health challenges in youth, to apply the appropriate steps to the YMHFA action plan, and to choose appropriate methods for self-care following the application of mental health first aid.

The Youth Mental Health First Aid certification training is a two-part program with part one taking place via asynchronous instruction and the second part taking place in-person. Participants complete the asynchronous instruction on their own prior to the in-person training. The asynchronous instruction includes two hours of self-paced content organized in modules. Module topics include a pre-evaluation of knowledge, awareness of self-opinions, defining mental health, identifying risk and protective factors for experiencing mental health, and an introduction to the steps of the YMHFA action plan. The in-person component is six hours of training with two certified instructors. The in-person component reviews the asynchronous content and further develops skills for managing mental health situations through discussion and role play.

Results to Date

To date, 13 preservice teachers at The Ohio State University have completed the Youth Mental Health First Aid certification. Following certification, participants were asked to reflect on their training as a preservice teacher preparing to enter student teaching. Feedback from the preservice teachers was largely positive. Feedback included these selected comments from participant self-reflections that captured the sentiment of the overall group feedback. One preservice teacher shared, “Today I learned truly how important training on this topic is and why teachers should be trained.” A second preservice teacher expressed, “My views of being an Ag teacher have been reinforced. My own mental health is why I joined FFA and I think this training will be really beneficial when I become an Ag teacher.” Another preservice teacher commented:

> Some of the topics were challenging to talk about, some of it was pretty heavy stuff. But what I learned will help me as a future educator. Being an Ag teacher you are often a confidant for students, they are likely to open up to you rather than other teachers. We need to be prepared for anything.

Future Plans/Advice to Others

The 13 participants are currently student teaching. At the completion of the student teaching experience, there are plans to collect additional feedback on the perceived benefits of the training after the participants have been immersed in a classroom environment with students, and potentially applied the training in real situations. This feedback will be taken into consideration for implementing the certification program with future preservice teachers.

Other future considerations include implementing the Youth Mental Health First Aid training for junior cohorts of preservice teachers and implementing the Adult Mental Health First Aid training for senior cohorts of preservice teachers. The youth training focuses more on the introduction of mental health and the action plan to follow when assisting with a mental health challenge. The adult training goes into more depth with the training and scaffolds from the youth curriculum to provide more comprehensive content and training exercises. Providing more opportunities for preservice teachers to engage with mental health literacy may enhance confidence and skills of future educators.

It is recommended when implementing the Youth Mental Health First Aid training with preservice teachers, that the facilitator discloses to participants prior to the training that some content and discussions may be triggering. Additionally, introducing the topic of mental health and the impact of mental health on students would be helpful to set the context for the importance and need for the training. Lastly, providing an opportunity for reflection is critical. Due to the sensitive and heavy nature of the content, an opportunity for reflection, both individual and group, may help students process the experience.

Costs/Resources Needed

The cost to register for the Youth Mental Health First Aid is $75 per person; Adult Mental Health First Aid registration is $115 per person. The costs for the certified instructors and curriculum resources for participants in this situation were covered for the teacher preparation program through a collaboration with Ohio State University Extension. OSU Extension received a grant to provide trainings across the state. Dinner and snacks were provided for the preservice teachers during the in-person trainings by the teacher licensure program. Additionally, a room is needed for the in-person training that is conducive for active learning strategies and role play.

References

McLain, S. R. (2021). *Ohio FFA State Officer Experiences with Mental Health Topics in Ohio Agricultural Education Programs* [Master's thesis, Ohio State University]. OhioLINK Electronic Theses and Dissertations Center. http://rave.ohiolink.edu/etdc/view?acc_num=osu1619028482043487

Miller, L., Musci, R., D'Agati, D., Alfes, C., Beaudry, M. B., Swartz, K., & Wilcox, H. (2019). Teacher Mental Health Literacy is Associated with Student Literacy in the Adolescent Depression Awareness Program. *School Mental Health*, *11*(2), 357–363. https://doi.org/10.1007/s12310-018-9281-4

National Council for Mental Wellbeing. (2023). *Mental Health First Aid.* Retrieved February 20, 2023, from https://www.mentalhealthfirstaid.org

Wei, Y., Hayden, J. A., Kutcher, S., Zygmunt, A., & McGrath, P. (2013). The effectiveness of school mental health literacy programs to address knowledge, attitudes and help seeking among youth. *Early Intervention in Psychiatry*, *7*(2), 109–121. https://doi.org/10.1111/eip.12010

A Cross-disciplinary Approach to Agricultural Literacy at the Middle School Level: "Growing" Interest in Social Studies & Science Students

K. Dale Layfield
256 McAdams Hall
Clemson, SC 29634
(864) 656-5676
dlayfie@clemson.edu

Paul Johnson
4757 Mount Gallant Rd
Rock Hill, SC 29732
(803) 985-1700
pcjohnson@rhmail.org

Joe Brandt
4757 Mount Gallant Rd
Rock Hill, SC 29732
(803) 985-1700
jbrandt@rhmail.org

Cameron Ramsey
2399 West Main Street
Rock Hill, SC 29732
Phone: (803) 981-1100
cramsey@rhmail.org

Audie Cherry
153 McAdams Hall
Clemson, SC 29634
(270) 635-2371
audiec@g.clemson.edu

Joseph L. Donaldson
2223-D Broughton Hall
Raleigh, NC 27695-7607
(919) 515-1758
joseph_donaldson@ncsu.edu

Christopher J. Eck
457 Agricultural Hall
Stillwater, OK 74078
(405) 744-8027
chris.eck@okstate.edu

Beatrice Bailey
232 McAdams Hall
Clemson, SC 29634
(864) 656-3250
cbeatri@clemson.edu

A Cross-disciplinary Approach to Agricultural Literacy at the Middle School Level: "Growing" Interest in Social Studies & Science Students

Introduction/Need for Innovation

There are more than 98,000 public schools nationwide, serving students from pre-kindergarten through high school (NCES, 2022). Of those, only 8,817 offer school-based agricultural education (SBAE) programs (National FFA Organization, 2023), causing an insufficient number of youths seeking careers in food and agricultural sciences (USDA, 2022). Therefore, it is essential to develop creative means to reach additional students and increase the diversity of those seeking agricultural careers at the same time. One option is focusing on agricultural literacy tools with non-ag students, such as the National Agricultural Literacy Outcomes (NALO; Spielmaker & Leising, 2013). Additionally, the majority of SBAE programs are at the secondary level, creating a large need for middle school students to be exposed to agriculture. Moreover, three of the five themes in the NALO align with South Carolina's middle school curricula across science and social studies.

A cross-disciplinary approach in middle schools, linking science, social studies, and agricultural programs, is suggested to increase students' agricultural literacy. As our world continues to grow more complex and multidimensional, educators must look to an increase in collaboration amongst disciplines to move toward a more sustainable future (Galvão et al., 2021). When teachers integrate curriculum and collaborate, students are more successful. Due to positive implications of collaboration across disciplines and curriculum, programs need to be developed to facilitate and provide the necessary affective support (Nguyen & Nguyen, 2020) for professional collaboration and increased student learning. Studies of Occupations, Culture, and Innovations toward Agricultural Literacy (SOCIAL): Professional Development for Integrating Agriculture and History Curricula is a program funded by USDA-NIFA, from which one of the fellows returned home and engaged his science teacher to create *Big Water*, a cross-disciplinary program at Dutchman Creek Middle School in South Carolina that was partially funded by the SOCIAL project.

Program Phases/Steps

Big Water was conceived and implemented by three teachers, representing science, social studies, and agriculture. *Big Water* engages students in a multi-phase project that has the objective of initiating students' interest in agricultural careers. In phase 1 of *Big Water,* the students built and programmed multiple Arduino-controlled watering systems. Each system contained sensors that detect soil moisture levels, which then activated the Arduino system to automatically pump water to the pots with milkweed seeds provided by the SBAE teacher.

Phase 2 included a variety of experiments planned by the students under the direction of the science teacher. Students recorded their findings in Google Sheets/Docs. Phase 3 included a visit to a local technology center, where the middle school students learned about various careers in agriculture and natural resources from an SBAE teacher and FFA members.

In phase 4, students constructed raised-bed keyhole gardens in pre-determined locations around the school. For phase 5, milkweed plants were grown to the appropriate size and then planted into the keyhole gardens. Throughout the school year, publicity efforts were coordinated with school officials, English teachers, and career center personnel.

Throughout the phases of the project, the social studies teacher engaged the students in three topics related to the research: 1) *Economic Development*, where students explored the impact of water conservation on economic development in South Carolina; 2) *Technological Innovation*, where students investigated the role of technological innovation in transforming South Carolina's economy, from the Great Depression to the present day, and 3) *Economic Diversification*, where students explored how water conservation and sustainable practices can promote economic diversification in South Carolina.

Results to Date

The self-watering systems are in place and fully operational. Students from the science and social studies classes are involved in a variety of tasks supporting the *Big Water* project on a daily basis. They are conducting various experiments on the system, and some students are assigned to maintain the system's water levels and collect data, too.

When visited by faculty from Clemson University, a variety of those students were available to explain their engagement and share records they've collected in Google Sheets/Docs. To gain widespread interest from the students throughout the school, volunteer teachers across all disciplines were secured to serve as fosters for the plants/watering systems. Students constructed the keyhole gardens in pre-planned locations around the middle school and milkweed plants were transferred to the pollinator keyhole gardens.

Future Plans/Advice to Others

In the upcoming year, students will continue maintenance of the milkweed plants in the keyhole raised bed gardens. Under the guidance of the science teachers, they will monitor and record pollinator attraction and tag Monarch butterflies for research purposes. Also, the teachers in this project are looking into ways of generating revenue to make *Big Water* a district-wide activity. An evaluation is underway to understand how perceptions of food and agricultural careers may have changed due to this effort.

Advice for others wishing to replicate this project include organizing a committee of leaders at the beginning of the school year and assigning specific tasks to each member. It is imperative that the local SBAE teacher and principal are engaged at the onset of the planning. It is also recommended that plans accommodate the students' submission of their work for local science fairs. Since SBAE programs are not available in every school, other content area teachers could work collaboratively to integrate such a project, but it is recommended that guidance from an SBAE teacher or industry professional is sought out to help provide the appropriate connections.

Costs/Resources Needed

The supply costs per each unit for the *Big Water* project includes: WayinTop Automatic Irrigation DIY Kit Self Watering System - $30.59; water and related containers, and pots for plants - $10; a BBC keyhole garden - $169.95; a USB power adapter to support the Arduino controller and water pumps - $5, and ½ pack of milkweed seeds - $2.50/pack. It is recommended that two teachers work together on this project. Each teacher will spend three hours per week throughout the school year in planning and engaging staff and students. This is in addition to the estimated time to build one self-watering station, which is six hours.

A Windows computer is also required to code the Arduino chip for each of the systems. Although a guide for programming is included with the kit, it is recommended that someone with programming skills be available for consulting purposes. Students maintain their *Big Water* scientific observations in Google Sheets and Google Docs, so they will need access to Chromebooks or a computer with Internet access.

References

Galvão, C., Faria, C., Viegas, W., Branco, A., & Goulão, L. (2021). Inquiry in higher education for sustainable development: crossing disciplinary knowledge boundaries. *International Journal of Sustainability in Higher Education*, *22*(2), 291–307. https://doi.org/10.1108/IJSHE-02-2020-0068

National Center for Educational Statistics [NCES]. (2022). *Fast Facts: Educational Institutions*. https://nces.ed.gov/fastfacts/display.asp?id=84

National FFA Organization. (2023). *FFA Statistics*. https://www.ffa.org/statistics/

Nguyen, D., & Ng, D. (2020). Teacher collaboration for change: Sharing, improving, and spreading. *Professional development in education*, *46*(4), 638–651. https://doi.org/10.1080/19415257.2020.1787206

Spielmaker, D. M., & Leising, J. G. (2013). National agricultural literacy outcomes. Logan, UT: Utah State University, School of Applied Sciences & Technology. Retrieved from http://agclassroom.org/teacher/matrix

United States Department of Agriculture [USDA]. (2022). Farm Labor. https://www.ers.usda.gov/topics/farm-economy/farm-labor/

A Model for Cannabis Education: A Land-Grant Tribal College and Private University Partnership

Blake C. Colclasure
Doane University
1014 Boswell Ave.
Crete, NE 68333
(402) 826-6728
blake.colclasure@doane.edu

Introduction

The cannabis industry in the United States has seen extensive growth in the last several years, stemming from recent federal and state legalizations of varying forms of cannabis. The 2018 Farm Bill federally legalized the cultivation and processing of hemp (USDA, 2019), a version of cannabis with 0.3% or less tetrahydrocannabinol (THC). Marijuana, classified as cannabis with more than 0.3% THC, has become legalized in many states. The use of medical marijuana is now legal in a majority of states and adult-use or recreational marijuana has been legalized in 18 states (Mayorquinn, 2022). This legalization has led to U.S. hemp sales surpassing $820 million in 2021 (USDA, 2022), and the U.S. marijuana industry accounting for an impressive $14 billion in sales during 2019 (Marijuana Business Daily, 2019). However, the unprecedented growth of the cannabis industry has led to a severe shortage of qualified workers. Educational programming and workforce development on cannabis is needed (Black, 2020; Reid et al., 2022). Many institutions of higher education are rushing to fill this gap, as can be indicated by over 75 institutions offering cannabis-related programs in 2022 (Cornwell, 2022). Black (2020) argued that cannabis education must be innovative and nimble to navigate the complex and rapidly changing industry. Unique partnerships between institutions of higher education and between the cannabis industry can foster educational programming to meet the needs of those desiring credentials to enter the cannabis workforce. This innovative idea submission describes a partnership between Doane University, a private liberal arts university, and Little Priest Tribal College, a Land-Grant College in Nebraska, to develop and deliver cannabis education and credentials. The lens of this discussion will gravitate toward the experiences of the author on teaching one of the courses in the program - Hemp Cultivation.

How it Works

Doane University and Little Priest Tribal College formed a partnership to deliver seven unique online cannabis courses in hemp cultivation, testing, regulation, processing, and more (McCue, 2021). These online courses are taught by faculty at Doane University and are open to students from both institutions. Students from Little Priest Tribal College completing these online courses and other general education courses offered by the college, receive an Associate in Applied Science in Cannabis Studies Degree. Loretta Broberg, vice president of teaching and learning at Little Priest Tribal College, described the benefits of the partnership by stating, “students will be able to apply the newly acquired skills, as future jobs within the tribal community develop and to support Ho-Chunk Farms hemp production … we can become leaders in the hemp industry in Nebraska and nationwide” (McCue, 2021). To better illustrate how the program works, the author of this submission provides a detailed look into the hemp cultivation course they teach within the program.

The hemp cultivation course was designed to meet the needs of students from both institutions. Students from these two institutions take the 16-week course online at the same time within the Canvas Learning Management System (LMS). The course is broken down into 8, 2-week learning modules that include: (1) introduction to hemp; (2) soil and nutrient fundamentals; (3) the growing environment; (4) propagation and monitoring the crop; (5) common pests in hemp production; (6) integrated pest management; (7) harvesting and storing hemp; and, (8) the future of cannabis as an agricultural commodity. Each module includes short recorded lectures, discussion boards, readings, and a low-stakes quiz. The crux of the course includes four project assignments that require students to design a hemp cultivation plan from site selection through harvest. Students first identify the targeted hemp product (cannabinoids, fiber, grain, dual-purpose) for their growing operation. For each project assignment, students complete a draft and peer-review, and receive detailed feedback from the instructor. The assignments build upon each other, and for the final project, students combine assignments 1 through 4 to submit a polished hemp cultivation plan. The course is also designed with cultural relevance in mind. Students have the opportunity to design their hemp cultivation plans in ways that adhere to cultural norms and practices.

Results to Date and Implications

The partnership between Little Priest Tribal College and Doane University is in its second year. The hemp cultivation course completed its second year of running. In the spring 2022 semester, 21 students took the course (10 students from Little Priest Tribal College and 11 from Doane University). A total of 19 students completed the course in spring 2023 (9 students from Little Priest Tribal College and 10 from Doane University). The course has had excellent results to date. The online discussion boards provide students the option to submit video or text to specific prompts. The positive interactions between diverse students have created a unique and supportive course atmosphere. Students have enjoyed the opportunity to interact with peers who share similar interests in the hemp industry, and also have been encouraged to bring forward cultural practices and norms within their discussion and cultivation plans. Students have also found the peer review process interesting and helpful. Several students have expressed that the course projects are particularly valuable as they are currently working in or plan to immediately enter the hemp cultivation industry where they can put their cultivation plans to practice.

Future Plans and Advice to Others

A few unexpected challenges arose during the offerings of this course, leading to advice and future plans. The technical process to enroll students from multiple institutions into the same LMS course shell proved difficult. Student issues accessing the LMS were common at the start of the spring 2022 semester, leading to a loss of class time for some students. A solid technical plan should be put into place anticipating LMS complications and other logistical items (e.g., calendar scheduling between two institutions). Due to the online nature and programming offered by both institutions, several students were taking the course from areas other than Nebraska. The course was designed specifically for hemp cultivation in the Midwest, especially in areas pertaining to cannabinoid testing, regulation, and cultivar selection in Nebraska. Students from other states or countries were at a disadvantage. These portions of the course may be reorganized in the future. These cannabis course offerings are planned to continue. When seeking such partnerships, it is advised to be as transparent as possible and agree on a shared vision for the program. It is essential to listen to and meet the needs of both institutions, as well as their students and industry stakeholders.

Resources Needed

Many resources were utilized in the development of the cannabis courses and program. Supportive administration is essential, as well as proper infrastructure for online program development and delivery. One of the largest, unmet resources we initially faced was a lack of trustworthy and economically priced educational materials (e.g., textbook) on hemp/cannabis. Additionally, misinformation on this topic is rampant online. Therefore, the faculty team teaching these courses worked together to create a two-volume textbook on the hemp/cannabis topics taught. The chapters on hemp cultivation were written based upon peer-reviewed literature. The textbook, used in the seven courses, provides an affordable option to students entering the program. The textbook can purchased on Amazon as a hardcopy for $40 or as a digital version for $9 (Amazon, n.d.).

References

Amazon (n.d.). *Cannabis, a comprehensive overview—volume 1: Biology, cultivation, history and the basics of modern emerging cannabis industry.* https://www.amazon.com/Cannabis-Comprehensive-Overview-Cultivation-Emerging-ebook/dp/B09NF5R6QF

Black, B. E. (2020). *Creating a qualified cannabis workforce: How higher education can support cannabis career pathways*. [Doctoral dissertation, Kansas State University]. https://krex.k-state.edu/dspace/handle/2097/40335

Cornwell, A. M. (2022, June 2). *Ever thought about taking a university course in cannabis? Now you can.* Oracle. https://cbdoracle.com/news/cannabis-education-training-schools/

Marijuana Business Daily (2019). *Annual marijuana business factbook* (7th ed.).

Mayorquin, O. (2022, April 26). *In what states is weed legal? Here is the list*. USA Today. https://www.usatoday.com/story/news/nation/2022/04/20/states-with-legal-weed-recreational/7371071001/

McCue, L. (2021, November 14). *Little Priest Tribal College to offer cannabis studies degree*. Tribal College Journal of American Indian Higher Education. https://tribalcollegejournal.org/little-priest-tribal-college-to-offer-cannabis-studies-degree/

Reid, A. E., Crump, M. E. S., Clement, V. R., & Rolle, J. D. (2022). Introducing cannabis education on a college campus in 2021: The case of Medgar Evers College. *International Journal of Higher Education Management*, *8*(2), 36-53. https://doi.org/10.24052/IJHEM/V08N02/ART-3

United States Department of Agriculture. (2019, May 28). Executive summary of new hemp authorities [Memorandum]. https://www.ams.usda.gov/sites/default/files/HempExecSumandLegalOpinion.pdf

A New Model for Scholarship Dissemination in Agricultural Communication, Education, Extension, and Leadership

T. Grady Roberts, Professor
Agricultural Education and Communication
University of Florida
PO Box 110540
Gainesville, FL 32611-0540
groberts@ufl.edu

Amy Harder, Professor and Associate Dean
UConn Extension
College of Agriculture, Health and Natural Resources
1378 Storrs Rd., Unit 4134
W.B. Young Building, Room 233
Storrs, CT 06269-4134
amy.harder@uconn.edu

James R. Lindner, Professor
Agriscience Education
Auburn University
5058 Haley Center
Auburn, AL 36849
jrl0039@auburn.edu

Robert Strong Jr., Associate Professor
Agricultural Leadership, Education, and Communications
Texas A&M University
267 Agriculture and Life Sciences Bldg.
College Station, TX. 77843-2116
Robert.StrongJr@ag.tamu.edu

A New Model for Scholarship Dissemination in Agricultural Communication, Education, Extension, and Leadership

Introduction

Dissemination of results is a fundamental component of the research process (Ary et al., 2018). Most research is reported in scientific journals published by various professional societies, organizations, and institutions. These journals have evolved over time, with the Internet leading to substantial changes in the dissemination of research. The American Association for Agricultural Education's (AAAE) *Journal of Agricultural Education* (*JAE*) is no different (*JAE*, n.d.). Emerging trends in scholarship dissemination include open-access, open-data, publication ethics, and document/researcher ID numbers (Conrad, 2022). Social media is also now a common way to share published research (Klar et al., 2020)

In the AAAE, we have repeatedly discussed challenges related to timely publication of research, reviewer fatigue, indexing our journals, and impact factors. Given the changing landscape of scientific publishing and recurring challenges expressed within our profession, we created a new research journal, *Advancements in Agricultural Development* (*AAD*), to explore how things could be done differently. The purpose of this poster is to share what we have learned so far.

How It Works

The development of *AAD* was based on thorough examinations of other journals in the field, adopting things which worked, and seeking innovative solutions to problems. Our review led us to focus on how to staff the journal, submission guidelines, and the editorial process as key components impacting the quality and efficiency of the publication process. First, we adopted a staffing model which distributes the workload over multiple people with built in redundancy in case someone is temporarily unavailable. This includes an Editor-in-Chief, Senior Editors, Editors, and Editorial Assistants. None of our staff have defined terms of service. At the time of this submission, the *AAD* staff has 8 people, split equally between editors and editorial assistants.

Second, we developed submission guidelines designed to focus on the "so what?" question with 2/3 of the allowable pages devoted to results, conclusions, and implications. We also decided to keep the total page length shorter (15 pages double spaced) to make it easier for readers and reviewers to get to the essence of the article without the undue burden of excess pages of peripherally related content. Finally, we required each article to cite research published in Web of Science journals to connect our work with the broader scientific community.

Third, we developed an editorial process designed for both efficiency and rigor. When an article is initially submitted it is reviewed by the Editor-in-Chief to ensure in fits the aims and scope of *AAD* and then proceeds to an editorial assistant to review adherence to submission guidelines and strictly follows APA style (Stage 1). So far, every article submitted has required revisions at this stage. Following revisions, each article then goes through a rigorous review from one of our editors for technical merit, which serves as the first peer review (Stage 2). Some articles are rejected at this stage; others are asked for revisions to address noted deficiencies. Fewer than 5% of submitted articles make it past this stage without revisions. Once revisions are made, an article then goes to external peer review (Stage 3). Two reviewers are assigned and given two weeks to review. Once reviews are received, the editor managing the article makes an editorial decision (reject/resubmit/accept). Depending on the reviews, the editor is empowered to accept the article after revisions without additional peer review. Once accepted, the article is immediately sent to copyediting and then published once the page proof is approved by the authors (Stage 4). We use three social media platforms to share newly published articles and highlight previously published articles. These include Facebook (@agdevresearch), Twitter (@agdevresearch), and LinkedIn (https://www.linkedin.com/company/agdevresearch/).

As mentioned previously, *AAD* is an editor strong journal. Our editors all have experience as editors of other journals and are also very experienced researchers in our field. In addition to this internal experience, we seek guidance through our editorial board. We intentionally seek out established and emerging scholars with a wide range of expertise. We continue to add new board members to increase diversity of thought. Our current board has 9 members from 4 countries.

Results to Date

Detailed accomplishments can be found in Roberts et al. (2022) and Roberts et al. (2023). *AAD* has published 76 articles written by 197 unique authors representing 46 unique institutions from 7 different countries. As of January 2023, there have been 43,196 views of abstracts and 23,669 downloads of full articles. This equates to a total of 66,865 interactions with content published in *AAD*. People from 112 countries have accessed content from the *AAD* web platform.

For the calendar year 2022 (Volume 3 of the journal), we averaged 29 days to provide the initial editorial decision (end of Stage 2). The average peer reviewer completed their assigned review in 10.39 days (Stage 3). Finally, once accepted, we averaged 38 days for copyediting and getting author approval for publication (Stage 4). The largest observed delays in this process (Stages 2-4) have been slow responses from authors when resubmitting revisions or approving page proofs.

Future Plans

First, we are always assessing and improving our editorial process to provide the best experiences for both authors and readers. Second, we are continually seeking to engage new authors and readers from around the world. Third, as submissions to *AAD* increase, we will add additional editors and editorial assistants. Finally, we are making systematic adjustments to position *AAD* for acceptance into the prestigious indices of Scopus and Web of Science in 2024.

Costs/Resources

AAD operates as a 501(c)(3) non-profit organization. Annual operating expenses include: the PKP/OJS web platform ($1,500/year); Crossref membership and registrations (approx. $300/year); editor travel reimbursement ($1,500/editor per year); and miscellaneous filing fees (approx. $100/year). An additional non-monetary cost is time as all personnel involved are volunteers. Income is generated through publishing fees ($295/article). We want to acknowledge the Department of Curriculum and Teaching at Auburn University for paying the fee for the PKP/OJS web platform the last three years.

References

Ary, D., Jacobs, L. C., Irvine, C. K. S., & Walker, D. (2018). *Introduction to research in education* (10th ed.). Cengage Learning.

Conrad, L. (2022, January 31). 5 Scholarly publishing trends to watch in 2022. *Scholastica.* https://blog.scholasticahq.com/post/scholarly-publishing-trends-2022/

JAE. (n.d.). Journal history. https://www.jae-online.org/index.php/journal-history

Klar, S., Krupnikov, Y., Ryan, J. B., Searles, K., & Shmargad, Y. (2020). Using social media to promote academic research: Identifying the benefits of Twitter for sharing academic work. *PloS ONE*, *15*(4), e0229446. https://doi.org/10.1371/journal.pone.0229446

Roberts, T. G., Harder, A., & Lindner, J. (2022). 2022 state of the journal report. *Advancements in Agricultural Development*, *3*(1), 1–3. https://doi.org/10.37433/aad.v3i1.191

Roberts, T. G., Harder, A., Lindner, J., & Strong, R. (2023). 2023 State of the journal report. *Advancements in Agricultural Development*, *4*(1), 1–4. https://doi.org/10.37433/aad.v4i1.285

A Picture is Worth a Thousand Words: Using Photovoice Reflection Assignments to Build Cultural Competency

Cari A. Cearley
Master's Student
Department of Agricultural Education, Communications and Leadership
Graduate Research Associate 4-H Youth Development Programs
505 Agricultural Hall Stillwater, OK 74078
Oklahoma State University
(918)-728-5142
cari.cearley@okstate.edu

Tyler J. Price
Doctoral Student
Department of Agricultural Education, Communications and Leadership
Coordinator of LGBTQ+ Affairs
240 Student Union, Stillwater, OK 74078
Oklahoma State University
405-714-8289
tyler.price10@okstate.edu

Lauren Lewis Cline
Assistant Professor, Agricultural Leadership
444 Agricultural Hall Stillwater, OK 74078
Department of Agricultural Communications and Leadership
Oklahoma State University
405-744-8138
lauren.l.cline@okstate.edu

M. Craig Edwards
Professor, Agricultural Education
464 Agricultural Hall Stillwater, OK 74078
Department of Agricultural Communications and Leadership
Oklahoma State University
405-744-8141
craig.edwards@okstate.edu

A Picture is Worth a Thousand Words: Using Photovoice Reflection Assignments to Build Cultural Competency

Introduction/Need for Innovation

Technological breakthroughs in communication and travel have led to a smaller, multiculturally diverse world, and workforce demographic shifts reflect this change (Bowman, 2009). While the importance of multicultural education has been acknowledged by institutions of higher learning throughout the United States (Bowman, 2010; Denson et al., 2021; Mallinckrodt, et al., 2014; Mayhew & Grunwald, 2006; Zabala Eisshofer, 2022), the benefit of innovative teaching methods that take students out of their comfort zone should be examined in the transfer of knowledge among students in such coursework. As Mezirow (1991) notes, through critical reflection on prior knowledge and experience in the face of new experiences, individuals' worldviews may be changed through a process of disruptive and transformative learning. Through cognitive dissonance, students experience a change in thought processes wherein they form their own attitudes and opinions outside of their environmental worldview (i.e., those of their parents and what they experienced in their formative years (Mezirow, 1991). Banks (1994) asserted that diversity education increases critical thinking skills while broadening perspectives, which in turn positively affects both cognitive and personal growth. The American Association for Agricultural Education identified "Sufficient and Professional Workforce that Addresses the Challenges of the 21st Century" as an area of importance in its National Research Agenda (Roberts et al., 2016, p. 42). This agenda item seeks to understand what teaching methods and programs are most effective in preparing people to work in global agriculture. As students enter the workforce, acceptance of working in a culturally diverse world becomes paramount, and through multicultural coursework, students' cognitive horizons will expand, thus preparing them to thrive in an ever-changing society.

Photovoice reflections have been used as a method of qualitative data collection to represent the experiences of a population using photographs (Delgado & Wester, 2020). Innovative assignments such as *Photovoice Reflections* can give students a chance to capture first-hand new experiences and interactions, including with a culture different than their own. Many students' first real interaction with a culturally diverse population occurs upon entering college, as is likely their first experience in multicultural coursework (Bowman, 2012; Denson et al., 2021; Garvey et al., 2020). An assignment such as this pushes students out of their comfort zones, and into heterogenous experiences not previously undertaken prior to taking said courses.

How it Works

Students enrolled in *AGLE 2403 Agricultural Leadership In A Multicultural Soci*ety and *AGED 5703 Cultural Competency for Working in Agricultural and Extension Education* at Oklahoma State University completed a photovoice reflection assignment. Students were required to attend an event or participate in an experience related to a group of people or topic area that was unfamiliar to them. Experiences included visiting international-themed food stores and restaurants, visiting an Amish community, attending a Native American Powwow, among others. During the experience, students were tasked with taking three to five cell phone-quality photos that captured the essence of the experience. Students completed a reflection paper about their experience and a presentation. In the papers and presentations, students described the event, why they were attracted to the photo, identified any course constructs that the photo evoked and reflected on how the image illustrated their journey to becoming more culturally competent. For the graduate course, students were required to attend three experiences and a written report for each. The assignment for the undergraduate course was adapted to require one experience and an oral presentation.

Response to Innovation

Student reflective essays overall noted positive experiences. Many mentioned that getting out of their comfort zone was somewhat disconcerting, but worth it. One student stated: “At first, I wasn’t too keen on this project because I like to stay in my shell and do things that I am comfortable with. But ... I was thankful for this opportunity to explore another culture.” Others expressed a measure of surprise at what they discovered. In reference to a Nepalese grocery store, a student commented: “I found it funny that they had frozen, microwavable food which I tend to associate as an American thing.” Another remarked of an Asian market: “In many movies and tv shows I've [sic] always seen the whole ducks or chicken always hanging in the windows of these shops. I was very surprised when I didn't [sic] see them hanging in there.” While many of these preconceived notions triggered cognitive dissonance, others revealed that though cultures differed, similarities also existed: “In the end, I learned that when it comes to making money and being business savvy, Amish people are just like the rest of us and are just trying their best to make money with the skills that they have.” Students expressed transformed thinking through statements such as: “This helped me to realize that there are experiences I have that I [sic] subconsciously assume everyone shares, even though that is not remotely accurate” and “To be diversity conscious you must be willing to connect and have a friendship with others. It is about building a bridge to go to the other side to learn about other cultures.” Results support Mezirow’s (1991) assertion that preconceived ideals based on prior knowledge can be transformed through disruptive learning, resulting in a changed worldview. Further, Banks’ (1994) notion that improvement on both the cognitive and personal level through diversity experience was apparent, as well. Bowman (2009) posited that multicultural diversity courses serve to breakdown preconceived stereotypes by exposing students to cultures not previously experienced. Assignments such as *Photovoice Reflections* act to enhance this by entreating students to experience other cultures firsthand, affecting disruptive learning and cognitive change, as well as teaching students that though experiencing new things may initially be uncomfortable; doing so is often worthwhile in the end.

Resources/Advice to Others

This assignment was born out of the desire to provide students enrolled in multicultural courses in agriculture the opportunity to experience and observe cultures different from what they are most familiar. Post-secondary programs should work to provide opportunities for students to participate in and reflect on experiences of other cultures. This innovation can expose students to many areas of diversity depending on the experiences they undertake. Instructors of multicultural courses should implement this innovation. When implementing, instructors should be ready to provide students with recommendations of opportunities available for students to attend. Students did incur time outside of class to complete the assignment and may have had travel costs. To alleviate travel costs, the instructors recommended several experiences on or near the Oklahoma State University campus for students to attend. The only cost associated with the innovation from the instructor’s perspective was the opportunity cost (time) associated with the development, delivery, and assessment of the assignment.

References

Bowman, N. A. (2009). College diversity courses and cognitive development among students from privileged and marginalized groups. *Journal of Diversity in Higher Education, 2*(3), 182–194. https://doi.org/10.1037/a0016639

Bowman, N. A. (2010). Disequilibrium and resolution: The nonlinear effects of diversity courses on well-being and orientations toward diversity. *Review of Higher Education*, *33*(4), 543–568. https://doi.org/10.1353/rhe.0.0172

Bowman, N. A. (2012). Promoting sustained engagement with diversity: The reciprocal relationships between informal and formal college diversity Experiences. *Review of Higher Education, 36*(1), 1–24. https://doi.org/10.1353/rhe.2012.0057

Banks, J. A. (1994). *Multiethnic education: Theory and practice*. Allyn and Bacon.

Delgado, H., & Wester, K. L. (2020). Using photovoice as an intervention to promote meaning-making in a suicide loss support group. *Journal of Mental Health Counseling*, *42*(3), 189-205. https://doi.org/10.17744/mehc.42.3.01

Denson, N., Bowman, N. A., Ovenden, G., Culver, K. C., & Holmes, J. M. (2021). Do diversity courses improve college student outcomes? A meta-analysis. *Journal of Diversity in Higher Education, 14*(4), 544–556. https://doi.org/10.1037/dhe0000189

Garvey, J. C., Richter, E., Payton, S., Kiemele, R., & Sanders, L. A. (2020). Diversity appreciation among white first-year residential students. *Journal of Student Affairs Research and Practice, 57*(5), 487–504. https://doi.org/10.1080/19496591.2019.1662794

Mallinckrodt, B., Miles, J. R., Bhaskar, T., Chery, N., Choi, G., & Sung, M.-R. (2014). Developing a comprehensive scale to assess college multicultural programming. *Journal of Counseling Psychology*, *61*(1), 133–145. https://doi.org/10.1037/a0035214

Mayhew, M. J., & Grunwald, H. E. (2006). Factors contributing to faculty incorporation of diversity-related course content. T*he Journal of Higher Education, 77*(1), 148–168. https://doi.org/10.1353/jhe.2006.0005

Mezirow. (1991). *Transformative dimensions of adult learning* (1st ed.). Jossey-Bass.

Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). *American Association for Agricultural Education national research agenda: 2016-2020.* Gainesville, FL: Department of Agricultural Education and Communication. https://aaaeonline.org /resources/Documents/AAAE_National_Research_Agenda_2016-2020.pdf

Zabala Eisshofer, C. (2022). Framing and efficacy of university-required diversity courses in the research literature. *Review of Educational Research*, 1-37. https://doi.org/10.3102/00346543221123793

Adapting the 5E Instructional Method to a Foundational Agricultural Communications Course

Victoria U. Beasley
114D McCord Hall
The University of Tennessee
Knoxville, TN 37996
(865) 974-7010
vutsman@tennessee.edu

Molly A. West
321B Morgan Hall
The University of Tennessee
Knoxville, TN 37996
(865) 974-7860
malbin1@tennessee.edu

Emoni White
320 Morgan Hall
The University of Tennessee
Knoxville, TN 37996
(865) 974-7371
ewhite71@tennessee.edu

Tyler Granberry
114C McCord Hall
The University of Tennessee
Knoxville, TN 37996
(865) 974-8256
tgranber@tennessee.edu

Introduction

Undergraduate students have expressed apprehension about writing skills, particularly in agricultural communications courses (Ahrens et al., 2016; Fisher et al., 2017). Similarly, a study by Leggette (2015) revealed that instructors of writing-intensive courses related to social sciences in agriculture noted that students often rushed through writing tasks and did not fully develop written assignments. Despite reporting fear of feedback, students have identified that constructive criticism has been beneficial in developing their communication skills (Fischer et al., 2017). Ahrens et al. (2016) recommended that agricultural communications instructors encourage peer review as a way for students to receive feedback prior to turning in final drafts of assignments. Additionally, students have expressed interest in more public speaking opportunities via an agricultural communications-based public speaking course, and project-based writing assignments, like prepared public speeches, are recommended to increase student learning in writing-intensive coursework (Ahrens et al., 2016; Leggette & Homeyer, 2015). The University of Tennessee sought to address this interest by developing ALEC 240, a foundational agricultural communications course focused on prepared public speaking. However, the implementation of this course brought the challenge of selecting instructional methods that met the needs of the students who chose to enroll.

The Biological Sciences Curriculum Study (BCBS) developed the 5E instructional method by incorporating components of historical and contemporary instructional models related to science instruction and inquiry (Bybee et al., 2006). The five phases, or *E*s, of the 5E instructional model are Engagement, Exploration, Explanation, Elaboration, and Evaluation (Bybee et al., 2006). Each phase requires students to draw upon various skill sets to develop their critical thinking (Bybee et al., 2006). Although the original intent of the 5E model was to encourage inquiry-based instruction in science education, the model has the potential to be adapted into other contexts where it may be beneficial to student achievement.

How It Works

For ALEC 240, the 5E instructional method was adapted into the 5-Step Process for Prepared Public Speaking. The process incorporates four low-stakes informal assessments and one formal assessment. As part of the process, students are required to demonstrate critical thinking skills related to planning, executing, and reflecting on their speech writing and delivery, which aligns with the recommendations of Leggette (2015). Students work through the process on four occasions throughout the semester via prepared speaking projects, a personal introduction speech, a demonstration speech, an informative speech, and a persuasive speech.

The first step of the process consists of students *engaging* with topic ideas for their speech through a Mind Map. Each speech has specific requirements which need to be considered when brainstorming topics. This low-stake informal assessment provides students with feedback on how they can develop their selected topic ideas into a quality speech. Once a completed mind map is submitted, students move to Step two. Step two, the Outline Peer Review, consists of two parts: 1) submitting a draft outline and 2) peer-reviewing the draft outlines of classmates. Students are given an outline template for each speech to help plan listener goals, strategies, activities, and personal public speaking SMART goals. This step encourages students to *explore* their chosen topic through research and peer feedback. To participate in step two, students must submit their draft outline to the group discussion board. Students are tasked with examining peer outlines for two areas of strength and two areas of improvement for each member of their small group and post to the discussion board. Upon receiving peer feedback, students are challenged to reflect and integrate peer comments into their revised outline. Step three, the Revised Outline, consists of students submitting a final version of their speech outline that *explains* their intentions for the speech focus. The instructor provides feedback and grades revised outlines to ensure students plan and prepare properly for their speech. Step four is the Speech Presentation, during which students verbally *elaborate* on their chosen topic in small groups of approximately a dozen. The small groups are designed to ease nerves, allow instructors to facilitate higher enrollment numbers, and maximize course time. Step five, Reflection, asks students five reflection questions to assist in identifying how they applied course materials to prepare, *evaluate* their speech delivery, and explain areas to improve for the next speech process.

Results to Date and Implications

The impetus for designing the 5-Step Process was the realignment of ALEC 240 to meet general education requirements at the University of Tennessee, which resulted in increased course capacity and added sections. The 5-Step Process was implemented in an asynchronous online format during the Summer 2022 semester. The process has since expanded to serve asynchronous online and synchronous in-person sections, reaching 252 undergraduate students. The organizational process allows for the planning phase to be completed in class (synchronous in-person sections) and serves as a pacing guide for asynchronous online students. A common concern with multiple instructors in sections of a course is a lack of consistency; however, implementing the 5-Step Process grants consistency to all sections and modalities related to formal assessment. Regardless of the modality, the 5-Step Process provides instructors with check-in opportunities to monitor student performance related to course progression. During an evaluation of the instructional methods used in the course, students have offered positive feedback related to the 5-Step design. One student stated, “I think it’s a good layout, especially for...a basic oral communication course.” Other students felt that the format of the 5-Step Process in the learning management system was “really helpful” and “well laid out.”

Future Plans and Advice to Others

The 5-Step Process is being mirrored by ALEC teaching faculty in leadership courses for S.W.O.T analysis, essays, leadership plans, and recruitment plans. The ALEC department plans to formally evaluate the effectiveness of the 5-Step Process as an instructional method in a variety of courses. To ease the implementation of this method, we recommend communicating to students why the process is being used and for course facilitators to consistently use nomenclature associated with the 5E method to describe assignments.

Resources Needed

Applying the 5-Step Process to a course is free if the learning institution provides access to a learning management system that allows the instructor to control students’ pace through modules or locked assignments. However, any instructional technique based on the 5E method requires significant time investments to adequately plan assignments and design the content in the learning management system.

References

Ahrens, C. A., Meyers, C., Irlbeck, E., Burris, S., Roach, D. (2016). Exploring agricultural communications students' perceptions of communication apprehension and writing apprehension in the classroom. *Journal of Agricultural Education, 57*(2), 119-133. https://doi.org/10.5032/jae.2016.02119

Bybee, R. W., Taylor, J. A., Gardiner, A., Van Scotter, P., Powell, J. C., Westbrook, A., & Landes, N. (2006). The BSCS 5E instructional model: Origins and effectiveness. BSCS. https://fremonths.org/ourpages/auto/2008/5/11/1210522036057/bscs5efullreport2006.pdf

Fischer, L. M., Meyers, C. A., & Dobelbower, S. E. (2017). Exploring how pedagogical strategies change student perceptions of writing apprehension. *Journal of Agricultural Education, 58*(4), 254–268. https://doi.org/10.5032/jae.2017.04254

Leggette, H. R. (2015). Faculty define the role of writing in the social sciences of agriculture. *NACTA Journal, 59*(2), 104–110. https://www.nactateachers.org/index.php/vol-59-2-jun-2015/2292-faculty-define-the-role-of-writing-in-the-social-sciences-of-agriculture

Leggette, H.R., & Homeyer, M. (2015). Understanding students' experiences in writing-intensive courses. *NACTA Journal, 59*(2), 116–121. https://www.nactateachers.org/index.php/vol-59-2-jun-2015/2290-understanding-students-experiences-in-writing-intensive-courses

Agricultural Education on the Move FFA partner training day

Max Hagaman, University of Missouri
Dr. John D. Tummons, University of Missouri
Dr. Rebecca L. Mott, University of Missouri
Natalie Koch, University of Missouri
Heather Fletcher, Ag Education on the Move

127 Gentry Hall
University of Missouri
Columbia, MO 65211
573-882-9599
mh8nt@missouri.edu
tummonsj@missouri.edu
MottR@Missouri.edu
ndk99t@mail.missouri.edu
heather@agmoves.com

Agricultural Education on the Move FFA Training Day

Introduction/Need for innovation or idea

Agriculture Education on the Move (AEOTM) was established in 2011, when Missouri Soybean Merchandising Council saw a need for implementing agriculture education in elementary classrooms across the state. In 2018, the Missouri legislature approved a bill to authorize the Department of Elementary and Secondary Education to establish a pilot program to provide agricultural education in elementary schools, then to determine how to best implement a program statewide. Agricultural content integration into the general curriculum can help students learn through experiential learning (Mabie & Baker 1996). Many elementary teachers believe agriculture provides situatedness, connectedness, and authenticity to other content areas, but also report lack of instructional resources as a barrier (Knobloch, et al. 2007).

AEOTM is now managed as a program of Missouri Farmers Care, and has evolved to provide age-specific, industry-validated agricultural information to consumers through both school-based teaching and special events. Within schools, AEOTM educators deliver 3rd grade curriculum through 10 weekly lessons. Each hour-long lesson aligns the journey of products grown by Missouri farm families with key classroom objectives and standards in core subjects. In 2020, AEOTM began a partnership with Missouri FFA, where high school FFA members can become AEOTM educators in their own schools. AEOTM staff and university faculty conducted a needs assessment with commodity organizations, agriculture teachers (who supervise youth AEOTM educators), and full-time AEOTM educators to identify areas of program strength, needs, then develop a strategic plan to grow the AEOTM/FFA and 4-H partnership. Specific needs identified included: 1) FFA/4-H advisors needed help in preparing their students to present AEOTM lessons, 2) AEOTM needed to grow participation and facilitate more consistent teaching from youth educators, and 3) university needed opportunities for preservice teachers to build content knowledge, experience teaching high school students, and a mechanism to train, identify, then recruit future agriculture teachers who had positive teaching experiences.

How it works/methodology/program phases/steps

From these shared needs, AEOTM staff, interns, and university faculty collaborated to create the AEOTM Training Day. Training purposes included 1) to prepare high school FFA members for their role as AEOTM educators, 2) to provide experience for preservice teachers, and 3) to build connections between AEOTM educators and Ag Education faculty and students.

The training was planned and conducted by pre-service Ag Education students at University of Missouri. FFA advisors were allowed to register up to five FFA members to attend. The AEOTM program director sent out invitations to attend using a Qualtrics survey created by a faculty member. Prior to the training day, AEOTM interns (who were also undergraduate AEL students) prepared all materials needed for attendees to complete the ten activities from the curriculum. Materials and lunch were provided by AEOTM. Leaders made the decision to cap the participation at 5 students per school and 125 students total, based on room size and teaching capacity. The event was free for FFA members, and we were at capacity.

The training day was a service-learning project of the undergraduate Ag literacy class, a curriculum class within the teacher certification program. At the beginning of the training, Preservice teachers taught all the students together for the first lesson- soybeans. The soybean lesson was taught from beginning to end, modeled in full, including the hands-on activity and a discussion on how to access and teach the curriculum. This took about one hour. After the first activity, students were divided into four groups. These groups rotated through a short training on lessons 2-5, where the preservice teachers reviewed the content of the lesson, then facilitated the hands-on activity in full. Students rotated every 30 minutes. After lunch, students stayed in their small groups and rotated through lessons 6-9, then came together into one group for the final lesson and wrap-up. Preservice students provided all content and instruction. FFA members were given a t-shirt and a curriculum notebook, and were encouraged to take notes on behavior management, how to order and prepare materials, and classroom management.

Results to date/Implications

On September 12th, 2022, 125 FFA members from 30 schools attended AEOTM Training Day on the University of Missouri campus. The event was held on an early fall Monday for two reasons- many 4-day schools do not have school on Mondays, and the training needed to be after schools had started, but before FFA members began their AEOTM teaching duties. We utilized Qualtrics to evaluate teacher perceptions of AEOTM Training Day. Thirteen teachers completed the questionnaire, which was sent one month after the conclusion of the event. A five point Likert scale was used for each of the statements. The scale ranged from 1-Extremely dissatisfied to 5-Extremely satisfied. Overall teachers were satisfied with the event (M=4.46, SD=.50) and indicated a desire to bring students in future years (M=4.31, SD=.72). Additionally, teachers reported they would recommend this event to another agriculture teacher (M=4.62, SD=.72).

Ag Ed on the Move experienced record growth in 2022, teaching 8,266 elementary students in 144 schools in 50 counties, a 73% increase in participation. Preservice students and Ag Education faculty focused on building relationships with FFA members for recruitment Preservice students reported gains in confidence and content knowledge as part of the project.

Future plans/Advice to others

We are currently considering the addition of a spring training to ensure that all of the students who are interested in becoming involved with Ag Ed on the Move can be trained. However, spring is a busy time of the year for agricultural teachers and students, so the specific time frame will need to be carefully evaluated. Although most stations were hands-on, FFA members were bored toward the end of the day. We plan to revise lesson 10 and have FFA members teach the preservice teachers. We had behavior issues with FFA members from one school. After investigating, the students had all previously taught the curriculum. We plan to limit future participation to first-time attendees and break schools within student groups.

Costs/resources needed.

There were no direct costs to the university- students provided the teaching as part of their service-learning assignment, and we utilized classrooms in the agriculture building at no cost. We were able to borrow microwaves and power strips for the corn plastic activity. Ag Education on the Move partners provided t-shirts ($11/participant), notebooks ($11/participant), lunch ($6/participant), and teaching supplies ($3.50/participant).

References

Knobloch, N. A., Ball, A. L., & Allen, C. (2007). The Benefits of Teaching and Learning about Agriculture in Elementary and Junior High Schools. *Journal of Agricultural Education*, *48*(3), 25-36.

Mabie, R., & Baker, M. (1996). A comparison of experiential instructional strategies upon the science process skills of urban elementary students. *Journal of Agricultural Education*, *37*, 1-7.

An Inaugural Career Development Event in Sustainable Agriculture

Introduction

Career Development Events (CDEs) provide members of the National FFA Organization with experience related to potential career opportunities and assessing their knowledge and skills sought by employers (Lundry et al., 2015). The inaugural CDE in Sustainable Agriculture served as a pilot study and was open to all FFA chapters in Texas. The Sustainable Agriculture CDE served as an educational innovation and reflected the characteristics of an innovation, as described by Rogers (1995) including *trialability* for FFA members competing, *observability* for agricultural educators, and *compatibility* with common components of other CDE. The pilot helped FFA members and teachers recognize the *relative advantage* of this new CDE in context of current trends toward a more sustainable food system (Williams, 2000).

Steps/Phases

This contest format was similar to other CDEs at the state level. Nursery/Landscape and Farm Business Management CDEs provided models for compatible contest components. Rules sent to all FFA advisors in Texas followed the format and structure of state-adopted rules for other CDEs. References and resources were shared with hyperlinks following the rules to provide agricultural educators and FFA members easy access to relevant training materials. The Sustainable Agriculture CDE included three components, a 50-question multiple-choice exam, 20 identification items, and 10 problem solving questions. Student volunteers assisted with coordinating the CDE.

A promotional flyer, rules, and resource list were posted to Ag Teacher Buddies, a private Facebook group for agriculture educators, and through a direct email to all FFA advisors in the state. The team who developed the CDE presented an overview of the contest rules, resources, and information through a webinar hosted by the Agricultural Teachers Association of Texas.

Teams entered the CDE through the same process used to enter other CDEs. Observability was achieved by allowing advisors for each team to review all contest materials and components following the event. Trialability resulted from teams actually participating in the CDE. Additional phases included obtaining feedback from those agricultural educators with teams competing in the CDE, as well as industry experts who also have familiarity with FFA and CDEs.

Results to Date and Implications

The inaugural CDE was held May 3, 2022 at Texas A&M University-Commerce. Participants included 14 teams with 49 individual team members. The CDE was administered by dividing the contestants into groups, which then rotated through the three contest components. A hospitality room was provided and contest materials were distributed to the agricultural educators with teams participating during the event. Following the CDE and a break for lunch, an awards ceremony was held. The top three teams and the three individual with the highest scores were recognized and presented with awards.

Each of the 49 team members competing and their advisors received a promotional tee-shirt. Based on observation and feedback from advisors, the CDE was well-received.

Future Plans

Contest providers for the Sustainable Agriculture CDE will use input from teachers and industry experts to make minor revisions in contest format and the number items in each component. An exam-item test-bank, consisting of 250 multiple-choice questions, was developed by agricultural educators and other students in a graduate course about issues in Sustainable Agriculture. The test-bank will be used to support future contests. We also plan to increase the number of items in the identification category. We anticipate that the problem-solving component of the CDE will have an annual theme that focuses specifically on one or two training resources.

This CDE was hosted for the second time during the Spring of 2023 as an invitational event open to all FFA chapters in the state. Only five teams participated but four of those teams were from FFA chapters that had participated the first year. After the second year of hosting the CDE, we hoped to have enough interest and support from FFA members and agricultural educators for the Texas FFA leadership to consider including it in the official list of CDEs for state competition. However, due to the low participation in 2023, we are working on some new promotional strategies, professional development opportunities, and encouragement for FFA chapters that host invitational CDEs to include this contest. By increasing the number of opportunities to participate, we believe that we can achieve an interest level representative of critical mass for adoption at the state level.

Costs and Resources Needed

The cost of hosting CDEs is a purposeful investment because it provides agricultural education students with opportunities to develop knowledge and skills relevant to future career choices. Participation in CDEs also allows FFA members opportunities to visit college and university campuses, thus becoming more familiar with institutions of higher education resulting in experiential learning that cannot be measured in monetary units.

Entry fees generated $515 in revenue. Itemized expenses for this inaugural Sustainable Agriculture CDE are categorized below.

Awards	$1,178.85
Promotional Tee-Shirts	1,286.21
Hospitality	201.88
Answer scan sheets	86.00
Total Expenses	**$2,752.94**

References

Lundry, J., Ramsey, J. W., Edwards, M. C., & Robinson, J. S. (2015). Benefits of career development events as perceived by school-based, Agricultural Education Teachers. *Journal of Agricultural Education*, *56*(1), 43–57. https://doi.org/10.5032/jae.2015.01043

Rogers, E. M. (1983). *Diffusion of Innovations* (4th ed.). New York: The Free Press.

Williams, D. L. (2000). Students' knowledge of and expected impact from Sustainable Agriculture. *Journal of Agricultural Education*, *41*(2), 19–24. https://doi.org/10.5032/jae.2000.02019

Art, Ag, & Action: Developing Campus Partnerships for Inquiry-Based Learning in Agricultural Literacy

C. Letot, ctl84@psu.edu

J. Myschisin, jrm7133@psu.edu

R. Duke, red1042@psu.edu

A. Cherry, audiec@g.clemson.edu

The Pennsylvania State University

012 Ferguson Building, University Park, 16802

(616) 295-8742

Introduction

Pre-service students in agricultural education at The Pennsylvania State University complete a curriculum that includes educational theory, methods, and psychology. Students have previously identified shortfalls in preparation to deliver place-based learning opportunities, however. Campus entities like museums (Gray, 2007), botanical gardens, (Olsen et al., 1999) and commons spaces in the libraries (Galle, 2017) offer potential for high impact learning experiences that facilitate the benefits of place-based learning. Work from Lin (2022) documented measurable impact on food security education through the significant integration of sustainable campus farms into courses and Langran and DeWitt (2020) noted increased student engagement and retention of skills because of content supplemented with place-based learning experiences. Additionally, inquiry-based opportunities are shown to be more effective when conducted on-site as a place-based experience (Thomas, 2020). While studies on place-based learning and use of inquiry techniques are prolific, exploration of the intersection of place-based learning at art museums to engage students in agricultural literacy is absent. Scholars have documented a narrow focus of agricultural literacy at the elementary level (Balschweid et al., 1998) and little enhancement at the secondary level (Colbath & Morrish, 2010). Educational systems must take a role in addressing agricultural literacy (Dale et al., 2017) and considering that combining science and art synthesizes increased innovation and motivation (Jefferies & Jeffries, 2022) the use of art for literacy may become a powerful tool for teachers in applied STEM to facilitate differentiated instruction. Arts integration has been documented as a successful tool in addressing Next Generation Science Standards (NGSS) are implemented and art museums represent a storehouse of art-based tools for high-impact, place-based learning opportunities for applied STEM educators.

Given the identified gap in place-based instruction, agricultural literacy, and preparation of pre-service agricultural education students to deliver place-based instruction related to agricultural literacy, the instructional team at the Center for Professional Personnel Development at Penn State developed a partnership with the Palmer Art Museum to leverage inquiry-based learning demonstrations in a place-based context. Educational outreach coordinators from the Palmer Art Museum led activities with varying degrees of inquiry that were bookended with practice in designing and refining learning objectives from the course instructors. For many teachers, a lack of background in pedagogical training for use of the arts leads to a disconnect between art and the STEM area (Glass & Wilson, 2016). Therefore, pre-service students who are training to be agricultural educators participated and concluded the experience with the construction of a digital learning artifact that peers in the agricultural education community can use for best practices in delivering place-based inquiry learning opportunities.

How it Works

Initial conversations with the Palmer Art Museum began at the start of the semester through a shared interest in both working with agricultural education students as well as providing experience for the museum's educational outreach intern in planning and delivery of programming. On the day-of, students from the agricultural education capstone course were guided through a pre-departure activity where they met at the Palmer Art Museum and worked in pairs to identify objectives that they deemed appropriate for a field trip to an art museum. The tour began and the first stop was a showcase of teacher-centered learning with an in-depth explanation of a painting showcasing agricultural commodities from Pennsylvania. The second stop was a showcase of inquiry-based learning using a piece of art that related to early textile production in the Northeastern US. The final stop was a student-centered approach to learning in the affective domain as students were tasked with finding and discussing an agricultural-themed art piece that related to their personal journey in agricultural education. Students concluded the experience by revisiting their objectives to identify needs for adjustment based on how the place-based experience went and what they would repeat or do differently to facilitate a similar experience during student teaching and beyond.

Results to Date

Students in the capstone teaching methods course (n=11) who participated in the place-based education experience reflected about the session as well as thoughts for application of the session in their professional blogs. Every student created a reusable learning artifact anchored in their blog space that will serve as a playbook for peers to plan and deliver a high impact place-based experience. Their reusable learning artifacts were collected and combined into a shared folder for use during the student teaching internship and all but one of the pre-service student teaching candidates have planned a place-based experience for their students using the best practices gleaned from the session at the art museum.

Future Plans

Student feedback as well as feedback from the museum educators were positive and the foundation for a partnership beyond just the capstone class was established. Students from other grade levels will now be visiting the museum in various capacities to engage in professional development that uses agricultural literacy through the medium of art. Long-term research will be conducted to evaluate the impact of the experience through improved agricultural literacy, increased use of the arts to deliver content, and improved educator self-efficacy to plan and deliver place-based learning opportunities.

Resources Needed

Items	Notes/Description	Unit Cost	Qty.	Total
Curator Fee	Museum fee for curator time	**$50**	**1**	**$50**
Lesson Materials	Workbook for tour	**$5**	**11**	**$55**
			Total	**$105**

References

Balschweid, M.A., G.W. Thompson and R.L. Cole. (1998). The effects of an agricultural literacy treatment on participating K-12 teachers and their curricula. Journal of Agricultural Education 39(4): 1-10. DOI:10.5032/jae.1998.04001.

Colbath, S.A. and D.G. Morrish. (2010). An analysis of the spatial effects of population density on the agricultural knowledge of college freshmen. NACTA Journal 54(4): 11–15. https://www.nactateachers.org/ attachments/article/390/Colbath_December%20 2010%20NACTA%20Journal-4.pdf.

Dale, C., Robinson, J. S., & Edwards, M. C. (2017). An assessment of the agricultural literacy of incoming freshmen at a land-grant university. *NACTA Journal*, *61*(1), 7-13.

Galle, J. (2017). The potential for place-based learning experiences on the college campus. In Interdisciplinary Approaches to Pedagogy and Place-Based Education (pp. 85-101). Palgrave Macmillan, Cham.

Glass, D., & Wilson, C. (2016). The art and science of looking: Collaboratively learning our way to improved STEAM integration. *Art Education*, *69*(6), 8-14.

Gray, H. R. (2007). Geo-caching: place-based discovery of Virginia state parks and museums. Journal of Museum Education, 32(3), 285-291.

Jefferies, L.R., Jefferies, S.S. (2022). Biochemistry and Art: Incorporating Drawings, Paintings, Music, and Media into Teaching Biological Science. https://doi.org/10.1007/978-3-030-98592-9_23

Jones, C. (2009). Interdisciplinary approach – Advantages, disadvantages, and the future benefits of interdisciplinary studies. *ESSAI*, *7*(26), 76-81. https://dc.cod.edu/essai/vol7/iss1/26

Langran, E., & DeWitt, J. (2020). Place-Based Inquiry in Action. In Navigating Place-Based Learning (pp. 117-139). Palgrave Macmillan, Cham.

Lin, C. I. (2022). Campus Farming and Sustainable Agriculture: Values and Beliefs. In Handbook of Best Practices in Sustainable Development at University Level (pp. 395-410). Springer, Cham.

Olsen, S., Amundsen, D., Varga, B., Minch, D., & Anderson, D. (1999). The Utah Botanical Gardens: An educational resource for the university and the community. HortTechnology, 9(4), 562-565.

Thomas, T.G. (2020), "Place-based inquiry in a university course abroad: lessons about education for sustainability in the urban outdoors", International Journal of Sustainability in Higher Education, Vol. 21 No. 5, pp. 895-910. https://doi.org/10.1108/IJSHE-07-2019-0220.

Bringing History to Life: Creation of Supplemental Curriculum to Illuminate NFA History within School-Based Agricultural Education Programs

Jeanette T. Furlong
481 Agricultural Hall
Oklahoma State University
Stillwater, OK 74078
405-744-4260
jeanette.furlong@okstate.edu

Nathan A. Smith
456 Agricultural Hall
Oklahoma State University
Stillwater, OK 74078
405-744-3686
nathan.smith@okstate.edu

Bringing History to Life: Creation of Supplemental Curriculum to Illuminate NFA History within School-Based Agricultural Education Programs

Introduction/Need for Innovation

With a mission to promote agricultural leadership, character, thrift, scholarship, cooperation, and citizenship in its members, the New Farmers of America (NFA) was founded in 1935 (Lilly, 2005). In a time of segregation, the NFA gave African American male students the opportunity to participate in vocational agriculture in public high schools (Wakefield & Talbert, 2003). NFA members developed skills and received training in farming, farm mechanics, livestock husbandry, and innovations in farming technology (Lilly, 2005). For 30 years, the NFA was a thriving organization with a rich history of member accomplishment. When the NFA and FFA merged in 1965, the NFA consisted of 1,004 chapters in 12 states with over 50,000 members (National FFA, 2023). Consistent with most business mergers, NFA members were absorbed into the FFA, but the customs and traditions which gave the NFA its unique identity was not. Today, it is hard to find NFA traditions, history, and culture being taught in agriculture education classrooms throughout the country.

The National FFA Organization has developed a new strategic plan. With record FFA membership, the emphasis to reach diverse student populations and promote inclusive practices within the FFA organization and agricultural industry is imperative (National FFA, 2023). Some could argue that the focus of future diversity efforts should be on enrolling more minority students and increasing membership in the FFA where programs are currently being offered (Moore, 1994). This would appear to be the logical solution, but, in many school-based agricultural education (SBAE) classrooms, NFA history is simply glossed over. So, what can be done to highlight the rich, diverse history that helped shape the FFA and enhance the curriculum for all FFA members? This question is what led Mr. Tim Taylor, agricultural education instructor/FFA advisor at Okmulgee Public Schools to create an instructional video highlighting the 70-year anniversary of the Dunbar NFA Chapter, past NFA members, and minority FFA members who are currently active within the chapter. This innovative idea was witnessed by the author during a 15-week clinical teaching experience in the fall semester of 2022.

Methodology/How it Works

In addition to National FFA curriculum, the video is used as supplemental material to teach the history of the NFA and its cultural significance in communities across the nation. The video showcases an interview conducted by a current Okmulgee FFA member with two former Dunbar NFA members. During the interview, the former NFA members share about their experiences and reactions to the "merger" of NFA and FFA in 1965 and give advice for current African American FFA members. In preparation for filming, preserved primary historical source artifacts (McDowell, 2002) including meeting minutes, photographs, plaques, pins, receipts, and awards were reviewed. Once collected, the primary and secondary source artifacts were displayed for use as b-roll during the interview.

This video is shown to students in both 8th Grade Ag Exploration, and all Introduction to Agriscience classes taught at Okmulgee Public Schools. Students are posed with two critical thinking questions prior to watching the video: 1) what does diversity and inclusion mean to them, and 2) how they can help others feel included as a member of Okmulgee FFA? After the video, students are asked to compose a one-page reflective essay answering these questions.

Results to Date

The video was filmed in July of 2021 and published to Facebook and YouTube that September. Since its initial posting, the video has been viewed over 3,000 times on Facebook, almost 600 times on YouTube, and has been shared on the National FFA website. Additionally, Okmulgee FFA was highlighted in an article published by National FFA in the *New Horizons* magazine and received a shoutout during the opening session of the 95th National FFA Convention and Expo. Students in both 8th Grade Ag Exploration and Introduction to Agriscience said that the video was a great addition to FFA history curriculum. Upon completion of their one-page reflective essay, students read from their papers what diversity and inclusion meant to them. One student said, “to me it [diversity and inclusion] means giving equal opportunities to all students no matter what you look like.” Students were then asked how they can help others feel at home as a member of Okmulgee FFA. One student said, “make sure that they know there is always a spot for their ideas at the table.” Another said, “as a chapter we can make sure that there is minority representation in leadership roles.” The video sparked so much interest in students that the Okmulgee FFA chapter officer team decided to include additional Dunbar NFA alumni activities to their Program of Activities (POA) for the 2021-2022 school year.

Future Plans/Advice to Others

As the video was being filmed, current Okmulgee FFA members were excited to see integral members of their community be highlighted for their significant role in NFA history. Plans for future projects include another video highlighting specific experiences offered to Dunbar NFA members and launching a campaign to find a Dunbar NFA jacket to put on display. It is recommended that FFA chapters do their own research on NFA history in their area. This will help students foster a deeper sense of connection to the information as it pertains to their own FFA chapter. If programs do not have the equipment to film, or funding to hire an outside media producer, there are a number of alternative projects which can be done to highlight FFA chapter’s NFA history. Projects may include scrapbooks, podcasts, archival displays, and timelines. It is important to note that a program does not need to have NFA history to complete these projects. Having students research, plan, and complete an NFA history project, of any sort, will help them gain a deeper understanding and appreciation for what the organization once was and the role it played in FFA history.

Costs/Resources Needed

Resources needed for the video project include a camera with the option to record, and video editing software. If outsourced, costs may vary from State-to-State. In Oklahoma, the average cost of hiring a multimedia producer is $130/hour. If you choose to complete a different project to showcase your chapter’s NFA history, prices may vary, but each can be done for little to no-cost depending on available materials.

References

Lilly, R. (2005). *New Farmers of America Records, 1929-1965.* University Library, IUPUI. https://special.ulib.iupui.edu/special/nfa

McDowell, W. H. (2002). *Historical research: A guide.* Routledge.

Moore, E.A. (1994). *Supporting diversity: An unfinished agenda*. The Agricultural Education Magazine. https://www.naae.org/profdevelopment/magazine/archive_issues/Volume66/v66i12.pdf

National FFA Association (2023). www.ffa.org

Wakefield, D. B. & Talbert, B. A. (2003). Historical narrative on the impact of the New Farmers of America (NFA) on selected past members. *Journal of Agricultural Education*, *44*(1), 95-104. https://www.doi.org/10.5032/jae.2003.01095

Building Professional Collaboration and Identity Through Pre-service Agricultural Education Teacher Professional Development

Trent Wells, Ph.D.
Southern Arkansas University
Department of Agriculture
Agriculture (AGR) 208
Magnolia, AR 71753
ktwells@saumag.edu

Christopher M. Estepp, Ph.D.
University of Arkansas
1120 W. Maple
AFLS E111
Fayetteville, AR 72701
estepp@uark.edu

Building Professional Collaboration and Identity Through Pre-service Agricultural Education Teacher Professional Development

Introduction

To be considered effective, school-based agricultural education (SBAE) teachers must possess a wide range of traits, including knowledge of agricultural subject matter, active planning of instruction, and professional engagement (Eck et al., 2019). Professional engagement activities, such as attending annual teacher conferences and participating in specialized professional development (PD) events, are vital to the development of competent SBAE teachers, as they help fill gaps in teachers' knowledge and skills (Phipps et al., 2008). However, to maximize the positive impacts of PD on teachers, programming should be conducted intentionally and proactively (Wells & Hainline, 2021).

Teachers' engagement in PD can impact their professional identity. According to Shoulders and Myers (2011), professional identity refers to SBAE teachers' perceptions of themselves as teachers and their place in the larger context of the profession. Shoulders and Myers (2011) noted that several factors influence SBAE teachers' professional identity development, including gender, the nature of the agricultural education profession, instructional practices, and societal expectations. Moreover, they suggested that agricultural teacher education programs can be especially influential in developing teachers' professional identity. Because of the social nature of professional identity development (Shoulders & Myers, 2011), self-segregation can occur as a social support mechanism among people with similar backgrounds, interests, and ideas (Moore-Jones, 2022). However, such practices can cause division and may hinder the "spirit of unity among classroom teachers" ascribed to by the National Association of Agricultural Educators ([NAAE] 2022, Our Mission section, ¶ 1).

With this in mind, there are currently four active agricultural teacher education programs in Arkansas. Historically, interactions between the programs and their respective faculty have been professionally cooperative; yet, student recruitment efforts between the four programs have tended to be quite competitive, particularly in recent years. Anecdotally, this competitive atmosphere between the four programs has helped foster university-related divisions among the SBAE teachers in the state. Consequently, teachers have tended to gravitate toward engaging more frequently with their fellow university alumni versus with colleagues who graduated from other universities (i.e., self-segregation). To overcome barriers related to self-segregation based on agricultural teacher education program and positively impact the professional identity development of pre-service SBAE teachers, perhaps providing highly-collaborative PD for pre-service teachers might be a useful approach. Such programming could intentionally and proactively build a mindset of professional unity and cohesiveness, regardless of the agricultural teacher education program attended.

How it Works

The Arkansas Pre-service Teacher Conference was created to bring together pre-service teachers from each of the four agricultural teacher education programs for PD. Workshop sessions were designed to maximize involvement and collaboration among participants in order to facilitate professional identity growth among the group. Workshop topics pertained to classroom management, working with community members, using social media to promote the complete SBAE program, Arkansas reporting requirements, professionalism, and using resources provided by the National FFA Organization. Additionally, joint experiences outside of the workshop sessions, such as meals and free time, were intended to foster relationship-building among the pre-service teachers.

Results to Date

In January 2022, state staff with the Arkansas Department of Education hosted the inaugural Arkansas Pre-service Teacher Conference, which was an intensive, two-day PD event designed for pre-service teachers completing their student teaching experience during either the Spring 2022 semester or the Fall 2022 semester. The event was held at Camp Couchdale, a centrally-located campground owned by the Arkansas FFA Association. Participants checked-in to the event mid-morning of the first day and ate lunch together.

Workshops were conducted throughout the first afternoon, followed by dinner. The participants were given free time after dinner and were encouraged to socialize and visit with each other. Several pre-service teachers from various universities used the free time to leave camp together and travel into the surrounding town. Breakfast was provided to participants on the second morning, which was followed by workshops both before and after lunch. The event ended in the late afternoon of the second day. This was the first year to host this event; however, anecdotal evidence provided by conversations with pre-service teachers revealed that the event helped them develop relationships with future colleagues from other universities. Many of the pre-service teachers exchanged contact information and planned to contact each other during their student teaching experience for advice or help.

Future Plans and Advice to Others

The state staff at the Arkansas Department of Education plan to continue this event in the future. We recommend that in the future, planners seek out more sponsors (e.g., Arkansas Farm Bureau, Arkansas Cattlemen’s Association, etc.) to help lower the overall cost of the program’s delivery. Involving additional sponsors and inviting them to the event could help introduce the pre-service teachers and sponsors to each other, thereby fostering additional opportunities for relationship-building. We found this event to be a useful, practical approach to collaboration and professional identity-building between pre-service teachers from different universities. We recommend that other states consider adopting a similar approach if they do not currently do so.

Costs / Resources Needed

Pre-service teachers attended this PD event at no cost beyond their travel to and from the venue. The primary costs for event organizers were meals, workshop supplies, and giveaways, which equated to about $1,300.00 total. A curriculum company sponsored one of the meals. Because the Arkansas FFA Association owned the campground, lodging and workshop space were available at reduced cost. The cost to host this type of PD event will vary depending upon available resources.

References

Eck, C. J., Robinson, J. S., Ramsey, J. W., & Cole, K. L. (2019). Identifying the characteristics of an effective agricultural education teacher: A national study. *Journal of Agricultural Education*, *60*(4), 1-18. https://doi.org/10.5032/jae.2019.04001

Moore-Jones, P. (2022). Self-segregation, sense of belonging, and social support: An inquiry into the practices and perceptions of Chinese graduate students at an American mid-Atlantic university. *Journal of Global Education and Research*, *6*(1), 1-12. https://www.doi.org/10.5038/2577-509X.6.1.1114

National Association of Agricultural Educators. (2022). *Who we are.* https://www.naae.org/whoweare/index.cfm

Phipps, L. J., Osborne, E. W., Dyer, J. E., & Ball, A. (2008). *Handbook on agricultural education in public schools* (6th ed.). Thomson Delmar Learning.

Shoulders, C. W., & Myers, B. E. (2011). Considering professional identity to enhance agriculture teacher development. *Journal of Agricultural Education, 52*(4), 98-108. doi:10.5032/jae.2011.04098

Wells, T., & Hainline, M. S. (2021). Examining teachers' agricultural mechanics professional development needs: A national study. *Journal of Agricultural Education, 62*(2), 217-238. https://doi.org/10.5032/jae.2021.02217

Caring Cards: A Peer-to-Peer Mental Health Intervention in Agricultural Communities

Katrina A. Clontz
University of Kentucky
3855 Belleau Wood Dr. Apt 1
Lexington, KY 40517
katrina.clontz@uky.edu
(602)430-3865

Stacy K. Vincent
University of Kentucky

Kelly J. McFarland
University of Kentucky

Carolyn Oldham
University of Kentucky

University of Kentucky

Introduction/Need for Innovation

Less than 25% of Kentucky's mental health professional needs were met as of the fourth quarter of FY 2021 (Health Resources and Service Administration, 2021). Access to mental health professionals within Kentucky's agricultural communities is even more limited as services cluster around urban areas. Thus, farmers face significant chronic mental health care and outcomes disparities due to the lack of access to and distance from clinicians, as well higher health-care costs due to rural area low patient volumes (Taylor, 2019). Community-based mental health, as well as suicide prevention programs, have been cited as key to addressing the increasing worldwide suicide rate and are essential to addressing morbidity and mortality in the agricultural sector (Coppens et al., 2014; Kral et al., 2009). Communities can implement specific suicide prevention strategies relevant to their context and cultures. The Caring Cards program seeks to strengthen interpersonal connections within agricultural communities by providing a space for personal correspondence to promote peer support and network building.

Thwarted belongingness and perceived burdensomeness are the major interpersonal risk factors for suicide according to Joiner's Interpersonal-Psychological Theory of Suicidal Behavior (Van Orden et al., 2010). Caring Cards are a way to address thwarted belongingness by bolstering farmer social networks and peer-to-peer support. Caring Cards initiatives are based on the idea of "Caring Contacts," where individuals who are admitted to a hospital following a suicide attempt receive semi-regular contact from hospital staff or other caring individuals. Many individuals contacted as part of Caring Contacts expressed positive feelings of being part of the program (U.S. Department of Veterans Affairs, 2021). Caring Contacts has been shown to decrease rates of suicide in individuals who were admitted to a hospital after a suicide attempt over a two-year period: 1.80% of patients who had received letters went on to suicide compared to 3.52% of patients who did not receive letters (Motto & Bostrom, 2001). Studies that evaluate the effect of various post-discharge interventions generally show reductions in suicide deaths, attempts, and ideation as a result of the intervention (Luxton et al., 2013). Caring Cards takes support out of a clinical setting and into a peer-to-peer setting. Originally implemented in the veteran community to address high rates of suicide, Caring Cards initially involved veterans with mental health concerns by sending handwritten cards to their peers. According to the 2017 Census of Agriculture, 11% of the nation's producers are veterans or are currently serving in the armed forces as compared to 6.9% of the general US population (USDA, 2020).

How it Works/Methodology

The Southeast Center for Agricultural Health and Injury Prevention (SCAHIP) has developed 5 Caring Cards for distribution. The design and messages of the cards were evaluated at numerous community-level events. Upon approval of pilot funding, the team will identify 3 small, bounded communities through agriculture extension in which to test the cards (e.g. gardening club, cattleman's club, 4-H club leaders. etc.). Once a partnership is established, the Caring Cards and envelopes will be sent to the organizations for them to distribute and disburse. Participants are asked to write personalized messages on the inside of the cards and either mail or hand deliver the cards to someone whom they believe is facing a difficult time. Each card has a QR code on the back which, when scanned by the recipient, will take them to a brief survey.

The cards have simple designs with positive messages inspiring gratitude, comfort, and positive affirmations. For example, one message, "Thinking of You," was included to address geographic, occupational, and social isolation present within agricultural communities. The insides are left blank for the senders to write personalized messages to the recipient. In fact, personalization is encouraged. The cards were designed to have minimal influence on the sender's message while still being aesthetically appealing.

Results to Date/Implications

To address mental health concerns within the agricultural community, the team developed 5 Caring cards for distribution and introduced them in a number of agricultural domains, such as county Farm Bureau meetings, the Kentucky State fair, and farmer appreciation days where the cards were made available to community members for free. A total of 1439 cards were distributed. During these events, community members were polled on their opinions about the cards, such as which cards they felt were most visually appealing and which messages they felt were most important for farmers to hear. Many individuals stated that they would like to be involved in the program and that mental health and suicide were important concerns to address within their communities. Based on positive reception at these events, Caring Cards are now pending pilot funding where they will be piloted in 1-3 bounded communities. New cards will be designed and distributed to the partner communities where they will be available for members to send to one another, sharing messages of compassion and support. Since cards will be sent and received from within the community, interpersonal connection and integration should be increased among participating individuals.

Future Plans/Advice to Other

Pending pilot funding approval, Caring Cards will be implemented in 1-3 bounded communities, such as commodity subgroups within a county. Cards will have a printed QR code which participants can scan and take a quick survey which will inform the social networks participants are a part of as well as impact of the cards on mental wellbeing. The period of pilot testing will be used to gauge effectiveness and allow for adjustments to be made. Following the pilot study, further dissemination and implementation of Caring Cards throughout the Southeast region and into other regions would be ideal. Besides the identified bounded communities, various organizations could create and send Caring Cards in the future, such as teachers, youth organizations, Farm Bureau, and Women in Ag. Due to the personal, community-level nature of the Caring Cards program, uptake by individual communities is necessary for farmers in that community to reap the benefits.

Costs/Resources Needed

The designing, purchasing, and printing of the cards was the largest expense. Through funds provided by the Southeast Center for Agricultural Health and Injury Prevention, the cards and envelopes were funded for each participating youth organization. The cost was approximately \$0.17 per 1-2-color card, \$0.26 per 4-color card, and \$0.10 per envelope. Additional costs may be incurred through dissemination of the cards (do cards need to be mailed or shipped), while resources (space, displays) may be needed if the cards were to be housed at different sites. For the sustainability of the project, organizations will be asked to provide resources to assist in the production costs of the Caring Cards.

References

Coppens E, Van Audenhove C, Iddi S, Arensman E, Gottlebe K, Koburger N, Coffey C, Gusmão R, Quintão S, Costa S, Székely A, Hegerl U. (2014). Effectiveness of community facilitator training in improving knowledge, attitudes, and confidence in relation to depression and suicidal behavior: Results of the OSPI-Europe intervention in four European countries. *J Affect Disord 165,*142-50. https://doi.org/10.1016/j.jad.2014.04.052

Bureau of Health Workforce Health Resources and Services Administration (HRSA) U.S. Department of Health & Human Services (2021). Designated Health Professional Shortage Areas Statistics: Fourth Quarter of Fiscal Year 2021. Designated HPSA Quarterly Summary [Internet]. Shortage areas. Available from: https://data.hrsa.gov/topics/health-workforce/shortage-areas

Kral MJ. (2016). Suicide and Suicide Prevention among Inuit in Canada. *The Canadian Journal of Psychiatry, 61*(11), 688-695. https://doi.org/10.1177/0706743716661329

Luxton, D. D., June, J. D. & Comtois, K. A. (2013). Can postdischarge follow-up contacts prevent suicide and suicidal behavior? *Crisis: The Journal of Crisis Intervention and Suicide Prevention*, *34* (1), 32-41. https://doi.org/10.1027/0227-5910/a000158

Motto, J.A., & Bostrom, A. G. (2001). A randomized controlled trial of postcrisis suicide prevention. *Psychiatric Services*, *52*(6), 828-833

National Agriculture Statistics Service. (2020). *2017 Census of agriculture: Producers with military service* [Fact sheet]. United States Department of Agriculture. https://www.nass.usda.gov/Publications/Highlights/2020/census-military-producers.pdf

Taylor M.M. (2019). *Rural Health Disparities: Public Health, policy, and planning approaches.* Cham, Switzerland: Springer.

U.S. Department of Veterans Affairs. (2021). *Caring Contacts*. U.S. Department of Veterans Affairs - Rocky Mountain MIRECC for Suicide Prevention. Retrieved October 31, 2022, from https://www.mirecc.va.gov/visn19/cpg/recs/13/

Van Orden KA, Witte TK, Cukrowicz KC, Braithwaite SR, Selby EA, Joiner TE Jr. (2010) The interpersonal theory of suicide. *Psychol Rev. 117*(2):575-600. https://doi.org/10.1037/a0018697

Communicating agriculture to the public: A conference for high school agriculture students

Max Hagaman
124 Gentry Hall
Columbia, MO 65211
(304) 203-7445
Mh8nt@missouri.edu

Rebecca Mott
123 Gentry Hall
Columbia, MO 65211
(573) 881-0749
mottr@missouri.edu

Jon Simonsen
126 Gentry Hall
Columbia, MO 65211
(573) 884-7375
simonsenj@missouri.edu

John Tummons
127 Gentry Hall
Columbia, MO 65211
(573) 882-9599
tummonsj@missouri.edu

Communicating agriculture to the public: A conference for high school agriculture students

Introduction/Need for Innovation or Idea

Prospective university students are not always aware of career opportunities available in the broad and diverse field of agriculture (Baker & Abrams, 2011). In an era where trends regarding university student entrance, retention, and graduation as key indicators of institutional successes and failures are being highlighted (Adams-Johnson et al. 2019), it is important incoming students are well informed about agricultural careers so they can make informed major choices. Agricultural Communications is a fast-growing segment of agricultural education (Telg and Irani 2011) which can connect students to numerous career opportunities in agriculture.

Agricultural Communications is an emphasis area of the Agricultural Education and Leadership Program offered at the University of Missouri. University of Missouri Agricultural Education and Leadership (AEL) developed a one-day outreach event- *Communicating Agriculture to the Public*- with the goal of developing skills and motivating high school students to explore career paths in agricultural communications. Additionally, we aimed to raise awareness about opportunities at University of Missouri and provide an opportunity for high school students to network with agricultural communications professionals from across the state. This innovative project addresses American Association for Agricultural Education Research Priority 3.2: "What methods, models, and practices are effective in recruiting agricultural leadership, education, and communication practitioners and supporting their success at all stages of their careers?" (Roberts et al., 2016).

How it works/methodology/program phases/steps

Communicating Agriculture to the Public was hosted in a large high school located in the south central part of the state- a location that doesn't have easy access to events offered on the university campus. The local high school agriculture teacher assisted with space reservations, meal planning, and facility coordination.

On the morning of the early fall event, University of Missouri undergraduate and Master's students set-up for *Communicating Agriculture to the Public* an hour before high schoolers were due to arrive. Registration opened at 9:30 a.m., with an undergraduate University of Missouri student delivering greetings 30 minutes later. An opening address delivered by a agriculture broadcasting/communications professional officially kicked off the morning.

At the conclusion of the opening session, the 80 high school students were divided into one of four randomly assigned breakout groups. Each high school student breakout group attended three 30-minute-long workshops. Workshop sessions included the following: "Event Planning, Finding Your Voice", "Creating Newsworthy Content", "Policy Communications", and "Social Media and Photography". Workshop presenters included communications professionals from Missouri Farm Bureau, a commodity group, a national agricultural publication company, an agricultural broadcasting organization, a private agriculture company and the University of Missouri. Each breakout group was assigned one or two university students who guided participants from room to room, facilitated questions, built connections with the high school workshop attendees.

The morning workshops were followed by a luncheon and remarks from the sponsoring commodity group. At the conclusion of the meal, an agriculture industry panel was moderated by university students. The student moderators directed the panel discussion toward two topics: 1). pathways and processes to achieve a career in agricultural communications, and 2). the future of agriculture communications. A reflection activity led by university students helped solidify learning from the speakers and breakout workshops, and the day concluded with closing remarks from a past national FFA officer. After adjournment, participants received "swag" to take home, as well as University of Missouri photo backdrops where students could take pictures.

Results to date/implications

The fall of 2022 was the first time for our department to host an event like this away from the University of Missouri campus. During this inaugural event, there were 80 students in attendance, from all grades 9-12. Two Agricultural Education & Leadership university faculty members were present, along with 7 undergraduates and 3 master's students. Eight presenters spoke on behalf of 5 agricultural organizations, all either based in or have significant holdings in [STATE]. Incorporating an evaluation plan which aligns with our program objectives will be critical for future success of the event. With a goal of continuous improvement, we have plans to design and implement a Qualtrics survey to collect feedback on strengths and challenges at the conclusion of next year's event. Additionally, a system should be implemented to track the number of student participants who go on to attend the University of Missouri and/or major in a communications-related field.

Future plans/advice to others

One critical component of planning for our event was utilizing existing partnerships to source presenters and sponsors and to find a hosting school. Our future plans include rotating the conference to high schools in different regions of the state so that it is accessible to students that might not normally attend an event on the university campus due to transportation challenges. In the future, we also plan to allow students to rank their workshop choices when they register so their conference experience can be better tailored to participants' specific career interests. We also found that hosting an event early in the school year makes registration particularly challenging. We recommend others who consider implementing similar recruitment events carefully consider the academic calendars of both the university and high schools in the state.

Costs/Resources Needed

AEL spent less than $100 on miscellaneous supplies including workshop materials, candy for students, promotional materials and presenter gifts. Mostly, these items were sourced from inventory already on hand. The lunch was sponsored by a state commodity organization who also presented at the conference. All presenters and student helpers were volunteers, and the facility was reserved by the partnering FFA chapter.

References

Adams-Johnson, S., Cranmore, J., Holloway, A. M., & Wiley, J. D. (2019). Higher education recruitment in the United States: A chronology of significant literature. *Journal of Educational Administration and History*, *51*(3), 213-238.

Baker, L. M., Irani, T., & Abrams, K. (2011). Communicating strategically with generation me: Aligning students' career needs with communication about academic programs and available careers. *NACTA Journal*, *55*(2), 32-39.

Roberts, T. G., Harder, A., & Brashears, M.T. (2016). *American Association for Agricultural Education national research agenda: 2016-2020*. Gainesville, FL: Department of Agricultural Education and Communication

Telg, R., & Irani, T. A. (2011). *Agricultural communications in action: A hands-on approach*. Cengage Learning.

Tucker, M., Whaley, S. R., & Cano, J. M. (2003). Agricultural education and agricultural communications: Striking a proper balance in the academy. *Journal of agricultural Education*, *44*(1), 22-30.

Cultivating Collaborative Action: National Supply and Demand Data Sharing

Michael Spiess
Professor Emeritus
California State University, Chico
College of Agriculture
Chico, CA 95929-0310
(530) 521-6866
mspiess@csuchico.edu

Amy R. Smith
Associate Professor and Program Leader
University of Minnesota
146 Ruttan Hall
St. Paul, MN 55108
(612) 624-6590
arsmith@umn.edu

Daniel Foster
Associate Professor
The Pennsylvania State University
212 Ferguson Building
University Park, PA 16802
(814) 863-0192
foster@psu.edu

Rebecca Lawver
Department Head & Professor
Applied Sciences, Technology and Education
Utah State University
1498 N 800 E | ASTE 101C
UMC 2300
Logan, UT 84321
(435) 797-1254
rebecca.lawver@usu.edu

Cultivating Collaborative Action: National Supply and Demand Data Sharing

Introduction

As evidenced by the American Association for Agricultural Education (AAAE) Research Agenda (Stripling & Ricketts, 2016), a collective and critical issue facing agriculture is access to a sufficient and qualified workforce. Having a supply of qualified teachers is, and has been, a well-documented and pressing concern for school-based agricultural education (SBAE). As such, since 1965, AAAE has collected supply of and demand data for SBAE teachers across the U.S.

Since 2014, National Ag Ed Supply and Demand (NSD) data collection has been facilitated by a team of AAAE members. Annually, an executive summary has been provided to AAAE membership and published for broader use, with three-year reports available at the conclusion of each three-year cycle. While presenting discipline-related data through periodic reports to the profession is commonly accepted practice, a gap exists between current dissemination practices and what is possible leveraging modern digital technology.

Structural capacity limitations and human resource availability have, in some cases, prevented timely responses to data requests from AAAE members and stakeholders. As such, the team was compelled to explore open-access possibilities and consider open research efforts. Open access refers to immediate and online availability of research output, like annual reports, and data with rights to use outputs in a digital environment for research (Springer, 2023). Open access data has accelerated the pace of discovery with enhanced interdisciplinary conversations and collaboration, increased citation and usage, and fostered broader public engagement.

Government agencies commonly publish datasets on the internet, but it is less common for a discipline to publish research data in this way. While government data may be useful, it is often not in a format conducive to further analysis and/or may be poorly documented. Relational database systems (RDBS) were first described in a seminal article by Cobb (1970), who posited that all data could be defined or represented as a series of relations with or to other data. A spreadsheet by itself is not a database (Dilling, 2020); a database enables creation of a multidimensional structure to cleanly and accurately contain data. Presenting NSD data in a way that allows for new research techniques and methods could enable both faculty and student scholars in AAAE to engage in temporal analysis. It may also allow for the identification of more actionable research as we seek an understanding of and solutions to the long-standing challenge of ensuring a sufficient and qualified workforce of SBAE teachers.

How it Works

From 2014 to 2022, data was collected using two separate Qualtrics instruments sent to different populations. A supply instrument, collecting information about agricultural education program completers, was sent to agricultural teacher education program representatives, while the demand instrument was sent to agricultural education state staff representatives. Qualtrics data output was stored in Excel spreadsheets. To aggregate data, existing data had to be standardized, as there was slight variation between years. Once standardized, the data was imported into a Microsoft Access (MS-Access) relational database as two tables (supply and demand). MS-Access was chosen since it is a common desktop application and is easily integrated into the web application. Once imported, a table was created for regional grouping of data (e.g., AAAE, National Association of Agricultural Educators (NAAE), and FFA regions). Additional tables drive the web application for chart generation and report lists. A web application was written in ASP.NET to retrieve the data from the database. Google Chart, a free data visualization tool, was used to drive the visual representation of the data in chart and map formats. The application is a data-driven interface which minimizes the need for maintenance.

Using simple Structured Query Language (SQL) queries, data is extracted and presented in chart or tabular form. Using SQL, data can be extracted from either table or combined for more complex analysis. In addition, common metrics can be calculated. Since data extraction is driven by queries, adding, or editing a report is a simple task requiring only a few minutes. The nature of the RDBS makes connecting the two datasets simple. Tabular data can be viewed on a web page or downloaded in an Excel readable (CSV) file. The user may choose from a variety of queries in a drop-down list and specify a year or state. The website also provides a data dictionary (stored in the database) and PDF copies of instruments used. The web application is driven by the data in the database so updates do not require any additional coding. To update either queries or the data, the MS-Access database is edited and then uploaded to the website.

Results To Date

The web application is available at http://aaae.agedweb.org/nsd. Since development, the data has been updated twice, and a total of 22 tabular queries and 14 chart queries have been developed. The process of combining annual data, from 2014 to present, into a common format and database enables more convenient access to longitudinal research, allowing for quick extraction. Extracted data can be analyzed using common research tools like SPSS, SAS, and Excel. A brief manual was written describing the application and how to update the database. A "user's guide" is also provided to aid researchers in analysis of downloaded data. Data is available in much more detail than written reports for additional analysis.

A challenge to the design was dealing with incomplete data. Flags were added to the data to indicate valid data. These flags are used by the queries to select only valid records. The ease of extraction has also been helpful in connecting the dataset to other sources of data such as FAEIS, NCES, and others. Making NSD data more accessible is an initial step toward encouraging collaboration and parallel lines of inquiry in our discipline for heightened research impact.

Future Plans/Advice to Others

The immediate plan is to update the MS-Access database as data is collected. As such, consistent terminology, variable naming, and spreadsheet structure is important. For similar projects, this process may be helpful to organize data sets allowing for additional research. SQL queries should be developed around the needs of potential users; requests from AAAE members and other Ag Ed stakeholders may encourage the development of queries. Selection criteria might commonly be on date and other appropriate groupings. With consideration of privacy, data should be aggregated as necessary to hide information not in the public domain.

Costs/Resources Needed

Costs for this innovation include data preparation, building the web app, hosting, and maintenance. The cost of data preparation will be highly variable depending on data format and uniformity. For this project, approximately 16 hours was required to assemble all years into the database. The web application was built in about 8 hours; due to the technical nature of this task, it may need to be contracted. A total of 4 hours were spent on documentation and outlining the process for updates. Hosting services commonly cost $200/year if a campus host is not available. Ongoing maintenance is required if/when additional data is collected. The time for updates is estimated as 1-2 hours/year (dataset).

References

Codd, E. R. (1970). A relational model of data for large shared data banks. *Communications of the ACM.*13:377–387.

Dilling, T. J. (2020). Artificial Intelligence Research: The Utility and Design of a Relational Database System. *Advances in radiation oncology*, *5*(6), 1280–1285. https://doi.org/10.1016/j.adro.2020.06.027

Lawver, R. G., Foster, D. D., & Smith, A. R. (2018). *Status of the U.S. Supply and Demand for Teachers of Agricultural Education, 2014 - 2016*. http://aaaeonline.org/Teacher-Supply-and-Demand

Springer Nature. (2023). *The fundamentals of open access and open research.* https://www.springernature.com/gp/open-research/about/the-fundamentals-of-open-access-and-open-research

Stripling, C. T., & Ricketts, J. C. (2016) Research Priority 3: Sufficient Scientific and Professional Workforce That Addresses the Challenges of the 21st Century. In T. G Roberts, T. G., A. Harder, M. T. & Brashears, (Eds). *American Association for Agricultural Education national research agenda: 2016-2020. (pp. 30-35).* Gainesville, FL: Department of Agricultural Education and Communication. Retrieved from: http://aaaeonline.org/resources/Documents/AAAE_National_Research_Agenda_2016-2020.pdf

Cultivating the Next Generation of Educators Through an Online Ag Ed CDE

Cheyenne Hoppes, NC State University
Hannah Houk Gordon, NC State University
Wendy Warner, NC State University
Mary Kate Morgan Lanier, NC State University

Department of Agricultural and Human Sciences
2221 Broughton Hall
2601 Stinson Drive
Campus Box 7607
Raleigh, NC 27695

cehoppes@ncsu.edu
hghouk@ncsu.edu
wjwarner@ncsu.edu
mkmorga2@ncsu.edu

Introduction/Need for Innovation or Idea

The ongoing shortage of agriculture teachers has been of great concern to numerous stakeholders. Since 1965, the American Association for Agricultural Education (AAAE) has supported research collecting data of the supply and demand of agriculture teachers across the country (Smith et al., 2021). More recently, the National Association of Agricultural Educators (2023) initiated the National Teach Ag Campaign, to promote careers in school-based agricultural education and recognize the importance of agriculture teachers in schools and communities.

The continual demand for agriculture teachers in North Carolina and the influence of career development events on career interests and readiness (Lundry et al., 2015) was also recognized by FFA members. This led to chapter delegates at the 2019 North Carolina FFA Convention proposing, discussing, and passing a motion to create and implement an Agricultural Education CDE event. The recommendation was then sent to the North Carolina FFA Board of Directors. At the board meeting, it was decided that an event would be developed and administered for high school juniors and seniors.

How it Works/Methodology/Program Phases/Steps

In order to offer the Agricultural Education CDE, an event superintendent was identified. The superintendent determined the delivery of the event would closely align with course content in an undergraduate course, Administration and Supervision of Student Organizations. Therefore, the CDE was created as an online event so that undergraduate students could assist with the delivery. Using the Agricultural Education CDE event guidelines from several states, as well as components of the edTPA, the event superintendent and an undergraduate student developed a North Carolina specific event. The competition involved a three-part submission modeled after common responsibilities of agricultural educators to generate student interest and skill in this career area. The contest required students to be familiar with concepts in agricultural education, common teaching strategies, and their own personal teaching philosophy.

The first of these requirements was a detailed lesson plan outlining what would be conducted during a 15–20 minute lesson based on the North Carolina Agricultural Education Curriculum. To aid students in developing this lesson plan, a template was provided on the North Carolina FFA Event Guidelines listing the different sections of a lesson plan and a recommended structure. The second element was a recorded demonstration of the lesson. This video submission had to be continuous and unedited with the inclusion of students for participation and questioning.

After this, participants completed a written reflection about the successes, challenges, and future improvements of their lesson. The written lesson plan, teaching video, and reflection were submitted virtually and evaluated by the rubrics provided in the North Carolina FFA Event Guidelines. The five participants with the highest total score advanced to the final round consisting of a virtual interview. Students were evaluated based on their response to questions, their poise and presence, and their demonstrated passion for agricultural education.

Results to Date/Implications

Due to the COVID-19 pandemic the event was delayed until the spring of 2022. There were 12 FFA members that participated the first year through the virtual submission of a Google Drive folder containing their lesson plan, recorded demonstration, and written reflection. This was followed by the finalist interviews which were conducted through Zoom with a panel of three judges, consisting of a teacher educator and two undergraduate agricultural education students. The students who placed in the top three were recognized on stage at the North Carolina FFA State Convention in June of 2022.

Future Plans/Advice to Others

After the review of submissions by undergraduate students, a reflection was conducted to develop a best practices guide for participants. Recommendations included suggested group sizes of 4-10 students to demonstrate questioning and student interaction, practice recordings to determine the best placement of camera and sound quality, and a list of specific components to be clearly identified in the submitted lesson plan. It was also suggested to continue involving preservice agricultural education students in the facilitation of the event, either as part of a course or through a student organization. After evaluating the lesson plans and teaching videos submitted for the CDE, the undergraduate students commented that it provided them with a new perspective about the importance of lesson planning and its contribution to impactful teaching. To further develop the event, the creation of informational videos and offering help sessions could be done to promote participation.

Costs/Resources Needed

Approximately 10 hours of time was invested in the creation of the event guidelines. The North Carolina FFA staff provided support for the event registration and submission process. The initial evaluation of materials and determination of the top five contestants included 18 undergraduate students and required five hours of class time. An additional two hours was needed to conduct the final zoom interviews. In order to recognize the top three contestants with plaques on stage at the State FFA Convention, a $500 sponsorship was secured through the North Carolina FFA Foundation.

References

Lundry, J., Ramsey, J. W., Edwards, M. C., & Robinson, J. S. (1995). Benefits of career development events as perceived by school-based agricultural education teachers. *Journal of Agricultural Education, 36*(1), 43-57. https://doi: 10.5032/jae.2015.01043

National Association of Agricultural Educators. (2023). *National Teach AG campaign*. https://www.naae.org/teachag/index.cfm

Smith, A. R., Foster, D. D., & Lawver, R. G. (2022). *National agricultural education supply and demand study, 2021 executive summary.* Retrieved from:http://aaaeonline.org/Resources/Documents/NSD 2021Summary.pdf

Cultural Awareness and Support for Safety Education: Integrating Inclusive Research Design

Taija Jackson
Utah State University
2300 Old Main Hill
Logan, UT 84322
(435) 790-0999
a00289452@usu.edu

Michael Pate
Utah State University
2300 Old Main Hill
Logan, UT 84322
(435) 797-0989
michael.pate@usu.edu

Becki Lawver
Utah State University
2300 Old Main Hill
Logan, UT 84322
(435) 797-1254
rebecca.lawver@usu.edu

Dustin Perry
Montana State University
230 Linfield Hall
Bozeman, MT 59717
(406) 994-5773
dustin.perry@montana.edu

Scott Smalley
Iowa State University
217 Curtiss Hall
Ames, IA 50011
(515) 294-0047
smalle16@iastate.edu

Introduction/Need for Innovation

Specific underserved populations of the agricultural community have significantly higher rates of injury (Goldcamp et al., 2006), and currently, there is minimal data reported on the number or ability of instructors to use Tractor and Machinery Safety resources among underserved populations (Jepsen, 2012). The Youth Farm Safety Education and Certification (YFSEC) Instructor Professional Development Needs Assessment Survey was developed to identify curriculum needs and potential barriers to extension and school-based agriculture education (SBAE) instructors to deliver tractor and machinery safety instruction specifically to youth among African American, Native American, and Hispanic/Latinx farming communities.

Both the National Safe Tractor and Machinery Operation Program (NSTMOP) and Gearing Up have served as tractor and machinery youth curriculum models to be delivered by extension or SBAE teachers (Snyder et al., 2013) via face-to-face instruction. Yet, there has been little effort to address instructor preparation regarding engaging or meeting the needs of underrepresented populations using YFSEC curriculum. The need for inclusive curriculum has risen and will continue to be prominent given the recent world pandemic of COVID-19 (Hartshorne et al., 2020). This project sought to utilize an inclusive research design (IRD), wherein partners work together to plan and design research approaches and processes (McKemmish et al., 2012), as an innovative approach to better serve people of diverse backgrounds. This process sought to be attentive in developing an approach founded on empathy and respect for underserved populations. The principles and process of IRD include a connection to the community in all stages of the research, from conception to dissemination (McKemmish et al., 2012).

Program Phases

To systematically consider diverse and differing perspectives, we began an inclusive approach to develop a national YFSEC instructor professional development program for training underserved youth in agricultural safety and health. Initially, culturally responsive pedagogy and YFSEC instructor competency literature were utilized to draft professional development items (Mellom et al., 2018; Snyder et al., 2013). During the second stage of the program, individual experts were solicited to serve as an advisory committee (Flores & Alonso, 1995). This committee was formed with three individuals representing 1890 historical Black college land-grant institutions, 1862 Hispanic serving land-grant institutions, and 1994 Tribal land-grant institutions. This committee participated in a two-day intensive focus group to identify key barriers, programmatic elements, curriculum implementation strategies, and professional development needs. Member checking was used to assess the credibility of the summation of the feedback using quarterly zoom calls during the initial year (Nassar-McMillan & Borders, 2002). Focus group data were interwoven into survey items for identifying the professional development needs of extension and SBAE instructors who may instruct underserved youth. During the second year, we sought to field test the items to address cultural sensitivity, inclusive language, reading proficiency, and accessibility. A two-day meeting was held with six individuals representing 1862, 1890, and 1994 land-grant institutions to validate the questionnaire.

Results to Date

This collaborative effort highlighted several areas for improvement when surveying instructor needs. Several issues dealt with question stem construction, response options, and overall length. Recommendations for improvement were made accordingly. These included relevance of exemptions for youth learners, reduction of department of labor references, simplifying language and inclusion of relevant pictures. Rural accessibility to online access for surveys was noted to be limited. The average time to complete the survey was 10 minutes. However, many participants strongly urged reducing the length and offering an opt-in option. This opt-in option was justified as the topic relevance may deter participation and lower survey engagement. Field test participants noted and appreciated the diversity of thought used to develop the survey. Recommendations for accessing specific populations were identified using the federally recognized Tribal extension agents, 1890 land-grant extension agents, and 1862 Hispanic serving land-grant institutions.

Future plans/Advice to others

Overall, the summary from the field test was that “words matter.” Lessons learned for agricultural safety and health professionals were that language is crucial when considering survey item development. Implications include verifying reading difficulty, avoiding unnecessary wordiness, reducing response options, and contextually framing the survey to highlight the relevance for the population. This survey development will be critical in determining a foundational pool of competencies to establish instructor professional development competencies for implementing YFSEC programming among underserved communities. Future plans will be to pilot test the survey items developed with a representative sample of instructors who may provide safety programming to underserved youth. A dedicated focus on IRD should be incorporated into education research methodology courses to raise awareness and provide tools to avoid bias in program design and implementation of interventions. We recommend the use of IRD to identify language, or terminology, that is appropriate with underserved populations. We believe that the inclusion of diverse and differing perspectives in YFSEC professional development is vital in developing an inclusive training program. This adds a quality control measure to programs resulting in minimizing the bias in the selection of program efforts.

Costs/Resources Needed

Costs associated with the IRD included travel expenses and expertise stipends for the advisory committee. Advisory committee members were reimbursed for travel expenses including per diem for meals, personal vehicle mileage, lodging, and airfare. Overall expenses associated with travel totaled $1,393. Expertise stipends totaled $2,000. Stipends were made in two installments. The first installment of $1,000 occurred after completion of the face-to-face meeting. The second installment of $1,000 occurred after the third follow-up conference call used for member checking.

References

Flores, J. G. & Alonso, C. G. (1995). Using focus groups in educational research: Exploring teachers' perspectives on educational change. *Evaluation Review, 19*(1), 85-101. https://doi.org/10.1177/0193841X9501900104

Goldcamp, E. M., Hendricks, K. J., Layne, L. A., & Myers, J. R. (2006). Nonfatal injuries to household youth on racial minority-operated farms in the U.S., 2000. *Journal of Agricultural Safety and Health, 12*(4), 315–324. https://doi.org/10.13031/2013.22011

Hartshorne, R., Baumgartner, E., Kaplan-Rakowski, R., Mouza, C., & Ferdig, R. E. (2020). Special issue editorial: Preservice and in-service professional development during the COVID-19 pandemic. *Journal of Technology and Teacher Education*, *28*(2), 137–147. https://www.learntechlib.org/primary/p/216910/.

Jepsen, S. D. (2012). The U.S. department of labor’s tractor and machinery certification program: Management styles and perceptions held by community stakeholders and instructors. *Journal of Agricultural Safety and Health*, *18*(3), 217–232. https://doi.org/10.13031/2013.41958

McKemmish, S., Burstein, F., Manaszewicz, R., Fisher, J., & Evans, J. (2012). Inclusive research design: Unravelling the double hermeneutic spiral. *Communication & Society, 15*(7), 1106-1135. https://doi.org/10.1080/1369118X.2012.707225

Mellom, P. J., Straubhaar, R., Balderas, C., Ariail, M., & Portes, P. R. (2018). “They come with nothing:” How professional development in a culturally responsive pedagogy shapes teacher attitudes towards Latino/a English language learners. *Teaching and Teacher Education, 71,* 98-107. https://doi.org/10.1016/j.tate.2017.12.013

Nassar-McMillan, S. C., & Borders, L. D. (2002). Use of focus groups in survey item development. *The Qualitative Report, 7*(1), 1-12. https://doi.org/10.46743/2160-3715/2002.1987

Snyder, S., French, B., Field, W., Tormoehlen, R., & Ess, D. (2013). Identification and validation of agricultural hazardous occupations order certification program instructor criteria and competencies. *Journal of Agricultural Education, 54*(1), 111-123. https://doi.org10.5032/jae.2013.01111

Developing a Competency Based Registered Apprenticeship for Military Veterans

Sara Kidd
North Carolina State University

Angel Cruz, Ph.D
North Carolina State University

Joseph L. Donaldson, Ph.D
North Carolina State University

Center for Environmental Farming Systems
Plant Sciences Building,
Campus Box 7825
Raleigh, NC 27695-7825
919-513-0954
skkidd@ncsu.edu

Introduction

Almost 80 years after the Servicemen's Readjustment act of 1944 created the first GI Bill, which included agricultural training programs (Petty, 2008), many of today's military veterans continue to be interested in pursuing farming as a second career (Donoughue et al., 2014). While North Carolina has the 8th highest population of military veterans in the nation, there is a lack of targeted long-term, hands-on agricultural training programs to prepare them to own and manage farms. Developing a registered agricultural apprenticeship program addresses this training need while also allowing veterans to utilize their GI Bill benefits for additional income. Host farm employers also benefit from gaining a committed employee who is eager to learn. This apprenticeship is North Carolina's first registered apprenticeship program for military veterans that pairs Agriculture and the Defense sector, two of North Carolina's top industries. The apprenticeship program is being piloted by the Center for Environmental Farming Systems (CEFS) a partnership of North Carolina State University, North Carolina Agricultural and Technical State University, and the North Carolina Department of Agriculture and Consumer Services

How it works

Registered apprenticeship programs help recruit and develop a diverse highly skilled workforce, increase productivity, allow employers to participate in training, and increase job retention. The five main components of a registered agricultural apprenticeship program are below:

1. *Business involvement:* The farms that employ apprentices are the foundation of the program. The host farms are chosen through an application and interview process. The host farms oversee and mentor the apprentices on a day-to-day basis.
2. *Structured on the Job training:* Apprentices are paid employees of the host farms so they "earn while they learn" by working 30-40 hours each week throughout the apprenticeship. Each apprentice receives hands-on-training from an experienced mentor at their host farm.
3. *Relevant Related Instruction*: Apprentices develop a customized related instruction plan based on courses, conferences, workshops, and webinars delivered by institutions on a list of approved related instruction providers. The Project Coordinator organizes and communicates upcoming apprentice training opportunities each month.
4. *Rewards for Skill Gains:* The apprentices receive pay increases after each 6-month period or when they meet certain benchmarks for skill competencies.
5. *Recognized Credentials:* Upon completion, apprentices will have earned an industry recognized credential.

Development of a competency based curriculum

Registered apprenticeships are classified as time based, competency based, or a hybrid of the two. Due to the educational focus of this program, a competency based approach was selected. Apprentices receive technical and academic training around the nine core competencies identified in the curriculum. The curriculum has a checklist of twenty eight basic farm management skills within the nine competency areas. Apprentices must become at least "competent" on the modified competency rating scale that was adapted from the Maine Cooperative Extension New Farmer Typology and the Dreyfus Model of Skill Acquisition (novice, advanced beginner, competent, proficient, and expert). The competency based curriculum has been approved by ApprenticeshipNC, the state coordinating agency for registered apprenticeships, making it one of the first registered agricultural manager apprenticeship programs in North Carolina. During the program, apprentices complete a skills assessment at the beginning, mid-point, and end of the apprenticeship to track their competency progression. Additionally there is a baseline survey that collects demographic information as well as information on apprentices' military service, farming goals, and agricultural background.

Results to date & Implications

With the pilot cohort of apprentices finishing the apprenticeship mid to late 2023 and another cohort of apprentices beginning early in 2023, it is too early to determine long term results of the program. However, anecdotal evidence points to positive results to date. Further research will explore barriers veterans face to participation in long term training programs, how farmers and apprentices determine competency in skills acquisition, and what benefits can be gained from an apprenticeship program versus informal modes of on-the-job training.

Future plans

In the future the registered apprenticeship program will continue with plans to amplify the program evaluation and expand. To determine long term results and implications of the apprenticeship program, apprentices will be surveyed at 2 and 5 years post completion. Additionally, apprentices and host farm employers will be participating in focus group interviews to provide feedback on the program. A strategic development of the apprenticeship would be to create a pre-apprenticeship program that would be Department of Defense Skillbridge approved. This would allow active duty service members to gain the required experience to begin the full apprenticeship while continuing to receive their military pay and benefits during their last 180 days of service. To determine long term results and implications of the apprenticeship program, apprentices will be surveyed at 2 and 5 years post completion.

Advice to Others

There are three main points of advice to others considering the benefits of registered apprenticeships. First, it has been important to recruit host farms that understand the required mentoring commitments and have spent time reviewing the job book and skills list before an apprentice starts. Well prepared host farms provide enthusiastic mentorship for their apprentices making the experience more positive for all parties. Second, and equally important is recruiting apprentices who have had some previous experience in agriculture and are ready to make the commitment to a long-term training program. Finally, it is extremely important to establish clear program guidelines and procedures including streamlining the enrollment and onboarding processes to reduce the paperwork and time burden on apprentices and host farm employers.

Costs & Resources Needed

The two pilot cohorts are currently funded by a USDA Beginning Farmer and Rancher Development grant. Program costs are predominantly in staff support and providing educational stipends to veterans for their time spent in their related instruction courses (144 hours total). Additional funding is used for travel support to check-in with apprentices and host farms across the state. Federal funding for registered apprenticeships in "high-demand" occupations may offset employers' wages and educational costs. Although agriculture is considered one of North Carolina's top industries, agricultural jobs will require "high-demand" classification to realize this funding opportunity.

References

Collins, B. (2016). Apprenticeship in the United States: Frequently Asked Questions. CRS Report R44174, Version 3. Updated. *Congressional Research Service*. https://crsreports.congress.gov/search/#/?termsToSearch=r44174&orderBy=Relevance

Donoghue, D., Goodwin, H., Mays, A., Arsi, K., Hale, M., Spencer, T., . . . Donoghue, A. (2014). Armed to farm: Developing training programs for military veterans in agriculture. *Journal of Rural Social Sciences, 29*(2) https://egrove.olemiss.edu/jrss/vol29/iss2/5

Dortch, C. (2012, September). The post-9/11 veterans educational assistance act of 2008 (post-9/11 GI bill): Primer and issues. *Congressional Research Service, Library of Congress.* https://crsreports.congress.gov/search/#/?termsToSearch=rR42755&orderBy=Relevance

Dreyfus, S. E. (2004). The five-stage model of adult skill acquisition. *Bulletin of science, technology & society*, *24*(3), 177-181. https://doi.org/10.1177/0270467604264992

Fleming, L. L. (2015). Veteran to farmer programs: An emerging nature-based programming trend. *Journal of Therapeutic Horticulture*, 25(1), 27-48. https://www-jstor-org.prox.lib.ncsu.edu/stable/24865257

Forstadt, L. (2019). Supporting relationships for farm success: a toolkit for agricultural service providers. *The University of Maine Cooperative Extension*. https://northeast.sare.org/resources/supporting-relationships-for-farm-success/

Gladwell, S. (2022, May 20). *Funding approved to expand registered apprenticeships*. NC Community Colleges. https://www.nccommunitycolleges.edu/news-center/news/funding-approved-expand-registered-apprenticeships

Petty, A. (2008). I'll take my farm: The GI bill, agriculture and veterans in North Carolina. *The Journal of Peasant Studies*, *35*(4), 742-769. https://doi.org/10.1080/03066150902737566

Rice, O., Hudson, J., Foster, L. Klein, S. (2016). Connecting Secondary Career and Technical Education and Registered Apprenticeship: A Profile of Six State Systems. Washington, D.C.: *U.S. Department of Education, Office of Career, Technical and Adult Education*. http://cte.ed.gov.

US Census Bureau. (2019). United States Census Bureau Quickfacts: North Carolina. https://www.census.gov/quickfacts/NC

Developing a Sheep Marketing Educational Website for Educators and Novice Producers

Sarah L. J. Thies
Purdue University
915 West State Street, LILY 4-401
West Lafayette, IN 47906
406-450-2703
thies0@purdue.edu

Neil A. Knobloch
Purdue University
915 West State Street, LILY 3-232
West Lafayette, IN 47907
765-494-8439
nknobloc@purdue.edu

Developing a Sheep Marketing Educational Website for Educators and Novice Producers

Introduction/Need for Innovation or Idea

Over the years, the number of sheep in the U.S. has been declining and factors including inflation have challenged the industry to adapt (American Lamb Board*,* 2023). Sheep producers are looking to diversify their businesses (USDA, 2020). For example, one of the market outlets for the sheep industry is restaurants, but because of COVID19, producers turned to other options including marketing their products locally (American Lamb Board, 2023). The changing attitudes and values of consumers are also driving a change in the focus of how producers market their products. Consumers want to know where their products come from, producers' stories, and how the product was grown and/or processed (American Sheep Industry Association, 2020). Organizations such as the American Lamb Board (2023) are setting goals and creating funding opportunities to create educational programs and help producers expand their operations and businesses. There are sheep marketing plan materials online, however, the materials often focus on marketing either wool or meat instead of helping producers see their options for marketing multiple products and diversifying their business. Business plan resources for sheep producers available often are handouts to fill out and lack a commentary about the process as well as various examples. The goal of this sheep marketing educational website was to provide short videos that guided producers through the steps of developing a market plan with relevant examples and handouts that they could use, if they desired.

How It Works/Methodology/Program Phases/Steps

A comprehensive instructional design process (Merrill, 2012) was followed to design the educational website. First, a needs assessment questionnaire was developed to produce results that would guide the creation of the website. The needs assessment questionnaire was dispersed through social media, emails gathered from public breed directories, and snowball sampling occurred as well. The needs assessment provided information about the demographics of sheep producers from 41 states including years of experience (range: 1 - 80), operation demographics, marketing experiences, and the resources they used. Results from the needs assessment showed that producers market various sheep products in various ways with the majority reporting off the farm, or directly to consumers. Under other, producers reported word of mouth as a common marketing strategy. In response to the resources producers use, the top five responses were: other producers, periodicals, social media, extension educators, and sheep101.info. When asked what educational resources producers would use, the top five "Would definitely use" responses were: websites, extension educators, an online resource bank, articles / blogs, and YouTube. Second, informed by the needs assessment questionnaire, the Sheep Marketing website is a public website available to sheep producers, educators, and any business person. The videos and content were designed for beginner producers, producers looking to expand their business options, and high school students. The videos are accompanied by study guides and examples and were uploaded through YouTube. Third, for accessibility, the content uses neutral colors, two dyslexia friendly font styles, and word documents with alternative fonts. The website has a page for educators with the aligning national standards and other supporting content for implementation. Fourth, participants from all levels of experience who responded to the questionnaire provided resources they used. The resource page is a library of extension publications, books suggested by other producers, periodicals, university sheep program websites, and other resources for producers. Finally, a questionnaire was adapted from course and teacher evaluation tools

(Curriculum Support Guide, n.d.). Using Qualtrics, the review questionnaire was sent via email to a convenience sample of producers, educators, and industry advocates. The questionnaire targeted the marketing content and briefly covered the accessibility and website navigation.

Results to Date/Implications

The educational website (https://sites.google.com/view/sheep-marketing/home) consists of a home page that displays all six of the videos that were developed. From the home page, each video has its own website page with additional resources and industry examples. Based on producer feedback, the website has a resource page that links producers to educational materials. There is a page for educators that outlines the standards the videos address, lists essential questions (if taught as a unit), and extension activities. The resource bank consists of a list with links to 1,350 extension publications, a list of books that producers reported using, a list of sheep industry periodicals, links to university sheep operation social medias and websites, a link to the USDA market report, and links to sheep industry focused podcasts.

We are receiving feedback (on-going) regarding the website from educators, producers, and industry advocates. Preliminary feedback shows reviewers “agree” and “strongly agree” the video content is valuable and beneficial to their application. Reviewers “agree” and “strongly agree” the website is easy to navigate. Based on this, we conclude the educational website will be a useful tool for agricultural and extension educators, producers, and industry advocates.

The content created aligns with a majority of the National ANFR Agribusiness Systems Career Pathway Content Standards (The National Council for Agricultural Education, 2015). The videos and handouts could be utilized by Career and Technical Education (CTE) educators to teach business content using sheep industry examples. The content could also be utilized by Extension educators to help sheep producers and possibly other livestock producers build their businesses as well as help 4-H youth market their projects.

Future Plans/Advice to Others

Future plans are to review the website annually for content updates. Future plans may include exploring an alternative website platform to improve mobile accessibility of the website. To disseminate the information to producers and educators, collaboration with state and national sheep associations and programs and Extension events or journals will be explored. Even though the content targets sheep producers, the marketing content could be applied in other contexts. Industries interested in developing content should conduct a needs assessment for direction.

Costs/Resources Needed

Costs associated with this project included $25 for a video editing subscription. The website platform, Google Sites, was free to use and create; the creator had to have a Google account. Upkeep is the responsibility of the website owner. Participants needed access to the internet and a connected device. Human resources, time, were a cost associated with the development of the website content (approximately 100 hours for the developer) and the completion of the needs assessment and review assessment (15 minutes and one hour, respectively, for participants). Website users will need access to a device and the internet. Users may also need access to a printer and office supplies if they choose to print the handouts. The resources and content shared with participants are open access.

References

American Lamb Board (2023). *American Lamb Board Strategic Plan 2023 - 2028*. https://static1.squarespace.com/static/5df2bf866e42151b88818a9e/t/63c6e9206564160aac6474c3/1673980199409/ALB+2023-28+Strategic+Plan+1+9+23+FINAL+pages+web.pdf.

American Sheep Industry Association. (2020). *Wool Trust Report*. USDA Agricultural Marketing Service. https://www.ams.usda.gov/sites/default/files/media/WoolTrustReport2019_2020.pdf.

Curriculum Support Guide. (n.d.). *The Curriculum Support Guide Instruction Partners*. https://curriculumsupport.org/wp-content/uploads/2019/02/Stakeholder-Feedback-Survey.docx

Merrill, M. D. (2012). *First Principles of Instruction*. Germany: Wiley.

The National Council for Agricultural Education. (2015). *AFNR Career Cluster Content Standards*. https://opi.mt.gov/Portals/182/Page%20Files/Career%20%26%20Technical%20Education/Docs/Agriculture/council_afnr_career_cluster_content_standards.pdf

United States Department of Agriculture. (2020, June 24). *Sector at a glance*. USDA ERS - Sector at a Glance. https://www.ers.usda.gov/topics/animal-products/sheep-lamb-mutton/sector-at-a-glance/

Developing an Agricultural Mechanics Academy

Brittney Heibel
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-2130
bhh19@txstate.edu

Ryan G. Anderson
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-3325
r_a461@txstate.edu

Doug Morrish
Texas State University
601 University Dr.,
San Marcos, Texas 78666
512-245-2130
dm43@txstate.edu

Developing an Agricultural Mechanics Academy

Introduction

Agricultural mechanics courses are widely popular throughout U.S. high schools, training secondary education students to become tradesmen for welding manufacturing, electrical maintenance, engine repair, and more. In order for agricultural mechanics instructors to accurately reflect current industry standards and practices, they are encouraged to maintain relevant curriculum (Shultz et al., 2014). To be successful instructors must also be informed and confident on how to perform these practices. Historically, insufficient agricultural mechanics training at a post-secondary level has ultimately led to inexperienced instructors that are unfamiliar and under prepared with concepts they are expected to teach (Clark et al., 2021).

Instructors who lack proper training are encouraged to participate in weekend and summer workshops that will enhance their skillset and help them to provide more informed, well-rounded lessons. This innovative idea of an agricultural mechanics professional development workshop was created with the intention of improving its participants' ability to teach agricultural mechanics to their students, as well as enhance their laboratory awareness and management skills. This workshop was also intended to prepare secondary agricultural education students to fill the various skills gaps in the agricultural mechanics workforce.

Workshop Procedures

The Agricultural Mechanics Academy (AMA) is a ten-day, grant funded, professional development workshop held at [UNIVERSITY]. The academy included trainings in the areas of small gasoline engine fundamentals and management; electrical systems and residential wiring; and welding principles and applications. These trainings aimed to target high-focus areas of secondary and post-secondary agricultural mechanics concepts. Of the 78 applications received from high school agricultural mechanics teachers across the U.S., 20 participants were selected to attend AMA. Selection for participation was based upon the applicants' prior experience levels and expected future agricultural mechanics course loads indicated in their application. The goal of the AMA was to train SBAE instructors who possessed the least amount of experience, while simultaneously having the largest course load of agricultural mechanics courses for their upcoming school year.

Days One, Two and Three of the academy were spent training and focusing on small gas engines through hands-on lab trainings and classroom curriculum. The small gas engine trainings were led by a Briggs and Stratton training specialist. Days Four, Five, and Six of the academy were focused on residential electrical wiring hands-on trainings. These trainings were led by [UNIVERSITY] instructors. Day Seven of the AMA was spent training the participants oxyacetylene cutting and welding. Finally, days Eight, Nine, and Ten were spent training the participants in Shielded Metal Arc Welding (SMAW) and Gas Metal Arc Welding (GMAW) with hands-on lab trainings and classroom curriculum sessions. This portion of the academy was led by Lincoln Electric *Train the Trainer* instructors and focused on teaching maintenance of welding machines, welding processes constructs, and multi-configuration welding performance.

Results to Date

Results from our first AMA workshop were collected through pre- and post-completion surveys. The surveys were intended to evaluate the participants' perceived level of ability, knowledge, and importance of the various lessons covered during the workshop, using a five-point Likert-type scale. The results from our in-service training workshop show that the participants experienced significant positive changes from all provided trainings. Our AMA participants expressed that they saw a significant increase in their perceived knowledge, importance, and ability to teach small gas engines, residential electrical wiring, oxyacetylene cutting/welding, and welding constructs. Participants also expressed that they realized significant positive impacts on their personal ability to perform small gas engine fundamentals and management, electrical systems and residential wiring, and the various welding principles and applications covered during the academy. These positive impacts on our SBAE participants' knowledge, importance, and ability to perform agricultural mechanics constructs will enable them to provide higher quality lessons to their future students.

Future Plans

The format of our first AMA was highly successful, and at the recommendations of our past participants, we have elected to add AMA Ambassadors to our future academies. The AMA Ambassadors are comprised of previous participants who have successfully implemented the curriculum into their respective SBAE programs. AMA ambassadors will help bridge the gap between industry trainers and classroom practitioners during the academy trainings, ensuring seamless transferability to secondary education students. Our future plans for the academy are to locate external funding to secure long-term sustainability of the program. This funding will also ensure that registration fees are not a barrier to future participants. We also plan to create an Advanced Agricultural Mechanics Academy that provides an additional training opportunity to those who have already completed AMA or who already understand the basics of agricultural mechanics. The Advanced Agricultural Mechanics Academy could potentially cover computer-aided design, electronic fuel injection, and other topics not included in AMA.

Associated Costs

The AMA workshop was hosted and facilitated at no cost to the University or department. Upon acceptance into AMA, participants were only responsible for initial travel to the workshop and final travel back home. This project was funded by a USDA Professional Development grant, covering registration and entry fees for all participants. The grant also aided in funding tools, curriculum, and equipment used during the workshop, as well as gifting personal equipment and curriculum for participants to return home with. Industry partnerships were created with welding, engine, and local gas supply companies to provide free breakfast and lunch to our participants every day of the workshop. Without grant funding, it would cost participants approximately $2,000 to attend the AMA workshop as currently designed.

References

Clark, T., Anderson, R., & Paulson, T. (2021). Agricultural mechanics preparation: How much do school based agricultural education teachers receive? Journal of Agricultural Education, 62(1), 17-28. http://doi.org/10.5032/jae.2021.01017

Shultz, M. J., Anderson, R. G., Shultz, A. M., & Paulsen, T. H. (2014). Importance and Capability of Teaching Agricultural Mechanics as Perceived by Secondary Agricultural Educators. *Journal of Agricultural Education*, *55*(2), 48-65.

Developing College of Agriculture Students to Become Civic Leaders

Kameron Rinehart, MS
Jason Headrick, Ph.D.

Davis College – Agricultural Education & Communications 15th Street Lubbock, TX 79409

740-505-2805

Kameron.rinehart@ttu.edu

Jason.headrick@ttu.edu

Developing College of Agriculture Students to Become Civic Leaders

Introduction/Need for Innovation or Idea

Civic involvement has steadily decreased in the last 50 years, and "brain drain," a phenomenon that discusses the movement of human capital and loss of those with higher levels of education, continues to impact our communities (Giannoccolo, 2009; Salt, 1997). College of Agriculture graduates seek a sense of purpose and direction for their careers. The Civic Leadership Academy (CLA) aims to help agricultural students from the Lubbock region realize their potential to enact change and develop their communities, beginning with themselves. The program aims to develop participants' understanding of their leadership potential and demonstrate the merits of civic leadership through engagement and interaction with entrepreneurship, nonprofits, community development, and community-driven leaders and businesses. It also raises awareness of opportunities to impact communities utilizing strategic methods to produce long-term results.

How it Works/Methodology/Program Phases/Steps

A grant was received from the [FOUNDATION] to begin allowing students to explore civic leadership and community development. College of Agriculture students were asked to apply, and twelve students were selected from 48 applicants by a committee of agricultural education, communications, and leadership faculty. Participants have been introduced to the world of civic leadership and explored ways of engagement through the experiences of the program on a national, regional, and community level. The culmination of the experience asked participants to propose a project at the end of the program to encapsulate the civic leadership experience. It will carry out their project with a local community partner of the participants' choice. The program was developed using the Social Change Model of Leadership Development (Astin, 1996; Komives & Wagner, 2016**)** and included:

- *Leadership Development.* The Academy students with leaders from across the ranks of Texas-based and Lubbock region-based businesses and industries. Throughout the process, participants engage in leadership development workshops to refine their own leadership styles.
- *Values Assessment.* Academy participants are encouraged to deepen their understanding of personal, corporate, and community values. By understanding the value assessment and development process, participants will better understand how to work through the intersection of competing values.
- *Community Development*. Field experiences and collaborations with community partners allow Academy participants to develop their understanding of civic leadership and engagement across multiple community levels.
- *Agricultural Foundations of Rural Areas/ Entrepreneurship*. Participants will gain an appreciation for the role of agriculture in the Lubbock region. They will interface with entrepreneurs, agricultural operations, small business entrepreneurs, and commodity representatives to understand the multi-faceted ways agriculture is incorporated into communities and how they can better leverage this into engagement and career plans.
- *Real-world Application.* After completing the workshops and field experiences, the Academy participants decide on a capstone project in the Lubbock region to invest time, leadership, and resources into using their training and experiences. They will demonstrate

how investing in the region can benefit the community while successfully demonstrating their civic leadership skills.

Results to Date/Implications

CLA has had an outstanding beginning. Throughout 2022, the inaugural class engaged with 22 [UNIVERSITY] faculty and staff, five workshop presenters from outside universities, 12 nonprofit agencies represented by 18 staff, 16 local and state government representatives (including the Mayor and a State Representative), and eight agricultural commodity and industry groups. Students report increased cognition of civic leadership and strategies to impact a larger community. Most report a better understanding of their leadership capabilities, which has transferred to student organizations on campus. CLA concluded the first year by engaging in workshops about international civic leadership and adaptive leadership and developing pitches to contribute a budgeted $15,000 towards community-based projects. The projects include a college-wide day of service in the Lubbock community, the creation of a food pantry at a local school, and providing electric bikes for reliable transportation to a nonprofit focused on assisting recovering homeless, abused, and sexually trafficked individuals. The second year of CLA began in January 2023.

Future Plans/Advice to Others

The CLA is a program that has the capacity to change individual lives and have a real community impact. While funding was received from the [FOUNDATION], additional grants are being investigated. Continued funding will keep the CLA moving forward and impacting communities. Future plans for the CLA include expanding cohort membership, increasing community partners, collaborations, projects, and the program's endowment.

Community-based programming requires time, planning, and a strong network. After the Covid-19 pandemic, nonprofits seek new ways to engage with college students and the community. There are prime opportunities for faculty members within our disciplines to create collaborations and expand service learning for our students across agriculture and the community. Seeking new ways of collaborating with others across the community for service and civic projects to demonstrate to students their capacity to impact their college communities and the communities they call home and will settle in for the future.

Costs/Resources Needed

The proposed budget of the CLA for Year 1 was $30,000. While this may seem high, many startup costs will not be repeated in supplemental years, including this year (2023) with the beginning of Cohort Two. Therefore, the initial cost is an investment in the sustainability of the program and long-term implications for the community. Resources needed will vary on the community and the network of scholars and friends of your program who could supply speakers, workshops, and related resources.

References

Astin, A. W. (1996). Involvement in learning revisited: Lessons we have learned. *Journal of college student development, 37*(2), 123-34.

Giannoccolo, P. (2009). The Brain Drain: A Survey of the Literature. *SSRN Electronic Journal.* https://doi.org/10.2139/ssrn.1374329

Salt, J. (1997) International movements of the highly skilled. OECD Social, Employment and Migration Working Papers No. 3; OECD Social, Employment and Migration Working Papers, Vol. 3. https://doi.org/10.1787/104411065061

Komives, S. R., & Wagner, W. (Eds.). (2016). Leadership for a better world: Understanding the social change model of leadership development. John Wiley & Sons.

Developing Transformational Student Learner Outcomes Through Artificial Intelligence

Jennifer Richards
Jennifer.richards@utk.edu

Brent Lamons
Blamons1@utk.edu

Tyler Granberry
tgranber@utk.edu

Jamie Greig
jgreig@utk.edu

Shelli Rampold
srampold@utk.edu

Molly West
Malbin1@utk.edu

Victoria Beasley
vutsman@utk.edu

Carrie Stephens
cfritz@utk.edu

Christopher Stripling
cstripli@utk.edu

2640 Morgan Circle Drive
114B McCord Hall
Knoxville, TN 37996
(865) 946-1089

Developing Transformational Student Learner Outcomes Through Artificial Intelligence

Introduction

Agriculture is a dynamic and ever-evolving field requiring continuous adaptation to stay relevant and competitive. Adequately preparing students for careers in agriculture requires departments within colleges of agriculture to develop and maintain up-to-date and relevant learning outcomes to ensure students are equipped with the skills and knowledge needed to succeed in an industry that is constantly changing (Sommers et al., 2019). This is particularly true in relation to emerging technologies. Advances in artificial intelligence (AI), big data, and automation are creating new challenges and ethical dilemmas (Howard & Borenstein, 2018). Educating students on responsible and ethical technology use is crucial to prevent negative outcomes, such as the misuse of data, privacy violations, or discriminatory practices (Dennis & Harrison, 2021). A recent examination of [Department]'s existing student learning outcomes (SLOs) and assessment plan revealed significant gaps, specifically related to the responsible and ethical use of technology, leadership, diversity, and inclusive practices. Both students and faculty expressed that the current SLOs did not accurately reflect the breadth and depth of the program. Additionally, existing SLOs were vague, difficult to measure, and not representative of all areas of content covered in the [Department's] academic programs. To promote intentional, transformational learning, ChatGPT, an AI-driven language processing software, was used as an innovative methodological tool to enhance the development of qualitative performance indicators for programmatic SLOs (OpenAI, 2022).

How it Works

Course-level objectives were collected for all University of Tennessee's Agricultural Leadership, Education & Communications (ALEC) undergraduate courses. These outcomes were used to create a curriculum map showing alignment of course objectives to existing program SLOs. Most courses exhibited weak or no alignment between course objectives and SLOs. To check confirmation bias and see other possibilities that technology might illuminate, a free word cloud generator was used to create a visual representation of the most common concepts among course objectives. The word cloud also identified words that were not present but ones that represented the program (e.g., diversity, inclusion). This reflective process led to the identification of the following critical attributes of an ALEC graduate: critical thinking; leadership; communication (written and oral); ethical use of technology; and diversity, equity, and inclusion.

As the emergence of AI tools such as ChatGPT increases, questions arise as to how the tool might be used to operationalize programmatic SLOs as well as where the ethical boundaries might lie in using such a tool for academic purposes. ChatGPT is a language model that has been trained on a large dataset to recognize language patterns, but it does not have access to external information beyond its training data or data fed to it by users, which means it cannot access internet sources (OpenAI, 2022). The free research preview of ChatGPT Feb 13 Version was asked to "write performance indicators of critical thinking" and further asked to "refine the performance indicators to be more measurable." ChatGPT returned ten discrete performance indicators by which critical thinking competency can be measured. This process was repeated for leadership, communication, ethical use of technology, and diversity, equity, and inclusion.

Results to Date

A series of 10-20 performance indicators were returned for each critical attribute for a total of 85 indicators. Since indicators were grouped by attribute, each grouping was reviewed to combine like items and eliminate redundancy. Through this process, questions were asked to form the boundaries of the ethical use of an AI tool in crafting scholarly work. Questions included, "Is it intellectually dishonest to use an AI tool to shortcut the outcome development process, or rather does using the AI tool reduce the likelihood of unconscious biases shaping our SLOs?" and "Where is the line between collaborative scholarship with AI and intellectual dishonesty?" For example, when publishing the process of creating new SLOs using ChatGPT, is the language model a tool or a co-author? In fact, ChatGPT was used to generate draft text, which was edited and polished for the Introduction and Future Plans of this abstract.

Future Plans/Advice to Others

The next step in developing programmatic SLOs for ALEC is to distribute the AI-generated performance indicators, grouped by critical attribute, to all ALEC teaching faculty. Each faculty member will rank each item on a scale of importance. Responses will be collected, analyzed, and synthesized to identify areas of consensus and disagreement. Depending on the level of agreement additional rounds of ranking may be used to refine and clarify performance indicators. The final lists of indicators will be used to craft SLOs, which will be measured by those indicators.

ALEC faculty are exploring the expanded use of AI for curriculum development and its potential integration into coursework. Although discussions about how best to proceed with this technology are ongoing, undergraduate students in a program planning course have been introduced to AI-generated content as part of a learning activity, followed by a discussion on the ethical use of the technology for instructional design. Introductory oral communication course faculty are planning to introduce AI generated personal public speaking SMART goals on common areas of concern (i.e., eye contact, filler words) for undergraduate students to critique. Additionally, faculty in other departments at UT are collaborating with Food Science faculty about the integration of AI technologies into their academic program.

Beyond purely ethical considerations, potential adopters are cautioned to familiarize themselves with the limitations of the technology. ChatGPT excels as a language editor, generating high-quality English text from a given input. However, its ability to apply knowledge is limited to the content and timeframe of its training data. When presented with queries outside its knowledge boundaries, ChatGPT may invent facts to provide a response. For instance, in a research literature review query, ChatGPT provided fictional citations with invented paper titles, journals, and DOI numbers. On the other hand, it provided accurate information when asked about SPSS statistical software, likely because SPSS textual data was included in its training data.

Resources Needed

A research preview version of ChatGPT is available for free at chat.openai.com/chat. New users must create an account to access the platform; however, there currently is no fee. The free plan allows the user to enter queries or prompts and receive immediate responses. There are times when the system is overwhelmed by demand rendering the platform inaccessible. For USD $20 per month, users can update to a ChatGPT Plus subscription, which ensures access even when demand is high, provides a faster response rate, and early access to new features (OpenAI, 2023).

References

Dennis, M., & Harrison, T. (2021). Unique ethical challenges for the 21st century: Online technology and virtue education. *Journal of Moral Education, 50*(3), 251–266. https://doi.org/10.1080/03057240.2020.1781071

Howard, A., & Borenstein, J. (2018). The ugly truth about ourselves and our robot creations: The problem of bias and social inequity. *Science and Engineering Ethics, 24*(5), 1521–1536. https://doi.org/10.1007/s11948-017-9975-2

OpenAI. (2022, November 30). ChatGPT: Optimizing language models for dialogue. *Announcements.* https://openai.com/blog/chatgpt/

OpenAI. (2023, February 7). Introducing ChatGPT plus. *Announcements*. https://openai.com/blog/chatgpt-plus/

Sommers, A. S., White, H., Alred, A., Dauer, J., & Forbes, C. (2019). Teaching styles and student outcomes in undergraduate food, energy, and water systems (FEWS) courses. *NACTA Journal, 63*(2), 67–77. https://www.nactateachers.org/index.php/vol-63-2-apr-oct-2019/2947-teaching-styles-and-student-outcomes-in-undergraduate-food-energy-and-water-systems-fews-courses

Engaging and Educating Agricultural Educators through In-State Study Experiences

Nikki Miller
North Carolina State University
NCSU Campus Box 7607
Raleigh, NC 27695
cnmille3@ncsu.edu
(919) 515-6077

Joy Morgan
North Carolina State University
NCSU Campus Box 7607
Raleigh, NC 27695
jemorga2@ncsu.edu

Wendy Warner
North Carolina State University
NCSU Campus Box 7607
Raleigh, NC 27695
wjwarner@ncsu.edu

Travis Park
North Carolina State University
NCSU Campus Box 7607
Raleigh, NC 27695
tdpark@ncsu.edu

Misty Lambert
North Carolina State University
NCSU Campus Box 7607
Raleigh, NC 27695
mdlamber@ncsu.edu

Introduction/Need for Idea

As FFA members, we can all recite the words of the FFA Creed, however, today many of our students pursuing agricultural-related degrees do not come from farms or have the agricultural background knowledge that the creed describes. For students majoring in Agricultural Education or Extension, this background knowledge is incredibly important as they embark on careers that ultimately will place them in situations where they are leading classrooms and programs specifically focused on agriculture. While students enroll in university courses and many contain labs, these experiences often only offer a glimpse into the real-world component. Immersive experiences with farms, ag ed programs, Extension programs, and agricultural industries allow students to connect content knowledge with real-world opportunities and perspectives that can be integrated into extension programming and curriculum development. Immersive field trips provide an experience that is unattainable within the classroom while strengthening them personally and professionally (Bruening et al., 2002). Further, it is important that the most up-to-date agricultural practices are known and future educators share these experiences with their students (Luckey, 2012).

How It Works/Methodology/Program Phases

After generating the idea to develop an in-state study experience, team leaders researched grant opportunities that were available to support a fall break study tour. The team applied and secured funding through the North Carolina Tobacco Trust Fund grant program to support the extended field trip experience and cover the majority of the costs for students. It was important to secure funding that supported almost all costs so as to not prohibit students from attending due to financial constraints. The group selected fall break as the time for the trip to avoid conflict with popular spring break excursions or summer study-abroad experiences. From there, team leaders reached out to farmers, Extension agents, agriculture teachers, and industry representatives to develop a schedule that highlighted all four equally. Visits were encouraged to have a hands-on component if possible to allow students an opportunity to experience equipment and technology while “seeing” themselves in this career. The team leaders were split into two different groups and two in-state study experiences occurred. One group headed west and another group headed east. During the study tour, students engaged in conversations with agricultural leaders to learn more about why they chose that particular career path while also increasing their agricultural awareness. Following the trip, each participant selected one visit from the trip and developed lesson plans that could be used by an Extension agent or agriculture teacher. The lesson plan was aligned with the North Carolina course of study and promoted student learning and higher-order thinking skills. The lesson plans were distributed to teachers and agents in hopes of providing real-world context and examples that highlight the most up-to-date practices, emphasize agricultural career opportunities, and increase ag awareness.

Results to Date/Implications

During the fall break in-state study experience, twenty students participated and were led by four faculty members. All students have an interest in pursuing future careers related to agriculture and were majoring or minoring in Agricultural Education and/or Agricultural Extension, or were considering seeking a career as an agriculture teacher or Extension agent. Visits included both small and large family farming operations, processing facilities, farm markets, secondary agricultural education programs, Extension programs, research facilities, commodity organizations, historical locations, and state parks. All students indicated that the experience opened their eyes to new careers and expanded their knowledge and awareness of agriculture. Student A stated, “It was my first time in a cotton picker. I was amazed at the technology and the process involved from the field to our clothes.” Another individual indicated being surprised at the challenges that farmers experience, yet their dedication and devotion to the profession are unwavering. The four faculty saw another benefit to this experience that was not part of the original objectives. Student participants grew together as a cohort and the discussions that took place after each visit in the van were reflective and showed a deeper understanding of agriculture. In addition, several of the students had never traveled to the parts of the state that were visited. One student never had imagined wanting to student teach anywhere farther than an hour away from home. She now wishes to student teach in the mountains and find a teaching job there due to this experience. This will be approximately four hours from her home.

Future Plans/Advice to Others

This study experience was incredibly beneficial for all who participated. The team leaders hope to make this experience a course offering similar to a study abroad experience. Without the grant funding, a few students indicated that they would not have attended due to financial constraints so it is imperative to secure funding that can assist with the costs. While this grant was a one-time funding source, several of the commodity organizations would be willing to sponsor a meal or component of the trip in the future. In addition, an hour per stop was budgeted, however, the majority of the stops took longer than an hour, especially when students had additional questions. Further, it greatly helped that most of the tour stops and presenters who spoke to the students were viewed as leaders in North Carolina agriculture. Their stories and explanations highlighted the “joys and discomforts” and encouraged students to think about their impacts.

Costs/Resources Needed

The grant provided $24,000 to lead two study tours. The major costs associated with the trip were hotels, meals, and transportation. The trip utilized university vans, but there was still a cost associated with using those for trips. Students were encouraged to room together at hotels, but due to COVID concerns, some students opted for single rooms which placed that budgeted item slightly higher than expected. The majority of the meals were supported by the grant with the students paying for only three total meals. Hotels with breakfast included were also a determining factor to cut down on costs.

References

Bruening, T. H., Lopez, J., McCormick, D. F., & Dominguez, D. R. (2002). Active learning: The impact on students participating in an extended field trip to Puerto Rico. *Journal of Agricultural Education*, *43*(4), 67-75.

Luckey, A. (2012). *Assessing youth perceptions and knowledge of agriculture: The impact of participating in an AgVenture program* (Doctoral dissertation, Texas A & M University).

Enhancing Collaborative Learning in Agricultural Communication Internship Courses through the TPACK Model

Dr. Shuyang Qu
Assistant Professor
Iowa State University
515-294-8343
squ@iastate.edu

Chuanli Zhou
Instructional Designer
Amazon Web Services
Lilicz@amazon.com

Hang Shi
Graduate Student
Iowa State University
515-815-0718
hangshi@iastate.edu

Enhancing Collaborative Learning in Agricultural Communication Internship Courses through the TPACK Model

Introduction

Many agricultural communication programs in the United States require an internship course as part of their graduation requirements. Typically, these courses involve a combination of classroom instruction and hands-on work experience, with classroom activities including reflective journals, site-supervisor reports, and student reports on their internship projects. Collaborative learning among peers is particularly beneficial for internship courses, as it provides a diverse range of concrete internship experiences in the classroom. This abstract proposes the use of the Technological Pedagogical Content Knowledge (TPACK) model, developed by Mishra and Koehler (2006), to enhance collaborative learning in agricultural communication internship courses.

How it works

The TPACK model is a framework for understanding the complex interplay between technology, pedagogy, and content knowledge in the context of teaching and learning (Mishra & Koehler, 2006). The model was developed to help educators integrate technology effectively into their teaching practice. This model has been widely adopted as a theoretical base in educational research to guide the design of technology-enhanced learning environments. The TPACK model consists of three knowledge domains: technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). The model proposes that effective technology integration requires a deep understanding of all three domains, as well as the interplay between them (Figure 1). Mishra and Koehler (2006) argue that "technology cannot be understood without considering the context in which it is used, and the goals and content that it is meant to support" (p.1029). In other words, technology should not be viewed as a separate entity from pedagogy and content knowledge, but rather as an integral component of effective teaching and learning.

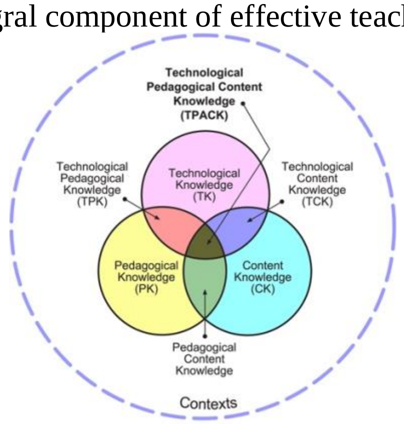


Figure 1. TPACK Framework

For the Agricultural Communication Internship course at Iowa State University, the instructor aimed to provide students with a deeper understanding of their internship experience by incorporating two critical content knowledge (CK) areas: communication theory and industry perspectives. To achieve this, the instructor collaborated with a course designer to integrate various pedagogical knowledge (PK) approaches, including lecturing, peer-based learning, reflection, and guest speakers. Additionally, they worked alongside a technology specialist to utilize technology knowledge (TK), including professional video recording and virtual collaboration tools such as Canvas Studio functions and discussion boards.

To address the communication theory content, the instructor recorded a series of mini-lectures on various communication theories in a professional recording studio. For the industry perspective content, several industry professionals were invited to the university campus studio to record their perspectives on the career competencies desired from agricultural communication graduates (Figure 2). These video materials were professionally edited and integrated into the Canvas course, where students were required to reflect on their internship experience after reviewing both types of video materials. They were also encouraged to engage in peer-to-peer interaction to foster a collaborative learning experience.

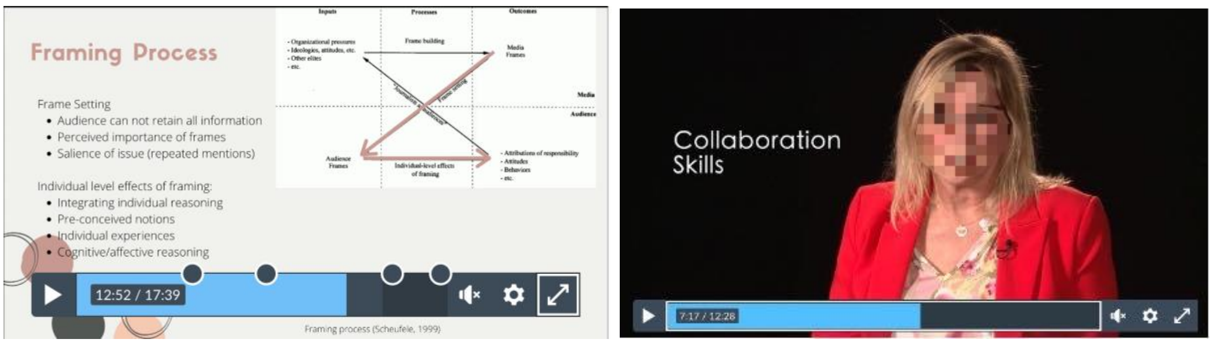


Figure 2. Video Materials: Theory lecture (left), industry professional video (Right)

Results

The incorporation of CK, PK, and TK resulted in a collaborative and engaging learning experience. Since Fall 2021, the TPACK-inspired learning materials have been integrated into the agricultural communication internship course, with 59 students enrolled so far. Notably, student interactivity has increased. and feedback on the course indicates appreciation for the resulting collaborative learning. For instance, one student remarked, "I was able to read about my peers' experiences and perspectives. I enjoyed having that type of interaction." Another student stated, "The discussion posts based on our internships helped me the most in this course. I liked being able to read about other experiences in their internships."

Advice to Others

Forming a team with a solid grasp of content, pedagogy, and technology is crucial for successful application of TPACK. If resources permit, collaborating with a course designer and technology specialist can be highly advantageous. The TPACK model can be applied not only to course content delivery but also to assessments and student collaboration (Harvey & Caro, 2017; Njiku, Mutarutinya, & Maniraho, 2021; Schmidt, 2009). It is advisable to gather feedback from students to ensure that the content is relevant, the technology is accessible, and the pedagogy is effective.

Cost/Resources Needed

The cost and required resources will depend on the nature of the content, technology, and pedagogy utilized. In the example presented in the abstract, an internal grant of $8,000 was obtained to cover the costs of the distant learning service provided by the Brenton Center of Iowa State University, including a technology expert, a course design specialist, professional video recording and editing services, and travel compensation.

References:

Harvey, D. M., & Caro, R. (2017). Building TPACK in preservice teachers through explicit course design. *TechTrends*, *61*, 106-114.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for integrating technology in teacher knowledge. *Teachers College Record*, 108, 1017–1054. doi:10.1111/j.1467-9620.2006.00684.x

Njiku, J., Mutarutinya, V., & Maniraho, J. F. (2021). Building Mathematics Teachers' TPACK through Collaborative Lesson Design Activities. *Contemporary Educational Technology*, *13*(2).

Schmidt, D. A., Baran, E., Thompson, A. D., Mishra, P., Koehler, M. J., & Shin, T. S. (2009). Technological pedagogical content knowledge (TPACK) the development and validation of an assessment instrument for preservice teachers. *Journal of research on Technology in Education*, *42*(2), 123-149.

Expanding Youth Knowledge and Skills in Lawnmower Safety

Forrest Lang
The Ohio State University
126 Halterman Hall
1328 Dover Rd. Wooster OH 44691
330-464-6746
Lang.485@osu.edu

Dr. Dee Jepsen
The Ohio State University
262 Agricultural Engineering
590 Woody Hayes Dr. Columbus, OH 43210
614-292-6008
Jepsen.4@osu.edu

Dr. Amanda Bowling
The Ohio State University
200F Agricultural Administration
2120 Fyffe Rd. Columbus, OH 43210
614-688-1121
Bowling.175@osu.edu

Introduction and Literature Review

Lawnmowers can cause serious injuries to young operators and despite manufacturers' improvements, injuries to youth continue to occur. A longitudinal study from 1990 – 2014 found a reported 212,258 children under the age of 18 received emergency treatment for lawn mower-related injuries, with an annual average rate of 11.9 injuries per 100,000 U.S. children (Ren, 2017). In 2021 alone, a reported 4,462 children received treatment for lawnmower related injuries (National Electronic Injury Surveillance System, 2022). A search for age-appropriate educational materials for youth yielded very limited results as the only source of information was found within small engine 4-H project books, which focus more on engines rather than lawnmower safety and operation.

Youth education and development takes on many forms and is present in many programs across the United States. The 4-H Organization reaches nearly 6 million youth each year with various styles of programs (National 4-H Council, 2021). The traditional 4-H club offers a variety of topics for youth to learn about in a project book format that engages them with the experiential learning model of experience, reflection, generalization, and application activities (Horton et al., 1999). An evaluation of a tractor and machinery 4-H project book found 86.3% of respondents agreed or strongly agreed that they were safer tractor operators because of their participation in the program and 97.1% agreed or strongly agreed that the program was effective at teaching youth to be safe tractor and machinery operators (Carrabba Jr. et al., 2001). The 4-H project book provides a format that engages youth in learning a new topic, as well as acquiring safety knowledge.

Methodology

Based on the findings of the literature review, five objectives were identified for the scope of this project

1. Describe the characteristics of lawnmower safety, operation, and maintenance that will educate 4-H youth;
2. Develop activities based on the experiential learning model that has been adapted to the national 4-H curriculum;
3. Develop a training and practice guide based on the national 4-H lawn mower competition;
4. Provide a draft project book for evaluation in the 2022 4-H year; and
5. Publish the project book for use in the 2023 4-H year.

To meet these objectives a panel of experts consisting of Purdue University extension agents, the Ohio 4-H Curriculum Manager, and the State Agricultural Safety and Health Leader of Ohio convened to develop the content of the book. The panel decided to have the content focus on three areas including (1) lawnmower safety, (2) operation of lawnmowers, and (3) lawnmower maintenance. Activities for each area were developed by referencing the 4-H experiential learning model and through the panel's knowledge on the included topics. The developed project book contains 13 content-based activities and 4 operational courses that engage youth in the 4-H experiential learning model. These activities can be completed with any style of lawnmower (i.e. push mower, riding mower, zero-turn mower, electric, and gas mowers) and provide the option to be repeated, if youth want to take the project multiple years, using a different mower as their project focus. Each activity encourages youth to learn about a different component of their specific mower by providing guiding information. The activities also include a further challenge which promotes youth to engage with adults in their community who are involved in the lawncare industry. One consistent section of each activity was titled Manual Moment, which emphasizes reference to the operator's manual when working on or operating a lawnmower.

Results

Once activities and content were developed, a draft version of the book was sent out for evaluation to 31 Ohio and Indiana 4-H Extension professionals and volunteers. Info about your instrument: A 10-item rubric was used to collect information from these volunteers. Quantitative responses (n = 2) and qualitative responses (n = 15) were collected and incorporated into the final version of the book. The draft version was then made available to attendees of the Indiana State 4-H Lawnmower Competition held at the Indiana State Fair. The responses to the book yielded very positive feedback from 4-H volunteers, parents, and members; many of which stated that the book was a much-needed resource in the 4-H curriculum.

Following the pilot test phase, the evaluation results were discussed with the panel, changes were made to the book, and the content was formatted by a 4-H designer to ensure the book conformed to 4-H publishing standards. The result was a 52-page project book that is available in Ohio and Indiana for the 2023 4-H program year. A final version will also be submitted to the national 4-H review board for their jury review.

Future Plans

While this book focuses specifically on lawnmowers, it provides a starting point for expanding the 4-H curriculum to include further topics for youth interested in the landscape industry. Such topics may include landscape machinery, lawn and plant health, and starting a lawncare business. A previous Ohio 4-H lawncare project book was taken out of publication in 2008 due to low enrollment and outdated content. A new book focused on lawnmowers may spark future interest in lawncare management.

The processes outlined in this project provide an outline for the development of future 4-H books that address the needs of youth regarding their education about machinery safety. The activities in this book could be used as a template for other types of machinery that youth may operate even though their age may fall outside of the recommendations of manufacturer.

Costs/Resources

A USDA-NIFA grant sponsored the development and pilot testing of the project. The cost for youth is $10, which covers production costs of the book. Currently the project is available to 4-H youth within Ohio and Indiana. Once the book goes through the national 4-H review board, it will be made available through 4-H programs nationally.

References

Bachier, M., & Feliz, A. (2016). Epidemiology of lawnmower-related injuries in children: A 10 year review. *The American Journal of Surgery*, *211*(4), 727–732. https://doi.org/10.1016/j.amjsurg.2015.11.025

Carrabba Jr., J. J., Talbert, B. A., Field, W. E., & Tormoehlen, R. (2001). Effectiveness of the Indiana 4-H tractor program: Alumni perceptions. *Journal of Agricultural Education*, *42*(3), 11–20. https://doi.org/10.5032/jae.2001.03011

Horton, R. L., Hutchinson, S., Barkman, S. J., Machtmes, K., & Myers, H. (1999). *Developing experientially based 4-H curriculum materials*. The Ohio State University. https://ohio4h.org/sites/ohio4h/files/d6/files/4-H%20897%20Developing%20Experientially%20Based%204-H%20Curriculum%20Materials.pdf

National 4-H Council. (2021). *What is 4-H?* https://4-h.org/about/what-is-4-h/

National Electronic Injury Surveillance System. (2022). *NEISS Data Highlights—Calendar Year 2021* (p. 5). Consumer Product Safety Commision. https://www.cpsc.gov/Research--Statistics/NEISS-Injury-Data

Vollman, D., & Smith, G. A. (2006). Epidemiology of lawn mower–related injuries to children in the United States, 1990–2004. *Pediatrics*, *118*(2), e273–e278. https://doi.org/10.1542/peds.2006-0056

Experiential Agricultural Literacy:
Focus on Commodities Elementary School Curriculum

Kelly Gill
University of Illinois at Urbana-Champaign

Amy M. Leman
University of Illinois at Urbana-Champaign

Hannah Spangler
University of Illinois at Urbana-Champaign

Corresponding Author:
Dr. Amy M. Leman
139 Bevier Hall, 905 S. Goodwin Ave.
Urbana, IL 61801
bunselme@illinois.edu

Introduction/Need for Innovation or Idea

Miller et al. (2022) recommend that agriculture education should be improved to increase agricultural literacy in elementary students. In a study done by Hess and Trexler (2011) those students participating could name common foods in their raw form but could not name the agricultural crop that common products originate from. This demonstrates that students have a basic understanding of agricultural products but have no knowledge of products that originate from agricultural crops (Hess & Trexler, 2011). When people have knowledge of the agriculture industry, they are able to make informed decisions as consumers (Kovar & Ball, 2013). The Focus on Commodities curriculum contains lessons and activities to help students better understand what agricultural products make up commonly used items and the process in which they are made.

Experiential learning is a theory of learning in which students gain knowledge through direct interaction with the world (Kolb, 1984). Each of the activities in the Focus on Commodities curriculum is designed with this theory in mind. Within each section of the curriculum, there are times for students to take an opportunity to reflect on their learning. Experiential learning that includes relevant reflection can lead to increases in self-efficacy and students' voices, in addition to increases in academic knowledge (Gartland, 2021).

How it Works/Methodology/Program Phase/Stages

Four schools and seven 4-H clubs in Illinois were recruited to participate in the Focus on Commodities project beginning in the fall of 2021. The teachers or 4-H leaders participated in a two-hour training in which they learned about the delivery of the activities in the curriculum and received the materials they needed to lead the six-session program. The participants were divided into three groups. The first group received instructions and participant workbooks that had pages for participants' written reflections after each lesson. The reflection questions allowed participants to think about what they learned from the lesson, how they might apply that information to other areas of their lives, and what questions they still had about the topic. The second group received a curriculum that gave the instructor a set of questions to verbally ask the participants at the end of the lesson, allowing participants to raise their hands to answer the questions. The third group received no reflection questions, just the activities.

In the original design, the same number of schools and participants were in each group. However, starting with the training in the fall of 2021, we ran into consistent problems related to the COVID pandemic. The first two training dates for teachers had to be rescheduled due to COVID-related closures and procedure changes. 4-H clubs faced similar issues, canceling meetings and rescheduling events. Therefore, only 2 schools and 3 4-H clubs completed all six lessons of the curriculum. This curriculum was created for an elementary-aged audience in Illinois, piloted with classes and 4-H clubs in areas characterized as rural or quasi-suburban. It will need to be adapted to use in other states.

Results to Date/Implications

Multiple Choice Responses

Participants received the same learning check at the end of their program. The results of the multiple choice questions were tallied for correct answers and the applied questions asking participants to list items or give short answers were compared to their beginning answers for accuracy. Table 1 below illustrates the percentage of participants that answered the question correctly on the before and after program learning checks. In many areas, it showed growth in knowledge after learning information in the program.

The only question that showed a decrease in knowledge related to growing pumpkins on a sandy beach. While the question was meant to say that pumpkins prefer sandy soil, the question may have been confusing to the participants after spending time creating an ecosystem for their pumpkins involving more than just sand.

Table 1
Pre and Post Test Learning Check Correct Answer Responses

Learning Check Questions	Pre-Program Answer % Correct Response (*n*=44)	Post-Program Answer % Correct Response (*n*=35)	Change in Response
Is field corn the same as corn on the cob	55%	83%	+28
Field corn grown in Illinois is in products all over the world	57%	77%	+20
Types of soil	5%	54%	+45
Factors important for planting pumpkins	61%	77%	+16
Pumpkins grow well on a sandy beach	100%	89%	-11
Parts of the ruminant digestive system	43%	86%	+43
Ruminant animals	64%	80%	+16
Cow and non-ruminant stomachs differences	25%	71%	+46
How food is converted into energy	30%	69%	+39

Knowledge Application

For each section of the learning check, there is one knowledge application question. In the section of the program about corn by-products, participants were asked to list as many products as possible that humans use on a daily basis that contain field corn. Compared to the pre-program learning check, in the post-program learning check learners were able to include many more products and products without corn in the name. In response to the sections related to pumpkins, participants were asked to list factors that people should consider when planting a crop that is not pumpkins. The before and after program learning check produced similar answers of water, soil, and seeds. Additional factors added to the after-program learning check were sunlight, time of year, and seed spacing. To attempt to apply knowledge related to animal science, participants were asked what an animal's diet can tell us about the structure and function of the animal's digestive system. On the post-program learning check, participants were able to explain their answers using key terms taught in the program in order to get to the correct answer.

Future Plans/Advice to Others

The Focus on Commodities program is currently available for use by the Illinois Ag in the Classroom staff and will be posted publicly after the official 4-H review.

Costs/Resources Needed

Within each lesson, there is a list of supplies needed for the activities. Many of the activities require supplies that can be found in a classroom such as markers, scissors, paper, flip chart paper, etc. Beyond classroom items, some additional supplies will need to be acquired such as soil, pumpkin seeds, packing peanuts, etc. which are listed in the lesson plan. As a note, the original lesson on soil relates to Illinois soil comparisons, which will need to be adapted to fit other states.

References

Gartland, S. (2021). Exploring elementary student perceptions of experiential learning within critical service-learning. *Journal of Experiential Education, 44*(1), 50-64. https://doi.org/10.1177/1053825920980786

Hess, A. J. & Trexler, C. J. (2011). A qualitative study of agricultural literacy in urban youth: What do elementary students understand about the agri-food system? *Journal of Agricultural Education, 52*(4), 1-12. https://doi.org/10.5032/jae.2011.04001

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development, 1st ed.* Prentice Hall Publishing.

Kovar, K. A. & Ball, A. L. (2013). Two decades of agricultural literacy research: A synthesis of the literature. *Journal of Agricultural Education, 54*(1), 167-178. https://doi.org/10.5032/jae.2013.01167

Miller, A., Warnick, B., Spielmaker, D. (2022). A case study: Agricultural literacy proficiency in an Iowa elementary school. *Journal of Agricultural Education, 63*(4), 220-231. https://doi.org/10.5032/jae.2022.04220

Experiential Learning Through Podcasting: Creating Opportunity for Advanced Pedagogy

Introduction/ Need for Innovation

College instructors across agricultural disciplines are constantly seeking ways to move the needle on their use of pedagogies and instructional strategies in their courses. Technology-based pedagogy allows educators to interact with learners in relevant and impactful ways. Podcasting is an innovative approach to education with a variety of educational applications. The use of podcasting as an instructional methodology provides opportunities for educators to enhance learner engagement, foster classroom collaboration, supplement course content and facilitate the review of the pertinent subject matter. The creation of a podcast is economically feasible and can be completed with relative ease on any smartphone device (Android or iOS).

A podcast is defined as any digital media file, or series of files, distributed over the Internet for playback on media players and personal computers (Lonn & Teasley, 2009). Podcasts gained in popularity as a direct result of the COVID-19 pandemic (Nee & Santana, 2021). Podcasts have been used as pedagogy during the last decade across agricultural courses and education in general (Beard & Morote, 2010; Ng'ambi & Lombe, 2012; Barnes et al., 2021). The use of a podcast assignment extends the notion of experiential learning and provides an opportunity for richer learning to take place (Baker & Robinson, 2018).

How the Innovation Worked

The podcast assignments were created to give students in a [University] [Department Name] [Course] the opportunity to build on the content knowledge developed over the course of the semester. During the first semester of offering this course, the instructor reflected on the heavy number of papers that had been assigned to students and the instructor wanted to engage students more in a collaborative manner. During a check-in session with students, it became clear that students wanted the opportunity to engage with the material in new ways outside of the traditional paper format. The instructor was evaluating reflections while sitting in their office listening to "Business Wars," a podcast focused on competition and origin stories of Fortune 500 brands, when the inspiration hit. One of the students noted in their reflection the connections of class content with the information they had heard in a podcast they had been listening to. It was in this moment that the new podcast assignment was born.

The original intent was to have students work across collaborative teams, select a topic, prepare a script, and turn these in for a grade. However, after team meetings with the instructor, it was clear that the students were creating engaged scripts that explored the course content and were worthy of sharing with the masses. The instructor began to brainstorm how to create, launch, and maintain a podcast. The creation of a podcast from the student work furthered the idea of community engaged scholarship. Community engaged scholarship (Fitzgerald & Primavera, 2013) promotes the notion that universities can create connection between the community and institutions by sharing knowledge and research in new ways. The development of the podcast, [Podcast Name], has been an engaging way of sharing information to the public and to share the learning that has occurred in the agricultural classroom.

A survey focused on podcasts and skill development was distributed to students. Survey results were used to place students in podcast working teams. The working teams were given class time to meet and discuss the goals of the podcast assignment. Each team was given a list of content that had been covered throughout the semester and resources to help them create a podcast script. Each team was given the following discussion items to begin their work.

1. **Meet your team.** How do you connect to one another? What information do you like to know about people you are working with?
2. **So, podcasts?** What do you know about podcasts? Any questions about them?
3. **Select a topic.** What content could your group talk for 5-25 minutes about? Is there a topic that you are interested in from the course content or that you want to become an expert in?
4. **Make team decisions.** How will you distribute the work? What are your expectations of one another and what are your goals?
5. **Create the podcast connection.** How can you make the most out of class content? What is important about your topic and how can people in agriculture use the information to understand the importance of your topic? Develop a podcast script using the resources provided to share your understanding of the content knowledge and how it can be applied across agriculture and communities.

Results to Date/ Implications

The podcast working teams created dynamic and engaged podcast ideas that advanced the content knowledge gained in the classroom. They went from consumers of content to masters of the concepts, theories, and models that had been discussed during the semester. This allowed a creative outlet for the students to showcase their understanding and allowed them a way to discuss practical application of the knowledge to the masses.

[Podcast Name] launched in Spring 2022 and has gained momentum in the initial months. Future students have begun to inquire about their class being involved in the podcast, so it has created buzz around courses offered through the agricultural leadership discipline. The podcast has also allowed potential partnerships to develop through the community engaged process. These partnerships are good for the department, but also will help in securing internship and job opportunities for students and creating opportunities for further applications of content in communities and across industry.

Future Plans/ Advise to Others

This assignment will be distributed across agricultural leadership courses on a semester basis. The intent is to allow students practical ways of sharing their content knowledge and experiencing new technology through experiential learning. In a follow-up survey to students, the podcast assignment has shown to improve their content knowledge and understanding, enhanced self-confidence by allowing them to become the content “expert” and empowered them to develop new skills related to writing and podcast creation. From an instructor perspective, the assignment should have been introduced earlier to the class. This would have helped with topical ideas and allowed students to make notes along the way that might have improved their transfer of ideas from content to podcast.

Costs/ Resources Needed

Anchor was used to record and distribute the podcast across their platform and Spotify. This is a free service for registered users and their resources help to create, edit, and distribute the podcast episodes. Recording equipment and studio space managed by the agricultural communications faculty were generously shared. However, podcast microphones average between $24.99 and $119.99 on Amazon and other retailers.

References

Baker, M., & Robinson, S. (2016). The Effects of Kolb's Experiential Learning Model on Successful Intelligence in Secondary Agriculture Students. Journal of Agricultural Education, 57(3), 129–144. https://doi.org/10.5032/jae.2016.03129

Barnes, J., Carraway, C., & Jones, S. (2021). Using lecture podcasts in the COVID-19 transition to virtual post-secondary education in agriculture. *Natural Sciences Education*, *50*(2), e20064.

Beard, K., & Morote, E. S. (2010). Using podcasts with narrative pedagogy: are learning objectives met? *Nursing education perspectives*, *31*(3), 186-187.

Fitzgerald, H.E., & Primavera. J. (Eds). (2013). Going public: Civic and community engagement. Michigan State University Press.

+Lonn, S., & Teasley, S. D. (2009). Podcasting in higher education: What are the implications for teaching and learning? *The Internet and Higher Education*, *12*(2), 88-92. https://doi.org/10.1016/j.iheduc.2009.06.002

Nee, R. C., & Santana, A. D. (2021). Podcasting the pandemic: exploring storytelling formats and shifting journalistic norms in news podcasts related to the Coronavirus. *Journalism Practice*, 1-19.

Ng'ambi, D., & Lombe, A. (2012). Using podcasting to facilitate student learning: A constructivist perspective. *Journal of Educational Technology & Society*, *15*(4), 181-192.

Fab it Up: Involving Pre-service Teachers in an In-service Teacher Professional Development Experience

Trent Wells, Ph.D.
Southern Arkansas University
Department of Agriculture
Agriculture (AGR) 208
Magnolia, AR 71753
ktwells@saumag.edu

P. Ryan Saucier, Ph.D.
Sam Houston State University
School of Agricultural Sciences
P. O. Box 2088
Huntsville, TX 77341
ryansaucier@shsu.edu

Fab it Up: Involving Pre-service Teachers in an In-service Teacher Professional Development Experience

Introduction

Using experiences as teaching and learning opportunities has long been a significant component of school-based agricultural education (SBAE) (Phipps et al., 2008). Dewey (1938) indicated that high-quality, suitable learning experiences can have a lasting impact on one's knowledge and skill development over the long term. Through the lens of experiential learning (Kolb, 1984), using positive experiences coupled with insightful reflection can promote further engagement in learning. Granberry et al. (2022) further noted that individuals' perceptions regarding a topic (e.g., perceived competence to perform agricultural mechanics skills, etc.) may change as they engage in subsequent experiences. Considering these notions, it is evident that positive, reflective experiences can be leveraged to impact individuals, such as pre-service teachers.

The development of effective SBAE teachers occurs through numerous avenues, such as early field experiences and technical agriculture coursework completed within traditional agricultural teacher education programs (Whittington, 2005; Wells et al., 2018). Effective SBAE teachers are familiar with different agricultural subject matter areas (Eck et al., 2019), which includes animal science, plant science, and agricultural mechanics (Albritton et al., 2020). Regarding teacher competence, ensuring that teachers are adequately prepared prior to starting their first position can reduce the likelihood of encountering liability issues (Love & Roy, 2017). Considering the need for competent teachers who are capable of addressing students' learning needs while also keeping them safe, it is vital that SBAE teachers be prepared to successfully teach agricultural mechanics (Wells & Hainline, 2021; Wells et al., 2021). Such preparation can occur through professional development (PD) workshops (Wells & Hainline, 2021). It is worth considering that perhaps involving pre-service teachers in an in-service teacher PD workshop experience could be a practical approach to the teacher competence development process.

How it Works

During the Fall 2022 semester, the lead author, who is currently an agricultural teacher educator at Southern Arkansas University (SAU), selected five pre-service teachers to participate in an introductory-level trailer fabrication PD workshop hosted by a faculty member at another university. Three pre-service teachers were female while two were male. He employed two selection criteria for each pre-service teacher: (1) they must be preparing to complete their student teaching experience during the Spring 2023 semester and (2) they must have successfully completed either the agricultural metal fabrication course that he teaches or an equivalent post-secondary course. He reviewed each pre-service teacher's academic transcript and consulted with the Agricultural Education degree program coordinator at SAU to ensure all five of the selected pre-service teachers met both of the designated criteria. Afterward, he contacted each pre-service teacher via text message to confirm their interest. He subsequently completed the appropriate university paperwork to procure travel permissions. A SAU Foundation Student Travel Grant award covered travel expenses (e.g., lodging, fuel, meals, etc.). Each pre-service teacher was responsible for paying the $150.00 PD workshop registration fee.

The PD workshop took place on Friday, September 30, 2022. Upon arriving at the PD workshop location, the pre-service teachers collected the personal protective equipment (PPE) they needed (e.g., safety glasses, welding helmets, etc.) and reported directly to the facilitating faculty member. Once all the in-service teachers arrived, the faculty member introduced himself and provided an opportunity for all the participants to introduce themselves. Afterward, the faculty member introduced the day's trailer fabrication project and provided each participant with project and curriculum resources for them to use in their respective SBAE programs.

Throughout the day, the pre-service teachers worked alongside the in-service teachers to perform project lay out procedures, take measurements, cut steel, and perform the appropriate welding, cutting, and finishing procedures. The in-service teachers served as project mentors for the pre-service teachers and provided them with guidance on proper fabrication procedures, shared information regarding their professional teaching experiences, and built a substantial degree of camaraderie with them throughout the day. Once the project was finished and the participants were dismissed by the faculty member, the participants exchanged contact information and took extensive, detailed pictures of the completed trailer fabrication project.

Implications, Future Plans, Advice to Others, and Costs

The intention of involving these pre-service teachers in the PD workshop experience was two-fold: (1) to positively impact their confidence and competence in completing large agricultural mechanics projects and (2) to help them build professional relationships by allowing them to closely engage with in-service teachers during a day-long PD workshop. Throughout informal visits with the pre-service teachers during the PD workshop, they reported that: (1) their self-perceived confidence and competence in completing large agricultural mechanics projects increased as the project progressed, (2) the in-service teachers served as valuable, competent mentors throughout the project, and (3) they more thoroughly understood what PD is and why it is important for their growth as teachers in the future. One female pre-service teacher excitedly remarked that, "Coming to this workshop really reinforced my confidence to teach agricultural mechanics and I really enjoyed the opportunity to network with current teachers. I am looking forward to teaching agricultural mechanics to my own students soon!"

To further enhance pre-service teacher competence in agricultural mechanics, the lead author is developing a trailer fabrication PD workshop experience that he plans to deliver annually to all senior-level pre-service teachers at SAU. This workshop will be funded by selling the completed trailer fabrication project. He further plans to involve these five pre-service teachers in helping deliver a trailer fabrication PD workshop that he will host at SAU in June 2023. Thus, these five pre-service teachers will apply their knowledge and skills to help instruct a group of in-service teachers. Based on the outcomes that these five pre-service teachers reported, he advises that other agricultural teacher educators consider seeking out or developing similar learning opportunities for their own pre-service teachers. Doing so would better prepare pre-service teachers to successfully teach agricultural mechanics in the future.

In total, it cost approximately $1,000.00 to provide the PD workshop experience opportunity to these five pre-service teachers. The lead author used approximately 48 hours of his time to facilitate this opportunity (e.g., procuring lodging, travel time, etc.).

References

Albritton, M. C., & Roberts, T. G. (2020). Agricultural technical skills needed by entry level agriculture teachers: A modified Delphi study. *Journal of Agricultural Education, 61*(1), 140-151. https://doi.org/10.5032/jae.2020.01140

Dewey, J. (1938). *Experience and education*. Collier.

Eck, C. J., Robinson, J. S., Ramsey, J. W., & Cole, K. L. (2019). Identifying the characteristics of an effective agricultural education teacher: A national study. *Journal of Agricultural Education, 60*(4), 1-18. https://doi.org/10.5032/jae.2019.04001

Granberry, T., Roberts, R., & Blackburn, J. J. (2022). "A challenge that I'm willing to take on:" The self-efficacy of female undergraduate students in agricultural mechanics. *Journal of Agricultural Education, 63*(3), 44-58. https://doi.org/10.5032/jae.2022.03044

Kolb, D. A. (1984). *Experiential learning: Experience as the course of learning and development*. Prentice-Hall, Inc.

Love, T. S., & Roy, K. R. (2017). Tools and equipment in nontraditional spaces: Safety and liability issues. *Technology and Engineering Teacher*, *76*(8), 26-27. https://www.researchgate.net/profile/Tyler_Love/publication/315614632_Tools_and_equipment_in_nontraditional_spaces_Safety_and_liability_issues/links/590b9e36a6fdcc5d421ed6bb/Tools-andequipment-in-non-traditional-spaces-Safety-and-liability-issues.pdf

Phipps, L. J., Osborne, E. W., Dyer, J. E., & Ball, A. (2008). *Handbook on agricultural education in public schools* (6th ed.). Thomson Delmar Learning.

Wells, T., & Hainline, M. S. (2021). Examining teachers' agricultural mechanics professional development needs: A national study. *Journal of Agricultural Education*, *62*(2), 217-238. https://doi.org/10.5032/jae.2021.02217

Wells, T., Hainline, M. S., Rank, B. D., Sanders, K. W., & Chumbley, S. B. (2021). A regional study of the agricultural mechanics knowledge and skills needed by school-based agricultural education teachers. *Journal of Agricultural Education*, *62*(2), 148-166. https://doi.org/10.5032/jae.2021.02148

Wells, T., Smalley, S. W., & Rank, B. D. (2018). Early field experience course students' perceptions of school-based agricultural education laboratory environments. *Journal of Agricultural Education, 59*(3), 243-257. https://doi.org/10.5032/jae.2018.03243

Whittington, M. S. (2005). The presidential address to the Association for Career and Technical Education Research: Using standards to reform teacher preparation in career and technical education: A successful reformation. *Career and Technical Education Research, 30*(2), 89-99. https://www.ctc.ca.gov/docs/default-source/educator-prep/cte-files/cte-research-presidential-address.pdf

How Can Agricultural Education Scholars Compete with Other Fields h-index's? Answer: Reporting Their Field Citation Ratios

Robert Strong
Bruce Herbert
Texas A&M University

James R. Lindner
Auburn University

Nicole Ray
Fresno State University

Primary author:
Robert Strong
Texas A&M University
2116 TAMU
College Station, TX. 77843-2116
979-845-1139
robert.strongjr@ag.tamu.edu

Introduction/need for innovation or idea

Priority 7 of the American Association for Agricultural Education's *National Research Agenda* emphasized the need to address complex problems. Institutions are challenged with producing impact from their research, teaching, and extension efforts with stakeholders (Kassab et al., 2020). Many academic departments now are faced with reporting their impact and the extent the impact aligns with the higher education system's institutional goals. Metrics of scholarly impact, such as citations, is relatively new. The Web of Science bibliometric database was launched in 2002 (Berenbaum, 2019), while both Elsevier's Scopus database and a beta version of Google Scholar were launched in 2004 (Hicks et al., 2015). Research metrics are used in benchmarking, strategic planning, and faculty promotions in universities around the world (Herbert, 2021). Bales et al. (2019). Metrics are used to justify claims of the scholarly or societal impact of scholarly publications. Research metrics are often used with a wide range of other indicators of scholarly prestige such as prestigious awards, speaking invitations, and serving on prestigious panels, committees, or other positions (Kreiner, 2016).

Small disciplinary communities, such as agricultural education, can be at a disadvantage when research is evaluated through measures such as total citation counts or journal impact factors because of the effect of community size on quantitative citation rates (Bornmann & Haunschild (2017; McKiernan et al., 2019). Inititaives in defining the responsible evalutaion of research have called for the use of article-level metrics, the use of metrics combined with other, more holistic methods of evaluation, and the use of metrics that reflect the unique mission and values of researchers and research organizations (Hicks et al., 2015).

How it works/methodology/program phases/steps

The challenges assessing disciplinary differences in citation praxes caused researchers of bibliometrics to develop field-standardized impact indicators referred to as relative citation ratios and field citation ratios. The National Institutes of Health Office of Portfolio Analysis developed the RCR as an effort to improve evaluations of project team's grant outcomes (Hutchins et al., 2016). The Field Citation Ratio (FCR) is a citation-based measure of scientific influence of one or more articles (Moher et al., 2018). It is calculated by dividing the number of citations a paper has received by the average number received by documents published in the same year and in the same Fields of Research (FoR) category (Bornmann & Haunschild, 2017). The field citation rate in Dimensions is given for specific research publications (older than 2 years) and the geometric mean is calculated for researchers and organizations. A value of 1 indicates that a publication is cited at the same rate as the mean citation rate of publications in the same field. A FCR value of 4 indicates that a research publication, researcher, or organization is being cited at four times the rate of the average citations of publications in that field. FCR Mean is the average Field Citation Ratio (FCR), which indicates the relative citation performance of an article, when compared to similarly aged articles in its Fields of Research (FoR) category. The values per year are the years in which the publications were published. As with other calculations involving the FCR, the average calculated is the geometric mean, which reduces the effect of outlier publications with extreme citation rates (Purkayastha et al., 2019).

Results to dates/implications

An example FCR output indicated,

> "[Faculty Name] Field Citation Rate (FCR) for multiple articles is over 12.4 – indicating that her scholarship is cited more than 12.4 times the (geometric) average of papers in her discipline published in 2012. This is extremely high. The mean FCR for [University] was 4.12. This provides strong evidence of the scholarly **impact** of her publications."

Another FCR output included,

> "[Faculty Name's] Field Citation Rate (FCR) for multiple articles is over 9.7 - indicating that her scholarship is cited more than 9.7 times the (geometric) average of papers in her discipline published in 2019. This is very high. The mean FCR for [University] is 3.64. This provides strong evidence of the scholarly **impact** of her publications."

A third result was,

> "[Faculty Name] Field Citation Rate (FCR) for multiple articles is over 7.4 - indicating that his scholarship is cited more than 7.4 times the (geometric) average of papers in his discipline published in 2021. This is very high. The mean FCR for [University] is 2.48. This provides strong evidence of the scholarly **impact** of his publications."

Future plans/advice to others

Promotion, tenure, and post-tenure review decisions have involved the review of faculty's research metrics (Herbert, 2021). Since the type of metrics and their use can affect faculty behavior (both negatively or positively), it is important to draw from the bibliometric and scientometric research literature for best practices and new types of metrics that can support richer narratives of the impact and significance of research. The FCR offers advantages when comparisons and context are needed when using citation rates to justify narratives of scholarly impact and significance. Departmental mentors should communicate strategies to faculty in being more responsive in providing metrics and impact assessments to internal and external stakeholders based on what artificial intelligence tools exist.

Costs/resources needed

The direct costs associated with reporting Field Citation Ratios is purchasing a subscription to Dimensions.ai. Researchers, a Department Head, or Dean's representative can contact dimensions.ai at https://www.dimensions.ai/contact-us/ for quotes. Indirect costs relate to the time researchers would need to allocate in developing a culture of reporting their deliverables and impact in dimensons.ai and other artificial intelligence systems (Google Scholar, ORCID, SCOPUS, ResearchGate, Academia.edu) including social media (LinkedIn, Twitter, etc.) as cited by Strong and Lindner (2023).

References

Berenbaum, M. R. (2019). Impact factor impacts on early-career scientist careers. *Proceedings of the National Academy of Sciences, 116*(34), 16659–1662. https://doi.org/10.1073/pnas.1911911116

Bornmann, L., & Haunschild, R. (2017). Relative Citation Ratio (RCR): An empirical attempt to study a new field-normalized bibliometric indicator. *Journal of the Association for Information Science and Technology, 68*(4), 1064–1067. https://doi.org/10.1002/asi.23729

Herbert, B. (2021). Advancing scholarly communications innovations among the campus community: A change model. https://hdl.handle.net/1969.1/193594

Hicks, D., Wouters, P., Waltman, L., de Rijcke, S., & Rafols, I., (2015). Bibliometrics: The Leiden Manifesto for research metrics. *Nature, 520*(7548), 429–431. https://doi.org/10.1038/520429a

Hutchins, B. I,, Yuan X., Anderson, J, M., & Santangelo, G. M. (2016). Relative Citation Ratio(RCR): A new metric that uses citation rates to measure influence at the article level. *PLoS Biology 14*(9), e1002541. https://doi.org/10.1371/journal.pbio.1002541

Kassab, O., Bornmann, L., & Haunschild, R. (2020). Can altmetrics reflect societal impact considerations?: Exploring the potential of altmetrics in the context of a sustainability science research center. *Quantitative Science Studies, 1*(2), 792–809. https://doi.org/10.1162/qss_a_00032

Kreiner, G. (2016). The slavery of the h-index-Measuring the unmeasurable. *Frontiers in Human Neuroscience, 10*(556). https://doi.org/10.3389%2Ffnhum.2016.00556

McKiernan, E. C., Schimanski, L. A., Muñoz Nieves, C., Matthias, L., Niles, M. T., & Alperin,J. P. (2019). Use of the Journal Impact Factor in academic review, promotion, and tenure evaluations. *eLife, 8*, e47338. https://doi.org/10.7554%2FeLife.47338

Moher, D., Naudet, F., Cristea, I. A., Miedema, F., Ioannidis, J. P. A., & Goodman, S. N. (2018). Assessing scientists for hiring, promotion, and tenure. *PLOS Biology, 16*(3), e2004089. https://doi.org/10.1371/journal.pbio.2004089

Purkayastha, A.,et al. . (2019). Comparison of twoarticle-level, field-independent citation metrics: Field-Weighted Citation Impact (FWCI)and Relative Citation Ratio (RCR). *Journal of Informetrics, 13*(2), 635–642. https://doi.org/10.1016/j.joi.2019.03.012

Strong, R., & Lindner, J. R. (2023, April 27). Artificial intelligence systems to share your impact: Things that change do not stay the same [Abstract]. *Proceedings of the 2023 Annual Conference of the Association for International Agricultural and Extension Education*. http://dx.doi.org/10.13140/RG.2.2.18263.96164

Implementing a Women of Welding Camp for Secondary Female Students

Lourdez Garza
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-2130
lbg64@txstate.edu

Kenedy Kornegay
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-2130
klk212@txstate.edu

Bradley Borges
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-2130
b_b518@txstate.edu

Ryan G. Anderson
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-3325
r_a461@txstate.edu

Implementing a Women of Welding Camp for Secondary Female Students

Introduction

Welding is a highly demanded skill, as a welder deficit exists in the United States (Croy, 2016). Recent projections indicate the domestic welding workforce will reach a deficit of ≥375,000 workers by 2026 (Guerra, 2018); this shortage is a combined result of more welding positions being created and older welders reaching retirement age. Access to a highly trained welding workforce has never been more critical to maintain our nation’s infrastructure (Byrd & Anderson, 2012). According to the Bureau of Labor Statistics (2021), of the 550,000 employed in the welding workforce, 3.5% of these individuals are female. With the growing workforce demands, it is important to increase the number of female welders to help offset the impending deficit of qualified welders. Therefore, it is critical to develop effective engagement activities that promote careers in the welding industry to females. This innovative idea describes the creation and implementation of the Women of Welding (WOW) camp. The overall purpose of the WOW camp is to promote women into the welding industry through an intensive five-day summer camp. WOW camp participants must be female, apply to the program through electronic application, and must be a rising sophomore, junior, or senior in high school.

How it Works

Current female Texas State University students were selected to serve as WOW ambassadors to assist in the planning, developing, and recruitment for the WOW camp. An electronic application was created by the authors that interested WOW camp participants were required to complete. Recruitment and distribution of the applications was done at 14 major agricultural mechanics events within the state of Texas in the spring of 2022. At the agricultural mechanics events, flyers with a QR code link to the applications were given to those who were interested. The application was also distributed to all School-Based Agricultural Education (SBAE) teachers through National and State listservs and via social media. A social media page for the camp was created to connect directly with the girls interested in the program. Applications were due on April 1st. WOW ambassadors reviewed and notified the applicants of their status by May 1st. Participants who were selected received an email with the camp information. Those who were not selected but placed on a waitlist and those not selected outright received a phone call from the WOW ambassadors to help them improve their application in order to apply next year if eligible.

Development of the camp program included discussions with industry representatives and stakeholders to identify needed areas for the participants to receive career exposures. The selected participants who attend the WOW camp were engaged in several areas in the welding industry, including metal processing, oxy-acetylene cutting, manual plasma cutting, CNC plasma cutting, metallurgy, Gas Metal Arc Welding, Shielded Metal Arc Welding, Flux-Core Arc Welding, and underwater welding. Two female lead teachers with extensive welding industry and educational experience were selected to lead the WOW camp. Additionally, women in the welding industry volunteered their instructional services that aided in the camp’s overall experience. These women also shared their experience as a female in a male-dominated industry and described their success in the welding industry.

The WOW camp started on a Sunday evening with dinner, a camp overview and keynote speaker. During the five days of the camp, the WOW participants were transported from the hotel via bus to campus by 8:00 am. Each morning would start with an hour of class instruction that focused on the safety, operation, and career opportunities associated with the daily theme. Following the classroom instruction, the participants transitioned to the welding laboratory for three hours of skill development. During that time, the participants had an opportunity to use virtual reality welding training machines, computer-aided welding machines and traditional live welding training machines in combination to improve their welding knowledge and skill. Each day was broken down into different welding processes to advance the participants skills. During lunch there was a fifteen-minute career spotlight speaker comprised of women in the industry, post-secondary students pursuing welding related degrees, and researchers. After lunch, the participants returned to the welding laboratory for approximately three hours to use their newly acquired skills to complete application exercises where they built small projects such as welding tables and rocket stoves. They then departed back to their hotel and had dinner with a keynote speaker who was a woman in the welding industry. Each day operated similarly to this outline, although the activities varied based off what topic that was being covered that day. During the final day of the camp, the WOW participants split into four small groups that experienced underwater welding, CNC plasma cutting, visual inspections and weld evaluation and reflect on their time at the camp in focus groups. The camp ended mid-day with an award luncheon and career spotlight presenter.

Results to Date

The first WOW camp received 60 complete applications, of which, 28 girls from 14 states were accepted based on the number of hotel rooms available. In addition to the two lead teachers, four female welding educators volunteered to assist with the camp. Five female industry leaders volunteered their time as nightly keynote speakers. Eight more volunteers served as career spotlight speakers during the lunch break. Several companies donated personal protective equipment (PPE), t-shirts, stickers, and other materials promoting the welding industry. Three companies provided approximately $20,000 in scholarship money.

Future Plans/ Advice to Others

As a USDA funded project, the camp will continue through the summer of 2023. Future plans include reaching out to major welding schools to feature an educational spotlight, sponsor lunch, and provide additional scholarship money for the participants. After 2023, industry support will be critical to provide this camp for free to young women interested in the welding industry. If this project were to be replicated, we recommend partnering with national, regional, and local companies in the welding industry to provide funding and in-kind donations to cover the cost of consumables, boarding, meals, PPE, and scholarships to the WOW participants. Additional funding should be secured for faculty salaries, plus WOW ambassador and lead teacher stipends.

Cost/ Resources Needed

This project is funded by a USDA/NIFA WAMS grant program for two years at $99,999. Two-thirds of the expense is for the WOW camp, the remaining balance is used for faculty salaries, travel, and indirect costs. For the first year, hotel expenses were $4,700, food costs were $4,560, materials and supplies costs were$6,335, lead instructors and evaluator costs were $9,000, and WOW Ambassador stipends were $6,000. In addition to the funds from the grant, a full welding laboratory set up included, virtual reality trainers, CNC plasma tables and welding machines would be necessary to complete the program as described above.

References

Bureau of Labor Statistics. (2021). Employed persons by detailed occupation, sex, race, and Hispanic or Latino ethnicity [Data set]. Labor Force Statistics from the Current Population Survey. U. S. Bureau of labor Statistics. https://www.bls.gov/cps/cpsaat11.htm

Byrd, A., & Anderson, R. (2012). Integrating virtual reality to reduce anxiety in beginning welders. Poster presented at the North Central Region –American Association for Agricultural Education Research Conference, Champaign, IL

Croy, B. (2016). *Why welding is an incredibly important industry*. Manufacturing.Net. http://doi.org/www.manufacturing.net/labor/blog/13193137/why-welding-is-an-incredibly-important-industry

Guerra, E. (2018). National Welding Month: Time to Let Everyone in on the Secret. American Welding Society: Retrieved from: https://www.aws.org/resources/detail/national-welding-month-time-to-let-everyone-in-on-the-secret

Stone, R. T., Watts, K. P., Zhong, P., & Wei, C. (2011a). Physical and cognitive effects of virtual reality integrated training. *Human Factors*, *53*(5), 558-572. http://doi.org/10.1177/0012720811413389

Incorporating a MakerSpace Project into an Introduction to Agricultural Engineering Course

Brittney Heibel
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-2130
bhh19@txstate.edu

Bradley D. Borges
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-7106
b_b518@txstate.edu

Ryan G. Anderson
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-3325
r_a461@txstate.edu

Incorporating a MakerSpace Project into an Introduction to Agricultural Engineering Course

Introduction

The Ingram Hall Academic MakerSpace (IHM) on Texas State University campus is an invaluable resource, costless to university faculty and students. The IHM benefits students through hands-on learning and varying perspectives on multi-disciplinary engineering. Academic MakerSpaces encourage students to complete projects that require complex, collaborative, and creative efforts (Bouwma-Gearhart et al., 2021). The MakerSpace encompasses three fabricating sections: rapid prototyping, industrial manufacturing, and woodworking. Notable equipment in the rapid prototyping section ranges from 3D printers to CO_2 lasers. In the industrial manufacturing section, machinery available to students include waterjet cutters, 5-axis CNC mills, fiberoptic lasers, and multi-process welding machines. Lastly, the woodworking section comprises CNC routers, table saws, and basic woodworking tools. The IHM also features five teaching labs containing advanced teaching equipment like universal testing machines, CAD engineering equipment, and more (Texas State University, 2020).

Students recognize MakerSpaces as spaces with a welcoming and encouraging environment that promotes participation from a diverse group of people, including students who were intimidated or uninterested at first (Bouwma-Gearhart et al., 2021). By empowering them to pursue more innovative ideas, students' utilization of MakerSpaces has led to high levels of teamwork, communication, and time management, all valued skills within agricultural engineering industries (Lagoudas et al., 2016). Incorporating MakerSpace projects into the agricultural engineering curriculum will allow students to receive meaningful learning through hands-on experience that attends to physical, technical, and social components across systems.

How It Works

Instructors for the Introduction to Agricultural Engineering courses will introduce the MakerSpace and potential projects that can be created. Following a tour of the MakerSpace, instructors provide students with the MakerSpace Project Assignment: to create a unique project utilizing at least one piece of equipment within the MakerSpace. Students are encouraged to be creative with this opportunity. Once students create their project design, receive approval from the instructor, and complete necessary training protocol for machines they wish to operate, they are allowed into the MakerSpace to begin fabrication. Table 1 outlines steps of the MakerSpace Project process.

Table 1

MakerSpace Project Assignment Outline

Steps	Action	Description
Step 1	Students tour the on-campus MakerSpace	Accompanied by the instructor, students receive a comprehensive tour of the MakerSpace by a MakerSpace Technician (MST).
Step 2	Students are instructed to develop a project outline	The instructor gives examples of projects created using the MakerSpace. Students must identify their desired project and which MakerSpace machine(s) they will use.

Step 3	Instructor reviews project design outlines	The instructor reviews project design submissions from the students, confirming machine selection. The purpose of this step is to ensure the feasibility of the proposed project.
Step 4	Students complete required training protocol for specific machines they plan to use	Virtual training is provided through CANVAS. Students must score 100% on all training quizzes before access to the machine is granted. Additional in-person trainings are required for specialized equipment.
Step 5	Students complete their MakerSpace project over the course of the semester	Students may work on their individual projects, at their own pace, over the semester to provide adequate time for complex project construction.
Step 6	Students submit their project report for grading at the end of semester	Projects are graded according to completion, as the purpose is to engage students in using the MakerSpace.

Results to Date

Of the (n = 91) students who created a MakerSpace project during the class, 37 used 3D printers, 13 used laser cutters, 12 used CNC embroidering machines, 10 used waterjet cutters, and eight used laser etching machines. Less than five students opted to use other machines such as the CNC lathe, CNC mill, vinyl cutter, table saw, MIG welding machine, or plasma cutting table. All projects were designed and executed completely by students. Noteworthy projects include a layered wooden shadowbox etched with images, a welded metal hat rack embellished with decorative designs, 3D printed topographic maps, and a laser-cut aluminum deck to be fitted on a boat. Some students elected for simpler designs such as embroidered pillowcases or design-printed t-shirts. It was not determined if students continued to utilize the MakerSpace resources on campus following project completion.

Future Use of MakerSpaces

Partnering with institutions across campuses, like the MakerSpace, can improve students' college experience through diversifying and enhancing their education. Students operating technical equipment firsthand receive advanced training they otherwise wouldn't have received. Through these experiences within the MakerSpace, students acquire skills and experiences that better prepare them to integrate into the agricultural engineering industry.

Future implementation of MakerSpace projects in university-level courses should allow students ample time within the MakerSpace to acquaint themselves with the many machines. Implementation should also blend team-based learning with project assignment to further enhance heterogenous engineering experience. Further, plans to monitor whether students continue their use of the MakerSpace after the project lesson is needed.

Costs and Resources Needed

The MakerSpace is a free resource to all students, staff, and faculty on campus that provides training for basic and specialized equipment at no cost, thus the only cost incurred was that of specific materials needed for their projects (i.e., lumber, steel, or fabric). Materials sold in the IHM Stock Store were available to students at-cost. This on-campus resource is something to be marveled and taken advantage of as students are given extensive exposure to advanced project development and production at minimal or no costs.

References

Bouwma-Gearhart, J., Choi, Y., Lenhart, C., Villanueva, I., Nadelson, L., & Soto, E. (2021). Undergraduate Students Becoming Engineers: The Affordances of University-Based Makerspaces. Sustainability, 13(4), 1670. https://doi.org/10.3390/su13041670

Lagoudas, M., Froyd, J., Wilson, J., Hamilton, P., Boehm, R., & Enjeti, P. (2016, June 26-August 28). *Assessing Impact of Maker Space on Student Learning* [Paper presented]. 2016 ASEE Annual Conference & Exposition, New Orleans, LA, United States.

Texas State University. (2020, March 5). *About Us.* Ingram School of Engineering: Texas State University. https://www.engineering.txstate.edu/Ingram-Hall-Makerspace/About-Us.html.

Increasing Access to Undergraduate Research

Logan Layne, Ph.D. Student
loganjl@vt.edu

Donna Westfall-Rudd, Ph.D.
mooredm@vt.edu

Hannah Sunderman, Ph.D.
hsunderman@vt.edu

Virginia Tech
(540) 231-6836

214 Litton-Reaves Hall
MC (0343)
175 West Campus Drive
Blacksburg, VA 24061

Increasing Access to Undergraduate Research

Introduction

Undergraduate research is an increasing focus of higher education across all institutions, particularly colleges of agriculture and life sciences (Cooper et al., 2019). The benefits of undergraduate research as an experiential learning pedagogical technique in curricular and co-curricular settings have been well documented, including transferable skill development, critical thinking, and interpersonal communication. Notably, students who have participated in undergraduate research experiences have higher rates of attaining a scientific bachelor's degree, acceptance into graduate school, and longer time in future science research opportunities presented to them (Hernandez et al., 2018). Additionally, experience conducting research increases students' capacity to adjust to new situations and solve challenging problems. Factors contributing to student success in undergraduate research include a strong mentor relationship with faculty who have shown promise for guiding new and emerging scholars (Cooper et al., 2019).

Besides preparing students to succeed in research, faculty must be prepared to lead undergraduate research efforts (Davis et al., 2020; Morales et al. 2016). Historically, this department has offered minimal undergraduate research opportunities to students, largely due to limitations in faculty capacity and experience working with undergraduates in a research capacity.

Program Phases

The undergraduate research program has two main components: (a) incorporating an undergraduate research experience into an existing introductory course for all students majoring in Agricultural Sciences and (b) working with committed faculty members within a community of practice (CoP) to provide professional development and accountability for mentoring undergraduate students.

First, the students enrolled in a required course are exposed to a two-module curriculum that gives a high-level overview of general research and features recent scholarship conducted by faculty members in the department. The students engage directly in data analysis by analyzing a short scene from an open-access interview to develop themes. Finally, students should consider a career-related question they are curious about and what data would be needed to address it.

Building upon the two modules, students will implement basic data analysis strategies in their undergraduate service projects. Specifically, students in an existing required course must do 16 hours of undergraduate service related to their major at a service site of their choice. As part of their 16 hours of service, students interview 2-3 people. Students then code the interviews for overarching themes and prepare a presentation for the class. These activities aim to scaffold students' experience and help them feel comfortable with research.

For our second component, the project team developed a CoP to provide faculty professional development (e.g., structuring an undergraduate research experience to benefit both faculty and student) and accountability for mentoring undergraduate students. The CoP will be purposeful in discussing methodologies and research topics/questions that are well-suited to undergraduate exploration and align with students' current research interests.

Results to date/implications

During this program's pilot phase, the project team developed the draft instructional curriculum for the content embedded into the existing courses. Along with the instructional content, the team created student assessments to reinforce the undergraduate research opportunities and support student development of their own ideas about research that is of interest to them. A project team member taught the new curriculum as a guest speaker in both courses and assisted with reviewing student assignments. The revised instructional and assessment materials are formatted for ease of use by others under the creative commons copyright policies. They are available for public access through the university's platform.

This year the CoP includes the three-faculty involved in this project. Beginning in the fall, all department faculty interested in offering undergraduate research experiences will be invited to participate in the CoP. The CoP collaborations will include a Google Shared Folder to allow all participating faculty to access the project resources.

There is currently one undergraduate student engaged in research associated with the initiatives of this project. The anticipated involvement of other students will begin during the summer and continue throughout the academic year.

Future plans/advice to others

The project team provides its curriculum resources to others through the university's open-access platform. These resources are published with a creative commons copyright allowing others to modify and use them for their classes. The expectation is that users will acknowledge the original authors of the materials according to the creative commons copyright policies. This public access will minimize the cost of the materials needed to implement this program at other universities.

Next fall, the project team will work with the instructor of the first-year experience course to modify an existing assignment that students must meet with their advisor to introduce themselves and share their interests as they start their collegiate experience. The addition will be to request the advisors specifically share their research focus area and current work with their advisees during this introductory meeting. The research team will ask faculty to share how they collaborate on research with other faculty both in and outside of the department.

Costs/resources needed

This project involved no additional costs to the department. The instructional components are embedded into existing courses. Other departments interested in implementing this formalized undergraduate research initiative are welcome to use the instructional materials we publish on our university's open-access platform. The student research opportunities should be linked to existing faculty work, requiring only a small amount of additional faculty time. As part of faculty responsibilities, they are expected to work alongside of undergraduate researchers.

References

Cooper, K. M., Gin, L. E., Akeeh, B., Clark, C. E., Hunter, J. S., Roderick, T. B., Elliott, D. B., Gutierrez, L. A., Mello, R. M., Pfeiffer, L. D., Scott, R. A., Arellano, D., Ramirez, D., Valdez, E. M., Vargas, C., Velarde, K., Zheng, Y., & Brownell, S. E. (2019). Factors that predict life sciences student persistence in undergraduate research experiences. *PLOS ONE*, *14*(8), e0220186. https://doi.org/10.1371/journal.pone.0220186

Davis, S. N., Jones, R. M., Mahatmya, D., & Garner, P. W. (2020). Encouraging or Obstructing? Assessing Factors That Impact Faculty Engagement in Undergraduate Research Mentoring. *Frontiers in Education*, *5*, 114. https://doi.org/10.3389/feduc.2020.00114

Hernandez, P. R., Woodcock, A., Estrada, M., & Schultz, P. W. (2018). Undergraduate Research Experiences Broaden Diversity in the Scientific Workforce. *BioScience*, *68*(3), 204–211. https://doi.org/10.1093/biosci/bix163

Morales, D. X., Grineski, S. E., & Collins, T. W. (2016). Influences on Faculty Willingness to Mentor Undergraduate Students from Another University as Part of an Inter Institutional Research Training Program. *CBE—Life Sciences Education*, *15*(3), ar35. https://doi.org/10.1187/cbe.16-01-0039

Using Agricultural Literacy to Develop a Community of Practice for SBAE Students

Jenny E. Bennett, M.Agr.

Nathan Clark, M.Agr.

Kellie Enns, PhD

Colorado State University

Agricultural Education

301 University Avenue

Fort Collins, Colorado 80523-1101

(720 281 5905)

Jennifer.Bennett@colostate.edu

Using Agricultural Literacy to Develop a Community of Practice for SBAE Students

Introduction

A community of practice (CoP) is a group of individuals who engage in a shared experience (Cox, 2005). Where "ways of doing things, talking, beliefs, values, practice emerge in this mutual endeavor" (Holmes & Meyerhoff, 1999, p. 174). In School-Based Agricultural Education (SBAE) teacher programs, the development of a CoP is valuable because a community of practice bridges teaching theory and practice while promoting the development of a community for the individuals involved (Berggren & Soderlund, 2011; Holmes & Meyerhoff). Researchers have identified that upon graduation, many SBAE students still feel they lack the skills necessary to be successful (Garton & Chung, 1997). Additionally, due to the ongoing agricultural education teacher shortage crisis, teacher educator programs should invest in innovative programming within preservice programs that will contribute to teacher success in the short and long term (Eck & Michael, 2019). One way that the Program of Agricultural Education at Colorado State University (CSU) is exploring incorporating CoP into the SBAE teacher preparation program is through the use of our agricultural literacy outreach program, CAM's Ag Academy (CAA). It is hoped that providing experiences for SBAE students to engage in agricultural literacy work together will foster a CoP promoting practices central to success in the agricultural education profession.

Methodology of an Agricultural Literacy Community of Practice for SBAE Students

From June 2022 to February 2023, the CAA program facilitated two opportunities for SBAE students to become part of the core team to develop, deliver, and evaluate agricultural literacy programming. A community of practice develops within "three crucial dimensions; mutual engagement, a joint enterprise, and shared repertoire" (Holmes & Meyerhoff, 1999, p.175). The methodology and results of this innovative idea will be explained using the dimensions as a thematic framework for developing the agricultural literacy CoP.

Mutual engagement

The space of mutual engagement is considered the "basis for the relationships that make CoP's possible" (Holmes & Meyerhoff, 1999, p. 175). The CAA students regularly interacted through regular weekly meetings and group travel opportunities. From the start of the experiences-regular meetings were held to accomplish team business and conduct team-building activities. Additionally, these students were immersed in unfamiliar locations to deliver agricultural literacy experiences. Often these events would last for several long days, significantly expediting the relationship development of the individuals who were part of this core team.

Joint enterprise

The joint enterprise dimension explains the set of experiences that the members experience, which contributes to the CoP's common goal and their development as a member of the CoP. Using the experiential learning model, the core team members created original agricultural literacy lessons, took turns being "program leads" for each event, and conducted training for CSU and school-aged youth serving as guest educators in agricultural literacy programming. In the examples above, students were active in teaching and learning, immersed in a cycle of experiences, reflection, thinking, and doing (Bergsteiner et al., 2010).

Results to Date

Shared repertoire

The third dimension essentially describes the results of the CoP (Holmes & Meyerhoff, 1999). As of February 2023, CAA has had the opportunity to engage 9 SBAE students. What began as a simple student hourly job to conduct agricultural literacy work transformed into an innovative, collaborative community of practice for SBAE students. At the end of their experiences, each student completed a post-survey which revealed that CAA positively impacted their knowledge and skills of practices relevant to teaching agriculture, including curriculum development, self-efficacy to teach, and effectively engaging K-12 students and their knowledge of agriculture. Additionally, students remarked that working alongside their peers significantly impacted their development as a professional, specifically in curriculum development, mentorship skills, and teaching self-efficacy. One student mentioned that the CAA experience contributed to developing an increased sense of belonging. Wenger (2010) explains that the critical features of this phase: Shared ways of doing things, communication, propagation of innovation, acknowledgment of member strengths, shared stories and inside jokes, and efficiency in addressing problems. Faculty observed that students went from acting as independent units to independently organizing group sessions to test curriculum; they would critically reflect on their own, as well as, evaluate each other's teaching, and develop innovative solutions as a team to overcome daily challenges. Students shared jokes and stories and shared a common language. Lastly, they would openly discuss and draw upon each other's strengths in moments of need.

Future plans

Future plans for this program are to consider it an essential part of the preservice program of SBAE students, including developing ways for more students to engage in CAA meaningfully. Additional future plans include collecting more data from SBAE students participating in CAA to determine medium and long-term outcomes. Advice to others includes implementing similar experiential learning opportunities that foster CoP development. These opportunities should be student-led to promote ownership and a sense of communal *wins* and *losses* during the execution of the experiences. Additionally, adequate training, debriefing, and reflection time are essential to the experience SBAE faculty must provide.

Costs

No direct costs are associated with this innovative idea of a CoP for SBAE students. However, costs were associated with the experiences provided. All students involved in the CAA program were hired as hourly student workers at $15.00/hour, 20-30 hours per week that they were hired. Transportation and lodging costs were also accrued at an average of $250.00 per day when travel was required. Lastly, each developed agricultural literacy lesson costs approximately $25.00, totaling $225.00 for all nine CAA students.

References

Berggren, C., & Soderlund, J. (2011). Management education for practicing managers: Combining academic rigor with personal change and organizational action. *Journal of Management Education, 35*(3), 377-405. doi:10.1177/1052562910390369

Bergsteiner, H., Avery, G. C., & Neumann, R. (2010). Kolb's experiential learning model: critique from a modeling perspective. *Studies in Continuing Education*. https://doi.org/10.1080/01580370903534355

Cox, A. (2005). What are communities of practice? A comparative review of four seminal works. *Journal of Information Science*, *31*(6):527–540. doi:10.1177/0165551505057016

Eck, C., & Michael, E. (2019). Teacher Shortage in School-Based, Agricultural Education (SBAE): A Historical Review. *Journal of Agricultural Education*, *60*(4), 223–239. https://doi.org/10.5032/jae.2019.04223

Garton, B. L., & Chung, N. (1997). An assessment of the in-service needs of beginning teachers of agriculture using two assessment models. *Journal of Agricultural Education*, *38*(3), 51–58. doi:10.5032/jae.1997.03051

Holmes, J., & Meyerhoff, M. (1999). The Community of Practice: Theories and methodologies in language and gender research. *Language in Society*, *28*(2), 173–183. https://doi.org/10.1017/S004740459900202X

Wenger, E. (2010). Communities of practice and social learning systems: The career of a concept. In C. Blackmore (Ed.), Social Learning Systems and Communities of Practice (pp. 179–198). London: Springer. doi:10.1007/978-1-84996-133-2

Integrating Agriscience: Using Hands-on Teaching to Develop Hands-on Teachers

Jennifer Brown
Louisiana State University
225 J. C. Miller Hall
Baton Rouge, LA 70803
(225) 578-6128
jbro542@lsu.edu

Dr. Kristin Stair
Louisiana State University
135 J. C. Miller Hall,
Baton Rouge, LA 70803
(225) 578-6128
kstair@lsu.edu

Introduction/Need for the Idea

Science, Technology, Engineering and Math (STEM) concepts have been identified as beneficial to increasing student knowledge in science (Ricketts, Duncan, & Peake, 2006) as well as being seen as an integral part of agricultural education (Stubbs & Myers, 2016). In a national study conducted by Shoulders and Myers (2013) it was reported that agriscience teachers spend approximately 43% of their time providing concrete experiences and only 12% of their class time engaging learners in active experimentation.

Kolb's (1984) Experiential Learning Theory (ELT) is a method by which learners use experience to enhance learning. According to Kolb, ELT can be defined as "the process whereby knowledge is created through the transformation of experience. (Kolb 1984, p. 41). Kolb's ELT allows for learning through four modes with the facilitator or instructor being responsible for guiding learners through the experiences. The model consists of grasping learning through concrete experiences and/or abstract conceptualism and then transforming that learning through reflective observations and/or active experimentation (Kolb & Kolb, 2017). The completion of all four stages of experiencing, reflecting, thinking, and acting provides a complete learning cycle by which learning can occur (Kolb & Kolb, 2005). However, in a study conducted by Shoulders & Myers, only 30% of teachers surveyed reported using all four stages of ELT to support learning within their classrooms (Shoulders & Myers, 2013).

In Louisiana, few teachers were implementing STEM content or lab assignments in their courses, and many expressed discomfort since they were relatively unfamiliar with conducting the labs themselves (Personal correspondence, Smith, H., 2019). To develop divergent knowledge, teachers should not only provide opportunities for students to grasp new knowledge but must also experience that knowledge actively (Knapp & Benton, 2006). With that in mind, Louisiana State University developed a course focused on teaching scientific concepts, as well as encouraging hands-on participation in agriscience laboratories.

How It Works

The purpose of the Agriscience Applications course was to assist students in developing teaching strategies needed for teaching agriscience and STEM laboratories. The instructor provided lectures on agriscience content, including ways to implement content into school based agricultural education courses, followed by student engagement in a relevant laboratory assignment the subsequent class period. Students were also required to submit two laboratory reports on labs of their choice throughout the semester, which encouraged students to develop skills in scientific writing and communications that can be used to discuss scientific content with formal and non-formal audiences.

In Fall of 2020 and 2021, the course was offered as a special topics course for six students. In Fall of 2022, the course was expanded and offered as a full course with 12 students enrolled. In total, 12 scientific methods laboratories were offered as part of the course with content including scientific methods introduction laboratories, plant science laboratories, animal science laboratories, microbiology laboratories, and entomology laboratories.

In addition to required laboratory participation and laboratory reports, students were asked to complete an Agriscience Fair project for their final exam grade which included a scientific paper, a poster, and a presentation of their project. Students were instructed to follow the National FFA Agriscience Fair handbook when developing their projects, and the final project was graded using the National Agriscience Fair rubrics. Sections of the paper were due throughout the semester to allow students to get feedback on their writing which could then be applied to their final paper.

Results to Date

When asked about the impact of the class, students reported a highly favorable attitude about the course and the course content. Selected comments included:

"I loved this course and it created new passions for me to use in my classroom"
"A project heavy class that requires a lot of hands–on work but is a very fun class"
"I loved the opportunity to do an agriscience fair project. I never did this in high school but feel like I could have my students participate in it now."
"This class gave me a ton of ideas to use in my own classroom"

Future Plans/Advice to Others

The course will continue to be offered in alternating fall semesters to help support STEM integration for students at Louisiana State University along with professional development trainings of the labs included in the course for in-service teachers. Additionally, follow-up data will be collected to determine if labs are being implemented once students begin teaching and if not, identify barriers to implementation.

Before beginning a similar course, universities should identify essential lab content that their teachers may be able to integrate as part of their state curriculum. In Louisiana a new curriculum and laboratory guide was recently developed for teachers that works in conjunction with state credentialing requirements. Therefore, lab assignments were designed to tie into that curriculum. Also, since school budgets and space vary, laboratories that are easy to run without extra equipment and with inexpensive materials, should be used primarily within this course to make the laboratories usable for the majority of teachers when they enter the classroom as well as discussions on how to implement laboratories with limited space or equipment.

Cost/Resources Needed

The overall cost of the course is dependent on which labs are being conducted during the semester. Most labs are designed to use materials that can be found at a grocery store or obtained inexpensively through online supply companies such as Lab-aids or Carolina Biological. Ideally, the labs for this class should be ones that students can easily replicate in a classroom environment with a very low budget. In 2022, the course cost was $657 of which, the largest cost of materials for gel electrophoresis lab ($384). It is important to note that many of the higher costs associated with scientific labs are one-time costs for materials, equipment, or kits and that the cost of the classes is lower once you only need to purchase refills or perishable supplies from year to year.

References

Knapp, D., & Benton, G. M. (2006). Episodic and semantic memories of a residential environmental education program. *Environmental Education Research*, *12*(2), 165-177.

Kolb, A. Y., & Kolb, D. A. (2005). Learning styles and learning spaces: Enhancing experiential learning in higher education. *Academy of management learning & education*, *4*(2), 193-212.

Kolb, A. Y., & Kolb, D. A. (2017). Experiential learning theory as a guide for experiential educators in higher education. *Experiential Learning & Teaching in Higher Education*, *1*(1), 7-44.

Kolb, D. A. (1984). Experiential learning: Experience as the source of learning and development. New Jersey: Prentice-Hall.

Shoulders, C. W., & Myers, B. E. (2013). Teachers' Use of Experiential Learning Stages in Agricultural Laboratories. *Journal of Agricultural Education*, *54*(3), 100-115.

Stubbs, E. A., & Myers, B. E. (2016). Part of What We Do: Teacher Perceptions of STEM Integration. *Journal of Agricultural Education*, *57*(3), 87-100.

Ricketts, J. C., Duncan, D. W., & Peake, J. B. (2006). Science achievement of high school students in complete programs of agriscience education. *Journal of Agricultural Education*, *47*(2), 48.

Integrating NFA History into School-Based Agricultural Education

Susan L. Jones
Athens Drive Magnet High School
sjones28@wcpss.net

Wendy J. Warner
NC State University
wjwarner@ncsu.edu

Introduction/Need for Innovation or Idea

From 1935-1965, the New Farmers of America (NFA) evolved into one of the most prominent Black youth farm movements in American history with a membership of over 50,000 Black farm boys participating in high school vocational agriculture classes in 18 states across the South and along the East Coast. Yet, on October 13th, 1965, the organization vanished without a trace (Smith, 2022). Since that time, there has been limited research on the NFA. A monograph by E. M. Norris (1993) entitled *Forty Long Years*, detailed the "swallow up" of the NFA by the FFA. Strickland (1995) documented much of the NFA history and also details of the consolidation of the two organizations. Dissertation research has been conducted on the impact of the NFA and the merger on both teachers and members (Gilman, 2013; Wakefield, 2001) and additional inquiries have been made as to the traditions and influential leaders (Callaghan & Hock, 2019; Connors, 2021; Jones et al., 2021). In school-based agricultural education classes, it appears that instruction on the NFA remains minimal. In order to introduce the NFA, allow students to explore the organization, and to promote the inclusion of historical research and archival analysis in the classroom, two assignments were developed and implemented, NFA Artifact Analysis and NFA History Choice Board.

How it Works/Methodology/Program Phases/Steps

For the NFA Artifact Analysis, students were provided with five documents. These included a NFA camp brochure, an Activities of the NFA brochure, a NFA Supply Service Brochure, the NFA Emblem, and a North Carolina NFA Convention brochure. Students were expected to select one document to analyze and complete a Google form asking them to define the type of document, describe their selected artifact, and answer a few additional questions. When completing the NFA History Choice Board, students could illustrate a timeline, compare and contrast the history of the two organizations, create a social media profile for an individual who was vital to the success of the NFA, or provide a two-paragraph discussion on possible causes of the limited diversity in the present-day FFA organization. Other possibilities included creating a detailed plan to incorporate some of the NFA traditions in the FFA, pretending to attend a week of NFA camp and writing a journal entry narrative, or conducting individualized research on the location of any remaining NFA members.

Results to Date/Implications

The NFA Artifact Analysis assignment has been implemented throughout the duration of six semesters, reaching over 250 students. As a result, many students inquired more about the organization and specifically about characteristics described within the artifacts. The NFA History Choice Board was introduced during one semester and received positive feedback due to the autonomy students had in which activity they picked. These assignments have led to chapter officers seeking opportunities to highlight NFA leaders and minority agricultural leaders on the morning announcements. Additionally, there have been collaborative opportunities presented between minority organizations at the high school where the activities were implemented. The timeline of assignment integration has varied. During spring semesters, incorporating these activities during February, and Black History Month, challenges students to consider the achievements of African American leaders in agriculture. These activities provide an opportunity for all students to identify the foundation the NFA set for the diversity that exists today in the National FFA Organization.

Future Plans/Advice to Others

Before introduction, modifications should be made to each assignment to meet the needs of all learners. Both could be modified by reducing the number of options and/or adjusting the number and level of analysis questions students must answer. Also, activities could be built upon by encouraging students to create awareness about the NFA outside of their classroom. The activities could work in conjunction by first analyzing artifacts but then utilizing those artifacts such as creating an educational display about NFA for the school or library. Other activities that vary in difficulty could be added. These might include reviewing NFA articles published through *The Friday Footnote* (Moore, 2019-2021), inviting students to form a NFA committee within their chapter, or designing an NFA mural or art installation. Additional ideas could have students write a letter to their State Association requesting for a lost tradition of the NFA to be implemented back into the organization, plan a NFA Day for the region, or complete a book review of the recently published, *The Legacy of the New Farmers of America* (Alston et al., 2022). The intention of these assignments is to encourage the remembrance and appreciation of the NFA and its unique characteristics that impacted thousands of African American youth. Involving students in the education of the organization beyond the classroom walls is one step in accomplishing this goal.

Costs/Resources Needed

Additional resources are needed to establish a database of remembered NFA members and those still living across the southern states and nation. This resource would allow students to identify potential members of their communities who were impacted by the NFA. A database of NFA contacts would allow additional opportunities for students to understand the reach of the organization. Those willing, could serve as a contact for interviews, guest presentations, collaborations, and more. Creating this database would require an investment of time, financial resources and communication between Land-Grant Universities who once held close partnerships with the NFA in their states. This would also require networking between local community members within each state. Several sites could serve as field trip locations or be featured on FFA websites or social media, which would incur costs related to travel. These might include the F. D. Bluford Library at North Carolina Agricultural and Technical University, which holds one of the largest collections of NFA artifacts, or several other historical landmarks highlighting the NFA and its history.

References

Alston, A. J., Wakefield, D. B., & Cox, N. S. (2022). *Legacy of the New Farmers of America*. Arcadia Publishing.

Callaghan, Z., & Hock, G. (2019). *The contributions of George Washington Owens to the development of agricultural education opportunities for African Americans.* Research Proceedings of the North Central AAAE Conference, 107-113.

Connors, J. J. (2021). A historical analysis of the role of music in the FFA and NFA organizations. *Journal of Agricultural Education, 62*(4), 1-15. https://doi.org/10.5032/jae.2021.04001

Jones, S. L., Kirby, B. M., & Warner, W. J. (2021). The role of NFA Camps in agricultural education for rural African American boys in North Carolina. *Journal of Agricultural Education*, *62*(1), 276–290. https://doi.org/http://doi.org/10.5032/jae.2021.01276

Moore, G. (2019, 2021). *The Friday Footnote: NFA*. The Friday Footnote. https://footnote.wordpress.ncsu.edu/?s=nfa

Norris, E. M. (1993). *Forty long years* (O. Simpson, Ed.). Langston University Press.

Smith, B. J., II (2022). In search of the New Farmers of America: Remembering America's forgotten Black youth farm movement. *Journal of Agriculture, Food Systems, and Community Development, 11*(4), 9–12. https://doi.org/10.5304/jafscd.2022.114.021

Strickland, C. (1995). *New Farmers of America in retrospect: The formative years 1935-1965*. Joyco Printing.

Learn – Plan – Do: A Reflection Tool for Teacher Induction Professional Development

Lavyne L. Rada
Interim Executive Director
Minnesota FFA Association
711 Maplewood Avenue
Litchfield, MN 55355
(605) 695-1861
lrada@mnffa.org

Amy R. Smith
Associate Professor
University of Minnesota
146 Ruttan Hall
St. Paul, MN 55108
(612) 624-6590
arsmith@umn.edu

Bradley C. Greiman
Professor Emeritus
University of Minnesota
146 Ruttan Hall
St. Paul, MN 55108
(612) 987-3051
bgreiman@umn.edu

Learn – Plan – Do: A Reflection Tool for Teacher Induction Professional Development

Introduction

We do not learn from experiences; rather we learn from reflecting on experience (Dewey, 1933). John Dewey was the first theorist to introduce the concept of reflection as a problem-solving technique (Hatton & Smith, 1995). Dewey (1933) postulated that humans do not learn from experiences, but rather from reflections on them. Dewey recognized the role that real-life and hands-on experiences have on learning and the importance of connecting learning to real-life applications. It is essential to take into consideration Dewey's explicit focus on the necessity of reflection while providing support and guidance to early-career school-based agricultural education (SBAE) instructors through teacher induction programming.

Simply put, reflection is a process of meaning-making in which the learner attempts to relate previous and current experiences by drawing connections between them (Dewey, 1933). The impact of reflection on teachers is directly related to the understanding and practice they have in the classroom. The findings of previous research point to a significant connection between reflection and the awareness and development of a practitioner's professional practice (Schon, 1983). Dewey (1910) contended that reflection should take place within a community because active affirmation of meaning and encouragement of further thought can result from such group interaction. The Learn – Plan – Do reflection tool, when utilized for teacher professional development, provides reflection-on-action by planning an action and then reviewing and analyzing what resulted (Schon, 1983; Van den Bossche & Beausaert, 2012).

How it Works

Beginning in the 2017-2018, program coordinators for the Minnesota agriculture, food, and natural resource (AFNR) Teacher Induction Program (TIP) introduced the Learn – Plan – Do reflection tool. Early-career SBAE teachers engaged in the induction program received an electronic copy of the tool and were asked to utilize it throughout the year long program. Given the nature of programming, monthly professional development webinars offer early-career SBAE teachers a just-in-time topic related to their role as a SBAE teacher and FFA advisor. Content-experts share expertise with early-career teachers for about 30 minutes of the monthly professional development webinar, focused on a given topic such as student engagement techniques, integrating leadership development into the classroom, and grants and career and technical education funding. These topics provide a focus area for the early-career teachers to apply learning using the Learn – Plan – Do reflection tool. The content-experts' presentations are the focus of the *Learn* component of the reflection tool.

In the second step, the *Plan* component, program participants record their name and one thing they commit to do related to what was learned from the expert in the Plan section of a google document shared with all participants. Each participant is asked to focus specifically on one thing they want to remember and identify an action they will take in the next month to apply their learning. At the next monthly meeting, program participants return to the shared document, reflect on their plan, and share an update of the action that occurred. During this final step, the *Do* component, early-career teachers add a short statement in the shared document about what they did and what the outcome or result was.

Staff of the teacher induction program review the Learn – Plan – Do document each month to identify follow up needs, themes that emerged, and additional supports and resources needed by program participants. Instructional coaches and regional mentors for the program meet with staff monthly following the participant meetings and discuss the Learn – Plan – Do reflection tool, as well as actions and resources needed based on the monthly feedback from early-career teachers.

Results to Date & Implications

Each month, early-career teachers and induction program staff are given the opportunity to reflect on growth that has occurred and identify key professional development needs by referring to the Learn – Plan – Do document. These insights are used year after year to not only direct the preparation of the monthly professional development but also to determine which topics early-career teachers have found to be the most helpful in their classrooms. This information provides direction for the preparation of future presentations by both staff and subject matter experts.

Early-career teachers benefited from consistently engaging in reflective practice and being held accountable by focusing on one achievable action completed within a month to apply a newly acquired idea. While teachers have full autonomy over the way the monthly topic is incorporated into their own programs, the structure maintains reasonable expectations and fosters follow-through in the form of a reminder of intended actions. One participant indicated, "Learn – Plan – Do was a great way for me to reflect in the moment about what I learned from speakers, plan out a strategy to use with my program that helped me directly apply what I had just gained, and then actually do it and see some great results. I appreciated the applicability of the model and how it allowed me to actually make a plan of action rather than just getting the knowledge and not knowing where to go with it." Another emphasized the importance of providing time for collaborative reflection, stating, "During the first year of teaching, you are trying to figure out what works and what doesn't, but finding time to sit down and reflect is hard."

In addition, the Learn – Plan – Do reflection tool provides instructional coaches and regional mentors with a specific topic on which they can follow up with their early-career teachers. This helps instructional coaches and regional mentors support early-career teachers in a more personalized way.

Future Plans & Advice to Others

The Learn – Plan – Do reflection tool will continue to be used in the teacher induction program. In subsequent years, there will be a greater focus placed on intentional follow up with instructional coaches, which will assist in fully integrating the tool into on-site, in-person coaching. In addition, when several years of experience are gained, recurring themes of needs and actions will be recognized in order to further address the supports that early-career SBAE teacher's desire. It is advised that one Learn – Plan – Do document be used throughout the full year to make it possible for program participants and their support system to have simple access to the document. This also allows the document to be easily located and returned to.

Costs & Resources Needed

Implementing the Learn – Plan – Do reflection tool involves very little in the form of financial or other resources. The sole resource required is a document that can be accessed virtually and edited by multiple people.

References

Dewey, J. (1910). *How we think.* Boston, MA: D.C. Heath.

Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the educational process*. Lexington, MA: Heath.

Hatton, N., & Smith, D. (1995). Reflection in teacher education: Towards definition and implementation. *Teaching and Teacher Education*, *11*(1), 33–49. doi:10.1016/0742-051X(94)00012-U

Schon, D. (1983). *The reflective practitioner: How professionals think in action*. London: Temple Smith.

Van den Bossche, P., & Beausaert, S. (2012). The reflective practitioner: D. Schon. In F. Dochy, D. Gijbels, M. Segers, & P. Van den Bossche. *Theories of learning for the workplace: Building blocks for training and professional development programs* (pp. 59-86). Routledge.

Innovative

Mock Roof Project for Installation of Demonstration Solar Array by University Students

Jonathan Link
The University of Arizona
1110 E. South Campus Dr. #205 Saguaro Hall
Tucson, AZ 85721
(520) 621-1523
Jalink20@arizona.edu

Edward A. Franklin
The University of Arizona
1110 E. South Campus Dr. #205 Saguaro Hall
Tucson, AZ 85721
(520) 621-1523
uafrank0@arizona.edu

Robert Torres
The University of Arizona
1110 E. South Campus Dr. #205 Saguaro Hall
Tucson, AZ 85721
(520) 621-1523
Rtorres1@arizona.edu

Quinton Molina
The University of Arizona
1110 E. South Campus Dr. #205 Saguaro Hall
Tucson, AZ 85721
(520) 621-1523
qmolina@arizona.edu

Innovative

Mock Roof Project for Installation of Demonstration Solar Array by University Students

Introduction/Need for Project

According to the National Solar Jobs Census published by IREC (2020), between 2014 and 2019 solar employment increased almost five times faster than job growth in the overall U.S. economy. Installation of solar projects makes up 65% of the solar sector (IREC, 2020) with 68% of new hires landing in newly created positions. Over one third of new solar PV capacity installations across the globe are rooftop attachments. The share of rooftop solar peaked in 2018 when 43 percent of all solar panels installed were mounted on residential and commercial buildings (Jaganmohan, 2022). A research estimate of eight billion square meters of suitable roofs in the U.S. if covered with solar modules could produce nearly 1,400 terawatt hours (tWh) annually with two-thirds coming from the residential sector (Johnson, 2018).

Across industry sectors, the highest-demand jobs are concentrated in entry-level technical roles. According to the Bureau of Labor Statistics (2022) installation and construction jobs in the residential rooftop sector are some of the fastest-growing jobs in the country. Students preparing for a career in renewable energy need to assess their skills and interests if considering a pathway in the solar industry. Solar employers prefer candidates with bachelor's degrees and related work experience (Woodruff, 2014). Knowledge and skills of solar installation is part of the Job Task Analysis (JTA) for students preparing for the PV Associate Certification Exam (NABCEP, 2017). The activity of our focus is Domain IV: Installation, Task 3: Identify the elements of racking installation (NABCEP, 2017).

A roof mount method using a rack mount (SEI, 2004) was selected for this project. The solar modules are supported by a metal framework and set at a predetermined angle. The rack-mounted array is placed on the roof with track bolted on the roof's structural members. Manufacturers' mounting systems for pitched roofs tend to follow a top-down rail mounting scheme. Aluminum mounting L-feet are lag-bolted into a rafter, support and aluminum rail at intervals. Two rails support each row of PV modules and are secured to the rail by top-mounted clips. Clips are secured to the rail between modules connecting the sides of two adjacent modules (Hren, 2009). Rail-based racks have been the mainstay of the solar industry for years (Riegel, 2017).

How Does It Work

The roof should be constructed to standard building codes, with some exceptions (Parrish, 2016). The overall roof dimensions were as follows:

- Width: 15-ft Length: 20-ft Depth: 6-ft Pitch: 4:12

A 2-inch angle iron frame was laid out, cut, and welded together using a GMAW process. Nine 8-inch castors with rubber tires were mounted to the steel frame. The roof was composed of 2 x 8 rafters on 16-in centers, sheathed with ¾-inch plywood and 30# roofing felt. A 20-year asphalt composition shingle. Rafter spacing and plywood thickness selected to accommodate weight of multiple students on the roof at same time. All four edges were trimmed with aluminum edging. We outfitted the roof with a safety rail on three sides. To accommodate the use of a personal safety harness, a reusable roof anchor plate was installed on the top edge of the roof to prevent falls (OSHA, 2022). The solar array will consist of eight solar PV modules, mounted in two rows of four, in portrait-fashion. Each row will be supported by two module rails. Footings for each rail (approximately four) will be permanently affixed to the roof. Rails, modules, cables, micro-inverters, and module clamps will be attached and removed at the completion of each lab or demonstration activity. Example modules are 65” long and 40” wide. The roof has a three-foot spacing around the array to provide room for walking and installation.

Students were introduced to the roof-mount installation activity with a lecture presentation on various solar PV mounting methods including rack-mount roof top used in residential systems. At the beginning of the lab, a presentation and demonstration of various personal protective equipment (PPE) was conducted. A demonstration of the use of personal safety harness for work on pitched roofs was conducted. All students were required to wear a safety bump hat and work gloves were made available. Hand tools used in the attachment of mounting rails and tightening of bolts on clamps were shown and a demonstration on correct use was made. Students were quizzed on the roof mounting components and asked to identify system mounting feet, flashing, lag bolts, rails, end clamps, mid clamps. We finished with the safe handling of large solar PV modules. Two students put on the safety harnesses and attached the safety lines to the roof anchor plates. Students worked in pairs to carry and safely place modules on the rails prior to fastening. At the conclusion of mounting all eight modules in two rows of eight, modules were connected in series to build desired array voltage (Sanchez, 2011) and management of the wires beneath the array was discussed and conducted.

Advice for Others

Assess the solar industry opportunities for students in your region. This project compliments both our building construction skills instructional unit and electrical wiring unit. Students expressing a career interest in renewable energies benefit from this lab activity. As interest in the emerging Agrivoltaics sector grows (incorporating solar PV collection systems into production areas), there will be a growing demand for solar PV installers as well as system designers. Plan for space in your laboratory program for this engaging activity. Funding of $5,000.00 from an institutional sustainability grant secured the materials, tools, and safety materials for this lab teaching activity. Following completion of the Mock Roof, students were very eager to practice on it. There was a lot of positive feedback form our students saying that it was the “last twist of the lightbulb” and they were able to put all their knowledge together. This was the closest that we could get our students to a real world install without all the hazards of being on a building. Students were also surprised at how difficult it was to move among the roof with the fall safety devices on.

Resources

Materials used for this project included: Angle iron (0.125 x 2 x 2), Rafter material (2 x 8 lumber), Framing studs & cripples (2 x 4 lumber), Plywood (3/4 x 48 x 96), 30# Roofing Felt, Safety Rails & Mounts, PV mounting feet, rails, end clamps, mid clamps, 130-Watt solar modules (8 each), safety harness system, and assorted mounting fasteners,

References

Hren, R. (2009). Pitched roof mounting. *Home Power 130*, 74 – 80.

Hurd, B., LaForge, C., & Ventre, J. (2012) *Solar Training Best Practices: The Series*. https://irecusa.org/wp-content/uploads/2021/07/SITN-BP-5.pdf

Interstate Renewable Energy Counsel (IREC). (2022, March). Dynamic Careers in the Solar Industry.

Jaganmohan, M. (2022). Global rooftop share in solar PV capacity additions 2015-2022. *Statista: Energy & Environment*. https://www.statista.com/statistics/1172031/rooftop-share-in-solar-pv-deployment/#:~:text=Over%20one%20third%20of%20new,on%20residential%20and%20commercial%20buildings.

Johnson, S. (2018). A solar panel on every roof in the US? Here are the numbers. *Ars Technica* https://arstechnica.com/science/2018/02/a-solar-panel-on-every-roof-in-the-us-here-are-the-numbers/

Mayfield, R. (2008). Rack & stack: PV array mounting options. *Home Power 124*, 58-64.

NABCEP. (2017, September). PV Associate Job Task Analysis. https://www.nabcep.org/wp-content/uploads/2018/01/NABCEP-PV-Associate-JTA-9-13-17.pdf

OSHA. (2022). Green jobs hazards: Solar. *Safety and Health Tips*. https://www.osha.gov/green-jobs/solar

Parrish, P. (2016). *Photovoltaic Laboratory*. CRC Press.

Riegel, G. (2017). PV racks for sloped, asphalt-shingled roofs. *Home Power 181*, 22-29.

Sanchez, J. (2011). Configuring a PV array: Series & parallel wiring. *Home Power 144,* 32-33.

Solar Energy International (SEI). (2004). *Photovoltaics: Design and Installation Manual.* New Society Publisher.

U.S. Bureau of Labor Statistics. (2022). Fastest growing occupations. *Occupational Outlook Handbook.* https://www.bls.gov/ooh/fastest-growing.htm

Woodruff, V. (2014). Become a solar professional. *Home Power 160*, 66 – 72.

Oh Deer! A Lesson in Data Visualization and Mathematical Thinking

Kendrick L. Spencer
Virginia Polytechnic Institute and State University
214 Litton-Reeves Hall Blacksburg, VA 24061
(540) 231-6836
kendrickls@vt.edu

D. Brett Milliken
Virginia Polytechnic Institute and State University
214 Litton-Reeves Hall Blacksburg, VA 24061
(540) 231-6836
bmilliken@vt.edu

Oh Deer! A Lesson in Data Visualization and Mathematical Thinking

Introduction

Classes within the natural resource pathway of agriculture, food, and natural resources (AFNR) curriculum provide students with an opportunity to explore ecological, environmental, and societal challenges through an applied and regional lens (Hartmann & Martin, 2021; McKim et al., 2019). Many of the objectives that apply to natural resource classes in AFNR also apply to science courses such as environmental and ecological science. The Next Generation of Science Standards (NGSS) asks students to be able to analyze and interpret data to provide evidence of the effects of resource availability on organisms and populations in an ecosystem (NGSS Lead State, 2013). Additionally, the National Council of Teachers of Mathematics (NCTM) states that students in grades 9-12 should be able to understand various statistical measures, parameters, and ways to display data, as well as, develop inferences and predictions based on various forms of data (National Council of Teachers of Mathematics, 2023). Similar to the requirements of GSS and NCTM standards and expectations, the environmental service systems career pathway for AFNR requires students to analyze the factors that affect population density and dispersion in natural resource systems (The National Council for Agricultural Education, 2015).

Project WILD is a national educational resource program created by the Association of Fish and Wildlife Agencies that serves students in kindergarten through 12th grade in both formal and non-formal programs (Association of Fish & Wildlife Agencies, 2022). One activity provided by Project WILD is Oh Deer, which is a simulation game that demonstrates how animal populations increase and decrease depending on the availability of resources. Through this game, students are able to examine environmental conservation concepts. Additionally, agricultural science teachers can integrate mathematical thinking into the activity through the calculation of birth rate, death rate, carrying capacity, and using data to identify limiting factors which would help students ing standards and expectations set by NGSS and NCTM.

How It Works

Within a class of 28 high school students, an agricultural science teacher (AST) divided the students evenly into three groups. The Oh Deer! lesson stated that one group of students acted as “deer” and the other two groups of students acted as “resources' ' such as food, water, and shelter. The AST identified one student from each group to serve as the “statistician” to record the amount of resources available and the amount of deer during each round of the activity

Each group served as the “deer” four different times, making for a total of 12 rounds for each game. The AST designated which of the three major resources (food, shelter, water) that each student in the resource group represented. Then, the AST determined which of the major resources each student in the “deer” group needed. Students then played a game of tag to retrieve their desired resource. If students in the “deer” group were unable to find their resource they would “die” and become a resource for the next round. If a student was able to capture their resource, the student representing the resource would become a part of the deer group for the next round.

After each round the statisticians were required to record the number of students who represented deer and the number of students who represented each resource. After the 12 rounds were played, students examined the data for each resource and the deer population. Students were then required to create graphs and charts to display the changes in resources and population over the course of each round. Additionally, students calculated the birth rate, death rate, and identified which of the resources was the limiting factor in their group. .Students then compared data between each of the groups in order to calculate the carrying capacity of the different groups.

Results to Date

Students were engaged in mathematical thinking over the course of three class periods. Students were first challenged to use their knowledge of graphs and charts to create a diagram of the change in natural resources and the deer population over time. Students had to determine which graph would best represent the change and allow them to analyze which of the natural resources served as the limiting factor. Secondly, students were required to use their understanding of mathematics to decide how to calculate the birth and death rates of their populations. Students shared their results with other group members over the duration of the lesson. Finally, students had to ascertain the carrying capacity of their environment. Throughout the course of the game, students discussed the differences between line and bar graphs. Students learned the formulas for calculating birth rate and death rate of a population, and had to explain each of the steps in their analysis. A school administrator stated that this lesson was one of the most engaging STEM lessons they had witnessed.

Advice to Others

The ability to push basic concepts of agriculture, food, and natural resources beyond skills acquisition and into transferable skills is essential for all school-based agricultural science programs. Project WILD's Oh Deer! provided an opportunity for the AST to plan a lesson with an interactive game that was outside, physically engaging, and did not require the use of technology. The lesson was able to connect topics such as natural resources, limiting environmental factors, animal populations, and data visualization and interpretation to wildlife management while simultaneously meeting AFNR, NGSS, and NCTM standards. This lesson will be created into a formal lesson plan that other ASTs can access through the state database.

Other agricultural science teachers can use games and physically engaging interactions to increase students' ability to reason mathematically and present data. Teachers must become familiar with standards such as NGSS and the NCTM standards. They must also critically evaluate their curriculum for opportunities to highlight concepts of mathematics and science that are essential to agricultural science curriculum. While STEM integration has a large focus in the research literature base, teacher education programs should model how to incorporate NGSS, NCTM, and other curricular standards into AFNR curriculum. Teachers should be open to using tangible and real world cases to serve as examples and models for students to analyze. Project WILD's Oh Deer! serves as one example of how a simple interactive game can become a lesson in mathematics, science, and data visualization within AFNR.

Costs and Resources Needed

The Project WILD activity book is available through the Association of Fish and Wildlife website for approximately $21.00. The complete activity requires space for students to run and play tag, paper, pencils, markers, rulers, and calculators. The time necessary to prepare for this activity is similar to the time spent planning and coordinating daily classroom lessons or activities.

References

Association of Fish & Wildlife Agencies. (2022). *Project WILD K12 Guide*. https://www.fishwildlife.org/projectwild/project-wild

Hartmann, K., & Martin, M. (2021). A critical pedagogy of agriculture. *Journal of Agricultural Education*, *62*(3). https://doi.org/10.5032/jae.2021.03051

McKim, A., Raven, M., Palmer, A., & McFarland, A. (2019). Community as context and content: A land-based learning primer for agriculture, food, and natural resources education. *Journal of Agricultural Education*, *60*(1), 172–185. https://doi.org/10.5032/jae.2019.01172

National Council of Teachers of Mathematics. (2023). *Data Analysis and Probability*. https://www.nctm.org/Standards-and-Positions/Principles-and-Standards/Data-Analysis-and-Probability/

NGSS Lead State. (2013). *Next Generation Science Standards: For States, By States*. https://www.nextgenscience.org/standards

INNOVATIVE

Providing Agriculture Training to Veterans: The VAEAP Project in the Southwest

Introduction

The Veterans Agricultural Education and Apprenticeship Program (VAEAP) in the Southwest is a program designed to help returning military Veterans enter and sustain successful careers in agriculture. Hands-on and immersive training experience has been identified as a critical strategy to help returning military Veterans enter and sustain successful careers in agriculture (Donoghue et al., 2014; Ahern et al, 2015; Fleming; 2015; Considine et al., 2017). The long-term/overarching goal of this program is to increase the number of military Veterans pursuing successful careers in food, agricultural and green industry sectors through a comprehensive, hands-on, and immersive training program (Fusaro, 2010; Rowe, 2014; Shue et al., 2021) jointly provided by the [ORGANIZATIONS] and several [STATE] farms, food hubs, and nursery/landscape businesses. The program seeks to increase the Veteran's access to Federal, local, and/or private grants/loans by providing grant application/administration assistance. In addition, the program offers therapeutic healing to Veterans through farming, animal caring, and green industry practices.

The main objectives of the program are as follows: (1). To increase the number of military Veterans pursuing knowledge and skills development that lead to successful careers in the food, agriculture, and green industry sectors; (2). To assist Veterans in securing meaningful employment opportunities that strengthen rural economies across the Southwest; (3). To increase the Veteran's access to Federal, local, and private grants/loans by assisting with grant application and administration; and (4). To offer therapeutic healing to Veterans through farming, animal caring, and green industry practices. This program was funded by the USDA National Institute of Food and Agriculture (NIFA) for three years. After three years, the success and viability of the program will be examined to determine the potential for future funding or opportunities. Participants of VAEAP are returning military veterans interested in getting into the agricultural industry. Participants able to commit to the workshop schedule and internship. period. The program requires a minimum of twelve credits to graduate (non-transferrable to other educational institutions).

How it Works

Our project engages the project participants based on three Laws of Learning (McCormick 1984) and Domains of Learning (Wilson, 2022). The Cognitive Domain (Knowledge), Psychomotor Domain (Skill), and Affective Domain (Value) are used to engage program participants. The more senses employed in educational experiences the greater the percentage of retention of material. When students are satisfied with their learning experiences the more value they place on their experiences.

Methodology

This project was funded by a USDA grant for three years. Recruitment of program participants is by social media and veteran service organizations, and word-of-mouth from Veteran farmers and producers. Online interviews set up with potential program participants by program coordinators. University professors and program staff participated in interviews. Followed by online webinar orientations. Participants are contacted by email of scheduled workshops, online classes, tours, demonstrations, and presentations. To date, topics of workshops/demonstration/tours included: Encouraged to complete an internship experience with one of eight participating cooperating farm, or local producer

The program includes a curriculum of online classes (plant horticulture, agribusiness topics, solar PV & drone technology) which are designed to be self-paced and flexible. Each class is 1 to 2 hours long. Participants can continue working full time or attend classes at another educational institution while completing online classes for the VAEAP. Eight credits of online classes are required to complete the program, with each class being worth 2 credits. However, participants can choose to take additional classes if interested. Online classes are completed within four to six weeks. The classes include online lectures, virtual discussion sessions with the professors, and field trips and farm tours. There are online discussion groups and forums so that students work together and develop their networks. Topics include bed prep/seeding, plant propagation, solar PV systems, drone piloting, vermicomposting, orchard management, rainwater harvesting, hoop house construction, drip irrigation installation, hydroponics production, processing/cleaning vegetable products, greenhouse production, grain milling, mushroom production, marketing, direct to consumer sales, and restaurant sales. Eight farms/food hubs are serving as cooperating internship locations. All workshops and tours include a luncheon.

Implications

To date, we have a total of 40 program participants with 38 still engaged. Our program retention rate is 95%. Over 20 workshops/fieldtrips/tours have been conducted to date. A minimum of two per month are conducted. During the Pandemic, there were no face-to-face experiences. Eight participants are engaged in internship experiences, six participants have complete internship experiences. Two are scheduled for summer 2022. Feedback from participants is positive and includes suggestions for future topics.

Recommendations/Advice to Others

To date, our Veteran participants are engaged in the program and express satisfaction with the experiences. We see very few dropouts. The combination of online learning and in-person presentation (Cognitive Domain), and live demonstrations and hands-on activities (Psychomotor Domain), coupled with tours, provide opportunities for networking, interaction, and understanding (Affective Domain). Email communication and social media posting are effective tools to disseminate information and announce monthly activities. Social events promote Evaluations of Veteran experiences reveal participant levels of satisfaction with our program.

References

Ahern, J., Worthen, M., Masters, J., Lippman S. A., Ozer, E. J., & Moos, R. (2015). The challenges of Afghanistan and Iraqi Veterans transition from military to civilian life and approaches to reconnection. *PLOS ONE 10*(7): e0128599.PLOS ONE DOI: 10.1371/journal.pone.0128599

Considine, C. L., Seek, M. W., Lester, J., & Dean, A. W. (2017). Green infrastructure training for veterans *Engineering Technology.* American Society for Engineering Education. *https://digitalcommons.odu.edu/cgi/viewcontent.cgi?article=1080&context=engtech_fac_pubs*

Donoghue, D. J., Goodwin, H. L., Maus, A. R., Arsi, K., Hale, M., Spencer, T., O'Gorman, M. Jose, S., Gekara, O. J., Burke, J. M., & Donoghue, A.M. (2014). Armed to farm: Developing training programs for military veterans in agriculture. *Journal of Rural Social Sciences,* 29(2), Article 5.82-93. https://egrove.olemiss.edu/jrss/vol29/iss2/5/

Fleming, L. L. (2015). Veteran to farmer program: An emerging nature-based programming trend. *Journal of Therapeutic Horticulture,* 25(1), 27-48. https://www.jstor.org/stable/10.2307/24865257

Fusaro, J. M. (2010). *Exploring the potential benefits and challenges to collaboration between small farmers and Veterans* [Unpublished Master's Thesis]. Humboldt State University.

McCormick, F.G., (1984). *The Power of Positive Teaching.* Kreiger Publishing Co.

Rowe, A. (2014). Serving those who served: How can extension reach U.S. military Veterans? *The Journal of Extension, 52*(6), Article 3. https://tigerprints.clemson.edu/joe/vol52/iss6/3

Shue, S., Matthias, M. S., Watson, D. P., Miller, K.K., and Munk, N. (2021). The career transition experiences of military Veterans: A qualitative study. *Military Psychology*, (33)6, 359-371, DOI: 10.1080/08995605.2021.1962175

Wilson, L. O. (2022). Three domains of learning – Cognitive, affective, psychomotor. *The Second Principle.* https://thesecondprinciple.com/instructional-design/threedomainsoflearning/

Recruitment Road Trip: Partnering with FFA Evergreen Tour for Teach Ag Workshops
Introduction/ Need for Innovation

Kaitlynn R. Davis
Graduate Student
Washington State University
P. O. Box 646420
387 Clark Hall
Pullman, WA 99164-6402
509-335-1172
kaitlynn.r.davis@wsu.edu

Kaitlyn O. Wright
Program Coordinator
Washington State University
P. O. Box 646310
116 Clark Hall
Pullman, WA 99164-6402
509-335-0671
kaitlyn.o.wright@wsu.edu

Dr. Anna J. Warner
Assistant Professor of Agricultural Education
Washington State University
P. O. Box 646420
387 Clark Hall
Pullman, WA 99164-6402
509-335-1172
anna.warner@wsu.edu

Introduction

Nationally, the agriculture (ag) teacher shortage is a current problem because open positions outnumber individuals entering the profession (Lawver et al., 2018; Smith et al., 2022; Solomonson et al., 2019). Some solutions to the ag teacher shortage point towards effective recruitment and retention of ag teachers. Research has shown universities that target individuals can influence student choice when choosing a program of study (Bobbitt, 2006; Rocca, 2013; Alston et al., 2019). It has also been suggested that high school students make decisions based on their experiences and opportunities (Olamide & Olawaiye, 2013). A recent agricultural education recruitment study found low diversity of cultural and ethnic backgrounds of students being recruited (Alston et al., 2020). Recruitment efforts should intentionally focus on recruiting a diverse population of future ag teachers.

How it Works

In the fall of 2023, two graduate and seven undergraduate students from Washington State University (WSU) presented a Teach Ag workshop at the Washington FFA Association Evergreen Tour. These students were chosen due to their experience in agriculture education, present enrollment in the agriculture education program, and originating from or experience in each of the FFA districts. The FFA Evergreen Tour is planned and delivered by the FFA state officers in early October. The tour addressed each of the nine FFA districts at seven stops in five days. Dany Payne, the Washington FFA Association's Executive Director, described, "the focus of the Evergreen Tour is membership recruitment and kicking off the new year. A lot of chapters use this to introduce new members to FFA" (personal communication). The Evergreen Tour provided a foundation to show agriculture students the need for agriculture education and address the ag teacher shortage. Due to the FFA Evergreen Tour being conducted across Washington State, the recruitment team reached a larger demographic of students and introduced students to agricultural education experiences.

Various activities (see Table 1) encouraged students to consider the knowledge needed as an ag teacher and the different pathways to become an ag teacher. These activities were selected to provide experiences to agriculture students and to encourage high school students consider agricultural education when making career decisions.

Table 1
Evergreen Teach Ag Workshop Activities

Activity	Objective of Activity
Snowball Icebreaker	Students wrote what they enjoyed about their ag teacher on a piece of paper. They crumpled up the paper and threw it across the room. Students picked up a new piece of paper and shared their thoughts with another student to reflect on their experiences in their ag classes and with their ag teachers.
Gameshow-style Contest	Five different trivia posters were made with content from the seven different AFNR pathways. The students were split into teams and were competing to answer the questions. This activity expressed various knowledge that ag teachers need to know.
How to Become and Ag Teacher	This worksheet had fill in the blank spots that displayed to students that they could receive a bachelor's degree in Agricultural Education, work in the industry then obtain a teaching certificate, or pursue a certification by obtaining a master's degree.

Costs and Resources Needed

Costs directly associated with the recruitment event included motor pool vehicle, fuel, hotel rooms, Teach Ag swag, workshop supplies, and students' time for presenting. Table 2 shows the cost breakdown for the workshop. In a collaborative effort to conduct this workshop, funds from the Washington State Teach Ag Results (STAR) Grant, the WSU College of Agricultural Human and Natural Resources Academic Programs, and the WSU Agricultural Education Program funded the workshop.

Table 2
Resources and Costs for Evergreen Teach Ag Workshop

Resources	**Quantity / Unit**	**Unit Cost (US Dollars)**	**Total Cost (US Dollars)**
Motor Pool Car	6 days	30.00	180.00
Fuel	40 gallons	3.75	150.00
Hotels	3 nights	133.33	400.00
Teach Ag Swag	various		792.80
Workshop Supplies	various		140.00
Presenter Time	100 hours	15.74	1,574.00
Total			**2,444.00**

Results to Date

The Evergreen Teach Ag workshop was presented to 1,293 students and advisors from 112 FFA chapters across the state. Student engagement was high at each stop due to their previous knowledge of agriculture and their experience with their own ag teachers. Their engagement was demonstrated by their participation in the workshop activities and later discussions of the workshop with their teachers. When asked as an exit activity, many students wanted to become welders or mechanics as well as variety of other agricultural careers, including becoming an ag teacher themselves.

To expand the impact beyond FFA members, multiple news articles across the state addressed the agricultural education shortage, the teach-ag workshop, and the Evergreen Tour. Two of the articles include WSU press, "Washington State University, FFA team up to address Washington ag teacher shortage" (Sams, 2022) and another from the Tri-Cities Herald "'Critical' ag teacher shortage looms in Tri-Cities, rural Eastern Washington" (Rosane, 2022). This recruitment strategy led to successful outreach to a wide variety of communities and engaged students to share their love for agriculture and the importance of the industry.

Future Plans and Advice

In the future, this activity should be repeated at the Washington State FFA Evergreen tour as well as at other events where high school agriculture students gather. Increasing exposure of high school students to the agriculture education profession could provide a positive way to recruit students into the agricultural education profession. Literature and studies suggest that presenting at these events could also lead to cultural and personal diversity in the agriculture industry (Olamide & Olawaiye, 2013). In the future, presenters should collect recruitment contact information from students to allow for follow-up and to track the success of this program. Scheduling all stops during school hours and at the schools rather than on fairgrounds or during after school hours may increase student participation in the tour.

References

Alston, A. J., Roberts, R., & English, C. W. (2020). Toward a holistic agricultural student recruitment model: A national analysis of the factors affecting students' decision to pursue an agriculture related degree. *Journal of Research in Technical Careers,* 4(1). https://doi.org/10.9741/2578-2118.107

Alston, A. J., Roberts, R., & English, C. W. (2019). Building a Sustainable Agricultural Career Pipeline: Effective Recruitment and Retention Practices Used by Colleges of Agriculture in the United States. *Journal of Research in Technical Careers*, 3(2). http://dx.doi.org/10.9741/2578-2118.1073

Bobbitt, R. K., (2006). Factors influencing recruitment, retention, and job placement in the college of agricultural sciences and natural resources at Texas tech university. (Master's thesis).

Lawver, R. G., Foster, D. D., & Smith, A. R. (2018). *Status of the U.S. Supply and Demand for Teachers of Agricultural Education*, 2014 - 2016.

Olamide, S. O. & Olawaiye, S. O. (2013). The Factors Determining the Choice of Career Among Secondary School Students. *The International Journal of Engineering and Sciences*, 2(6): 33-44. ISSN(e): 2319 – 1813 ISSN(p): 2319 – 1805

Rocca, S. J. (2013). Comparison of factors influencing the college choice of matriculant and non-matriculant students into a college of agriculture. *NACTA Journal*, 57(2), 72-78.

Rosane, E. (2022, October 10). *'Critical" ag teacher shortage looms in Tri-Cities, rural Eastern WA.* Tri-Cities Herald. Retrieved February 19, 2023, from https://www.tri-cityherald.com/news/local/education/article266881126.html

Sams, A. (2022, November 4). *WSU, FFA team up to address Washington ag teacher shortage.* WSU Insider. Retrieved February 16, 2023, from https://news.wsu.edu/news/2022/11/04/wsu-ffa-partner-up-to-address-washington-ag-teacher-shortage/

Smith, A. R., Foster, D. D., & Lawver, R. G. (2022). *National Agricultural Education Supply and Demand Study, 2021 Executive Summary*. Retrieved from: http://aaaeonline.org/Resources/Documents/NSD 2021Summary.pdf

Solomonson, J. K., Thieman, E. B., Korte, D. S., & Retallick, M. S. (2019). Why do they leave and where do they go? A qualitative study of Illinois school-based agriculture teachers who left the profession. *Journal of Agricultural Education*, 60(4): 115-131. https://doi.org/10.5032/jae.2019.04115

Reflections on Data Collection Methods in Elementary Agriculture Education: Do large cash incentives matter?

Maria Helm
University of Georgia
405 College Station Road Athens, GA 30602
301.710.8572
maria.helm@uga.edu

Nicholas Fuhrman
University of
Georgia
180 E Green St, Athens, Ga 30602
352.226.1199
fuhrman@uga.edu

Jason Peake
University of Georgia
405 College Station Road Athens, GA 30602
229.392.6097
jpeake@uga.edu

Reflections on Data Collection Methods in Elementary Agriculture Education: Do large cash incentives matter?

Introduction

The inauguration of the pilot Elementary Agriculture Education (EAE) program in Georgia marks an exciting time for educational research. As the first formalized elementary agricultural education program in the country, there is a cadre of research topics to be explored. This is particularly relevant given that the National Research Council (2012) has promoted agricultural literacy as a means of connecting knowledge, skills, and attitudes/beliefs (KSABs) in science education (Vallera & Bodzin, 2016), highlighting the value of EAE for elementary students. With teachers playing a vital role in shaping how EAE is integrated into classrooms, their perceptions and beliefs toward agricultural education are of utmost importance. However, there are no existing organizations to encourage these pioneer teachers to collaborate and participate in research and training. In this study, we aim to investigate two data collection methods to determine teachers' participation in research and training aimed at improving their competencies in EAE. Through this research, we hope to pave the way for future initiatives and collaborations that will help elevate EAE literacy in the state and beyond.

How it works

This research was a combination of two different studies focused on EAE. For the first study, the Georgia Agricultural Education Teacher directory and EAE teacher contact information compiled by a professor of agricultural education at University of Georgia served as the population frame. Convenience sampling was used to select teachers who met the criteria for accessibility, proximity, availability and teachers' willingness to participate for the purpose of the study (Dörnyei, 2007). At the time of this study, there were 30 EAE teachers in Georgia. A recruitment email was sent that included information about the research and data collection methods to be used, time and place of data collection, responsibilities as a respondent (online questionnaire and in-person participation) and a $350 gift card honorarium to compensate for their time. In order to reach a reliable consensus among the subset of teacher (called, "panel members" for this study), the Delphi method, which included three rounds of data collection, was used (Sourani & Sohail, 2015). In the first round, participants were asked to answer open-ended and some demographics questions via an online instrument (Qualtrics). The second and third rounds were conducted in-person and lasted 180 minutes each. For the second round, the summarized list of answers from round one was shared via Qualtrics. The panel was asked to rate each statement using a 7-point Likert scale which, according to Taherdoost (2019), tends to reflect respondent's true subjective assessment of a usability questionnaire. Statements that received an average rating of five and above were moved to the third round. Finally, the third round was reached through panel discussions to arrive at group consensus. In a study by Vernon (2009), a 70-percent agreement among panel members was considered the standard and was met in this study.

For the second study, purposive sampling was used to select respondents who would provide adequate and useful information (Kelly, 2010). Thirty teachers were initially contacted by email and asked to complete an online pre-questionnaire to select a day for synchronous online data collection. Dillman et al. (2019) recommends providing two communication modes sequentially. After the initial invitation, email was used as the first mode and non-responders were later asked via SMS as the second mode. Included in these correspondents were links to the questionnaires, date and time of the meeting, and a $350 gift card honorarium to increase interest in participation (Millar & Dillman, 2011). A synchronous online focus group conducted via Zoom was used to generate information on collective views, meanings behind those views and interaction between participants and lasted for 180 minutes. A qualitative thematic analysis using MAXQDA 2022 (VERBI Software, 2021) was used to organize and manage the qualitative data.

Results to Date

For the first study, fifteen out of 30 EAE teachers answered the first round of the Delphi. Six teachers participated in the in-person second and third rounds of the Delphi. At the end of the three Delphi rounds, there was a 40% turnover and 20% participation of EAE teachers. In the second study, a total of 13 teachers responded to the survey request representing 43% of the EAE population in Georgia. Five of these confirmed after the first mode of reminder via email and six teachers confirmed after the second mode of reminder via SMS. A total of 11 teachers participated in the focus group representing 37% of all EAE teachers in Georgia. Three themes emerged from the qualitative thematic analysis from both studies where teachers were asked about preferred data collection methods: *synchronous online meetings, building interpersonal relationships through constant communication, and sending RSVP to the preliminary survey* were noted as important elements for data collection in the eyes of EAE teachers.

Future Plans

The results of our research have successfully validated a methodology to improve response outcomes for EAE teachers. Our study challenges the commonly held belief that cash incentives alone are sufficient to increase participation, highlighting the importance of building personal relationships with participants by sending out a pre-survey to choose a data collection date. This method is supported by Dillman et al. (2019) and can enhance the overall quality of the research data. The COVID-19 pandemic has necessitated a shift from in-person data collection to synchronous online experiences, a transition that has proved beneficial in the EAE context. Our study also found that using a sequence of communication modes, such as email and follow-text messages, significantly increased the overall response rate. To further enhance recruitment methods and survey responses for EAE teachers, we recommend exploring the use of social media groups to foster collaboration and engagement in future research and workshops. These groups can be used to maintain ongoing relationships with potential research subjects, allowing for better engagement and feedback. Overall, our research highlights the importance of personal relationships and diverse communication methods in improving survey response rates. Future studies should continue to explore effective recruitment approaches and innovative methods to enhance survey response rates in this context.

Costs

Participants in two studies received $350 gift cards from grant funds as incentives, which can support new research and benefit teacher professional development.

References

Dillman, D.A., Phelps, G., Tortora, R. Swift, K. Kohrell, J, Berk, J., & Messer, B. (2019). Response rate and measurement differences in mixed-mode surveys using mail, telephone, interactive voice response (IVR), and the internet. *Social Science Research, 38*(1), 1-18. https://doi.org/10.1016/j.ssresearch.2008.03.007

Dörnyei, Z. (2007). Research methods in applied linguistics. New York: Oxford University Press.

HB 1303 Georgia House. (2022). Open States. (n.d.). Retrieved October 12, 2022, from https://openstates.org/ga/bills/2021_22/HB1303/

Hewson C. (2008). Internet-mediated research as an emergent method and its potential role in facilitating mixed-method research. In S.N. Hesse-Biber & P. Leavy (Eds.), *The handbook of emergent technologies in social research* (pp. 525–541). The Guildford Press.

Horrell B., Stephens C., & Breheny M. (2015). Online research with informal caregivers: Opportunities and challenges. *Qualitative Research in Psychology 12*(3), 258-271. https://doi.org/10.1080/14780887.2015.1040318

Kelly, S. (2010). Qualitative interviewing techniques and styles. In: Bougeault I. Dingwall, R. & De Vries, R. (eds). *The Sage Handbook of Qualitative Methods in Health Research. Thousand Oaks.* Sage

Millar M.M., & Dillman, D.A. (2011). Improving Response to Web and Mixed-Mode Surveys. *Public Opinion Quarterly 75*(2), 249–269. https://doi.org/10.1093/poq/nfr003

National Research Council. (2012). A framework for K-12 science education: Practices, crosscutting concepts, and core ideas. Washington, DC: National Academy Press.

Sourani, A., & Sohail, M. (2015). The Delphi Method: Review and Use in Construction Management Research. *International Journal of Construction Education and Research, 11*(1), 54–76. https://doi.org/10.1080/15578771.2014.917132

Vallera, F., & Bodzin, A. (2016). Knowledge, skills, or attitudes/beliefs: The contexts of agricultural literacy in upper-elementary science curricula. *Journal of agricultural education, 57*(4), 101-117. https://doi.org/10.5032/jae.2016.04101

Service-Learning through CDEs for Preservice Teachers

Emily O. Manuel
Oklahoma State University
458 Agricultural Hall
Stillwater, OK 74078
(337)526-8234
emily.manuel@okstate.edu

Robert Terry Jr.
Oklahoma State University
448 Agricultural Hall
Stillwater, OK 74078
(405) 744-8036
rob.terry@okstate.edu

Nathan A. Smith
Oklahoma State University
456 Agricultural Hall
Stillwater, OK 74078
(405) 744-3686
nathan.smith@okstate.edu

Introduction

The AGED 3201 one-hour credit course is "A service-learning course focused on the processes and procedures required to host competitive events for agricultural youth organizations with an emphasis on roles of event hosts such as planning, coordination, volunteer management, and facilitation" (Terry, 2022). Service-learning has been used as a teaching technique for many years in school-based agricultural education (Roberts & Edwards, 2015). The National FFA Organization has also implemented service-learning initiatives to provide impactful experiences through programs such as the National FFA Days of Service (Roberts & Edwards, 2015; Roberts et. al, 2016). Service-learning courses at the university level have been shown to give students opportunities to build relationships with instructors while applying their learning in a real-world setting (Eyler et. al, 2001; Roberts et. al, 2019). Preservice teachers can gain responsiveness, professional experience, and management strategies from engaging in service-learning courses in college (White, 2020).

How it Works

Faculty at Oklahoma State University and other selected persons serve as the superintendent for each of the 33 Career Development Events (CDEs) offered at the Oklahoma FFA championship event held on the campus of OSU. Each student in AGED 3201 was assigned to serve as the student superintendent for one of these CDEs. During the course, students were instructed on topics such as the role of CDEs in SBAE, CDE rules, preparing CDE teams, superintendent duties, and scoring CDEs. They also heard from a panel of CDE superintendents and a panel of SBAE teachers concerning their perspectives about CDEs role in agricultural education.

Student superintendents were required to work with their faculty superintendent to plan, prepare, and execute the contest. To start the collaborative efforts, students were responsible for initiating contact with the faculty superintendent to set up a meeting. Students were provided a check sheet of duties and tasks to be discussed with the superintendent and were advised on best practices for collaboration. After the initial meeting, students planned follow-up meetings to facilitate the planning and implementation of their assigned CDE. Student superintendents were responsible for coordinating volunteers for the day of the event, which gave students not in the course an opportunity to serve. Students were required to provide reports during each class session leading up to the state finals event. Students' grade in the class was based on completion of course assignments and an evaluation instrument completed by their faculty superintendent.

Results to Date

For the most recent state FFA CDE finals event, students enrolled in AGED 3201 served as the student superintendent for 23 of the 33 CDEs offered. Approximately 2,300 FFA members competed in the Oklahoma FFA finals event, which took place on selected dates in April. Comments from students revealed they gained valuable experiences and developed beneficial relationships from their service as a student superintendent. The following comments were provided by student superintendents:

> From taking AGED 3201 I got to network with ag teachers in Oklahoma, which was extremely beneficial to me as an out of state student. I have connected with ag teachers who I can ask to observe when I get to upper-level agricultural education courses.

> I gained a better understanding of how it works to run a contest and coach a CDE team. I was also able to build stronger relationships with faculty and graduate assistants that will help me in future courses.
>
> Being a student superintendent was work, but I learned a lot. It was great to give something back to FFA and learn about a CDE I had never heard of before.
>
> By taking this class, I found I really enjoyed working with FFA members. It made me want to change my major to Ag Ed and become an ag teacher.

Faculty superintendents expressed appreciation for the service students provided and their contribution to the success of the event. The superintendent of the Agricultural Technology and Mechanical Systems CDE stated:

> The AGED 3201 course has become an invaluable part of the Oklahoma FFA contest. The ability for pre-service Ag Ed students to work directly with contest superintendents and aid in developing and implementing the contests is one of the best service-learning activities they can do in our program.

When speaking to the class in a panel discussion, faculty superintendents shared student superintendents complete important duties such as securing volunteers, editing CDE materials, registering teams, and scoring. This assistance reduces their workload and encourages them to continue serving as a CDE superintendent.

Future Plans/Advice to Others

We intend to continue offering this class each spring semester. Feedback provided by students, faculty superintendents, and SBAE teachers whose students participate in the state finals event will be used to continuously improve course content, the experiences of our students, and the quality of the event. Successful implementation of this service-learning course requires strong connections between instructors of the class, CDE superintendents, college administrators, campus facilities coordinators, state FFA officials, and SBAE teachers. The course should not be limited to agricultural education students. Rather, it should be open to any student interested in service of this nature. However, enrollment should be limited to the maximum number of students needed to serve as student superintendents.

Several other benefits of this class have been realized. College administrators appreciate that much of the responsibility for hosting the state CDE finals event is born by the Agricultural Education, Communications and Leadership Department. The service is also appreciated by state FFA officials and SBAE teachers. It has further strengthened relationships between the department and faculty from other departments in the college, the Oklahoma FFA Association, and the Oklahoma Agricultural Education Teachers Association.

Costs/Resources Needed

Costs associated with hosting and administering the CDEs are funded by the $3 per FFA member registration fee and supplemented by the Ferguson College of Agriculture funds. Locations for CDEs must be reserved six months in advance. CDE guidelines, schedules, and results are posted on a website that must be kept up to date. Course documents, such as the syllabus, forms, and contact information are maintained on the university online course platform.

References

Eyler, J., Giles, D. E., Stenson, C. M., & Gray, C. J. (2001). At a glance: What we know about the effects of service-learning on college students, faculty, institutions, and communities, 1993- 2000 (3rd ed.). Nashville, TN: Vanderbilt University.

Roberts, R. & Edwards, M. C. (2015). Service-learning's ongoing journey as a method of instruction: Implications for school-based agricultural education. *Journal of Agricultural Education, 56*(2), 217–233. https://doi.org/10.5032/jae.2015.02217

Roberts, R. Edwards, M. C., & Robinson, S. (2019). Benefits of using service-learning in the preparation of teachers: An analysis of agricultural education teacher educators' beliefs and intentions. *Journal of Agricultural Education*, *60*(4). https://doi.org/10.5032/jae.2019.04019

Roberts, R., Terry, R., Jr., Brown, N. R., & Ramsey, J. W. (2016). Students' motivations, value, and decision to participate in service-learning at the National FFA Days of Service. *Journal of Agricultural Education. 57*(2), 199-214. doi:10.5032/jae.2016.02199

Terry, R., Jr. (2022). AGED 3201: Planning and conducting agricultural youth organization events [Syllabus]. Agricultural Education, Communications & Leadership, Oklahoma State University.

White, E. S. (2020, November 30). Service-learning to develop responsiveness among preservice teachers. *International Journal for the Scholarship of Teaching and Learning, 15*(9). https://doi.org/10.20429/ijsotl.2021.150109

Still life with school supplies: Teaching agricultural photography through Kolb's Experiential Learning Model

Lucas Moreland
4424 Agricultural Sciences Building
1149 Evansdale Drive
Morgantown, WV 26501
lsm00001@mix.wvu.edu

Rachel Hendrix
4424 Agricultural Sciences Building
1149 Evansdale Drive
Morgantown, WV 26501
615-516-5480
rachel.hendrix@mail.wvu.edu

Emily Perdue
4425 Agricultural Sciences Building
1149 Evansdale Drive
Morgantown, WV 26501
emily.perdue@mail.wvu.edu

Introduction and Need for Idea

Modern Americans have limited experience with agriculture. Only 1.4% of the population works directly in the field, creating a stark divide in knowledge regarding the origins of food and fiber (USDA ERS, 2021). One method to educate this population about agriculture is the use of agricultural photography. Agricultural photography is a specialized branch of photography aiming to “illustrate the practice of cultivating, breeding, or harvesting plants and animals to provide food, wool, and other products” (Kohn, 2020, para. 4). Photographs featuring agricultural subjects are frequently used in newspapers, magazines, and websites for both agricultural and non-agricultural audiences (Chapman, 2016; Kohn, 2020).

Quality photographs taken by individuals knowledgeable about both art and agriculture provide powerful visuals and meaningful context to interest and inform those divorced from the industry (Chapman, 2020). However, many agriculturists are unaware of the artistic principles necessary to produce striking, representative images. This study seeks to teach agricultural communications students the basics of agricultural photography through Kolb’s Experiential Learning Model (Kolb, 2014).

How it Works

Students in West Virginia University’s agricultural communications class first receive instruction in photography techniques such as lighting, arrangement, emphasis, balance, depth of field, the rule of thirds, framing, and positioning. Next, students work in groups over three class periods to construct and photograph still lives demonstrating photography techniques. All still lives consist of school and office supplies, and students use their smartphone cameras to capture images. This makes it easy and affordable to source materials, provides students with a variety of objects to photograph, and allows them to learn more about the technological tools they use every day. The still life activity serves as the concrete experience portion of Kolb’s theory (Kolb, 2014) and introduces the basics of photography.

Once photography is complete, student photographs are evaluated for completion and understanding. Students also take time to reflect on their new photographic knowledge and discuss how good photography can create positive and effective representations of agriculture. Reflection occurs both through class discussion and through individual writing activities. Reflection questions begin with Jacobson and Ruddy’s (2004) five-question model for guiding critical reflection during experiential learning processes. Later questions follow up organically with student comments. This portion of the activity relates to the second and third parts of Kolb’s theory, which concern themselves with reflection on the outcomes of the concrete experience and the development of plans for performance in future situations (Kolb, 2014).

Finally, students complete an independent photo series activity requiring the use of course photographic techniques in a less structured situation. For this assignment, students select an agriculture-related subject of their choice and represent it visually to a general audience through a series of five photographs. Students must also provide a brief written explanation highlighting the techniques used in each photograph and their impact on the photograph's overall appearance. The photo series assignment correlates with the active experimentation portion of Kolb's theory, in which learners test their knowledge by applying it to the world around them in novel situations (Kolb, 2014). These assignments are graded by the instructor for completeness, photograph quality, and proper use of techniques.

Results and Implications

Results to date indicate this activity is an engaging way to introduce and practice basic photographic techniques in an agricultural communications class. Collected reflections indicate students are recognizing the power of photography as a storytelling tool, they benefit from the ability to practice photography and observe results, and enjoy learning to use smartphones cameras more adeptly. Students also mention how this activity encourages creative thinking and planning when taking photographs instead of simply snapping pictures.

Future Plans and Advice

Future plans for this study include gathering in-depth information on students' views, efficacy levels, and skills regarding photography basics. These data will be gathered through pre-lesson and post-lesson tests, as well as through discussion and written reflection. The researchers will compare pre- and post- efficacy and skill scores using a t-test, and will continue to analyze discussion and reflection for emerging and continuing themes.

Other plans for this study involve adding an expanded human and animal photography component to the lesson. Despite using similar base techniques as still life photography, human and animal photography requires its own skill set and knowledge. Knowing how to take quality photographs of people and animals will benefit agricultural communications students and empower them to portray the industry more effectively.

Cost and Resources Needed

This study uses common items that are available to students and instructors, making it low cost or even free. Students construct still lives from school supplies such as books, pencils, pens, rulers, markers, protractors, paperclips, and storage containers. The instructor provides some of these items for use, and students are invited to include their own items as well. The instructor also provides a list of photographs that students must take. Lists can either be printed on paper or displayed on a projector screen for students to reference. Students use their own smartphones to photograph their still lives, which saves money and teaches them to work with the technology they are most likely already using for photography.

References

Chapman, C. (2016). *Why you should be paying attention to agriculture photography*. Vice. https://www.vice.com/en/article/aenaap/why-agriculture-photography-matters

Jacobson, M. & Ruddy, M. (2004). *Open to outcome: A practical guide to facilitating and teaching experiential reflection.* Wood N Barnes.

Kohn, J. (2020). *Specialty: What is agriculture photography?* Wonderful Machine. Para https://wonderfulmachine.com/article/specialty-what-is-agriculture-photography/

Kolb, D. (2014). *Experiential learning: Experience as the source of learning and development* (2nd ed.). Pearson FT Press.

USDA Economic Research Service. (2021). *Agriculture and related industries provide 10.3 percent of U.S. employment.* United States Department of Agriculture. https://www.ers.usda.gov/data-products/chart-gallery/gallery/chart-detail/?chartId=102651

Student Engagement in a Place-Based Educational Experience to Enhance Ag Literacy

Bryanna Nelson
Ph.D. Candidate
Department of Agricultural Sciences Education and Communication
Purdue University
915 Mitch Daniels Blvd.
West Lafayette, IN 47906
nelso421@purdue.edu
651-500-8961

Hui-Hui Wang
Associate Professor
Department of Agricultural Sciences Education and Communication
Purdue University
915 Mitch Daniels Blvd.
West Lafayette, IN 47906
huiwang@purdue.edu

Neil Knobloch
Professor
Department of Agricultural Sciences Education and Communication
Purdue University
915 Mitch Daniels Blvd.
West Lafayette, IN 47906
nknobloc@purdue.edu

Student Engagement in a Place-Based Educational Experience to Enhance Ag Literacy

Introduction/Need for Innovation

In educational settings, there are several ways teachers and professors alike contextualize learning in their classrooms to encourage the development of agricultural literacy (Clemons et al., 2018). This might include service learning, community-based learning, inquiry-based learning, land-based learning and more. One pedagogy that is underutilized, especially in agricultural education, is place-based education (PBE)—currently, no literature exists in the *Journal of Agricultural Education* directly relating to place-based education. One exception is McKim et al.'s (2019) study on land-based education, a practice that shares theoretical backings with PBE. Place-based education aims to increase student and teacher engagement, impact communities, and boost academic outcomes (Loveland, 2003), which overlaps with agricultural educations three component model of engaging in multiple learning experiences such as experiential learning, laboratory and classroom instruction, and leadership experiences. The two models encourage engagement and learning experiences to occur in their community (Croom, 2008). Place-based education is often confused with similar models like project-based learning and field trips but has distinct characteristics that separates it from other frequently used practices in agricultural education.

PBE is defined as "the process of using the local community and environment as a starting point to teach concepts in language arts, mathematics, social studies, sciences, and other subjects across the curriculum" (Sobel, 2004, p. 11). It emphasizes the use of hands-on, real-world experiences to increase academic achievement while strengthening ties to their community and enhancing student appreciation for the natural world simultaneously. Place-based curriculum and the design of local investigations to create authentic engagement with people, places, and things, outside of the classroom involves an array of complexities (Demarest, 2014). In short, place-based education is designed to capitalize on lived experiences to help students learn about their immediate surroundings (Knapp, 2005). While authors like Vander Ark, Liebtag, & McClennen, (2020) argue there are six principles that must be met in order for it to be considered as place-based education, others simply identify common characteristics that are frequently observed in PBE curricula (Smith, 2002; Woodhouse & Knapp, 2000). These characteristics include phenomenon as a foundation, students as creators of knowledge rather than consumers, student-centered design through questions and hypotheses, teachers as facilitators and community "brokers", a fluidity between the school and the community, and contribution to the community wellbeing and sustainability (Ormond & Zandvliet, 2016).

How it Works/Methodology

A place-based educational unit was developed in collaboration with a local high school biology teacher in Indiana designed to address an overgrown school forest. The teacher expressed a desire to restore their outdoor classroom and create a space that students will be able to use and enjoy. The unit had three main topics: invasive and native species, biotic and abiotic indicators of ecological health, and forest restoration. Students explored concepts of native and invasive by using common examples like European Starlings, Zebra mussels, and nutria. Students then selected a local invasive species and created a public service announcement about how to identify and control the selected species. Once students understood native and invasive species, they conducted an ecological survey of the school forest by sampling a 10’x10’ area. The survey included identifying various plants, animals, and insects in their selected sample area. Students then calculated the biodiversity of the forest, paying close attention to what percentage of the forest was bush honeysuckle, a fast-spreading invasive species. Additionally, students surveyed biotic factors like plant and animal habitation, and abiotic factors like the soil profile, soil pH, and the temperature of the ground and air. Once the health of the forest was determined, students created restoration plans to be presented to a local soil and water conservation office. Narratives from their plans will be used to develop a grant application to fund the restoration efforts. The unit emphasized developing solutions to an agroecological systems problem in their community and encourages students to take ownership of the space.

Results to Date and Implications

Students completed a pre-post questionnaire about their preferred and actual learning environment and involvement in the community (Zandvliet, 2012). In addition to artifacts from the engagement and questionnaires, students were interviewed in groups about their experiences. While data for the intervention is still being analyzed, initial data shows a positive response to the unit. Upon introducing the project, most students were unaware that the schoolgrounds had a forest. This emphasized that community resources and connections exist and are waiting for us to use. As a result of the project, students expressed feelings of pride knowing they could address problems and be change makers in their community.

Future Plans and Advice to Others

Future plans for the project include extending it into a multi-year project where students will carry out the restoration plans the current cohort created. With the help of local ecology and wildlife professionals, their restoration plans can be put into action while learning from field experts. When planning place-based engagements, it is recommended to try to identify a community problem that needs addressing or a topic or phenomenon that can be connected to the community.

Cost and Resources Needed

Place-based education is very cost friendly, despite common assumptions that field trips or travel are required for implementation. Being able to engage in your community or at your own school does not require an associated cost. As place-based education is a practice, there is no associated curriculum package and lessons or units can be developed from existing plans. As far as resources, place-based education does not require special equipment or tools on its own but can be enhanced by using them.

References

Clemons, C., Lindner, J. R., Murray, B., Cook, M. P., Sams, B., & Williams, G. (2018). Spanning the Gap: The Confluence of Agricultural Literacy and Being Agriculturally Literate. *Journal of Agricultural Education, 59(4), 238-252 https://doi.org/10.5032/jae.2018.04238*

Croom, D. B. (2008). The Development of the Integrated Three-Component Model of Agricultural Education. *Journal of Agricultural Education Volume 49, Number 1, pp. 110 - 120 DOI: 10.5032/jae.2008.01110*

Knapp, C. E. (2005). The “I – Thou” relationship, place-based education, and Aldo Leopold. Journal of Experiential Education, 27(3), 277–285.

Loveland, E. (2003). Achieving academic goals through place-based learning: Students in five states show how to do it. *Rural Roots*, *4*(1), 1-6.

Marks, D., LaRose, S., Brady, C., Erasmus, M., & Karcher, E. L. (2021). Integrated STEM and poultry science curriculum to increase agricultural literacy. *Poultry Science*, *100*(10), 101319.

McKim, A. J., Raven, M. R., Palmer, A., & McFarland, A. (2019). Community as Context and Content: A Land-Based Learning Primer for Agriculture, Food, and Natural Resources Education. *Journal of Agricultural Education, 60(1), 172-185 https://doi.org/10.5032/jae.2019.01172*

Smith, G. (2002). Learning to be where we are. Phi Delta Kappan, 83(April), 548–594

Sobel, D. (2004). Place-based education: Connecting classrooms and communities. Great Barrington, MA: Orion Press.

Teton Science Schools. (n.d.) Place-based education. https://www.tetonscience.org/about/place-based-education/

Vander Ark, T., Liebtag, E., & McClennen, N. (2020). *The power of place: Authentic learning through place-based education*. ASCD.

Woodhouse, J., & Knapp, C. (2000). Place-based curriculum and instruction. http://www.ericdigests.org/2001-3/place.htm

Zandvliet, D. B. (2012). Development and validation of the place-based learning and constructivist environment survey (PLACES). *Learning Environments Research*, *15*, 125-140.

Student-Centered One-Health Modules:
Digital Science Curriculum to Address Complex Interdisciplinary Issues

Julie F. Harlin
Texas A&M University
TAMU 1113
College Station, Texas 77843-1113
979-845-0000
j-harlin@tamu.edu

Theresa Murphrey
Texas A&M University
TAMU 2116
College Station, Texas 77843-2116
979-458-2749
Theresa.Murphrey@ag.tamu.edu

Torri Whitaker
Texas A&M University
TAMU 2116
College Station, Texas 77843
torri.whitaker@ag.tamu.edu

Christine M. Budke
Texas A&M University
TAMU 4458
College Station, Texas 77843
cbudke@cvm.tamu.edu

Nicola Ritter
Texas A&M University
TAMU 4458
College Station, TX 77843
nritter@cvm.tamu.edu

Duncan M. Walker
Texas A&M University
PETR 218
College Station, TX 77843
walker@cse.tamu.edu

Student-Centered One-Health Modules:
Digital Science Curriculum to Address Complex Interdisciplinary Issues

Introduction

As the world continues to respond to the pandemic, Americans' lack of scientific knowledge makes deciphering fact from fiction difficult (Funk& Goo, 2015; Segers, 2020). The Pew Research Center consistently finds that U.S. students lag behind other countries in science, regardless of the test used (Desilver, 2017). Further, science is not among the most liked subjects in school despite its critical role in society (Jones, 2022).

This five–year project is part of a National Institutes of Health - Science Education Partnership (NIH-SEPA) grant (https://nihsepa.org) which has developed student-centered online modules to explore complex, real-world, One-Health topics that are focused on topics of interest to students. The One-Health modules provide rural middle school teachers with student-centered instructional strategies and resources for teaching life science through the integration of human, animal, and environmental health. The project focuses on rural schools which have large, educationally underserved populations, fewer teaching resources due to under-funding, and difficulty in recruiting highly trained science teachers (ERS, 2020). This project also addresses student motivation by incorporating relevant problem-based learning, a technologically appealing format, and by using a student-centered design.

How It Works

The project addresses both student motivation and teacher preparedness via three primary aims.

Aim 1. Develop and assess student-centered One Health modules using an online platform that students can access on mobile devices, tablets, and computers. Our Curriculum Development Team collaborated with software developers to create bilingual curriculum modules that incorporate authentic One Health case studies and motivational study aids. All curricula adhere to Next Generation Science Standards (NGSS). This approach engages students in curricular activities as individuals and groups, leading to classroom experiments, discussions, and presentations.

Aim 2. Structure the hosting website to accommodate the modules and enable resources to be accessible for teachers. The site currently serves a world-wide teacher audience (57,857 downloads each year by 2,201 teachers in 50 states). Restructuring/reorganization of the website has improved search features, enabling teachers to efficiently locate and utilize materials.

Aim 3. Provide professional development for teachers to strengthen their understanding of the significance of One Health topics and how they connect to science standards and aid teachers in implementing curricular resources within their classes.

Results to Date

To date, seven modules have been fully developed on the following One Health topics: Cell Biology, Stress, Infectious Diseases, Ecology, Clinical Trials, Genetics, and Zoonotic Disease.

Each module includes a motivating tool kit of cohesively integrated learning activities. The learner can select the order in which many of the activities are completed. Each module has pre and post tests and integrated learning activities including: Essential Knowledge-slide show of standards-based academic content; Backpack Adventures-science fiction story about a time-traveling group of middle-school students based on each module's theme; Meet the Scientist-short biography of a research pioneer in the topic area; Scientist Video Presentation-video on the topic from a scientist; Real Science Review-published research report that is rewritten at middle-school grade level. Students apply the scientific method to conduct a simulated peer review; Make a Note of That-note-taking templates aligned with academic content; Practice-mnemonic advice and engaging digital games to reinforce learning of essential knowledge. In addition, the Essential Knowledge, Backpack Adventures and pre and posttest sections have been translated to Spanish.

The modules are built as Sharable Content Object Reference Model (SCORM) packages and hosted through a university based LMS (Moodle). Teachers can see student progress, time spent in modules, and pre and post test scores. The project team is also able to use this information to determine engagement with the module and determine differences in pre and post test scores.

Approximately 100 teachers have participated in either in-person or online workshops as well as asynchronous micro-credentials allowing teachers to explore the modules. We currently have district approval for classroom use of curriculum from five Texas school districts and 185 teachers have registered to use the curriculum. During summer 2022, graduate and professional students partnered with teachers during remediation and enrichment programs to facilitate the use of the One Health curriculum. Data received to this point of 64 and 63 pretests and 24 and 22 posttests from the Cell Biology and Genetics modules (respectively) indicate gains in learning outcomes of .9 and 14.6 percentage points.

The "Summer Learning Experiences" hosted for middle and high school students engaged students in a One Health case study and enabled students to engage in problem-based learning.

Future Plans

Over the next year, we will ensure fidelity of the curriculum through pre and post-test data and compare students engaged with the modules to similar students who did not use the modules. Those wanting to implement a similar program are encouraged to engage with stakeholders and engage an interdisciplinary team of researchers. The One Health curriculum is publicly available, is relevant to agriculture education classes, and can promote collaboration among agriculture leaders and science professionals. As noted by Hall, et al. (2022), early career teachers indicate use of resources at a higher frequency. Thus, these teachers may find the modules useful.

Costs

As a NIH-SEPA funded project, access to the modules is free for teachers to implement. Mobile devices or computers with internet access are needed. Significant staff and faculty engagement as well as technical support (server space and LMS) was necessary to create and share the modules.

References

Desilver, D. (February 15, 2017). U.S. students' academic achievement still lags that of their peers in many other countries. *Pew Research Center.* https://www.pewresearch.org/fact-tank/2017/02/15/u-s-students-internationally-math-science/

Economic Research Service (ERS) (2020). Rural Education. *United States Department of Agriculture.* https://www.ers.usda.gov/topics/rural-economy-population/employment-education/rural-education/

Funk, C. & Goo, S.K. (September 10, 2015). A Look at What the Public Knows and Does Not Know About Science. Pew Research Center. https://www.pewresearch.org/science/2015/09/10/what-the-public-knows-and-does-not-know-about-science/

Hall, B.M., Easterly III, R. G., & Barry, D. M. (2022). A comparison of curricular resource use of Florida school-based agricultural education teachers by career stage. *Journal of Agricultural Education, 63*(4), 232-243. https://doi.org/10.5032/jae.2022.04232

Jones, M.G., Chesnutt K., Ennes M., Macher D., Paechter M. (2022). Measuring science capital, science attitudes, and science experiences in elementary and middle school students. *Studies in Educational Evaluation, Volume 74*. https://www.sciencedirect.com/science/article/pii/S0191491X22000578

Segers, G. (June 19, 2020). Fauci: Americans ignoring science during pandemic is "frustrating". *CBS News.* https://www.cbsnews.com/news/anthony-fauci-coronavirus-pandemic-americans-ignoring-science/

Supporting All Youth: Developing a Training Curriculum for Youth Development Organizations to Better Connect with LGBTQ+ Youth

Kevin Treadway
2373 Parker St. Unit 209
Cleveland, TN 37311
423-728-7001
Kevin Treadway: ktreadway@tennessee.edu
Dr. Jennifer Richards: jennifer.richards@utk.edu
Dr. Shelli Rampold: srampold@tennessee.edu
Dr. Craig Pickett: cpicket3@tennessee.edu
Dr. Daniel Collins: dcolli38@tennessee.edu
Dr. Carrie Stephens: cfritz@tennessee.edu

Introduction

The subjects of gender and sexuality have dominated recent conversations surrounding policy, education, and culture (Orr, 2016). Youth development organizations are uniquely situated as community educators to address these conversations with research-based knowledge; however, ensuring organization personnel and volunteers understand the concepts of gender identity and sexuality is critical in maintaining welcoming and inclusive environments. Additionally, organization personnel and volunteers are often assigned to work at overnight camps and events. These overnight events provide opportunities for youth to learn how to be strong leaders, develop life skills, and explore who they are as individuals. They can also provide ample number of opportunities for transgender or gender nonconforming students to experience discrimination and bullying (Orr, 2016; American Psychological Association). Therefore, it is necessary for youth development organization personnel and volunteers who work closely with youth to undergo training focused on gender identity and sexuality to better understand how to work with youth who are members of the LGBTQ+ community to create a welcoming environment where differences are not only accepted but valued.

How It Works

Development of the training curriculum was a culmination of a graduate student capstone project within the Agricultural Leadership, Education and Communications at the University of Tennessee Herbert College of Agriculture. Research and development were conducted over the course of a student's enrollment in tandem with his graduate committee and advisors.

The curriculum development process began by researching various pedagogical models and theories for adult learners (Driscoll, 2000; Lewis and Thompson, 2010; Jones, 2014), including ways ensure participant interactions allow for the safe processing of personal and sensitive topics (Curseau, et. al., 2018; Marana Unified School District). Findings indicated the importance of group discussions for program participants to discuss viewpoints and personal experiences regarding the topics of gender and sexuality. Additional research was conducted on best practices of working with LGBTQ+ youth. Research suggested a strong focus on emotional identification and regulation (Torre et al., 2018) and the importance of communication and listening skills to address youth who may be experiencing difficulties within their gender identity formation and sexuality (Wiseman, 1996).

Finally, a review of research literature was conducted to identify best practices in working with LGBTQ+ youth. These include the use of inclusive practices to ensure youth physical and emotional safety (American Psychological Association; Orr, 2016; CSBA), and the need for supporting youth in their gender identity and sexuality to provide a safe and welcoming environment for all youth (Orr, 2016). Existing research was examined for current LGBTQ+ terminology and concepts (Rogow; Orr, 2016). Collectively, this research provided the theoretical and foundational base of curriculum development. An expert panel was utilized through an iterative design process where drafts were presented to the expert panel for feedback and editing. This panel consisted of faculty and staff at UTIA with expertise in diversity, equity, and inclusion; LGBTQ+ studies; adolescent development; and crisis communications.

Results

A curriculum suite was developed to address the desired outcomes of:

This curriculum suite includes a six hour in-person workshop curriculum, a forty-five-minute curriculum to be utilized during guest speaking and/or conference breakout sessions, and a self-paced online curriculum utilizing the Nearpod software. The topics covered in the six-hour workshop curriculum include basic gender and sexuality terms, misconceptions of gender and sexuality, how best to create welcoming environments for youth who identify as gender nonconforming and LGBTQ+, and a concluding discussion based upon Allyship. Woven with the curriculum are personal check-ins for workshop participants to have personal space and time to reflect on the material discussed. The self-pace online presentation allows for all subject areas to be included. The forty-five-minute curriculum decreases subjects covered due to time constraints. This curriculum focuses upon the basics of gender and sex, working with parents of youth, best practices of working with LGBTQ+ in overnight settings, and concludes with a scenario prompt and group discussion.

There was a tangible need for this curriculum, as it provides youth development organization personnel and volunteers attending with the knowledge, skills and disposition to effectively create an environment of inclusivity and authenticity at youth events. Organizations must have the knowledge and ability to create a welcoming environment for LGBTQ+ youth, which is the purpose and motivation for the development of this curriculum.

Future Plans

The curriculum is currently in the publication and peer-review process. Once completed, the curriculum will be disseminated and utilized for intended use within youth development organizations across multiple states. Evaluation to establish the efficacy of the program will be conducted and the curriculum suite will be continuously updated to ensure current best practices and research-based knowledge is reflected within the program.

Costs and Resources Needed

Costs for the program to be implemented will include costs associated with the publication process, along with printing of materials and development of additional resources. Materials include notebooks, pens, and prizes. Printed materials include handouts, term cards, definition cards, and the written assessment. The greatest resource needed is human capital to review, learn, and implement the curriculum program within their (or other) organizations.

References

Curşeu, P.L., Chappin, M.M.H. & Jansen, R.J.G. Gender diversity and motivation in collaborative learning groups: the mediating role of group discussion quality. Soc Psychol Educ 21, 289–302 (2018). https://doi.org/10.1007/s11218-017-9419-5

Driscoll, M.P. (2000). *Psychology of Learning for Instruction: Gagne's Theory of Instruction.* 2nd edition: Part 7: Chapter 10. p. 341-372.

How Educators Can Support Families with Gender Diverse and Sexual Minority Youth: Promoting Resiliency for Gender Diverse and Sexual Minority Students in Schools. Division of School Psychology, Society for the Psychological Study of LGBT Issues, American Psychological Association.

Jones, J. (2014). Discussion Group Effectiveness is Related to Critical Thinking through Interest and Engagement. Psychology Learning and Teaching. 13(1). https://doi.org/10.2304/plat.2014.13.1.12

Lewis, A. and Thompson, A. 2010. *Activating Strategies for Use in the Classroom.* Cape Henlopen School District; Laurel School District.

Marana Unified School District - Office of Professional Practice. *Strategies for "Chunk and Chew".*

Orr, A., Baum, J., Brown, J., Gill, E., Kahn, E., Salem, A., Edited by Sherouse, B. (2016). "Schools in Transition: A Guide for Supporting Transgender Students in K-12 Schools."

Providing a Safe, Nondiscriminatory School Environment for Transgender and Gender-Nonconforming Students. *Policy Brief.* CSBA, 2014.

Rogow, F., Thompson, S., DeBruin, J., Quinlan, A. "Disclosure: Discussion Guide." https://www.disclosurethemovie.com/discussion-guide

Theresa Wiseman. Theresa Wiseman, "Toward a Holistic Conceptualization of Empathy for Nursing Practice," Advances in Nursing Science 30, no. 3 (2007): E61–72; Theresa Wiseman, "A Concept Analysis of Empathy," Journal of Advanced Nursing 23, no. 6 (1996): 1162–67.

Torre, J. B., & Lieberman, M. D. (2018). Putting Feelings Into Words: Affect Labeling as Implicit Emotion Regulation. Emotion Review, 10(2), 116-124. doi:10.1177/1754073917742706

Supporting International Graduate Students Through Participation in Graduate Peer Mentoring Programs

Abasiama-Arit Aniche
North Carolina State University
NCSU Campus Box 7607
Raleigh, NC 27695
aaaniche@ncsu.edu
(919) 515-6077

Andrew Waaswa
North Carolina State University
NCSU Campus Box 7607
Raleigh, NC 27695
awaaswa@ncsu.edu

Joy Morgan
North Carolina State University
NCSU Campus Box 7607
Raleigh, NC 27695
jemorga2@ncsu.edu

Introduction/Need for Idea

Balancing home, work, and academic demands can be challenging for graduate students returning to school after many years in a professional career. To assist in balancing and adjusting to student life, these graduate students need support systems that positively impact their abilities to succeed. Mentoring has been suggested as an effective strategy to address these issues (Kramer et al., 2018). According to Kramer et al. (2018), mentoring is a peer learning technique based on building a humanistic caring relationship between two people in the same place in which knowledge, support, and skills are exchanged with an emphasis on holistically supporting the beginner. A student can simultaneously be both a recipient and a provider, a leader, and a follower, a teacher and a learner, and a mentor and a mentee through mentorship, which builds a caring relationship and forms a community of learners. Through interactions and partnerships, peer mentoring enables the mentor and mentee to share activities, learn from one another, and develop a support network (Anderson & Watkins, 2018). It offers the mentee an opportunity to have a head start on the expected realities and also helps the mentor gain more knowledge and boost their self-confidence as well as gain a needed skillset for future careers in academia. Several studies (Nora & Crisp, 2007; P-Sontag et al., 2007) have reported that mentors need to be emotionally supportive, knowledgeable in their respective fields, role models, and fully aware of the program's goals to effectively support a mentee. In addition, peer mentorship programs can improve students' performance as well as retention rates and help students meet their academic needs (Crisp & Cruz, 2009); it builds caring relationships that stimulate higher self-awareness, knowledge, empathy, honesty, trust, humility, hope, and courage (Kramer et al., 2018). Further, these relationships extend beyond the goals of learning and skill development. And can be transformative since they are a developmental growth process that will affect participants' capacity to care for others in the future (Kramer et al., 2018).

While NC State University housed this program, our department had not previously participated. With an increase in international students and an increased need for mental health support, departmental graduate students were encouraged to apply and participate in the program to allow increased mentorship for our new graduate students who previously relied on advisors only.

How It Works/Methodology/Program Phases/Steps

Doctoral students interested in participating in the graduate peer mentorship program (GPMP) at NC State University must apply by completing the application form and submitting their resumes for consideration by their respective colleges. Each department is able to submit a nominee who will apply to participate in this program. Graduate peer mentors (GPM) are prepared to guide others after being admitted into the program and attending approximately 30 hours of virtual and in-person mentorship training before serving as peer mentors in their department or program for the academic year. The mentor and the mentee sign a formal document outlining their expectations from the mentoring relationship. They agree on when and how to meet but allow flexibility to accommodate unforeseen challenges that may not wait until the scheduled meeting dates. The mentors create an atmosphere where their mentees set realistic goals, develop successful behaviors, and feel psychologically supported. GPMs explore and recommend university and other resources relevant to their well-being and academic success. Student mentors are mentored by two faculty members who counsel and provide practical support, track the progress of the GPMs and mentors, and provide resources to facilitate the GPMs' meetings with their mentees.

Results to Date/Implications

Volunteer mentors receive peer mentoring training, develop and strengthen connections with students inside and across departments, and contribute to the well-being of their peers. In the Agricultural and Human Sciences Department at NC State University, two students enrolled as mentees in the mentorship program and stayed with their mentor until the end of the academic session. They reported that the program contributed to their success in the academic year. One student said, "My mentor gave me excellent study tips, which increased my confidence in my abilities to pass my classes. We could discuss subjects I was hesitant to discuss with a professor or advisor." Another student also shared their experience; "as a mentor, the GPMP had an impact on my life; participating in the program further strengthened my talents and thereby helped change the lives of others. This program's mentoring skills expanded my knowledge of mentoring roles and responsibilities through training sessions, interacting with fellow students, attending mentoring retreats, and partnering with faculty to build an initiative for graduate students within my department and at the college level."

Future Plans/Advice to Others

Graduate students should not wait until they have academic challenges to enroll in the GPMP; instead, they should enroll at the commencement of their academic programs. More students should volunteer to serve as mentors because the experience will increase their capacity and help them develop crucial career skills. Communication is essential; it should be open and flexible so that neither party becomes overburdened. The mentor-mentee load could be a future challenge for the program. As more mentees join the program, the demand for mentors grows, which can strain the mentors' academic work-life balance. It is recommended that a mentor have no more than three mentees at a time. Furthermore, peer mentoring should not be an added-on activity; it should be embedded into the graduate school program. Within our department, the GPMP was instrumental in assisting two new international students to become acclimated to the university, and new international students should be encouraged to participate as a mentee and then hopefully will agree to serve as a mentor in the future. This was the first time our department had participated in the program, and quickly realized that participation in the program greatly impacted the graduate student cohort and community.

Costs/Resources Needed

The GPMP necessitates time for the GPMs, program leaders, and GPM advisors/principal investigators (PIs). Advisors/PIs are impacted when their students are required to take time away from their departmental responsibilities to attend training organized by the GPMP. The program leaders have to schedule meetings and training sessions and source external personnel to hone the mentoring skills of the GPMs. Additionally, the GPMs are compensated with an annual stipend for their effort. Therefore, institutions of higher learning need to cater to the graduate students' general well-being and academic success by allocating part of their budget to graduate peer mentoring programs.

References

Andersen, T., & Watkins, K. (2018). The value of peer mentorship as an educational strategy in nursing. *Journal of Nursing Education, 57*(4), 217–224. https://doi.org/10.3928/01484834-20180322-05

Crisp, G., & Cruz, I. (2009). Mentoring college students: A critical review of the literature between 1990 and 2007. *Research in Higher Education, 50*(6), 525-545. https://doi.org/10.1007/sl 1162-009-9130-2

Kramer, D., Hillman, S. M., & Zavala, M. (2018). Developing a culture of caring and support through a peer mentorship program. *Journal of Nursing Education, 57*(7), 430–435. https://doi.org/10.3928/01484834-20180618-09

Nora, A., & Crisp, G. (2007). Mentoring students: Conceptualizing and validating the multi-dimensions of a support system. *Journal of College Student Retention, 9*(3), 337-356. https://doi.org/10.2190/CS.9.3.e

P-Sontag, L., Vappie, K., & Wanberg, C.R. (2007). The practice of mentoring: MENTTIUM Corporation. In B.R Ragins & K.E Kram (Eds.), *The Handbook of Mentoring at Work: Theory, Research, and Practice* (pp. 593-616). Sage.

Teaching Studios: combining content and pedagogy in early degree coursework

Jessica M. Blythe
jmblythe@mail.wvu.edu
Kirsten Stephan
kirsten.stephan@mail.wvu.edu
Danielle Grant
Danielle.Grant@mail.wvu.edu
Rachel Hendrix
Rachel.Hendrix@mail.wvu.edu
Aaron J. Giorgi
aaron.giorgi@mail.wvu.edu

West Virginia University
Davis College of Agriculture, Natural Resouces, & Design
P.O. Box 6109
Morgantown, WV 26505
(304) 293-5536

Teaching Studios: combining content and pedagogy in early degree coursework

Introduction/need for innovation or idea

Darling-Hammond and Bransford (2005) describe three areas of knowledge required for effective teaching: Subject area knowledge (SAK) is the specific content in a discipline, pedagogical knowledge (PK) is knowledge of universal teaching and learning principles, and pedagogical content knowledge (PCK) the discipline-specific teaching and learning principles within that specific content area (Roberts & Kitchel, 2010). Integrating these three areas assists the teacher in planning and implementing lesson plans that allow for student learning. Studio-based courses place emphasis on creativity, problem-solving, and communication utilizing coaching and peer critiques to help students hone the technical skills needed for their profession (Green & Bonollo, 2003). They utilize a mixture of pedagogies to provide space for the development of knowledge and practice in applying the knowledge to real-world situations. It requires the students to focus on a cycle of learning, application, reflection, and adaptation to develop the skills to succeed in their technical careers (Green & Bonollo, 2003).

This innovation explores using Studio-based courses with freshmen and sophomores to help students combine SAK with the PCK and PK early in their degree experience. This year, our program has offered two teaching studios; one with integrated SAK and another that provides the PCK while students were simultaneously in the SAK courses. This innovation allows the pre-service teachers to practice combining their new SAK with PCK for their future careers in secondary agricultural education.

How it works/methodology/program phases/steps

After reviewing student data for the teacher certification area of emphasis for the [university] program, the faculty determined that students need to engage in developing teaching practices and connecting them to the SAK closer to their SAK development. Based on the program of study and the Praxis Ag exam data, two different approaches were identified. The Integrated Studio (IS) was developed to provide SAK in the Forestry & Natural Resource (FNR) system pathways and the basics of two PCK methods to apply together to develop lessons. The Simultaneous Studio (SS) was developed to provide PCK development with the application to the SAK they developed in the Ag, Food, and Business courses of their core curriculum. Both studios will focus on developing Problem-based and Inquiry-based teaching methods, as research has shown they require more time and experience for teachers to implement effectively (Newcomb et al., 2003).

Keys for the Integrated Studio:

- 4-hour studio per week for 2 credits. The first 3 weeks focus on how people learn, IBI, and PBL. After the first 3 weeks, the time together will be split into 1 hour of micro-teachings and 3 hours of FNR content.
- Collaboration with SAK faculty is essential. The Co-instructor from Ag Ed focuses on the PCK, and the FNR Co-instructors focus on the SAK and resource exploration. The PCK should focus on demonstrating the IBI and PBL techniques and include additional instruction throughout the course based on the students microteaching. Examples include creating & utilizing rubrics, giving effective directions, etc.
- Utilize the [University] resources and peer faculty to highlight the variety of opportunities. For example, when teaching winter tree ID, visit the [University] arboretum.

- Upon completion of the course, the students will have 10 well-developed lesson plans, which will be combined with their peers to create an FNR Teaching Lesson Portfolio. Students will also utilize interactive notebooks throughout the course to document their SAK development, teaching practice highlights, and weekly reflections.

Keys for the Simultaneous Studio:

- 2-hour studio/1 credit. Utilizes a PCK faculty. The first 3 weeks are similar to the IS.
- This Studio focuses on collaboration with in-service teachers to help them develop ideas into instructional lessons. A call for topics asked teachers for lessons they have an initial idea for but have not yet developed into a lesson. Teachers request specific SAK focus and their teaching method choice.
- Based on the SAK coursework of the students, they are assigned one of the in-service teacher requests. Students meet with the teacher for the initial idea, then utilize the studio time to develop the introduction, learning activities, and assessments for the teacher. Students work with their instructors and peers to practice and develop their lessons.
- Students then visit the teacher and co-teach the lesson they created in the teacher's classroom. Based on that experience, they make a final version of the lesson, provide it to the teacher, and add it to their own lesson portfolio.

Results to date/implications

Implementation occurred in the Spring of 2023. To date, the class has been well received, with students indicating they were enjoying the course structure and the chance to start learning about teaching methods early in their degree. Additionally, one senior is taking the course and shared, “This is a great course; I can see how taking it early will help improve how well we understand and can apply some of the concepts that I struggled with last semester in teaching methods and curriculum development classes”. The only change has been that the 3 SAK/1PCK split for the studio time has been more of a 2hr even split than originally planned due to the time for the microteaching activities students have been developing and testing out.

Future plans/advice to others

Based on the early positive feedback from the pre-service educators in the course, it is the intention of our program to offer a teaching studio every other year, rotating between the IS and SS. The degree, because of the lower credit requirement, our fee structure, and flexible timing, they fit well for both our 4-year students and those who transfer into the program. Data-driven decisions are important to determine the type of studio that meets your program needs. Our decision to use FNR as our IS subject area was based on PRAXIS II scores in Environmental and Natural Resources systems and the secondary course offerings throughout the state. Partnership with peer faculty in the content areas is essential for success; someone with connections, knowledge, and enthusiasm appeals to pre-service teachers. As a teacher educator, when exploring the facilities and content of the included pathway, it is important to help the preservice teacher focus on the total program. For example, when visiting and learning about maple syrup production, it's not just about learning the process for the classroom but also thinking about the SAE implications and opportunities to explore within the FFA world as well.

Costs/resources needed

The largest cost is the ability to add it to a faculty’s teaching load. Only other additional costs related to travel and supplies for learning activities.

References

Darling-Hammond, L. & Bransford, J. (2005). *Preparing teachers for a changing world*. San Francisco, CA: Jossey-Bass.

Green, L. & Bonollo, E. (2003). Studio-based Teaching: history and advantages in the teaching of design. W*orld Transactions on Engineering and Technology Education*, *2.* p 269.

Newcomb, L. H., McCracken J. D., Warmbrod, J. R., & Whittington, M. S. (2003). *Methods of Teaching Agriculture* (4th ed.). Pearson.

Roberts, T.G., & Kitchel, T. (2010). Designing professional knowledge curriculum and instruction. In R. M. Torres, T. Kitchel, & A. L. Ball (eds.), *Preparing and advancing teachers in agricultural education* (pp. 100-111). Columbus, OH: Curriculum Materials Service.

The Growth in Leadership Skills and Development of Fellowship through Literacy.

Rachelle Andreatta North Carolina State University

Joy Morgan North Carolina State University

Wendy Warner North Carolina State University

Rachel Vann North Carolina State University

Travis Park North Carolina State University

Brent Jennings North Carolina State University

Rachelle Andreatta

315 Watchmen Ln.

Cameron, NC. 28326

(719) 989-0712

rrandrea@ncsu.edu

The Growth in Leadership Skills and Development of Fellowship through Literacy.

Introduction/Need for Innovation

There is an ever-growing need for leadership in the agricultural industry. While these skills are usually honed during high school programs, such as athletics, 4-H, and FFA, there is an even larger need for these skills at the collegiate level. Layfield et al. (2000) found significant growth in leadership skills among students involved in leadership organizations in their collegiate experience.

Within North Carolina State University, rural students make up 34% of the population. With the majority of these students wanting to pursue leadership-based careers and eventually return to their rural communities, program leaders undertook the task of creating an environment for these students to grow as leaders among members of other rural communities. The Rurally Engaged Agricultural Leaders (REAL) program was created to provide students with an opportunity to further develop their personal and civic leadership skills while addressing agricultural and rural issues impacting their state and communities. In addition, students complete an Extension experience to better understand the role of Extension in agriculture and rural areas. It was the hope of the program leaders to provide rural students with a group to which they can belong. Rural students often struggle to find community at larger institutions due to the large populations or universities being the same size as the communities they are from, causing feelings of disconnect or lack of community.

To accompany program sessions, students participate in small group book clubs where they dive deeper into topics of leadership and rural issues. The books included: “The Truth About Leadership” and “Rural People and Communities in the 21st Century”. The book club sessions were led by the program's graduate assistant, who met with the book club groups twice a month and facilitated the conversations.

How it Works

The students applied to the REAL program and were selected based on their applications. Students were required to be from rural communities and enrolled in an agricultural-related degree program. Within the applications, students shared their rural community/county, career interests, college department, and potential goals they hoped to accomplish through participating in the program. The applications were then evaluated by program faculty, Extension agents, and community stakeholders, and twelve participants were selected.

Program directors selected the books, with one focused on leadership and one addressing rural communities. Focusing on one book per semester, participants completed the assigned readings and were guided by reflection questions developed by the program graduate assistant. Twice a month, participants were expected to complete the readings and encouraged to use the questions to learn more about themselves as leaders and relate the readings to their leadership development and rural communities. The students meet every other Friday and select five questions from the list to discuss within their small book club groups. The book club facilitator was responsible for assigning readings, providing pre-questions about the readings, and directing the discussion at the club meetings. As facilitators, it was their responsibility to help the students dig deeper into the understanding of the book concepts and further develop reflection questions to help them grow as individuals. Students were also encouraged to use the readings as support for the program field trips. The book club facilitator was able to help students understand the connections between the books and the leaders they met during field trips. In addition, the readings served as a guide to develop questions to ask guest speakers and those agricultural leaders they met with during the program.

Results to Date

To date, the book club has brought 20 students, from first-year students to doctoral students at North Carolina State University, together to learn about leadership and agriculture and partake in fellowship. These students vary in major, agricultural experience, and future career goals. However, when brought together, the students create discussion from personal experience with respect and integrity. They are able to learn about others' opinions of leadership and agriculture, therefore helping them to grow as individuals. When asked what they have received from the book club, one student stated, “I have gotten a better understanding of what it means to be a true leader and the very important aspects of a leader. I have also gotten to know the people in the program. We all come from different parts of the state, yet we are connected through the world of agriculture.” While another student stated, “I feel like the book club meetings have really impacted my leadership qualities personally because of how much I have gained from them. One important leadership quality that the book club has impacted me would be listening. While everyone is sharing their answers to the questions each week, I get to improve my active listening skills. I feel like the course of the months of being in this has helped me carry this into my daily life conversations with friends and family. I just recently got a compliment from a friend for being such a good active listener. I felt like it was so much more than a compliment because I have been able to grow in this area where I once wasn’t as strong.”

Future Plans/Advice to Others

In the future, we plan to incorporate partners for book club sessions to promote further networking and relationship-building among the REAL cohort. For the partner sessions, the students will grab lunch or coffee and discuss questions provided by the book club facilitator. Then at the larger book club session, students are able to share their partner discussions with greater context. This is suggested to help them improve their leadership ability and keep each other in check and create more profound discussions surrounding their home communities and personal leadership experiences. Research supports that fellowship among students promotes success and establishing community; therefore, by allowing the students to create these friendships, they are more likely to thrive in an environment which they are not familiar with.

We strongly suggest that those interested in establishing book club programs select books relatable to participants. The books selected for our book club have scenarios and situations that college students could relate to, which aided in generating conversation. Also, participants enjoyed having pre-questions to guide their readings. These pre-questions also assisted students in their participation.

Cost/Resources Needed

To support the REAL book club, program leaders paid for the books. “The Truth About Leadership” costs $13.98 per book, and “Rural People and Communities in the 21st Century” costs $29.95 per book. Books were provided for each participant, the program leader, and the graduate program assistant. The REAL program was created through grant funding which supported a graduate assistant. The graduate assistant who leads the book clubs and assists with the overall program is paid through this grant.

References

Ewing, J.C., Bruce, J. A., & Ricketts, K.G. (2000). Effective leadership development for undergraduates: How important is active participation in collegiate organizations?. *Journal of Leadership Education, (7)*3, 118-131. https://journalofleadershiped.org/jole_articles/effective-leadership-development-for-undergraduates-how-important-is-active-participation-in-collegiate-organizations/

Ganss, K. M. (2016). The college transition for first-year students from rural Oregon communities. *Journal of Student Affairs Research and Practice, (53)*3, 269-280. https://doi.org/10.1080/19496591.2016.1157487

Layfield, K. D., Radhakrishna, R. B., & Andreasen, R. J. (2000). Self-perceived leadership skills of students in a leadership programs in agriculture course. *Journal of Southern Agricultural Education Research, 50*(1), 62-68.http://jsaer.org/pdf/Vol50/50-00-062.pdf

Malhoit, G. C. (2005). Providing rural Students with a high quality education: The rural perspective on the concept of educational adequacy. *Rural School and Community Trust,* https://files.eric.ed.gov/fulltext/ED497989.pdf

Schutz, P. F. (2003). Upon entering college: First semester experiences of first-generation, rural students from agricultural families. *The rural educator, 26*, 48-51. https://eric.ed.gov/?id=EJ783837

Tools for Another Time: Using a Weekend Course to Build Teacher Efficacy in Training Career Development Events in School-Based Agricultural Education

Tyler J. Price
Doctoral Student
Department of Agricultural Education, Communications and Leadership
Coordinator of LGBTQ+ Affairs
240 Student Union, Stillwater, OK 74078
Oklahoma State University
405-714-8289
tyler.price10@okstate.edu

Jon W. Ramsey
Professor
466 Agricultural Hall Stillwater, OK 74078
Department of Agricultural Education, Communications, and Leadership
Oklahoma State University
405-744-4260
jon.ramsey@okstate.edu

Tools for Another Time: Using a Weekend Course to Build Teacher Efficacy in Training Career Development Events in School-Based Agricultural Education

Introduction/Need for Innovation

“Learning is the process whereby knowledge is created through the transformation of experience” (Kolb, 1984, p. 38). The need for this innovation arose when a doctoral student at Oklahoma State University (OSU) recognized the need for preservice school-based agricultural education (SBAE) teachers to put the theory behind the training of Career Development Events (CDEs) in SBAE, gained in prior teacher preparation courses, into practice. This idea supports Kolb’s (1984) assertion that learning occurs as learners partake in experiences resulting in the transformation of their understanding. In addition to the perceived need for the innovation, Harris (2008) identified the preparation of CDE teams as one of the main areas of teacher interest for professional development. Garton and Chung (1996) reported preparing FFA teams was a perceived need of professional development by in-service teachers. Additionally, they identified many teachers identified a two-to-three-hour workshop as their preferred delivery method for training, supporting the development of a short course. This innovation aligns with Research Priority 5: Efficient and Effective Agricultural Education Programs (Rogers et al., 2016).

Agricultural education can be defined as the instruction of agriculture, food, fiber, and natural resources to elementary through adult learners with the purpose of preparing them for agricultural occupations, entrepreneurship, and increasing their agricultural literacy (Phipps et al., 2008). CDEs provide this intracurricular opportunity for students to apply the knowledge gained in agricultural education courses to a career context related to their interest and develop college and career readiness skills (National FFA Organization, 2022; Phipps et al. 2008). The Three-Circle Model of Agricultural Education includes: Classroom/laboratory instruction, Supervised Agricultural Experiences (SAE), and student leadership development through the National FFA Organization (Phipps et al., 2008). Successful and effective implementation of this model creates strong programs with the ability to produce individuals capable of becoming leaders in the agriculture industry (National Association of Agricultural Educators, 2022).

How it Works

A one-credit hour weekend short course was developed at OSU. The goals and objectives of *AGED 4990: Training Career Development Events in School-Based Agricultural Education* reflected the purpose of CDEs and highlighted examples of training resources and experiences related to the implementation of CDEs. The 12 students enrolled in the course were sophomore and junior agricultural education majors at OSU. The course occurred over the span of three days and included classroom instruction, small group activities, a self-guided CDE resource module, and site visits. Classroom instruction was used to introduce the purpose of CDEs in SBAE and how they can be implemented into courses in Oklahoma agricultural education. In small groups, students created presentations outlining different CDEs. An online *Canvas* module was created to guide students through various online resources for CDE training. Students participated in five site visits throughout the course designed to introduce community resources that may be available to SBAE teachers for training CDE teams. The site visits included: Walmart, Atwood’s, Lowes, a local nursery, and the OSU Botanical gardens.

Objectives for the course included: (1) Identify the purpose of CDEs in SBAE, (2) Identify how to implement CDEs in the classroom, (3) Discuss the ethics of CDE team selection, (4) Identify training resources for CDEs in Oklahoma, (5) Develop a training timeline for a CDE, (6) Create training resources, and (7) Locate training opportunities in the community (Price, 2022). Students completed a variety of assignments including CDE team presentations featuring the connection of the CDE to courses taught in Oklahoma, a CDE training timeline to implement in their future program, a site visit reflection, CDE identification photograph submissions, CDE resources worksheet, and a reflective essay. With student permission, resources created throughout the course including the team presentations, training timelines, and identification photos were shared with all students to be used in their future programs.

Results/Implications

When asked to reflect on their experience in the course through site visit reflections and reflective essays, students affirmed their appreciation for the class, the resources gathered, and the knowledge gained. In reference to the course, one student stated: “This class has further opened my eyes into how FFA is setting students up for the real world.” Another student offered: “After having taken this class, I understand the importance of needing to invest time in teaching what CDEs are and why we participate in them.” When reflecting on the resources gathered throughout the course, one student shared: “There are so many more ways to train a team than just looking at pictures in the classroom and taking practice test.” These results align with Harris (2008) regarding the need for more training in preparing preservice teachers for CDEs. When looking back on the knowledge gained from the course, one student reported: “I developed a new realization; career development events teach you valuable life skills.” Another student reiterated the importance of tying CDEs to classroom instruction when they stated: “My new understanding of CDEs is that they should be used as a continuation of content being taught in the classroom.” This is supported by Phipps et al. (2008) and the integration of the three-circle model of agricultural education. Results of the innovation supported Kolb’s (1984) views regarding experiential learning.

Advice to Others/Resources Needed

This course offering was born out of the desire to provide preservice SBAE teachers the opportunity to put theory into practice. Teacher preparation programs working to prepare SBAE teachers are encouraged to promote teaching opportunities to doctoral students with SBAE experiences. This innovation can be applied to other areas of preparing SBAE teachers e.g., preparing proficiency applications, writing speeches, supervising Supervised Agricultural Experience projects, and more. Teacher educators should identify the needs and interests of their preservice SBAE teachers and determine if the short-course approach could meet student needs. Resources included a syllabus, course description and proposal, a learning management system for course material distribution, a university vehicle for transport of students to site visits, and all necessary PowerPoints and videos needed to deliver the content of the course. Students incurred a university fee of $75 associated with a 1-credit hour short course. The only other cost associated with the innovation was the opportunity cost (time) associated with the planning, development, and delivery of the course by the instructor.

References

Garton, B. L., & Chung, N. (1996). The in-service needs of beginning teaches of agriculture as perceived by beginning teachers, teacher educators, and state supervisors. *Journal of Agricultural Education, 37*(3), 52-58. https://www.jae-online.org/attachments /article/560/37-03-52.pdf

Harris, C. R. (2008). Career development event participation and professional development needs of Kansas agricultural education teachers. *Journal of Agricultural Education, 49*(2), 130-138. https://files.eric.ed.gov/fulltext/EJ839889.pdf

Price. T. J. (Spring 2022). *AGED 4990: Training Career Development Events in School-Based Agricultural Education* [Syllabus]. Department of Agricultural Education, Communications, and Leadership, Oklahoma State University.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice Hall, Inc. https://www.researchgate.net/publication/235701029_ Experiential_Learning_Experience_As_The_Source_Of_Learning_And_Development

National Association of Agricultural Educators. (2022). *What is agricultural education?* https://www.naae.org/whatisaged/

National FFA Organization. (2022*). Career and leadership development events: Guide to policies and procedures*. https://ffa.app.box.com/s/vpx52yly9mpiai35srdzl7oq68 kldnbt

Phipps, L. J., Osborne, E. W., Dyer, J. E., & Ball, A. (2008). *Handbook on Agricultural Education in Public Schools* (6th ed.). Delmar.

Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). *American Association for Agricultural Education national research agenda: 2016-2020.* Gainesville, FL: Department of Agricultural Education and Communication.

Using a Head-to-Head Electrical Troubleshooting Championship Contest to Improve Student Engagement and Knowledge

Ryan G. Anderson
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-3325
r_a461@txstate.edu

Bradley D. Borges
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-7106
b_b518@txstate.edu

Using a Head-to-Head Electrical Troubleshooting Championship Contest to Improve Student Engagement and Knowledge

Introduction

The use of competition in a classroom setting, has been documented to produce positive outcomes in student development (Burguillo, 2010). Specifically, competition can have strong effects on attention and memory (DiMenichi & Tricomi, 2015). Additionally, through the application of Team Based Learning (TBL), students spend more time in group work during class time. TBL allows for more time spent on real world application through assignments called Team Activities (Michaelsen & Sweet, 2008). Competition between teams can be added to a TBL structured course to encourage teams to perform at a higher level (Parmelee et al., 2012). This innovative idea sought to create activities that challenged students at a higher cognition level. Troubleshooting aligns with higher order thinking because it requires student to "be able to see relationships between systems, using this information to solve problems and predict outcomes" (Hobbins et al., 2019, pg. 670). Furthermore, troubleshooting is considered to be a high level of thinking due to its evaluation and analytical nature. Individuals who are proficient at troubleshooting can quickly identify and correct the issue at hand. In an effort to combine higher levels of cognition and student engagement, the instructor of a spring 2020 electricity course had students compete in a head-to-head troubleshooting game.

How it works

Team-Based Learning utilizes a rigid structure that both the students and instructor follow. The instructor created weekly modules on Canvas that included pre-readings, videos, and PowerPoints that students completed prior to attending class. During the Tuesday lectures, the students completed an Individual Readiness Assurance Test (IRAT). Upon completion of the IRAT, students joined their teammates to complete the Team Readiness Assurance Test (TRAT). After all teams have completed their TRATs, the instructor facilitated a short clarifying lecture prior to the conclusion of class. The students then attend the laboratory portion of the class on Tuesday afternoons where the teams worked through two wiring exercises per laboratory. Once the teams successfully completed the wiring exercises, they were instructed to insert up to three "electrical bugs" in both of their wiring exercises to stump the team they were facing. The teams competed in the face-to-face electrical troubleshooting contest during the Thursday lecture timeslot. The team who successfully identified and fixed the bugs first won the weekly competition. If neither of the teams were able to identify and fix the bugs at the end of the 50-minutes, they were recorded as a tie. A stopwatch was used to record the time it took for each team to complete the competition each week to serve as a tiebreaker at the end of the regular season. The team records were compiled over the first ten weeks, with the top four teams advancing to the playoffs, while the remaining teams participated in the loser's bracket.

Table 1

Head-to-Head Electricity Game Steps

Steps	Action	Description
Step 1	Complete Pre-class work	Instructor would create weekly modules that students will complete prior to class

Step 2	IRAT's & TRAT's conducted	Students would come to class and complete the IRAT's, TRAT's, and clarifying lectures. (Tuesday)
Step 3	Students would 'bug' the wiring boards	At the end of the weekly laboratory activity, the students were tasked to "bug" their team's wiring boards. (Tuesday Laboratory)
Step 4	Team Assignments	Each team is assigned an opposing team for each week in a face-to-face competition format.
Step 5	Team Activity	At the beginning of the team activity, the instructor would start a stopwatch. The team that solved the problem the quickest would win that round. (Thursday).
Step 6	Regular Season	The competition would last for a total of ten weeks following steps 1-5.
Step 7	Playoff's	The last two weeks teams would compete in a playoff bracket.
Step 8	Championship	The top teams would be decided.

Implications

The instructor viewed the competition as a success in encouraging student engagement. The instructor noticed that students continued conversation about the team activities beyond class time. Student also seemed more engaged as the competition continued on. Students were highly involved with the competition itself and the troubleshooting activities. The "bugging" of the boards required additionally knowledge to try and confuse the other students. This encouraged higher order thinking because it made students aware of all of the aspects of the system (Hobbins et al., 2020).

Future Plans & Recommendations

We plan to incorporate competition-based team activities in other agricultural mechanics courses. Competition-based team activities could be consistent, (i.e., the head-to-head electricity game) or week/topic dependent. For example, for the small engines course taught at the same university various head-to-head competitions were conducted over the topics of tool & equipment identification, precision tool applications & engine system exercises. Students competed for most correct answers overall and/or fastest time completed. We recommend the use of competition to encourage student participation at higher levels of cognition. Additionally, the use of consist competition-based exercises promotes student creative and higher order thinking in real application exercises. These competition-based exercises can be implemented with or without TBL, however we have seen that it can be applied to TBL seamlessly. For the electricity course specifically, we recommend students use a multi-meter to show an open circuit prior to the introduction of electricity to the system. This ensures students understand how to use the safety equipment and prevent potential injury.

Resources Needed

There was no additional cost associated with this project. The only resources needed are the traditional tools and components associated with an electricity course. This course's laboratory activities only included those based in residential wiring. The boards, components, and wire can be reused after every lab to eliminate additional costs.

References

Burguillo, J. C. (2010). Using game theory and competition-based learning to stimulate student motivation and performance. *Computer & Education. 55*(2), 566–575. https://doi.org/10.1016/j.compedu.2010.02.018

DiMenichi, B. C., and Tricomi E. (2015). The power of competition: effects of social motivation on attention, sustained physical effort, and memory. *Front. Psychol. 6*. https://doi.org/10.3389/fpsyg.2015.01282

Hobbins, J. O., Murrant, C. L., Snook, C., Tishinsky J. M., & Ritchie, K. L. (2020). Incorporating higher order thinking and deep learning in a large, lecture-based human physiology course: can we do it?. *Advances in Physiology Education. 44*. 670-678. https://doi.org/10.1152/advan.00126.2019.

Michaelsen, L.K. and M. Sweet. (2011). Team-based learning. *New Directions for Teaching and Learning, 2011*(128): 41-51. https://doi.org/10.1002/tl.467

Michaelsen, L.K. and M. Sweet. (2008). The essential elements of team-based learning. *New Directions for Teaching and Learning, 2008*(116): 7-27. https://doi.org/10.1002/tl.330

Parmelee, D., Michaelsen, L. K., Cook, S., & Hudes, P. D. (2012) Team-based learning: A practical guide: AMEE Guide No. 65, *Medical Teacher 34*(5), e275-e287. https://doi.org/10.3109/0142159X.2012.651179

Using a Strawberry DNA Challenge to Explore the Needs of Students with Disabilities

Saralyn Smith
Louisiana State University
225 J. C. Miller Hall
Baton Rouge, LA 70803
(225) 578-6128
ssmi565@lsu.edu

Dr. Kristin Stair
Louisiana State University
135 J. C. Miller Hall,
Baton Rouge, LA 70803
(225) 578-6128
kstair@lsu.edu

Introduction/Need for the Idea

Approximately 7.2 million students from the ages of three to 21 years old received special education services in 2020-2021 (NCES, 2022). With that being said, 90% of preservice general education teachers who have completed or are about to complete their teacher preparation program say they are “less than adequately prepared to instruct the student(s) with specific disabilities” (Rosenzweig, 2009, pg 17). Giffing, et al. (2010) found that majority of agriculture teachers have the willingness to include students with disabilities in their classrooms but did not perceive that they have the ability and skills to do so. Previous research in agricultural education has described the benefits that agricultural education has for students with disabilities. In particular, concrete, hands-on learning activities are beneficial for students with disabilities because it helps them to develop life skills (Domody, et al., 2006). According to Shapiro and Lentz (1991) students who have had training in specific career and technical education coursework, on average had better employment outcomes upon entering the workforce, even if their career was not involved in the career they studies. This uniquely positions agricultural education to provide essential skill training to all students, including those with disabilities, by providing high-quality hands-on training which will benefit them in their future careers. However, in order to include students effectively, teachers must develop the skills needed to work with all learners when teaching hands-on skills.

How It Works

This activity is part of a larger workshop that has been conducted in a variety of formats including the National Association of Agricultural Educators (NAAE) professional development sessions, NAAE Future Agriscience Teacher Symposium workshops, National FFA Convention professional development sessions and at Louisiana State Univerity through a course titled *Engaging Diverse Learners in Agricultural and Extension Education.* The purpose of this activity is for participants to better understand the difficulties that come from trying to complete an activity while experiencing a significant challenge. Participants participate in a DNA extraction activity while blindfolded and then reflect on how the activity could have be simplified or clarified to help them complete the activity more easily. It is important to note, that being blindfolded does provide the same experience that a student might have who is blind, and it is stressed to participants that the purpose of the activity is not to experience the world like a person who is blind, but instead to focus on teaching methods and strategies that would have benefited the entire laboratory, even with the challenges provided.

For this activity, participants are put into pairs and given minimal instructions. No demonstrations or review of the directions is included. Instead, participants are instructed to read and figure out the lab activity on their own. One of the individuals in each pair is blindfolded. The other individual must read the instructions and give guidance for their partner to complete the final instructions of the activity. The individual who is blindfolded should complete all steps of the activity including moving around the classroom to gather materials. Roughly two-thirds of the way through the lab, as the pair is waiting for the filtration process to finish, they switch who is blindfolded. Then, the previously blindfolded individual must guide their partner through finishing the lab exercise. Once the pair has completed the lab, they remove the blindfold and reflect on the activity together. After each pair has reflected, the larger group is led in a discussion to identify teaching strategies which could have benefitted everyone completing the lab. Participants often identify strategies such as the teacher conducting a demonstration before they begin the lab activity, increased clarity, organization of the room and materials, and less distractions as some of the most common ways the lab could be improved. It is stressed that these activities would benefit all learners but could be especially helpful for helping students with disabilities complete lab activities successfully.

Results to Date

This workshop has received excellent evaluations when data were collected (average of a 4.7 on a 5-point scale). Most recently, this activity was conducted with a group of 14 students at Louisiana State University in the Engaging Diverse Learners in Agricultural and Extension Education course. After completion, students were asked to reflect on their experience and the impact of it, the students reported a positive change in thinking about students with disabilities. Selected comments include:

- “I think this activity was eye opening to show us how small things can change accessibility.”
- “It will make me take the extra time to make sure that they do understand what I am trying to tell them.”
- “It changed my way of thinking when working with people with disabilities because while vision was my disability in this lab others have different disabilities that I may never be able to relate to.”
- “We often do not notice or realize the little things in the classroom or a learning environment that people with disabilities may have trouble with it. I feel that this activity was the perfect way to help me realize what I need to do as an educator.”

Future Plans/Advice to Others

This learning activity will continue to be a part of coursework at Louisiana State University, and it will also continue to be offered in workshop format for organizations when requested. When replicating this workshop, any hands-on activity is effective, but care should be taken to select activities that will be safe for participants to conduct while blindfolded. Safety precautions must also be taken when participants are moving around the room to gather materials. It is also important to stress to participants that this is not a simulation activity and that being blindfolded does not replicate the experiences of someone who is blind. Instead, missing one of their major senses allows the participants to identify beneficial teaching strategies by exploring how teaching methods and strategies can improve the learning experience for all students.

Cost/Resources Needed

The overall cost of this lab is minimal. This lab is designed to use materials found in a traditional agricultural education classroom and grocery store. This lab can be easily replicated by the students in a formal and nonformal agricultural education setting with a low budget. This experience cost approximately $65. This cost is including all lab materials, such as plastic graduated cylinders and bandanas, that can be reused year after year and for various other labs. The perishable and reoccurring cost would include cups, strawberries, dish soap, salt, zip-lock bags, wooden stirring rods and isopropyl alcohol. The cost of these items is approximately $20.

References

Dormody, T. J., Seevers, B. S., Andreasen, R. J., & VanLeeuwen, D. (2006). Challenges experienced by New Mexico agricultural education teachers in including special needs students. *Journal of Agricultural Education, 47*(2), 93. https://doi.org/10.5032/jae.2006.02093

Giffing, M., Warnick, B., Tarpley, R., & Williams, N. (2010). Perceptions of agriculture teachers toward including students with disabilities. *Journal of Agricultural Education, 51*(2), 102–114. https://doi.org/10.5032/jae.2010.02102

National Center for Education Statistics. (2022). Students With Disabilities. Condition of Education. U.S. Department of Education, Institute of Education Sciences. Retrieved February 20, 2023, from https://nces.ed.gov/programs/coe/indicator/cgg.

Rosenzweig, K., (2009, October 21-23). Are today's general education teachers prepared to meet the needs of their inclusive students? [Paper presentation]. Northeastern Educational Research Association 40th Annual Meeting, Rocky Hill, CT, United States. https://opencommons.uconn.edu/nera_2009/10

Shapiro, E. S., & Lentz, F. E. (1991). Vocational-Technical Programs: Follow-up of Students with Learning Disabilities. *Exceptional Children, 58*(1), 47–59. https://doi.org/10.1177/001440299105800105

Innovative Idea

Integrating a Holistic Health Approach into Agriculture Education: An Innovative Model for Navigating the Transition from Military to Civilian Life

Robert Elliot
Veteran's Farm of North Carolina

Roberta Bellamy and Alyssa Ramsey Spence
North Carolina Agromedicine Institute-East Carolina University

1157 V.O.A. Site C
Greenville, NC 27834
252-744-1008
spencea20@ecu.edu

Integrating a Holistic Health Approach into Agriculture Education: An Innovative Model for Navigating the Transition from Military to Civilian Life

Introduction

Military veterans returning from active duty are at high risk for mental health problems, including risk of suicide. The first 12 months following separation from military service has been identified as a particularly difficult adjustment time for this population. Risks for suicide among veterans include factors outside more traditional mental health facets, like homelessness, relationship strain, and grief (U.S. Department of Veterans Affairs, 2022). Farmer veterans are a subpopulation of veterans who have transitioned from military service to farming as their occupation. In addition to veteran suicide risk factors, farmer veterans must also consider concerns specific to farmers who have a higher suicide rate when compared to many other occupations (U.S.Department of Labor, 2021). Farmers point to factors outside of their control, such as extreme weather events, market volatility, and government regulations, that contribute to the uncertainty of their future (Marcom, 2018). Furthermore, problems in relationships, isolation, and physical health issues are noted to be factors that increase feelings of stress, anxiety, and depression among farm family members (Miller & Rudolphi, 2022). "Soldier to Ag" programs (SAP) are agricultural education programs designed as a variation of "new" or "beginning" farmer and rancher programs. Unlike other new farmer programs, SAP integrate military culture and help veterans navigate the transition to civilian life and with the intention to help prevent veteran deaths by suicide. Since SAP combine a population with a high risk of suicide with a high-stress occupation, an innovation was needed in the SAP model to include multifaceted, culturally competent behavioral health interventions within the agricultural education program. The Veteran's Farm of North Carolina (VFNC) partnered with the the North Carolina Agromedicine Institute to develop a working program model that integrates a holistic health approach for veterans entering farming as an occupation. It is a three-prong approach built upon peer and network connections, focusing on the participants' the main areas of wellness, mental-physical, couple and family, and financial and legal.

How it Works

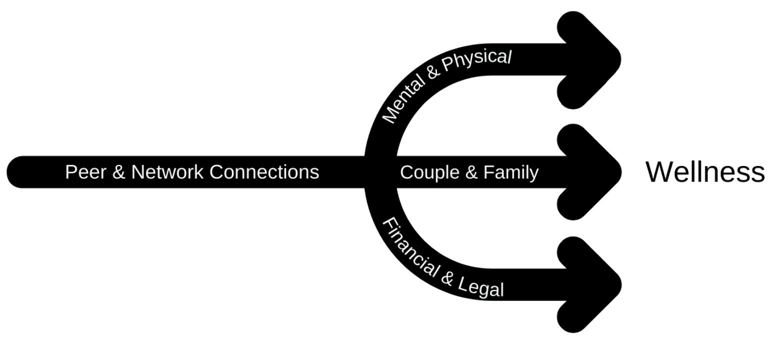
VFNC is a grant-funded program that provides hands-on training and opportunities to learn about agriculture networks, resources, plant and animal production practices, agricultural safety and health practices, and other farm business practices. The target audience includes military personnel who are preparing to transition from active military duty to farming as their next occupation. The Veteran Agricultural Training and Education Program (VATEP) is presented by VFNC in partnership with National Institute of Food and Agriculture as a project funded by the U.S. Department of Agriculture. The VFNC engages participants in VATEP through two, four-hour sessions, each week for six months. The program focuses on four educational outcomes: farmer veterans (1) build a support system through peer and network connections; (2) identify the link between family wellness and whole farm health; (3) understand mental-physical wellness needs as they relate to the occupation of farming; (4) implement sustainable business practices that are safe, savvy, and meet state and federal regulations. NC Agromedicine Institute specialists and VFNC founder collect data using exploratory-sequential mixed methods to shape the working model and inform their intervention strategies.

Results

After synthesizing the literature, participants' experiences, and anecdotal evidence from other farmer veterans, the team developed a model to summarize VFNC's behavioral health program. Figure 1 displays the VFNC Holistic Health Approach: Model for Navigating the Transition from Military to Civilian Life. The model is depicted as a trident-shaped diagram, highlighting the program's three major areas of development, mental-physical, family, and business wellness. The trident displays the model as a three-prong approach but actually identifies four essential program components. The three prongs, or the areas of "wellness", are built upon the trident's handle, the foundational component that welds the areas of wellness together and connects them at the base of the trident. The trident's handle is made of "peer and network connections," which strengthens the stability of the three prongs. The SAP model developed through the work at VFNC is a working guide to aim at helping prevent veteran suicide through agricultural education.

Figure 1

The VFNC Holistic Health Approach: Model for Navigating the Transition from Military to Civilian Life.



Future Plans

Rigorous evaluation is needed to measure agricultural education program outcomes. Future research should use mixed methodologies to evaluate the SAP model and track participants' long term outcomes upon completion of the program. An emergent research need is theresults from the integration of a population with a high-risk of suicide into a field with high occupational stress. There is limited research examining the mental health implications of veterans becoming farm operators. Some research in agricultural edcuation suggests that caring for plants and animals is therapeutic for veterans (Kyle, 2018), but the literature also identifies farming as a significant source of stress (Marcom, 2018). Research is needed to determine the point at which farming transforms from a source-of-relief to a source-of-stress.

Costs & Resources

VFNC is a fully operational farm that focuses on sustainable production using farmland, barn, greenhouse, and aquaponic facilities and equipment. The farm also has a classroom building on site. USDA-NIFA supplied $50,000 to the VFNC for the development of behavioral health interventions and resources that would be integrated into VATEP. The VFNC used these funds to partner with the NC Agromedicine Institute to develop the educational materials and program model. Other similar organizations may use and adapt the derived SAP model and resources for their purposes without the original development costs.

References

Kyle, C. A. (2018). *The formation of cultural capital using symbolic military meanings of objects and self in an adult agricultural education program serving military veterans* [Doctoral dissertation, Virginia Tech]. Virginia Tech, Blacksburg, VA. https://vtechworks.lib.vt.edu/bitstream/handle/10919/85241/Kyle_CA_D_2018.pdf?sequence=1&isAllowed=y

Marcom, R.T., Grafft, L., Wilson, E., Bruce, J., Jayarantne, K.S.U., & Roberson, G. (2018). Behavioral health issues of NC farmers: What can't be fixed with tape and twine. *North Carolia Medical Journal* (Durham, N.C.), 79(6), 378-381. https://doi.org/10.18043/ncm.79.6.378

Miller, C.D.M., & Rudolphi, J.M. (2022). Characteristics of suicide among farmers and ranchers: Using the CDC NVDRS 2003-2018. *American Journal of Industrial Medicine*, 65(8), 675-689. https://doi.org/10.1002/ajim.23399

U.S. Department of Labor. Bureau of Labor Statistics. *National Census of Fatal Occupational Injuries in 2021*. https://www.bls.gov/news.release/pdf/cfoi.pdf

U.S. Department of Veterans Affairs, Office of Mental Health and Suicide Prevention. *National Census of Fatal Occupational Injuries in 2021*. https://www.mentalhealth.va.gov/suicide_prevention/data.asp.

Using an FFA Officer Leadership Curriculum to Develop Leadership Skills in Middle School Agriculture Students

Rebekah L. Searels
Saddle Ridge Middle School
9858 N. Highway 27
Rock Spring, GA 30739
(706) 375-1219
rebekahwright@walkerschools.org

Jennifer Richards
114B McCord Hall
The University of Tennessee
Knoxville, TN 37996
(865) 946-1089
jennifer.richards@utk.edu

Shelli D. Rampold
321D Morgan Hall
The University of Tennessee
Knoxville, TN 37996
(865) 974-7471
srampold@utk.edu

Tyler Granberry
114C McCord Hall
The University of Tennessee
Knoxville, TN 37996
(865) 8256
tgranber@utk.edu

Christopher Stripling
320 Morgan Hall
The University of Tennessee
Knoxville, TN 37996
(865) 974-3344
cstripli@utk.edu

Introduction

All students in grades six through 12 who are involved in agricultural education at schools housing one of the 8,817 local FFA chapters across the United States have the opportunity to be active members of the organization (National FFA Organization, 2021a). According to the official manual of the National FFA Organization (2021b), active membership is key to the success of the organization and “drives” its organizational goals of being a student-led organization (p.10). Local chapters enroll members, elect chapter officers, and actively engage in the countless opportunities that support the FFA mission (National FFA Organization, 2021b). However, teachers have expressed that they need support to build and manage a successful FFA chapter. This is especially true of teachers with little agricultural education background (Crutchfield, 2016). In addition, the development of lesson plans for training chapter officers has been identified as an essential component of supporting our FFA advisors by the National FFA Organization (Crutchfield, 2016). Further, middle school agricultural education programs have been identified as the starting point for many students to explore agriculture-related industries and careers (National Council for Agricultural Education, 2000). Researchers have found that middle school students need instructional efforts centered around guided personal development and agriculture literacy (Rayfield & Croom, 2010). This innovative idea seeks to provide middle school agriculture educators with a comprehensive middle school officer training plan for both the fall and spring teaching semesters.

How it Works

Using an FFA officer training curriculum designed specifically for middle school students, agriculture instructors can follow, initiate, and facilitate a comprehensive middle school FFA officer leadership training experience for newly elected and developing officers. FFA develops leadership skills in youth, which is a primary reason they continue their involvement in FFA into high school (Sanok et al., 2015). The training curriculum developed for this project is straightforward and utilizes Tyler’s rational linear approach and the revised version of Bloom’s taxonomy (e.g., example training schedule/agenda, clear learning objectives, supporting learning activities, and a simple evaluation system) (Krathwohl, 2002; Wraga, 2017). The training curriculum is designed for a one to two-day format, focusing on providing leadership development in three main areas; *self*, *team*, and *chapter*. Students first participate in the introduction session, which can be tailored to fit a 20-minute to one-hour timeframe based on schedule preferences. During the introduction session, officers define personal strengths and goals through a series of icebreaker activities. These activities are centered around constructing a sense of belonging among the participants because if a student cannot relate to the group, they may ultimately feel like they do not belong to the organization (Martin & Kitchel, 2015). Between each session, the advisor has the option to implement breaks or alternative team building or icebreaker activities. Additionally, the advisor completes an evaluation sheet between sessions to track each officer’s progress. Session one centers on *self*, where students define, prioritize, and explain their roles and responsibilities. This takes into consideration The National FFA Organization’s commitment to the success of each member by providing a path for them to successfully execute each part of the organization’s mission: premier leadership, personal growth, and career success (National FFA Organization, 2019). This session can last up to two hours based on the chosen depth of the activities and reflection and can be divided into two parts.

Session two focuses on the *team*; this session supports the research that showcases the importance of agricultural educators helping students improve their interpersonal skills (Norris, 2021). FFA officer participants learn through a series of activities about servant leadership, identifying the strengths of others, and defining team goals. This session can last up to two hours or be divided into two parts, depending on the time structure. Session three spotlights the *chapter*; FFA officers develop chapter goals, review the chapter's Program of Activities (POA), and organize and develop chapter events. Research indicates that these types of FFA activities provide officers with autonomy and develop their sense of competence within the organization (Bird et al., 2020). This session can last up to three hours and can be broken up or modified based on the needs of the officer team. Lastly, setting aside time to conduct a bonding experience, like hiking, rafting, crafting, etc., is recommended as part of the program (Torrance, 2014). After the training program, officers are expected to reflect on their learning and experiences, be provided with information about the next steps in leadership development (e.g., chapter meetings, officer meetings), and undergo an individual review of their evaluation cards with the FFA advisor.

Results to Date

The first middle school FFA officer leadership training experience was offered to eight middle school students from the Saddle Ridge FFA officer team in Rock Spring, Georgia, during the Spring 2023 semester. Of the eight participating officers, six were female, and two were male. Further, three of the students attending the training indicated no prior experience with FFA leadership roles, chapter planning, or team-building activities. Prior to the training experience, middle school FFA officers expressed mixed emotions, ranging from excitement to nervousness. Following the leadership experience, each officer felt more confident in their role, connected to their peers and excited about upcoming events. These preliminary results are similar to the findings of Sanok et al. (2015), which indicated that students stay involved within the organization based on a few key factors, such as positive adult-leader interactions, personal relationships, and personal growth.

Future Plans

Future middle school, FFA officer trainings focused on expanded leadership and team development competencies are in development. These trainings may include conflict management, speech development, dinner etiquette, professional dress, and other relevant topics. Research to quantify the effectiveness of the training curriculum in developing middle school FFA Officers in self, team, and chapter objectives is planned. Lastly, using testimonies and highlights from the program participants through strategic communications as a recruitment tool for middle school FFA programs is a potential future output of the training program.

Cost and Resources Needed

The total cost for one student officer participant in Spring 2023 was $50. This cost included all materials, one night at camp, and a night hike team activity. The FFA Advisor handled event management, scheduling, communications, and registration of extra activities. The total time investment for the advisor was two hours of preparation and two days for implementation.

References

Bird, W. A., Ball, A. L., & Bowling, A. M. (2020). Exploring motivational strategies, outcomes, and theories within the career development event preparation process. *Journal of Agricultural Education, 6,* 221-234. https://doi.org/10.5032/jae.2020.01221

Crutchfield, N. (2016). Supporting our FFA advisors. *The Agricultural Education Magazine, 88*(4), 8–9. https://www.naae.org/profdevelopment/magazine/archive_issues/Volume88/2016%2001%20--%20Jan%20Feb.pdf

Krathwohl, D. R. (2002) A revision of Bloom's Taxonomy: An overview. *Theory into Practice, 41*(4), 212–218. https://doi.org/10.1207/s15430421tip4104_2

National Council for Agricultural Education. (2000). *The national strategic plan and action agenda for agricultural education.* https://eric.ed.gov/?q=fiber+AND+food&pg=5&id=ED463416

National FFA Organization (2019) About FFA. https://www.ffa.org/about/

National FFA Organization. (2021a, October 14). *FFA statistics*. https://www.ffa.org/statistics/

National FFA Organization. (2021b). *Official FFA Manual*. https://www.ffa.org/official-manual/

Norris, S. (2021). Leadership from ourselves and respect from others: Refining interpersonal skills and social emotional learning through FFA. *The Agricultural Education Magazine, 94*(2), 15–18. https://www.naae.org/profdevelopment/magazine/archive_issues/Volume94/2021%2009%20--%20September%20October.pdf

Martin, M. J., & Kitchel, T. (2015). Critical theory view of the National FFA Convention. *Journal of Agricultural Education, 56*(2), 122–137. https://doi.org/10.5032/jae.2015.02122

Rayfield, J., & Croom, C. (2010). Program needs of middle school agricultural education teachers: A Delphi study. *Journal of Agricultural Education, 51*, (4), 131-141. https://doi.org/10.5032/jae.2010.04131

Sanok, D. E., Stripling, C. T., Stephens, C. A., & Griffith, A. P. (2015). Factors impacting members' decisions to continue FFA beyond high school. *Journal of Agricultural Education, 56*(4), 138–152. https://doi.org/10.5032/jae.2015.04138

Torrance, N. (2014). Impacting for the future. *The Agricultural Education Magazine*, *87*(2), 7-15. https://www.naae.org/profdevelopment/magazine/archive_issues/Volume87/2014_09-10.pdf

Wraga, W.G. (2017). Understanding the Tyler rationale: Basic Principles of Curriculum and Instruction in historical context. *Espacio, Tiempo y Educación*, *4*(2), 227–252. https://doi.org/10.14516/ete.156

Using LinkedIn for an End-of-term Synthesizing Portfolio Project

Garrett S. Brogan
(208) 530-9625
gsbrogan@tamu.edu

Allison L. Dunn Ph.D.
(979) 458-7990
allison.dunn@ag.tamu.edu

Texas A&M University
Department of Agricultural Leadership, Education and Communications
College Station, TX 77843-2116

Using LinkedIn for an End-of-term Synthesizing Portfolio Project

Introduction

The Cooperative Institutional Research Program for 40 years has regularly surveyed incoming college freshmen on why they decide to attend college. “To be able to get a better job” was deemed the most important (Stolzenberg et al., 2020). Likewise, employers are looking for individuals who demonstrate effective leadership skills such as teamwork and communication (Crawford & Fink, 2020). Employers also see having critical thinking skills and the application of learning in real-world situations as ‘very important’ (Finley, 2021). As educators, we need to ensure we are providing opportunities for students to develop and use these skills. Enabling students to critically think about the role of their classes and their ability to apply course content in their future careers may allow them to be more engaged in the classroom. End-of-program portfolios or projects are great opportunities to showcase what a student has learned from their academic career, and employers see e-portfolios as being “very helpful” in communicating those skills and in evaluating those graduates (Finley, 2021).

In our department we offer a minor in leadership for students all across Texas A&M University. Students declare this minor for multiple reasons. Many students see the minor as valuable to their future careers. Moreover, employers see having leadership skills and the ability to work as a team as something of great importance (Finley, 2021; Gray & Koncz, 2017). With students coming from academic programs across the university and having a variety of future career interests, it is important to provide them with flexible learning and application opportunities. These opportunities need to be relevant to each and every student, regardless of an academic program, previous leadership experience, or what they want to do as a profession after they graduate. Previously, the end of minor portfolio project included creating a website and writing a paper. Students were asked to include items such as, but not limited to: their definition of leadership, Gallup Strengths, philosophy for leading change, and their ethical code of conduct. This website was never shared publicly and was basic in its design. Based on student feedback and shifting job markets, the faculty coordinator for the minor determined the project needed to be redesigned to help students apply content to their desired future careers and highlight what they have learned about leadership through participating in the minor. Therefore, the project requirement shifted from a website to a professional LinkedIn profile with a supplemental paper.

Program Phases

The Leadership Studies Minor engages students from a wide variety of academic programs, across the university. All students enrolled have a wide range of leadership experiences and varied career aspirations after graduation. Most students want an academic minor to help them learn and apply the different leadership principles to their future careers. Applications to the minor are accepted year-round. Students complete five classes for the academic minor with an end-of-minor portfolio project as part of their last course in the minor.

LinkedIn is a tool used to showcase yourself as a professional and connect with other professionals. We felt it could be used as an effective platform for students to synthesize what they have learned during their time in the minor. When students enter the minor, they are told what the portfolio project includes. Students complete different assignments, assessments, and activities as they progress through the minor and incorporate this information into different sections within their LinkedIn profiles. As they progress through the minor, they have the opportunity to start thinking critically about how they can apply these assignments in their future careers and how they can market those skills in their LinkedIn profile.

Not only will students be able to learn how to better market their leadership skills and abilities, but also develop their critical thinking skills. They were tasked with creating a narrative in their “About” section tailored to them with their leadership skills and abilities. They also include a creative video discussing reasons why what they have learned in the minor would be applicable to their future career goals. This video shows the student's personality, creativity, and critical thinking skills regarding how they anticipate applying their leadership competencies. Students also complete different steps in setting up their profile as they progress through the minor.

Results to Date/ Implications

Spring 2022 was the first semester we implemented the new portfolio project with the 28 students who completed the minor. Each student was given the task of enhancing their LinkedIn profile. The results, while positive overall, were mixed. Some students had established LinkedIn profiles, so it was much easier for them to adapt their current profiles. Other students were creating their profiles for the first time, which many found to be a challenge. The students who were the most successful created a narrative out of their experiences in the minor, which they directly connected to their career path. One student stated, “as a leader in the healthcare field I plan to influence and change my patients’ perspectives on how they view health.” Some students were more creative than others in improving their LinkedIn profiles.

Future Plans/Advice to others

Students are beginning to recognize the value of having a LinkedIn profile. They have opportunities to find jobs, connect with potential mentors and employers, and learn more about their intended industry before entering it. Enhancing their LinkedIn profile while in college helps them stand out against other profiles. Implementing this project has taught us that students need more than a single semester to build an effective LinkedIn profile to highlight what they have learned throughout the minor. Thus, we recommend that students build their LinkedIn profiles as they progress through the minor. Doing so gives students more time to critically reflect on and experiment with what they are learning in class, as well as learn how to better market themselves. Also, faculty should provide examples of successful profiles to help set expectations and assist students who are new to LinkedIn. These examples could be previous students' profiles, their own, or template profiles all students could explore.

Resources Needed

LinkedIn is a free social connection platform available to everyone. Countless resources are available on LinkedIn and other websites to help students improve and enhance their LinkedIn profile. Yet, faculty should also provide tutorials, example videos, and suggestions in a central location to help their students enhance their profiles and meet specific project expectations. Using a platform like LinkedIn allows students to continue to change and adapt their profiles to their current situations and goals.

References

Crawford, P. & Fink, W. (2020). *From academia to the workforce: Critical growth areas for students today*. Washington, D.C.: APLU

Finley, A. (2021) *How college contributes to workforce success: Employers view on what matters most.* Association of American Colleges and Universities. https://dgmg81phhvh63.cloudfront.net/content/user-photos/Research/PDFs/AACUEmployerReport2021.pdf

Gray, K. & Koncz, A. (2017). *Job Outlook 2018.* National Association of Colleges and Employers.

Stolzenberg, E. B., Aragon, M. C., Romo, E., Couch, V., McLennan, D., Eagan, M. K., & Kang, N. (2020). *The American freshman: National norms fall 2019.* Los Angeles: Higher Education Research Institute, UCLA. https://www.heri.ucla.edu/monographs/TheAmericanFreshman2019.pdf

Using Progressive Career Dinner Events to Promote Career Readiness and Opportunities

Joy Morgan
North Carolina State University
NCSU Campus Box 7607
Raleigh, NC 27695
jemorga2@ncsu.edu
(919)515-6077

Andrew Waaswa
North Carolina State University
NCSU Campus Box 7607
Raleigh, NC 27695
awaaswa@ncsu.edu

Nikki Miller
North Carolina State University
NCSU Campus Box 7607
Raleigh, NC 27695
cnmille3@ncsu.edu

Introduction/Need for Idea

As educators, our number one goal is to prepare our students with the skillset they need to enter the workforce upon graduation. Through the delivery of content and an understanding of the interests and needs of our students, we can carefully cater lectures, assignments, and activities to further their knowledge and skills for their future dream careers. However, another item that we should also add to our class goals is the opportunity for students to network with other career professionals in their desired careers. While most universities proudly boast career fairs where hundreds of employers sign up to host a booth for a day-long event, these career fairs lack the personal experience that can stem from networking opportunities within classes. These career fairs are good opportunities, but to avoid producing frustrated graduates, as Christie (2016) advised, we need to think outside the box. In a junior and senior level course at NC State University, course instructors incorporate guest speakers for each major module throughout the semester and host a career progressive dinner at the end of the semester. Many of us utilize guest speakers in our classes, however, the career progressive dinner exceeded our expectations.

How it Works/Methodology

The course instructors understand that students can feel uncertain of what to do next as they prepare to graduate from college. This concern has also been raised by Christie (2018), who found that students worry significantly about uncertain transitions. To help students prepare for their future, course instructors record the students' career goals, majors, and expected graduation dates at the start of every semester. The future career aspirations are categorized to allow every category to have a career representative at the dinner. In the invitation email to the six to eight career representatives, they are given the background context for the event as well as suggested talking points for the dinner conversation. The career progressive dinner is held during the last week of class before the course final exams occur. It is viewed as a rewarding event for the students to celebrate the end of the semester while also serving networking purposes. For the fall 2022 and spring 2023 classes, the dinner was held at the university club and sponsored by several businesses, commodity organizations, and individuals in addition to departmental funds. The entire event lasts approximately two hours with students spending thirty minutes per career representative and dinner course. Prior to the dinner, course instructors provided career guests' bios, and students were able to sign up to meet with three invited professionals (one per dinner course). These career representatives were seated at tables throughout the room. From there, career professionals remained seated at the same table, and students would rotate between dinner courses (salad, entree, and dessert).

Results to Date

Following two semesters of hosting progressive career dinners, instructors found this dinner allowed the students and career professionals to engage in deeper conversations about their career journey and also discuss the student's interests. Students reported they valued this event more than the campus career fair due to the more individualized and small group approach. Several of the students walked away with internships and job interviews as a result. All walked away with business cards and new connections within their desired field. One student emphasized that this was the first time that she had the opportunity to talk with someone that looked like her in the ag industry, and that she appreciated not having to compete for their time like at a typical job fair. The students also shared that they did not feel rushed and that the conversations were inviting and engaging while providing plenty of time for their questions. The career representatives also raved about this experience. When possible, departmental and college alumni are used as career representatives and they stated their appreciation for the opportunity to give back to students. In addition, some of the career representatives stated that they would be happy to contribute to the sponsorship of the event which further secures funding for the event to continue.

Future Plans/Advice to Others

As Christie (2016) noted, students should be supported in transitioning from college. This event is largely successful based on the student feedback and reflections as well as the feedback from the career representatives. Therefore, the instructors plan to make this a permanent event in their course. While it is impossible to find one career individual per student, the categorizing of career interests allows students to be grouped together within a career area. For example, students who were interested in working with commodity organizations and students interested in nutrition work had the opportunity to visit with a dietician who works with the Southeast Dairy Alliance. It is also important to select career representatives who are "chatty" and engaging. Career representatives are key to keeping the conversation going at the tables even though course instructors try to balance student personalities in the assigned rotations. In addition, because this event occurs outside of class time, an alternative assignment is given to those students who are unable to attend. The alternative assignment requires them to complete three phone or face-to-face career interviews where the students seek more information about specific careers that they are interested in pursuing.

To further the course networking, instructors also plan on creating professional groups through Google Groups, where each cohort of students can sign up using their personal and permanent email addresses. This will help track the student's performance in their respective careers after graduation and create a pool of professionals from which future career invitations will be made. Instructors hope student cohort groups will provide a platform where students will keep in touch and share future opportunities that may unveil in their different job industries.

Cost/Resources Needed

Career progressive dinners require social capital, human capital, financial capital, physical capital, and time. First, the instructors incorporated the dinner events as part of the course syllabus to emphasize the worth of this assignment. Making these events part of the syllabus aligns with previous research recommendations where Gray (2022) emphasized that transition preparations should be integral to the course modules. Secondly, to cater to other types of resources like social capital, instructors use established connections with agricultural career professionals including departmental and college alumni as well as other leaders that are in their various networks. Physical capital is intertwined with financial capital. Instructors seek out donors to sponsor students attending this event, each student attending costs approximately $40. The department pays for the cost of the career representatives to attend, and luckily there is not an event rental due to the university affiliation. Together from start to finish, this event incorporates approximately 20 hours to plan, facilitate, and evaluate.

References

Christie, F. (2016). *Uncertain transition: Exploring the experiences of recent graduates* (pp. 1–62) [Report]. Higher Education Careers Service Unit (HECSU)/Prospects Luminate. https://luminate.prospects.ac.uk/what-factors-contribute-to-a-successful-graduate-transition

Christie, F. (2018). *Constructing early graduate careers: Navigating uncertainty in transition* [Doctoral Thesis, Lancaster University; Application/pdf]. http://www.research.lancs.ac.uk/portal/en/publications/constructing-early-graduate-careers(c463bb4e-41a0-40e8-9e07-4a73ca08fdfe).html

Gray, N. (2022). *Design Graduates in Transition: Early Career Learning in the Design Agency* [Doctoral Thesis, Goldsmiths, University of London]. https://doi.org/10.25602/GOLD.00033024

Using Simulation to Teach Livestock Management Practices in an Undergraduate Agricultural Science Course

Randy H. Burnett, Ph.D.
Southern Arkansas University
Department of Agriculture
Agriculture (AGR) 206
Magnolia, AR 71753
rhburnett@saumag.edu

Trent Wells, Ph.D.
Southern Arkansas University
Department of Agriculture
Agriculture (AGR) 208
Magnolia, AR 71753
ktwells@saumag.edu

Using Simulation to Teach Livestock Management Practices in an Undergraduate Agricultural Science Course

Introduction & Need for Innovation

Agricultural education practitioners employ various approaches to maximize student engagement and learning with an end goal of preparing students for opportunities in the agricultural industry. Factors such as lack of access to ideal facilities and changes in societal norms have often fostered the need to re-assess teaching and learning practices in agricultural education settings (Edgar et al., 2016). This has been especially pertinent in the context of using live animals for teaching purposes, which is becoming increasingly difficult and in some cases impractical. Thus, the need exists to explore new approaches to teaching and learning about animals (Hart et al., 2005). Perhaps using simulation could serve as a practical alternative in lieu of traditional, hands-on approaches to animal science instruction involving live animals.

Simulation is a viable method for addressing students' learning needs (Agnew & Shinn, 1990; Brown & Knobloch, 2022). Simulations can be carried out using a range of applications, such as virtual reality, augmented reality (Bailenson, 2018), and physical models (Agnew & Shinn, 1990). When used appropriately, simulation can be used for assorted purposes, such as introducing new, abstract concepts to students and teaching students new psychomotor skills safely (Bailenson, 2018; Wells & Miller, 2022). As psychomotor skills blend both cognition and physical performance (Lancelot, 1944), it is imperative that the teaching and learning of such skills be well-planned and facilitated appropriately (Phipps et al., 2008).

The teaching and learning of psychomotor skills via hands-on experiences has historically been an important function of agricultural education (Lancelot, 1944; Phipps et al., 2008). Simulation has long been used to teach psychomotor skills in agricultural education settings. For example, Perritt (1984) studied using a tractor power train simulator as a physical teaching tool and found that implementing such a device can be practical without negatively impacting student learning. Agnew and Shinn (1990) further indicated that "simulation activities can provide students with basic knowledge and understanding" (p. 15) of concepts and procedures. More recently, Wells and Miller (2022) noted that using a virtual reality welding simulator system for welding skill training purposes can be effective and appropriate, particularly when teaching novices. Further, while students see value in strategically and deliberately using simulation as a teaching tool, they also indicate that simulation should be used to supplement and not completely replace actual learning experiences (Tiffany & Hoglund, 2014; Wells & Miller, 2022), such as learning to administer vaccinations or castrate livestock. Considering the preceding literature, there exists an opportunity for simulation to be used when teaching selected animal science-related psychomotor skills within an undergraduate agricultural science course.

How it Works

The lead author of this abstract, an animal scientist at Southern Arkansas University (SAU), is responsible for delivering a wide range of animal science coursework, such as Introduction to Animal Science, Beef Production, and Ruminant Animal Production. The courses he teaches are heavily laboratory-based and include extensive psychomotor skill instruction (e.g., palpating cattle, administering vaccinations, etc.) intended to provide students across SAU's six undergraduate agricultural science degree programs with diverse, practical experiences in different facets of livestock production. However, the current limitation with delivering the animal science coursework and experiences at SAU is the lack of suitable access to animals and facilities beyond beef cattle and chickens, such as horses, sheep, and swine, which can be used to support teaching and learning. Such limitations have created the opportunity to help address students' learning needs through physical simulation models.

The lead author used internal institutional teaching grant funds to acquire one Realityworks® Swine Litter Processing Simulators kit during the Spring 2022 semester. He first used the kit during the laboratory component of his Fall 2022 semester Introduction to Animal Science course. The kit contained: (1) four piglet simulators, (2) four teeth and tail snipper tools, (3) four ear notchers, (4) four plastic scalpels, (5) assorted consumable plastic and cloth supplies to teach needle teeth clipping, castration, tail docking, and ear-notching, (6) electronic curricula, and (7) a one-year warranty on the kit's components (Realityworks, 2022). During laboratory exercises focused on introductory-level swine management, the lead author used the kit to facilitate instruction in needle teeth clipping, ear-notching, castration, and tail-docking to all 85 students enrolled across all four laboratory sections of his course. The lead author grouped his students into small teams and each team was provided with one piglet and one set of tools to carry out the assigned laboratory exercises. He first demonstrated each task and subsequently allowed students to perform each task while he circulated around to assist students as needed. Between each laboratory section, the lead author reset each piglet to its original, unaltered condition (e.g., removed spent consumable materials on each piglet, etc.)

Implications

Using the kit in the laboratory component of the lead author's Introduction to Animal Science course proved fruitful for two reasons. Chiefly, the lead author was able to successfully facilitate psychomotor skill instruction with a livestock species that is not available for use on the SAU campus. Secondly, students anecdotally reported that they felt able to successfully and safely perform the designated tasks without fear of injuring themselves or a live animal. While using simulation should not completely replace actually performing hands-on tasks, it should be employed to teach students when appropriate to do so (Wells & Miller, 2022).

Future Plans and Advice to Others

The lead author plans to continue using the kit in the laboratory component of his Introduction to Animal Science course. Based on his experiences, he recommends that others who teach animal science-related subject matter consider purchasing and employing this kit when teaching swine management practices, particularly to novices.

Costs

One Realityworks® Swine Litter Processing Simulators kit costs $1,999.00. Beyond the kit's purchase price, the lead author's time preparing laboratory activities was the primary cost.

References

Agnew, D. M., & Shinn, G. C. (1990). Effects of simulation on cognitive achievement in agriculture mechanics. *Journal of Agricultural Education, 31*(2), 12-16. doi:10.5032/jae.1990.02012

Bailenson, J. (2018). *Experience on demand: What virtual reality is, how it works, and what it can do.* W. W. Norton & Company, Inc.

Brown, A. H., & Knobloch, N. A. (2022). Effects of a simulation on eighth grade students' business management knowledge and entrepreneurial intent in an exploratory agriculture course. *Journal of Agricultural Education, 63*(2), 88-101. https://doi.org/10.5032.jae.2022.02088

Edgar, D. W., Retallick, M. S., & Jones, D. (2016). Research priority 4: Meaningful, engaged learning in all environments. In T. G. Roberts, A. Harder, & M. T. Brashears. (Eds.), *American Association for Agricultural Education national research agenda: 2016-2020.* Gainesville, FL: Department of Agricultural Education and Communication.

Hart, L. A., Wood, M. W., & Weng, H. (2005). Mainstreaming alternatives in veterinary medical education: Resource development and curriculum reform. *Journal of Veterinary Medicine Education, 32*(4), 473-480. https://doi.org/10.3138/jvme.32.4.473

Lancelot, W. H. (1944). *Permanent learning: A study in educational techniques*. John Wiley & Sons, Inc.

Perritt, D. (1984). Effects of two instructional techniques used with the Ford power train simulator on the performance of Mississippi vocational agriculture students. *Journal of the American Association of Teacher Educators in Agriculture, 25*(1), 35-41. doi:10.5032/jaatea.1984.01035

Phipps, L. J., Osborne, E. W., Dyer, J. E., & Ball, A. (2008). *Handbook on agricultural education in public schools* (6th ed.). Thomson Delmar Learning.

Realityworks. (2022). *Swine litter processing simulator*. Retrieved from https://www.realityworks.com/product/swine-litter-processing-simulators/

Tiffany, J., & Hoglund, B. A. (2014). Teaching/learning in Second Life: Perspectives of future nurse-educators. *Clinical Simulation in Nursing, 10*, 19-24. https://ac.els-cdn.com/S1876139913001606/1-s2.0-S1876139913001606-main.pdf?_tid=7a59f746-aaad-4f1f-8f6e d959a27a3b3b&acdnat=1549230213_383ec46e8fc044eff5c08c3c0551a515

Wells, T., & Miller, G. (2022). Students' perspectives on using virtual reality technology in a university-level agricultural mechanics course. *Journal of Agricultural Education, 63*(2), 17-36. https://doi.org/10.5032/jae.2022.02017

Using the FEW-Nexus to Engage Middle Grade Students in Reasoning about Local Socio-Ecological Systems Issues

Kendrick L. Spencer
Virginia Polytechnic Institute and State University
214 Litton-Reeves Hall
Blacksburg, VA 24061
(540) 231-6836
kendrickls@vt.edu

Hannah H. Scherer
Virginia Polytechnic Institute and State University
(540) 231-6836
hscherer@vt.edu

Amy Azano
Virginia Polytechnic and State University
385 West Campus Dr
Blacksburg, VA 24061
(540) 231-8889
azano@vt.edu

Rachelle Kuel
Virginia Polytechnic and State University
(540) 231-8889
rkuehl@vt.edu

Michelle Rasheed
University of South Carolina Aken
B&E 209
471 University Parkway
Aiken, SC 29801
(803) 641 – 3209

Malle Schilling
Virginia Polytechnic and State University
(540) 231-8889
schillingmr@vt.edu

Heather Wright
Gardner-Webb University
106H Craig Hall
Boiling Springs, NC 28017
(704) 406-4482
hwright@gardner-webb.edu

Introduction/need for innovation or idea

For decades, scholars have been calling for an integrated, systems approach to resource management at a global scale. Boulding's (1966) framing of a "spaceship Earth" as a closed system with finite resources is a powerful concept and *The Limits to Growth* project (Meadows et al., 1972) demonstrated that the contemporary rate of consumption of natural resources was not sustainable. To prepare the next generation to be active participants in the ongoing struggle for long-term sustainability with equitable resource allocation — as encoded in the United Nations Sustainable Development Goals (United Nations, 2023) — agricultural, food, and natural resources (AFNR) education can play a central role.

These concepts at the global scale, however, may not resonate with learners and risk being abstracted to the point of neglecting their inherent complexity (Greenwood, 2012). Furthermore, there needs to be more explicit instruction in systems thinking to support learners in AFNR settings in developing the problem-solving abilities needed to address complex problems (McKim & McKendree, 2020). As rural spaces are traditionally sites of resource extraction and food production, rural learners need to be empowered to work towards the viability of their communities (Howley & Howley, 2010; Kuehl et al., 2022; Peine et al., 2020) and contribute to global solutions. To address these needs, we developed an interdisciplinary pedagogical framework that was used to design STEM learning experiences for a week-long summer camp for rural middle school students who were identified as gifted and talented.

How it works/methodology/program phases/steps

Our pedagogical framework integrates the Food-Energy-Water (FEW)-Nexus, systems thinking, and place-based education for rural learners. The *FEW-Nexus* is a framework for problem-solving that examines the interconnectedness of food, energy, and water as essential natural resources in modern society (Food and Agriculture Organization, 2014). The FEW-Nexus perspective has gained traction internationally in the past decade and has significant potential for achieving the UN Sustainable Development Goals (Simpson & Jewitt, 2019). FEW-Nexus-based education intentionally integrates food, energy, and water systems; centers decision making about management of natural resources in a complex system; and utilizes the nexus perspective in consideration of tradeoffs in potential solutions (NC-FEW, 2022). To emphasize connections within and among food, energy, and water systems for middle school aged youth, we draw from Meadows' (2008) general description of *systems thinking* as problem-solving that considers elements, connections, and functions of a system or interrelated systems. The "function" is broadly framed as providing resources for people in a way that promotes social, economic, and environmental sustainability. Critical place-based pedagogies (e.g.,Greenwood, 2012) necessitate that we *center the rural places* that youth come from in the curriculum and that we provide opportunities for them to explore real-world issues affecting their communities.

The STEM learning experiences for each of the 5 camp days included a classroom session, an experiential session, and group work on a case study project. Classroom sessions, such as a FEW-Nexus web activity in which youth had to identify connections between different elements, were designed to provide scaffolded systems thinking experiences to make mental models visible, elicit prior knowledge about FEW-related concepts, and deepen understanding of FEW-related issues affecting rural communities in their region. Experiential sessions included hands-on activities (e.g., water filtration at the campus pond), field trips to campus labs (e.g., meat processing lab), and a guest speaker from a local conservationist group. These sessions served to connect classroom sessions to real-world settings and exposed youth to new experiences with different aspects of the FEW-Nexus. Finally, we created case studies about problems related to the FEW-Nexus affecting local communities using local news articles and information about local industries. Case studies were centered on a particular part of the FEW-Nexus, but prompted consideration of tradeoffs in other areas. For example, one case study presented information about the construction of a natural gas pipeline through a landowner’s property and the group was asked to consider how the pipeline construction could impact natural resources, the environment, and local communities. Groups were tasked with identifying possible solutions to their cases and choosing one to present to the rest of the camp on the final day.

Results to dates/implications

40 middle schoolers participated in the summer camp in its inaugural year. The FEW-Nexus framework created an interwoven interdisciplinary lens to examine local industries and their connection to natural resource management. Campers created artifacts such as journal entries, drawings, concept maps, and models that we utilized to gain preliminary insights into learning outcomes. Through the sessions, youth used systems thinking to examine the multiple aspects of the FEW-Nexus and connect new concepts to what they knew about issues in their own communities. Campers drew on their own experiences, such as with the agriculture industry, pipeline construction in their community, and recreation in local rivers to make connections between the curriculum and their own lives. Findings from this pilot year are promising and point to the potential of our interdisciplinary pedagogical framework to inform AFNR education.

Future plans/advice to others

The summer camp will expand in its second year to service 20 returning campers and 40 new campers. The curriculum described here will be revised slightly based on the pilot and we will conduct a research study to systematically document learning outcomes. For the returning campers, we will include local agricultural and natural resource management industry partners and create more case studies to expand students’ understanding of the FEW-Nexus. The case study project we developed is similar to the model recommended by McKim & McKendree (2020) to promote systems thinking in AFNR education and others could use our framework to develop their own local case studies. Though we centered the rural context, place-based education can be implemented in any setting, and our approach could easily be adjusted for urban and suburban educational settings. In general, this shifts the focus from issues related to production/extraction to consumption. We recommend the concept of FEWsheds (Brinkley, et al., 2022) as a starting point for this work.

Costs/resources

Personnel was the primary cost for developing the framework and curriculum, roughly equivalent to a one-semester graduate assistant funded through various internal sources and an external grant that supports the camp overall.

References

Boulding, K. (1966). The Economics of the Coming Spaceship Earth. In H. Jarrett (Ed.), *Environmental quality in a growing economy: Essays from the Sixth RFF Forum* (pp. 3–14). The Johns Hopkins University Press.

Brinkley, C., Raj, S., & Raja, S. (2022). Planning for FEWsheds: The Role of Planning in Integrating and Strengthening Food, Energy and Water Systems. *Journal of Planning Literature*, Advance online publication. https://doi.org/10.1177/08854122221093387

Food and Agriculture Organization of the United Nations. (2014). *The Water-Energy-Food Nexus: A New Approach in Support of Food Security and Sustainable Agriculture*. http://www.fao.org/3/a-bl496e.pdf

Greenwood, D. A. (2012). A Critical Theory of Place-Conscious Education. In R. B. Stevenson, M. Brody, J. Dillon, & A. E. J. Wals (Eds.), *International Handbook of Research on Environmental Education* (pp. 93–100). Taylor & Francis Group. http://ebookcentral.proquest.com/lib/vt/detail.action?docID=1105876

Howley, C. B., & Howley, A. (2010). Poverty and school achievement in rural communities: A social-class interpretation. In K. Schafft & A. Youngblood-Jackson (Eds.), *Rural education for the twenty-first century: Identity, place, and community in a globalizing world* (pp. 34–50). Pennsylvania State University Press.

Kuehl, R., Callahan, C. M., & Azano, A. P. (2022). The forgotten many: Rural gifted learners. In J. L. Nyberg & J. A. Manzone (Eds.), *Creating equitable services for the gifted: Protocols for identification, implementation, and evaluation* (pp. 150–170). IGI Global.

https://serc.carleton.edu/nc-few/vision.html

McKim, A., & McKendree, R. (2020). Metacognition, systems thinking, and problem-solving ability in school-based agriculture, food, and natural resources education. *Advancements in Agricultural Development*, *1*(1), 38–47. https://doi.org/10.37433/aad.v1i1.21

Meadows, D. H. (2008). *Thinking in systems: A primer* (D. Wright, Ed.). Chelsea Green Publishing.

Meadows, D. H., Meadows, D., Randers, J., & Behrens III, W. W. (1972). *The limits to growth*. Universe Books. http://www.donellameadows.org/wp-content/userfiles/Limits-to-Growth-digital-scan-version.pdf

NC-FEW. (2022). *An NC-FEW community vision for FEW-Nexus-based education (version 1)*. https://serc.carleton.edu/nc-few/vision.html

Peine, E. K., Azano, A. P., & Schafft, K. A. (2020). Beyond cultural and structural explanations of regional underdevelopment: Identity and dispossession in Appalachia. *Journal of Appalachian Studies, 26*(1), 40–56.

Simpson, G. B., & Jewitt, G. P. W. (2019). The development of the Water-Energy-Food nexus as a framework for achieving resource security: A review. *Frontiers in Environmental Science, 7*. https://doi.org/10.3389/fenvs.2019.00008

United Nations Department of Economic and Social Affairs. (2023). *The 17 Goals*. United Nations. https://sdgs.un.org/goals

Innovative Poster

Using the Six America's Short SurveY (SASSY) to Teach Audience Segmentation

Ginger Orton, M.S.

Laura Fischer, Ph.D.

Texas Tech University

gorton@ttu.edu

Box 42131-Lubbock, TX 79409-2131

806.742.2816

Using the Six America's Short SurveY (SASSY) to Teach Audience Segmentation

Introduction/ Need for Innovation

Fundamental strategic communications scholarship and practice have encouraged communicators to understand who is in their audience before developing messages. Throughout agricultural communications courses, instructors encourage students to think carefully about the characteristics (e.g., demographic, psychographic, and behavioral) of their target audience, or subgroups of a public with similar characteristics which may influence message processing (Grunig, 1989; Warner et al., 2016). Furthermore, it is understood that messages tailored to these target audiences are more effective than one-size-fits-all messages that do not consider differences between audience members (Grunig, 1989). While target audiences have been identified based on demographic characteristics such as age, scholarship has urged future efforts to go beyond the demographics and include context-relevant psychographic and behavioral characteristics (Bouman et al., 2020; Corner et al., 2014; Dietz, 2012; Hine et al., 2014). When considering communicating about complex and controversial scientific issues (e.g., antibiotic resistance, GMOs, climate change), recent studies have indicated the importance of considering these additional attitudinal characteristics (Hine et al., 2014). This advise rests upon the understanding that individuals process messages regarding complex or unfamiliar issues with heuristics related to trust, values, and issue perceptions (Bouman et al., 2020; Corner et al., 2014; Dietz, 2012). These climate change communication studies have highlighted the importance of developing messages tailored to individual's values due to the controversial nature and varying perceptions of climate change in American society. These polarized perceptions increase the likelihood of adverse message effects (Kahan et al., 2011).

Audience segmentation has been used extensively in climate change communication literature and practice to develop messages that encourage perception and behavior change for distinct audience groups (Hine et al., 2014). One of the most common audience segmentation tools for climate change communication is the Global Warming Six America's Framework. This 36-item questionnaire measures issue belief, concern, and motivation and divides the respondents into six categories: alarmed, concerned, cautious, disengaged, doubtful, and dismissive (Maibach et al., 2009). A version known as the Six America's Super Short SurveY (SASSY) was developed by the seminal team to measure the same areas in a reliable but shortened format. This course-based innovation utilized the SASSY to engage an agricultural communications public opinion course in an audience segmentation activity. The activity sought to foster understanding of audience segmentation and target audience identification, particularly concerning controversial scientific issues. This innovation and abstract address the National AAAE Research Agenda Research Priority 5: Efficient and Effective Agricultural Education Programs (*Effective programs in communicating with diverse audiences*) (Thoron et al., 2016).

How it Works

We first disseminated an online Qualtrics survey containing the SASSY to a graduate agricultural communications public opinion class with both in-person and online sections. Students were required to take the survey for five discussion points, resulting in 35 respondents. The questionnaire contains four categorical items which reliably measure the original instrument's constructs (Chryst et al., 2018; Maibach et al., 2009). Upon taking the survey, the course instructor used the provided online Group Scoring tool to compare the class's views to the

American public (Chryst et al., 2023). This tool provided data visualizations depicting the size of each segment in the class vs. the American public (e.g., pie charts and bubble charts). The results were then presented to the class and were used as a launchpad for both in-person and online discussions. To reflect upon the activity, students were asked the following questions: "Considering the SASSY survey and surrounding discussion: 1) How did this activity help you learn about audience segmentation? 2) How could you apply this to your "hot topic" projects?"

Results/ Implications

We present the students' perspectives provided in both in-class discussion and online discussion boards. Overall, students were intrigued by how their class compared to the national norm and noted that the class had lower levels of the more skeptical and disengaged groups, likely due to a younger sample with higher education levels. Many students expressed the activity solidified what they had begun learning about audience segmentation, and the activity was particularly helpful due to being a controversial topic and aligning with their class project of investigating a "hot" agricultural topic. A few of their topic ideas include cultured and processed meat, dairy sustainability, prescribed burns, and GM labeling.

One student wrote, "I think the biggest thing I kept learning this week is to be prepared to work with people with many different opinions and ideas on the SAME topic. To also be prepared for not everyone to understand and support your point of view but be ready to make them feel their opinion holds weight." Another acknowledged, "With my project, I will need to look closely at my audience's values, leading to how receptive they will be toward the message." Another student also expressed the activity's application to their understanding, saying, "This exercise shows just how important audience segmentation is for opening pathways for discussion and audience buy-in of a topic...otherwise the data isn't enough to pinpoint your communication scheme and marketing plans beyond a broad stroke."

Future Plans/ Advice to Others

Due to climate change's polarized nature, care should be taken to emphasize that there are no "correct" answers, and no judgement will be passed on their responses. We emphasized that we aren't concerned with *what* they think but to consider it an opportunity to participate "behind the scenes" in an audience segmentation activity concerning a controversial scientific topic. Those who intend to use this tool should accompany this activity with audience segmentation lessons and examples of audience segmentation literature. Instructors should also have students complete an audience analysis with their own topics.

Costs/ Resources Needed

The survey and analysis tools can be accessed online for free at the Yale Program on Climate Change Communication website. Therefore, no costs are associated with this project. Although students will need access to a computer or cell phone to take the survey. Additionally, Blackboard was used to facilitate discussion about the assignment, and the project took about two-weeks of time from data collection to presenting results to discussion. Adequate time should be invested in planning and executing the activity.

References

Bouman, T., Verschoor, M., Albers, C. J., Böhm, G., Fisher, S. D., Poortinga, W., & Steg, L. (2020). When worry about climate change leads to climate action: How values, worry and personal responsibility relate to various climate actions. *Global Environmental Change*, *62*(102061). https://doi-org.lib-e2.lib.ttu.edu/10.1016/j.gloenvcha.2020.102061

Chryst, B., Marlon, J., Van Der Linden, S., Leiserowitz, A., Maibach, E., & Roser-Renouf, C. (2018). Global warming's "Six Americas Short SurveY": Audience segmentation of climate change views using a four question instrument. *Environmental Communication*, *12*(8), 1109-1122. https://www.repository.cam.ac.uk/bitstream/handle/1810/285758/six-americas-short_final.pdf?sequence=1

Chryst, B., Marlon, J., Wang, X., van der Linden, S., Maibach, E., Roser-Renouf, C., and Leiserowitz, A. (2023). *Six Americas Super Short SurveY (SASSY!)* Yale Program on Climate Change Communication. https://climatecommunication.yale.edu/visualizations-data/sassy/?gclid=Cj0KCQiAi8KfBhCuARIsADp-A55AkKP2dr1Kerlciyme3Fy3PjlTMwVJ1f8znbD7HAEgYCTNHqmHuZQaAllsEALw_wcB

Corner, A., Markowitz, E., & Pidgeon, N. (2014). Public engagement with climate change: The role of human values. *Wiley Interdisciplinary Reviews: Climate Change*, *5*(3), 411-422. https://doi.org/10.1002/wcc.269

Dietz, T. (2012). Bringing values and deliberation to science communication. *Proceedings of the National Academy of Sciences*, *110*(3), 14081-14087. https://doi.org/10.1073/pnas.1212740110

Grunig, J. (1989). Publics, audiences, and market segments: Segmentation principles for campaigns. In C. Salmon (Ed.), *Information campaigns: Balancing social values and social change*, (p. 199–228). Newbury Park, CA: Sage.

Hine, D. W., Reser, J. P., Morrison, M., Phillips, W. J., Nunn, P., & Cooksey, R. (2014). Audience segmentation and climate change communication: Conceptual and methodological considerations. *Wiley Interdisciplinary Reviews: Climate Change*, *5*(4), 441-459. https://wires-onlinelibrary-wiley-com.lib-e2.lib.ttu.edu/doi/pdf/10.1002/wcc.279

Kahan, D. M., Jenkins-Smith, H., & Braman, D. (2011). Cultural cognition of scientific consensus. *Journal of risk research*, *14*(2), 147-174. https://doi-org.lib-e2.lib.ttu.edu/10.1080/13669877.2010.511246

Maibach, E., Roser-Renouf, C., & Leiserowitz, A. (2009). Global warming's six Americas 2009: An audience segmentation analysis. https://cdn.americanprogress.org/wp-content/uploads/issues/2009/05/pdf/6americas.pdf

Thoron, A. C., Myers, B. E., and Barrick, R. K. (Eds). (2016). *American Association for Agricultural Education national research agenda: 2016-2020: Research Priority 5*. Gainesville, FL: Department of Agricultural Education and Communication.

Warner, L. A., Stubbs, E., Murphrey, T. P., & Huynh, P. (2016). Identification of the competencies needed to apply social marketing to Extension programming: Results of a delphi study. *Journal of Agricultural Education*, *57*(2), 14-32. http://www.jae-online.org/attachments/article/1967/2016-2-02-Warner.pdf

Using videos to disseminate information to extension agents and the general public.

Colleen Gariton
406 Rolfs Hall, Gainesville, FL 32611
352-273-3193
colleenh@ufl.edu

Matt Benge
126B Bryant Hall, Gainesville, FL 32611
352-294-1996
mattbenge@ufl.edu

Damilola Ajayi
406 Rolfs Hall, Gainesville, FL 32611
352-273-3193
d.ajayi@ufl.edu

Title: Using videos to disseminate information to extension agents and the general public

Introduction

A vital part of academia is sharing research and evidence-based practices with the public. Extension has historically been, and still is, a translator tool for many different audiences. Within this role, it is essential that extension agents stay informed on educational updates, evidence-based practices, new research findings, the best ways to communicate or translate these findings to their audiences, and ways to evaluate their efforts in sharing this information. It is a lot to ask agents to do this in addition to providing programing and completing their other job duties.

Currently, most of this information is shared with extension agents or educators via writing either through peer-reviewed academic journal articles or shorter factsheets. There has been a decline in the amount of time a person in the United States will read in a day. The U.S. Bureau of Labor Statistics (n.d.) found that in 2020, people between the ages of 15 and 44 read on average about twelve minutes each day. This means that people are more likely to read headlines, two or three sentences, short emails, or PowerPoint slides when looking to get information rather than reading longer journal articles (Gabielkov et al., 2016; Gann et al., 2013; Gelles-Watnick & Perrin, 2021). Expecting extension agents to be different from the average person by wanting to read lots of work material is unrealistic and unsustainable. If extension agents are not obtaining or being educated on the information they need from research, this can help increase the gap between research and practice (Hirschkorn & Geelan, 2008; Spoth et al., 2020). Therefore, it is crucial to find different avenues to share information with extension agents and the public (Hirschkorn & Geelan, 2008).

There are continuing education sessions and webinars given by many organizations throughout the year, however, these can cover large content areas, consume hours or days, and may not be available for the agent to find and watch whenever they need resources. Having short, concept-specific resources the agents can explore whenever they want might be a good tool to use when communicating new or updated information with agents. We addressed this challenge in the area of conducting surveys and analyzing data for program planning and evaluation by developing a series of “bite-sized” videos for agents.

Methods

To offer alternative ways to provide education and information to extension agents, two series of PowerPoints were created at the University of Florida: 1)Using Qualtrics and 2) Creating surveys (this is an existing UF EDIS publication). These areas were picked as the first videos due to all extension agents needing to have program evaluation knowledge and skills (Diaz et al., 2019), and this is an area of expertise for the graduate student and advisor. After being reviewed for content validity, voice recordings were added to the PowerPoints with live examples. The videos were about 10-15 minutes each and were placed on UF’s PDEC extension site for agents to access as they wanted. It is believed that the videos should cover one or two topics and be around ten minutes long to provide information in bite-size amounts for the agents to learn and use. Creating videos like this to share information is best suited for best practices, processes, and other information that does not frequently change.

Results to Date

The two series of videos, 19 covering Qualtrics and 10 covering surveys, were created at the University of Florida and posted to a central website and were advertised on social media and through email. Two months after the videos were released, a survey was sent to 350 extension agents and state specialists assessing the need for alternative modes of delivering information and usage of the videos. The actual number of views of the videos was unable to be retrieved due to website changes. The survey indicated that of the 43 respondents, 41 used varying EDIS publications to find information, and 55.8% (*n* =24) of respondents wanted to see information shared via alternative methods, such as videos or audio. The respondents' reasons for wanting alternative sharing methods consisted of three themes: 1) being able to reach different learning styles, 2) having short videos that they had time for, and 3) they could use the resources in teaching clients or audiences. When asked about the video series, only 7% (*n* = 3) of the respondents had viewed them, and all these respondents found them helpful and thought there should be more topics presented in this way. Of the other respondents, 86% (*n* = 37) did not know the videos existed, 2.3% (*n* = 1) could not find them, and 4.7% (*n* = 2) meant to view them but had not done so.

Future Plans and Recommendations

Better ways of marketing the series to see if more agents will view the videos needs to be assessed. Further investigation into the content extension agents would want the most needs to occur and then a few videos related to the top requested content need to be created. These videos are planned to be less than 10 minutes long each covering only one topic. Evaluation of this method of information sharing with the already available series needs to be studied more to assess what changes should be made to future video delivery methods.

It is recommended for others that want to create this type of information within their states that they first find a frequently used website/page to store the videos. They should also assess what videos the extension agents in their area want the most and produce those first along with an abundance of communication that these new resources are available.

Resources

The creation of these videos needs a good amount of time for development and implementation. These series at UF were created by a graduate student requiring about 150 hours to create 29 videos. The only cost involved in creating the videos was the graduate student's pay per hour, their advisor's supervision pay of about 30 hours, and about 10 hours of work for an IT specialist to create a page to house the videos. If more videos are added, there also needs to be a more advanced website that can house the videos and a system to search the videos for different topics. As the results at UF indicate, there needs to be a way to advertise the resources to ensure the agents know they exist.

References

Diaz, J., Chaudhary, A. K., Jayaratne, K. S. U., & Warner, L. A. (2019). Program Evaluation Challenges and Obstacles Faced by New Extension Agents: Implications for Capacity Building. *Journal of Extension*, *57*(4), 1.

Hirschkorn, M., & Geelan, D. (2008). Bridging the research-practice gap: Research translation and/or research transformation. Alberta Journal of Educational Research, 54(1), 1–13.

Gabielkov, M., Ramachandran, A., Chaintreau, A., & Legout, A. (2016). Social Clicks: What and Who Gets Read on Twitter? *Proceedings of the 2016 ACM SIGMETRICS International Conference on Measurement and Modeling of Computer Science*, 179–192. https://doi.org/10.1145/2896377.2901462

Gann, R. R., Sharp, L. K., and McIlquham, S. (2013). Textbook aliteracy in teacher education: information everywhere, but how much do they read?. American Reading Forum Yearbook. Vol.33(1). Retrieved May 6, 2022, from http://www.americanreadingforum.org/yearbook/13_yearbook/documents/

Gelles-Watnick, R., & Perrin, A. (2021). Who doesn't read books in America? *Pew Research Center*. Retrieved May 26, 2022, from https://www.pewresearch.org/fact-tank/2021/09/21/who-doesnt-read-books-in-america/

Spoth, R., Franz, N., & Brennan, A. (2020). Strengthening the power of evidence-based prevention in cooperative extension: A capacity-building framework for translation science-driven behavioral health. Child & Youth Care Forum, 50(1), 147–148. https://doi.org/10.1007/s10566-020-09573-2

U.S. Bureau of Labor Statistics. (n.d.). *Time spent reading for personal interest in 2020: The Economics Daily* Retrieved May 12, 2022, from https://www.bls.gov/opub/ted/2021/time-spent-reading-for-personal-interest-in-2020.htm

VR Graduate Seminars: Where Pants Are Optional but Engagement Is Encouraged

Jamie Greig
jgreig@utk.edu

Harrison Falcofksy
harafalc@vols.utk.edu

The University of Tennessee, Knoxville

Introduction

Virtual Reality (VR) is a novel media source that allows users to be fully immersed in a digital world. Although there are varying definitions of what VR is, most users in the education and communication communities define it as a headset device that the viewer wears, allowing them to view and sometimes interact with 360-degree video or imagery. The headset blocks out other visual and auditory distractions, allowing for a fully immersive learning experience (Belisle & Roquet, 2020). While VR has been primarily used for gaming and entertainment, there are new adaptations bringing VR to the business, education, and communication sectors. In this innovative idea, VR was used to conduct virtual seminars on the topic of leadership communication for graduate students and invited industry leaders. The seminars were conducted as part of a distance-education graduate level course and successfully simulated the immersive experience of an in-person seminar. VR allowed students to learn about practical leadership communication strategies from industry experts, creating a unique and engaging learning experience. The use of VR in these seminars allowed for a more dynamic and interactive approach to teaching and learning, with students being able to explore and engage with 360-degree environments that were not possible in a traditional online setting. The immersive nature of the technology also helped students feel more present and connected, despite being in different physical locations.

How it Works

Seven graduate students were selected to participate in four Virtual Reality seminars conducted remotely via distance-education using Meta Horizon Workrooms, a virtual reality (VR) platform developed by Facebook's parent company, Meta. The platform is designed for remote teams and enables users to collaborate in a shared virtual environment. Participants communicate with each other using customizable avatars and interact with shared documents and tools in a virtual workspace. Meta Horizon Workrooms includes features such as a virtual whiteboard, allowing users to share ideas and collaborate visually in real-time. The platform also includes customizable meeting spaces that users can configure to their specific needs, with options for different room layouts and settings. Hand and face tracking technology allows for more natural and immersive interactions, with participants able to perform actions in the virtual environment using hand gestures and realistic facial expressions. Prior to the seminars, the seven VR students were provided with online modules that contained guidance on how to use the headsets and Meta Horizon Workrooms platform effectively. Two industry leaders were also identified and provided with Quest Pro headsets, receiving in-person training on how to lead the virtual seminars effectively using the VR technology. Throughout the semester, four VR seminars were held using Meta Horizon Workrooms, with the VR students participating in the immersive VR experience while the other remaining students (n=40) either joined via video-conferencing embedded in the VR room or watched a recording of the session posted to Canvas. At the end of the semester, the seven VR students were interviewed to gather their perspectives on the experience and the use of Meta Horizon Workrooms for remote collaboration.

Results to Date/Implications

This technology has a wide range of applications and has been used in four main areas to engage users in a new perspective: simulations, training, distance learning, and to access limited resources (Kavanagh et al., 2017). In agriculture, for example, educators and business professionals can use VR applications such as the Metaverse and Meta Horizon Workrooms to provide a more engaging and stimulating environment for students (Rospigliosi, 2022). The potential of VR to enhance distance education and provide new and engaging learning experiences for students is vast. In comparison to more traditional distance education platforms like Zoom and Microsoft Teams, students were more engaged with their virtual avatars through VR and cited a deeper understanding, increased motivation, and increased satisfaction when paired with a learning environment in the virtual world (Hedrick et al., 2022; Kavanagh et al., 2017). Integrating VR into classrooms and adapting to new and emerging technologies can greatly impact educators and their students. In conclusion, the use of VR in education and training is a rapidly growing field and one that shows great potential in revolutionizing the way we learn. By leveraging the immersive and interactive nature of VR, educators can create unique and engaging learning experiences that were not possible before, as demonstrated by the successful virtual seminars on leadership communication.

Advice to Others

Faculty considering implementing VR seminars should plan ahead and think through all the details, including the goals of the seminars, the technology needed, the logistics of getting headsets to students, and the training needed for seminar leaders and participants. Effective communication with students is also crucial, including clear and frequent communication about the VR seminars, how to access and use the technology, and any expectations or requirements for participation. Additionally, it's important to provide thorough training for seminar leaders to ensure they can effectively lead the virtual seminars and troubleshoot any issues that arise. However, there are some challenges to consider, including the logistics of delivering headsets to students, the limitations of current VR technology such as scaling the seminars to include more participants (currently Horizon Workrooms limits the VR room to a maximum of 16 avatars and up to 50 video-conference participants), and the barriers of internet access and technology knowledge. To run these seminars, students were required to have reliable internet service that could support video-conferencing platforms like Zoom. We observed that internet speed-test results varied depending on the time of day, so we found it more helpful to ask students about their video-conferencing experience as a benchmark for success. It is important to identify and address these challenges to ensure the success of the VR seminars. Finally, consider collecting feedback from students and seminar leaders to continually improve the VR seminar experience and ensure it aligns with course goals and objectives.

Costs/Resources

The Meta-Quest Pro **(**$1,499.99) and the Meta-Quest 2 ($399.99) can be used to access the Horizon Workrooms. The Meta Horizon Workrooms is a free app that is currently in Beta development.

References

Belisle, B., & Roquet, P. (2020). Guest editor's introduction: Virtual reality: immersion and empathy. *Journal of Visual Culture*, 19(1), 3-1. Retrieved from https://doi.org/10.1177/1470412920906258

Hedrick, E., Harper, M., Oliver, E., & Hatch, D. (2022). Teaching & learning in Virtual reality: Metaverse classroom exploration. I*ntermountain Engineering, Technology and Computing (IETC)*. Retrieved from https://doi.org/10.1109/ietc54973.2022.9796765

Kavanagh, S., Luxton-Reilly, A., Wuensche, B., & Plimmer, B. (2017). A systematic review of virtual reality in Education. *Themes in Science and Technology Education*. Retrieved from https://www.learntechlib.org/p/182115/

Rospigliosi, P. (2022) Metaverse or Simulacra? Roblox, Minecraft, Meta and the turn to virtual reality for education, socialisation and work, *Interactive Learning Environments*, 30:1, 1-3. Retrieved from https:doi.org/10.1080/10494820.2022.2022899

We're Going Where? Creating an Interactive Virtual Tour of an Agricultural Facility

Kylie Harlan, B.S.
Graduate Research Assistant
Department of Agricultural Education and Communications
Texas Tech University
(903) 421-1132, kylie.harlan@ttu.edu

Courtney Meyers, Ph.D.
Professor
Department of Agricultural Education and Communications
Texas Tech University
(806) 834-4364, courtney.meyers@ttu.edu

Erica Irlbeck, Ed.D.
Professor
Department of Agricultural Education and Communications
Texas Tech University
(806) 834-6708, erica.irlbeck@ttu.edu

Lindsay Kennedy, Ph.D.
Assistant Professor of Practice
Department of Agricultural Education and Communications
Texas Tech University
(806) 834-8240, lindsay.kennedy@ttu.edu

Muntazar Monsur, Ph.D.
Assistant Professor
Department of Landscape Architecture
Texas Tech University
(806) 834-2994, mmonsur@ttu.edu

Introduction/Need for Innovation

Experiential learning opportunities can help students of all ages increase their knowledge on topics, develop skills, and clarify personal values (Association for Experiential Education, n.d.). Field trips are a common way to facilitate experiential learning because they take students to locations and provide them with experiences that typically cannot be replicated in a classroom setting (Behrendt & Franklin, 2014). Despite the valuable learning opportunities traditional on-site field trips offer, they can be difficult to execute due to financial constraints, safety concerns, proximity to site, lack of Americans with Disabilities Act (ADA) compliant sites, as well as other logistical concerns (Cassady et al., 2008; Han, 2020).

To overcome these challenges, online, electronic, and virtual field trips options can be utilized as an alternative to traditional field trips. While each of these types of tours can vary in the kind of equipment used to create the tour, as well as the format and features of the tour, they each seek to simulate the intended site (Han, 2020; Klemm & Tuthill, 2003). Similarly, interactive virtual tours (IVTs) replicate tour locations by using 3-D spatial scanning technology while incorporating various multimedia and curriculum components to make the virtual tour as interactive and immersive as possible (Mead et. al, 2019). In addition to overcoming various logistical issues, using virtual tours in a classroom setting can "support experiential learning by providing more realistic, first-person experiences" (Han, 2020, p. 182).

The purpose of this poster is to describe the development of an IVT featuring an agricultural facility. This IVT is part of a larger project to create virtual tours of several agricultural and food science facilities.

How it Works/Steps

To create the IVTs, we first identified potential tour sites based on geographic proximity and industry contacts with the goal of highlighting a diverse set of locations. For the creation of the IVT described in this narrative, we first received permission to scan the facility and made a "scouting" visit to the site to plan the subsequent scanning and video capture session. On the return visit, we used a 3-D Matterport camera to scan the site and create a 360-degree image. We also collected various stock photos, b-roll videos, and other complementary media components using a digital single-lens reflex (DLSR) camera.

Upon the completion of this step, we created an outline for the various "tour stops" and identified the content type for each stop (e.g., videos, text descriptions). Then we wrote scripts for the explainer videos, recorded voiceovers, and created and edited the videos. Photos, links, and additional information were then gathered and prepared to be incorporated inside the IVT.

After all content was collected, a grant team member used Matterport's online dashboard, integrate the materials into the tour. This process included placing each item in the correct place within the tour, identifying the correct settings for each stop, and finally organizing the tour stops into the correct process flow.

To use the IVTs, instructors, students, and other users simply click on the chosen tour site from the grant project's website on a computer, tablet, or mobile device. No additional headsets or technology are required to navigate the IVTs.

Results to Date

A focus group of seven graduate students in agricultural education and agricultural communications provided initial feedback IVT and how it could be implemented in a classroom setting. Overall, their response was positive. One student said, "It's a very great and convenient experience, especially for people who might not have the opportunity to tour these facilities."

Students also discussed the variety of content types that were embedded in the tour. One student said, "It was good that there was a combination of videos, pictures, and text. So maybe for those people who don't want to watch the videos, they can read everything and go through." Another student said, "I liked that the videos were kind of short and simple and to the point. They didn't just drag on; they hit the main points of each stop."

The students did suggest adding a demonstration prior to the start of the tour so future IVT visitors would understand the different ways the tour can be navigated. Several of them said they got "turned around" or were a bit confused at the beginning of the tour. Additionally, a couple of students suggested adding an "end stop," so users know they have reached the end of the tour.

Future Plans/Advice to Others

Based on the feedback, we are continuing to add supplemental content to the created IVT. To make each IVT even more robust, the grant team is creating curriculum guides for the tour sites. This will help instructors effectively integrate the tours into their classrooms. Outside of the classroom, users may refer to the curriculum guides to gain more context and information about the tour site. Additionally, as more IVTs are completed, we plan to collect formal evaluations from instructors, students, and other users.

For instructors who may want to integrate the IVTs into their classes, they should explore the tour on their own so they are comfortable navigating through it. There are two primary ways to explore the tour: 1) clicking, dragging, and moving at your own pace around the facility, or 2) using arrows to progress through each tour stop. This allows the user to move through the tour using the route the tour creator intended. Knowing the different ways to navigate the tour will allow instructors to provide their students with a brief demonstration, which may make tour navigation easier to understand. If others are interested in creating IVTs, they should gain experience using the 3-D camera and explore online hosting services such as Matterport.

Costs/Resources Needed

A U.S. Department of Agriculture Higher Education Challenge grant provided the funding necessary to create the IVTs. To create an IVT, creators will need a 3-D scanning camera and an online hosting service for the virtual tours. A DLSR camera is recommended to collect supplemental photos and videos, and access to video editing software such as Adobe Premiere Pro is necessary to create the video content. Finally, creators will need a computer with internet access to integrate the media into the virtual tour.

For those who want to simply view and interact with the IVTs, the resources needed are minimal. To access the tours, users will need internet access and a computer, tablet, or mobile device. In a group setting, using headphones while taking the tour is beneficial so each user can listen to the videos on their own.

References

Association for Experiential Education. (n.d.) What is experiential education? https://www.aee.org/what-is-experiential-education

Behrendt, M., & Franklin, T. (2014). A review of research on school field trips and their value in education. *International Journal of Environmental and Science Education*, *9*(3), 235–245. http://files.eric.ed.gov/fulltext/EJ1031445.pdf

Cassady, J. C., Kozlowski, A., & Kornmann, M. (2008). Electronic field trips as interactive learning events: Promoting student learning at a distance. *The Journal of Interactive Learning Research*, *19*(3), 439–454. https://www.learntechlib.org/p/24187/article_24187.pdf

Han, I. (2020). Immersive virtual field trips and elementary students' perceptions. *British Journal of Educational Technology*, *52*(1), 179–195. https://doi.org/10.1111/bjet.12946

Klemm, E. B. & Tuthill, G. (2003). Virtual field trips: Best practices. *International Journal of Instructional Media*, *30*(2), 177. https://www.questia.com/library/journal/1G1-107801001/virtual-field-trips-best-practices

Mead, C., Buxner, S., Bruce, G., Taylor, W., Semken, S., & Anbar, A. D. (2019). Immersive, interactive virtual field trips promote science learning. *Journal of Geoscience Education*, *67*(2), 131–142. https://doi.org/10.1080/10899995.2019.1565285

What's a PPAT? Coaching Strategies for Pedagogical Assessment Success

Emily O. Manuel
Oklahoma State University
458 Agricultural Hall
Stillwater, OK 74078
(405) 744-8036
emily.manuel@okstate.edu

Jeanette T. Furlong
Oklahoma State University
481 Agricultural Hall
Stillwater, OK 74078
(405) 744-8036
jeanette.furlong@okstate.edu

Jon W. Ramsey
Oklahoma State University
466 Agricultural Hall
Stillwater, OK 74078
(405) 744-4260
jon.ramsey@okstate.edu

Nathan A. Smith
Oklahoma State University
456 Agricultural Hall
Stillwater, OK 74078
(405) 744-3686
nathan.smith@okstate.edu

Introduction

Teacher effectiveness can be measured through the characteristics and behaviors a teacher exhibits in the classroom (Roberts & Dyer, 2004; Rosenshine & Furst, 1971). Variability, task-oriented behavior, providing students opportunities to learn, the ability to plan and execute lessons, and monitor student learning and behavior are some characteristics and behaviors said to be demonstrated by effective teachers (Rosenshine & Furst, 1971; Young, 1990). These characteristics are assessed by states to award teacher licensure through certifying examinations such as the Praxis® Performance Assessment for Teachers (PPAT®). The PPAT® "measures how teacher candidates apply content knowledge and teaching skills in the classroom" (ETS, 2022). This authentic assessment of preservice teachers occurs during their student teaching semester and is required for the attainment of teacher licensure in Oklahoma (OSDE, 2023). The PPAT® Assessment consists of four different tasks: (1) knowledge of students and learning environment, (2) assessment and data collection to measure and inform student learning, (3) designing instruction for student learning, and (4) implementing and analyzing instruction to promote student learning (ETS, 2022). Task 1 is formative and tasks 2-4 are summative; each submission requires both written commentary and artifacts. Score levels are determined using a 4-point rubric and the overall assessment score is the combined totals of task 2, task 3, and task 4 (ETS, 2022).

Lesson plans, scoring guides, anecdotal notes, student work samples, test scores, and video are examples of artifacts which make up the portfolio to be submitted for review. The PPAT® provides evidence of pedagogical content knowledge of preservice teachers. The goal of faculty was to provide preservice teachers with ample preparation for each PPAT® task. The increase in pass rate of the PPAT® on first submission is attributed to the innovation. A passing PPAT® score is 38 in Oklahoma (ETS, 2023). A score below 38 requires a resubmission of any task the student feels they can revise for a better score.

How It Works

To achieve the increased pass rate in PPAT® scores, the following innovation was implemented to better prepare preservice teachers for the assessment. A peer-to-peer panel session was facilitated during the first week of the student teaching semester. Recent PPAT® completers shared their experience preparing and completing the assessment. These student testimonials allowed future test takers to put the test into a manageable context. In addition to hearing from peers, a graduate teaching assistant was charged with creating templates that broke the tasks into manageable chunks that served as a writing template for the required PPAT® Tasks. These templates contain tables with prompts and textboxes for each PPAT® Task. Within each prompt selected terms are highlighted and italicized to assist student teachers in focusing their writing on the important terms and concepts. An example of this is bolding key writing prompts like "provide a rationale" so student teachers remember to provide an explanation and example situation within their reply to the prompt. Templates also include more detailed agricultural education specific examples for artifacts and situations than the PPAT® prompts may require. These templates are then submitted to University Supervisors via Canvas at least a week in advance of ETS deadlines where annotation tools are then utilized to provide individualized feedback to each student teacher. Student teachers apply feedback and then copy their submission from the template into ETS.

Results to Date/Implications

Eighty-two percent of agricultural education student teachers at Oklahoma State University pass the PPAT® Assessment on the first attempt. The remaining 8% pass after submitting a selected task for resubmission. Program completers shared their experiences with the innovation and provided the following statements:

The template created by Ag-Ed faculty made filling out the PPAT® Assessment stress-free. It gave me a space to organize artifacts, write, receive feedback, and edit all my work before logging in to the ETS system. When I was ready to submit, it was as easy as copying and pasting from the template to ETS. The only thing I had to worry about was linking my artifacts.

Feedback I received on the PPAT® from my university supervisor was extremely helpful. My university supervisor worked with me to ensure I was using proper grammar and punctuation, and that my content was hitting the benchmark for each task.

University Supervisors noted that compared to the system previously used for feedback, the new process was more streamlined. These faculty stated:

The templates are much more user friendly and help student teachers turn in higher quality work on their first draft. Students are able to continue using Canvas for PPAT® reviews the same way they have in all of their previous courses at OSU.

Future Plans

In the future, we would like to collect data on the experiences of student teachers and the impact of the PPAT® on their student teaching experience. There is also potential for collaboration with other teacher certification programs at Oklahoma State University to help them implement use of the template into their teacher preparation curriculum. These strategies and resources for coaching students through the PPAT® Assessment could also be shared with other agricultural education programs whose students complete the assessment.

Costs/Resources Needed

The Agricultural Education, Communications & Leadership Department covers the $200 cost for the initial registration for the PPAT® through scholarships. Students are responsible for paying for their resubmission if necessary. The resubmission fee is $75 per task. The template assignment was completed as a summer project by the GTA and considered a part of the assistantship. There is considerable cost in terms of time. Faculty and GTA's invest approximately 30-45 minutes reviewing each task so approximately three hours is dedicated to the review process. Several faculty review as many as five students so 15 hours is spent over the course of the semester on this service to students. Additional resources include training and collaborating with supervisors to ensure there is a level of consistency regarding reviews.

References

ETS. (2022). *PPAT® Assessment*. ETS. https://www.ets.org/ppat/states-agencies-epp/about.html

ETS. (2023). *PPAT® passing scores*. https://origin-www.ets.org/ppa/test-takers/teachers/scores/understand/passing-scores/

Oklahoma State Department of Education. (2023). *Teacher certification paths*. Oklahoma State Department of Education. https://sde.ok.gov/teacher-certification-paths

Roberts, T. G & Dyer, J. E. (2004). Characteristics of effective agriculture teachers. *Journal of Agricultural Education*, *45*(4), 82–95. https://doi.org/10.5032/jae.2004.04082

Rosenshine, B., & Furst, N. (1971). Research on teacher performance criteria. In B.O. Smith Ed., Research in Teacher Education (pp. 37–72). Englewood Cliffs, NJ: Prentice Hall.

Young, M. (1990). Characteristics of high potential and at-risk teachers. *Action in Teacher Education. 11*(4), 35–39.

Who wants to bring agriculture into their classrooms? An online professional development program

Shannon K. Allen
shannonallenk@gmail.com

Josey M. Webb
PO Box 9745 Mississippi State, MS 39762
jmw1552@msstate.edu

Carley C. Morrison
PO Box 9745 Mississippi State, MS 39762
662.325.0749
carley.c.morrison@msstate.edu

Stephanie M. Lemley
662.325.4367
smb748@msstate.edu

Allyson K. Moore
PO Box 9745 Mississippi State, MS 39762
akm564@msstate.edu

Who wants to bring agriculture into their classrooms?
An online professional development program

Introduction

The general population is often not involved with production agriculture and is, therefore, considered to be agriculturally illiterate which impairs their ability to make educated decisions regarding the industry (Kovar & Ball, 2013). And with students being at least three generations removed from the farm, it is important for us to consider the educator's role as they are key to a student's education (Reed Jr., 2019). When students have good teachers, "its impact amounts to an entire year's worth of learning" (Moe, 2011, p. 4). Therefore, to make agriculture literacy more prevalent in schools, the willingness and interest of the teachers must be taken into consideration. Consequently, we need to know what types of teachers are interested in bringing agriculture to their classrooms, and we should know why they are interested in doing so.

The Farm to Classroom Professional Development Program is facilitated by the School of Human Sciences, with the College of Education, at Mississippi State University. It is the mission of the project team to institute teacher professional development opportunities to train teachers to integrate agricultural-based lessons into core curriculum areas and allow them to develop a supportive network. The purpose of this study was to describe the demographics and professional interests of our participating teachers to better meet the needs of teachers through future professional development opportunities, as well as discover what groups we are not reaching with our program.

Methodology

The free Farm to Classroom Professional Development Program workshop is unique in the fact that it is a fully online educational course. Through the Canvas Learning Management System, participants complete the course online and at their own pace within the span of a month. This allows us to reach a broader group of educators and cater to their schedules. The course consists of four different modules. Each module includes a short lesson and hands-on assignment that trains educators on ways they can incorporate agriculture into their core subjects. The modules also include a discussion thread for participants to develop a network of peers. These lessons eventually lead up to participants creating their own agriculture-based lesson plan.

Advertisement for the workshop began a month in advance using the program's website and social media platforms. Email messages, containing a digital flyer and link to the application, were sent to public school superintendents and Extension offices across the state. They were asked to distribute the information to teachers within their area and inform them of receiving two free CEUs at the completion of the course. The application to participate in the workshop contained demographic questions such as where the participants currently teach and what subjects and age group they have taught. At the very beginning of the workshop, the participants were asked to take a pre-test through Qualtrics. The instrument asked the participants questions regarding their interest and background in agricultural literacy. It is from these applications, from the year 2020 to 2022 (three sessions), that the data was collected to describe the demographic information about the teachers who are interested in the program.

Results to Date

From 2020 to 2022 a population of 161 teachers (*N* = 161) applied to the workshop, with 94.4% coming from Mississippi (*n* = 152), and 5.6% of teachers (*n* = 9) from other states. Most applicants taught elementary school, making up 45.3% (*n* = 73), with 31.7% teaching high school (*n* = 51), 14.3% teaching middle school *(n = 23),* 2.5% taught all grade levels *(n = 4)*, and 6.2% specialized in other areas, such as community education *(n = 10)*. Every core subject was represented among the applicants. 6.8% taught math subjects (*n* = 11), 8.1% taught science *(n* = 13), 0.6% taught social studies (*n* = 1), 11.8% taught ELA *(n* = 19), and 29.8% taught multiple or all these subject areas (*n* = 48). Surprisingly, 42.9% of teachers (*n* = 69) taught in other areas. Some of these areas included agriculture-based topics, but this group also included culinary arts, elementary art, special education, etc. In total, 111 individuals participated in the program (*N* = 111). 97 of the respondents reported their gender (*N* = 97), 86.6% of the respondents were female (*n* = 84), with 12.4% identified as male (*n* = 12) and 1% preferred not to say (*n* = 1).

Participating teachers were asked if they considered themselves to be agriculturally literate. Of the 97 respondents (*N* = 97), 6.1% replied with "Definitely Not" (*n* = 6), 17.5% replied with "Probably not" (*n* = 17), 33% replied with "Might/Might Not" (*n* = 32), 27.8% replied with "Probably yes" (*n* = 27), and 11.3% replied with "Definitely Yes" (*n* = 15). These numbers show that the majority of the participants are agriculturally illiterate and therefore do not have previous experience with production agriculture (Kovar & Ball, 2013). When asked why they wanted to take a course on agricultural literacy, a few participants stated simply that they were interested and wanted to learn more about it. However, several teachers responded with concern for their students. Overall, teachers seemed to want their students to know where their food comes from and how they can grow their own food to be self-sufficient and experience new opportunities.

Future Plans/Advice to Others

Our plans include reaching out to past participants to assess the impact of agricultural literacy in their classrooms. We will assist those who reach out for help and continue to provide resources through the website and social media platforms. We will also continue to use the online Canvas platform. Our hope is to continue to reach a broader audience by expanding our social media to gain more interest. By looking at the results of the program, it can be concluded that a wide variety of educators are wanting to bring agriculture into their classrooms, but they often do not feel confident in doing so. We also plan to create material that caters to social studies teachers, who were poorly represented in the results. Our advice is to encourage extension-based services to conduct their own online workshops for interested teachers within their area.

Costs & Resources

This program is supported by the Agriculture and Food Research Initiative – Education and Workforce Development Program (2020 – 68018 - 1021637), from USDA, NIFA, who provided a total grant funding of 212,784 dollars for the expenses of this program, and we are in the third year of the four-year program. Associated costs included creating a Canva Pro account to create visuals for social media, funding for a master-level graduate assistant, and partial summer funding for three faculty members. Resources included free access to Canvas for workshops, free advertising and promoting through social media, and advertising through email communication.

Reference

Kovar, K. A., & Ball, A. L. (2013). Two decades of agricultural literacy research: A synthesis of the literature. *Journal of Agricultural Education*, *54*(1), 167-178.

Moe, T. M. (2011). *Special interest: Teachers unions and America's public schools*. Brookings Institution Press.

Reed Jr, D. D. (2019). Perceptions of Modern Meat-Animal Production from Consumers Two to Three Generations Removed from the Farm.

Analyzing Race and Ethnicity Trends of Program Completers in Agricultural Education

Daniel Foster
Associate Professor
The Pennsylvania State University
212 Ferguson Building
University Park, PA 16802
(814) 863-0192
foster@psu.edu

Amy R. Smith
Associate Professor and Program Leader
University of Minnesota
146 Ruttan Hall
St. Paul, MN 55108
(612) 624-6590
arsmith@umn.edu

Michael Spiess
Professor Emeritus
California State University, Chico
College of Agriculture
Chico, CA 95929-0310
(530) 521-6866
mspiess@csuchico.edu

Rebecca Lawver
Department Head & Professor
Applied Sciences, Technology and Education
Utah State University
1498 N 800 E | ASTE 101C
UMC 2300
Logan, UT 84321
(435) 797-1254
rebecca.lawver@usu.edu

Analyzing Race and Ethnicity Trends of Program Completers in Agricultural Education

Introduction

Diversity, equity, and inclusion are at the forefront of educational efforts. While not the only valuable metric used to measure diversity, race and ethnicity is one metric for exploring representation among the teaching profession. Since 1965, the National Supply and Demand (NSD) for Agricultural Education project has been supported by the American Association for Agricultural Education (AAAE) and utilized by members. The project collects race and ethnicity data for newly licensed program completers (PCs), however, securing this information has been a challenge (Kantrovich, 2010). In 2000, Camp reported that "Agricultural Education teachers are disproportionately white, non-Hispanic males" and suggested efforts be taken to address the underrepresentation of ethnic minorities in agricultural education. Unfortunately, profound underrepresentation still exists today. Lawver, Smith, and Foster (2018) recommended additional research to identify strategies to recruit underrepresented populations and that "major efforts should be made to recruit and prepare minority teachers for the profession."

Conceptual Framework

The conceptual framework for the NSD project (adapted from Lyndsey et al., 2009) identifies factors contributing to SBAE teacher supply and demand. Due to space restrictions for the poster abstract process, the figure can be viewed in the 2014-2016 NSD three-year report (Lawver et al., 2018) which is available on the AAAE Website.

Methods

This poster provides a historic review of race and ethnicity of PCs in SBAE. The objectives include: 1) describe race and ethnicity of SBAE program completers from 2014-2022 and, 2) determine trends and/or regional differences in race and ethnicity of PCs. Data resulted from NSD data collected (2014-2022), as approved by the Institutional Review Board at The Pennsylvania State University. PC data was provided as supply data from a frame representing agricultural education teacher licensure programs. Given this is a legacy study, the supply instrument was developed from previous iterations with additions and revisions based on literature and feedback from a panel of experts to ensure validity. Reliability was found appropriate for a descriptive study. Data was collected using Qualtrics in accordance with Dillman's (2014) guiding principles. In total, 2014-2022 surveys yielded 370 records. Since the study is concerned with race and ethnicity of the population, any records with more than 50% "unknown" or incomplete data were omitted. This resulted in the analysis of 365 complete records from 44 states and Puerto Rico.

Results

Data from 120 institutions (49 - North Central, 52 – Southern, 19 - Western), was analyzed. Institutional production of PCs varied from 1 to 350 over the study period. For objective 1, race and ethnicity profiles from 2014-2022 are provided in Table 1. In 2022, the race and ethnicity profile of PCs was 88% white, 1% African American, 5% Hispanic, 6% other, and 1% reported as unknown. Comparatively, practicing teachers were 81% white, 1% African American, 3% Hispanic, 2% other, and 13% reported as unknown (Foster et al., 2022). Objective 2 looked at trends and regional differences in PCs' race and ethnicity. Nationally, white PCs declined from 88% to 86%, although this varied from 93% to 86% over the study period. Regionally, race and ethnicity profiles of PCs were more diverse. North Central averaged 95% white, Southern averaged 87% white, and Western averaged 86% white. At the state level even more variation existed from 0% (Puerto Rico), 75% (Maryland and New Mexico) to 100% (Massachusetts, Iowa, New Jersey, West Virginia, Nebraska, Wisconsin, Michigan, and North Dakota).

Table 1:
Racial distribution of program completers from 2014-2021

Year	White	African American	Hispanic	All Other	Unknown
2014	88%	2%	5%	2%	0%
2015	91%	1%	5%	3%	0%
2016	91%	1%	5%	2%	0%
2017	89%	2%	6%	2%	2%
2018	93%	1%	5%	2%	0%
2019	87%	1%	4%	2%	6%
2020	89%	0%	6%	4%	0%
2021	92%	1%	4%	3%	0%
2022	86%	3%	5%	6%	1%
Average	89%	1%	5%	3%	1%

Findings

SBAE teachers continue to be predominately white. Nationally, there is no discernable trend toward increasing race and ethnicity diversity over the past nine years. Regionally and at the state level, we see differences in both numbers and trends. This is less surprising, since student race and ethnicity demographics in each state differ within datasets such as the National Center for Education Statistics. Anecdotally, California SBAE students are less than 40% white, while some states remain more than 90% white. This implies discrepancies exist in some states when it comes to mirroring program completers' race and ethnicity profiles to SBAE student profiles.

Conclusions and Recommendations for the Profession

If we indeed strive to have a SBAE teaching profession that reflects our students, we have significant opportunities for improvement. Agricultural education teacher preparation programs continue to graduate predominantly White program completers. Using gender as a demographic example, we observe program completer trends influencing the gender demographic profile of the agricultural teachers (Lawver, Smith, & Foster, 2018). This underscores the importance of investing in recruitment and retention of diverse students into teacher education programs. While only one metric of diversity, data suggests effort is needed to align teacher demographics with student, school district, and community demographics. Additional research is needed to understand the magnitude of these issues more clearly. Our profession must capture data like that collected by the National Teacher and Principal Survey (U.S. Department of Education, 2020). Alignment between race and ethnicity of SBAE teachers and students could assist in recruiting and retaining teachers from diverse populations. While desirable for agricultural teachers' and students' race and ethnicity to align, additional research should be done to assess if SBAE students reflect the demographics of schools, and to examine obstacles underrepresented students face when entering college agricultural education programs. Continued study of SBAE students also must address reasons why certain students don't consider teaching agriculture.

References

Camp, W. G. (2000). *The 33rd volume of a national study of the supply and demand for teachers of agricultural education 1996-1998*. Blacksburg, VA: Virginia Polytechnic Institute and State University. American Association for Agricultural Education.

Dillman, D. A., Smyth, J. D., Christian, L. M., & Dillman, D. A. (2014). *Internet, mail, and mixed mode surveys: The tailored design method.* Hoboken, N.J: Wiley & Sons

Foster, D. D., Lawver, R. G., Smith, A. R., Spiess, M., (2022). *National Agricultural Education Supply and Demand Study* [data set]. American Association for Agricultural Education. Retrieved from: http://aaae.agedweb.org/nsd.

Kantrovich, A. J. (2010). *The 36th volume of a national study of the supply and demand for teachers of agricultural education 2006-2009.* West Olive, MI: Michigan State University. American Association for Agricultural Education.

Lawver, R. G., Foster, D. D., & Smith, A. R. (2018). *Status of the U.S. Supply and Demand for Teachers of Agricultural Education, 2014 - 2016*. http://aaaeonline.org/Teacher-Supply-and-Demand

Lindsay, J. J., Wan, Y., & Gossin-Wilson, W. (2009). *Methodologies used by Midwest Region states for studying teacher supply and demand* (Issues & Answers Report, REL 2008–No. 080). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Midwest. Retrieved from http://www.eric.ed.gov/?id=ED506631

Smith, A. R., Lawver, R. G., & Foster, D. D. (2021). *National Agricultural Education Supply and Demand Study, 2016 Executive Summary.* Retrieved from:http://aaaeonline.org/Resources/Documents/NSD 2016Summary.pdf

U.S. Department of Education, National Center for Education Statistics, National Teacher and Principal Survey (NTPS) (2020) *"Public School Teacher Data File," 2017–18.* Available at: https://nces.ed.gov/programs/coe/indicator/clr

Are Two Better Than One? An Evaluation of Team Teaching in Teacher Preparation

Grace Dooley
Undergraduate Student
cdooley@stallions.abac.edu

Alyssa Glover
Undergraduate Student
aglover@stallions.abac.edu

Dr. Sallie McHugh
Associate Professor
smchugh@abac.edu

Dr. Farish Mulkey
Assistant Professor
fmulkey@abac.edu

Department of Agricultural Education and Communication
Abraham Baldwin Agricultural College
ABAC 8, 2802 Moore Hwy
Tifton, Ga 31793

Are Two Better Than One? An Evaluation of Team Teaching in Teacher Preparation

Introduction

Team teaching has been shown to improve both learning and teaching. From the student's perspective, team teaching allows for more active learning, which contributes to greater student interest and engagement (Zadra, 1998). Team teaching is an ever-present trend in K-12 education as the disparity in the student-to-teacher ratio continues to rise across all levels (Winn & Messenbeimer-Young, 1995). Higher education and teacher preparation programs often do not model team teaching though its effectiveness is supported in the literature (Winn & Messenbeimer-Young, 1995).

Team teaching can encompass an interactive model where two or more teachers teach during instructional time. Each team member alternatively leads instruction while the other team member(s) add comments (White et al., 1998). Modeling team teaching in preservice courses can be effective as students can interact and learn from multiple instructors with unique experiences. Team teaching in a preservice teacher preparation program allows for multiple viewpoints and depth of knowledge through lived instructor experiences shared with preservice teacher-learners. Likewise, team teaching prevents only one-sided viewpoints in field experience and practicum courses. Exposure to different approaches, perspectives, personalities, and experiences proves vital as preservice teachers develop their philosophy about the teaching and learning process (York-Barr et al., 2004). The purpose of this study was to determine students' perception of team teaching utilized in the Abraham Baldwin Agricultural Education program.

Theoretical Framework

Team teaching aims to improve how the material is presented to the students, and collaboration has been recognized as a foundation for professional growth (Darling-Hammond & McLaughlin, 1995; Lieberman,1995; Roth et al., 2002). The activity theory has been applied to the team teaching model by Roth and Tobin (2002, 2004). According to activity theory, the goal of team teaching may depend on a question: Are the teachers combining their efforts to offer a level of instruction that could not be accomplished independently (Roth & Tobin, 2004)? Cook and Friend (2017) defined team teaching as having two educators delivering meaningful instruction to diverse groups of students in a standard setting. This definition is used as a framework for this study.

Methodology

The population for the study was 108 individuals who had been team-taught through interactive and participant-observer models from the fall of 2019 through the fall of 2022. A survey was developed by the course instructors and two departmental students to measure the effectiveness of team teaching in two courses (Agriculture Practicum and Early Field Experience). Three other faculty members in the Agricultural Education department established the content validity of the survey instrument. Former and current students who completed the courses received the Qualtrics survey via email. The survey included demographic questions, questions about prior experience with team teaching, and their perceptions of the effectiveness of team teaching. The survey was open for two weeks. Sixty-two respondents completed the survey resulting in a 57% response rate.

Results to Date/Implications

Table 1 reports the overall mean scores for all participants along with the standard deviation and the percentage of respondents reporting agree or strongly agree for each team teaching indicator.

The highest reported percentages were provided multiple viewpoints (93.55%), satisfied with learning experience in two classes (93.55%), and highlighted that no two teachers are the same (93.54%). All means indicated respondents as a whole agree or strongly agree with all team teaching indicators.

Table 1
Analysis of Team Teaching Indicators Mean Score (n=62)

Indicators	Mean	*SD*	% agree/ strongly agree
helped keep faculty and students in a positive mindset.	1.66	0.93	87.09%
provided a great sense of comfort in the classroom.	1.54	0.98	83.87%
provided multiple viewpoints during class discussion and topics.	1.31	0.59	93.55%
allowed class to be more enjoyable due to variations of teaching styles.	1.48	0.70	88.71%
highlighted that no two teachers are the same, but each can be effective.	1.36	0.73	93.54%
is the preferred style than having only one lecturer.	2.18	1.28	64.52%
approach used in AGED courses has made me better prepared for the classroom.	2.05	1.27	69.36%
should continue to be used for AGED senior level courses.	1.52	0.89	88.72%
was successful and I was satisfied with my learning experience in the two classes.	1.38	0.88	93.55%

Note. Mean scores reported as 1= Strongly agree, 2= Agree, 3= Somewhat agree, 4= Neither agree or disagree, 5= Somewhat disagree, 6= Disagree, 7= Strongly disagree

Conclusions

Overall, the respondents had positive perceptions (either strongly agree or agree) that team teaching in courses of preservice preparation programs is an effective instructional method. The respondents indicated they received more insight from multiple perspectives on the same topic, and classes were more enjoyable due to variations in teaching styles. Respondents cited the importance of experiencing different teachers and noting that each can be effective, though their teaching styles may differ. The respondents indicated that the department should continue team teaching and that they were satisfied with the experience.

Implications/Recommendations

Based on the study findings, the faculty will continue incorporating the team teaching model with senior-level agriculture education courses and possibly expand to an additional lower-level agriculture education course. Faculty did note the lower overall score on the one lecturer-style question. Further research and analysis will be conducted to determine the cause. Continued research on team teaching will be conducted with each cohort to ensure the best learning experience for students. In the profession, recommendations are made for teacher preparation institutions to consider the application of team teaching in their programs. Team teaching is especially recommended when cohort enrollment is higher, and there is a need to lower the student-to-teacher ratio.

References

Cook, L., & Friend, M. (2017). Co-Teaching: Guidelines for Creating Effective Practices. *Focus on Exceptional Children*, *28*(3). https://doi.org/10.17161/foec.v28i3.6852

Darling-Hammond, L., & McLaughlin, M. W. (2011). Policies That Support Professional Development in an Era of Reform. Phi Delta Kappan, 92(6), 81–92. https://doi.org/10.1177/003172171109200622

Dieker, L. A. (2010). What are the characteristics of "effective" middle and high school co-taught teams for students with disabilities? *Preventing school failure: Alternative education for children and youth, 46*(1), 14-23. https://doi.org/10.1080/10459880109603339

Hatton, E. J. (2006). Team teaching and teacher orientation to work: Implications for the preservice and inservice preparation of teachers. Journal of Education for Teaching, 11(3), 228-244. https://doi.org/10.1080/0260747850110302

Lieberman, A. (1995). Practices that support teacher development: Transforming conceptions of professional learning. Phi Delta Kappan, 76, 591–596.

Roth, W. M., & Tobin, K. G. (2002). Redesigning an 'urban' teacher education program: An activity theory perspective. Mind, Culture and Activity, 9(2), 108–131.

Roth, W. M., Tobin, K., Zimmermann, A., Bryant, N., & Davis, C. (2002). Lessons on and from the dihybrid cross: An activity theoretical study of learning in co-teaching. Journal of Research in Science Teaching, 39(3), 253–282.

Roth, W. M., & Tobin, K. G. (2004). Coteaching: From praxis to theory. Teachers and teaching: Theory and practice, 10(2), 161–180.

White, C. S., Henley, J. A., & Brabston, M. E. (1998). To team teach or not to team teach – that is the question: A faculty perspective, *Marketing Education Review, 8*(3), 13-23. https://doi.org/10.1080/10528008.1998.11488640

Winn, J. A., Messenbeimer-Young, T. (1995). Team teaching at the university level: What we have learned. *Teacher Education and Special Education, 18*(4), 223-229. https://eric.ed.gov/?id=EJ530774

York-Barr, J., Bacharach, N., Salk, J., Frank, J. H., & Benick, B. (2004). Team teaching in teacher education: General and special education faculty experiences and perspectives *Issues in Teacher Education, 13*(1), 73-94. https://files.eric.ed.gov/fulltext/EJ796434.pdf

Zadra, N., "Team teaching: A study of collaboration" (1998). *Graduate Student Theses, Dissertations, & Professional Papers*. 10539. https://scholarworks.umt.edu/etd/10539

Budding Knowledge: Consumers' Information Needs Related to Agricultural Hemp

Anuradha Choudhary
University of Nebraska–Lincoln
143 Filley Hall, P.O. Box 830947
Lincoln, NE 68583-0947
402-472-2807
achoudhary3@unl.edu

Abigail Durheim
University of Nebraska–Lincoln
143 Filley Hall, P.O. Box 830947
Lincoln, NE 68583-0947
402-472-2807
abigail.durheim@huskers.unl.edu

Raquel Taylor
University of Nebraska–Lincoln
143 Filley Hall, P.O. Box 830947
Lincoln, NE 68583-0947
402-472-2807
rtaylor10@huskers.unl.edu

Kasey Harmon
University of Nebraska–Lincoln
143 Filley Hall, P.O. Box 830947
Lincoln, NE 68583-0947
402-472-2807
kharmon3@huskers.unl.edu

Dr. Taylor Ruth
University of Nebraska–Lincoln
218 Filley Hall, P.O. Box 830947
Lincoln, NE 68583-0947
402-472-8701
taylor.ruth@unl.edu

Dr. Nathan Conner
University of Nebraska–Lincoln
236 Filley Hall, P.O. Box 830947
Lincoln, NE 68583-0947
402-472-3938
nconner2@unl.edu

Dr. Blake Colclasure
Doane University
LI 117, Crete, NE 68333
402-826-6728
blake.colclasure@doane.edu

Introduction

The production of agricultural hemp was federally legalized in 2018 (United States Department of Agriculture [USDA], 2022). This legalization was aimed to help address the rapidly expanding domestic hemp market in the United States, which was valued at $824 million in 2021 (USDA, 2022). In 2019, Nebraska legalized the production of hemp, providing licenses to 84 farmers to start production in 2020 (Nebraska Department of Agriculture, 2020). While hemp is very different from marijuana, the two are often associated with one another leaving hemp with a potentially negative reputation (Cherney & Small, 2016). Consumers have trouble distinguishing the differences between hemp and marijuana and identifying associated misinformation (Ruth et al., 2023; Colclasure et al., 2021). Cooperative Extension programs can help address this issue because they are designed to bring "cutting-edge discoveries from research laboratories to those who can put knowledge into practice," (USDA, 2023, para. 1). To combat misinformation and consumers' lack of knowledge related to hemp (Ruth et al., 2023; Colclasure et al., 2021), Extension professionals and agricultural communicators should tailor their outreach and communication programs to provide accurate information that is relevant to their stakeholders. Therefore, the purpose of this study was to explore Nebraska consumers' information needs related to agricultural hemp.

Theoretical Framework

The theoretical framework used for this study was the *knowledge* element of the five-staged Innovation Decision Process (IDP) Model (Rogers, 2003). According to the IDP model, when individuals or other decision-making units decide to accept or reject an idea, concept, or physical practice, they pass through different stages of the model. The stages consist of gaining initial knowledge, forming an attitude toward acceptance or rejection, followed by implementation and confirmation. Specifically, in the knowledge stage, information-seeking activities occur, and then the information seeker processes it for further decision-making (Rogers, 2003). Guided by the knowledge element, this study sought what information Nebraska residents were interested in learning more about related to agricultural hemp. A display of expressed interest would show that the residents were motivated to change their knowledge, which would lead to a better understanding of the conversations centered around hemp and overcoming misperceptions related to hemp (Colclasure et al., 2021). However, people prefer to reject information that conflicts with their predispositions, either consciously or unconsciously, and only tend to expose themselves to ideas that align with their interests, needs, and existing attitudes, known as selective exposure (Hassinger, 1959). Therefore, it is important to understand consumers' information needs related to hemp so that Extension professionals and agricultural communicators can develop tailored education and communication campaigns.

Methods

Quantitative methods were used to fulfill the purpose of this study, and an online survey was distributed in February of 2022 via the online survey platform, Qualtrics. Purposive sampling was used, and the survey was distributed to an opt-in, non-probability sample of Nebraska residents who had to indicate they lived in Nebraska to take the survey. To help increase the generalizability of the responses, quotas were used to match Nebraska's census data for race, ethnicity, and gender. There was a total of 500 (n = 500) complete and usable responses for this study. The online survey instrument asked questions about attitudes and purchasing intent related to hemp, but only one question related to information needs was reported in this abstract. The question asked, "If you had the opportunity to learn more about hemp, which of the following topics would you be interested in learning more about?" Respondents were provided a list of topics based on prior literature (Colclasure et al., 2021) and were instructed to "check all that apply." Prior to distribution, the instrument was reviewed by a panel of experts with expertise in hemp cultivation and agricultural communication to account for face validity and was piloted at Doane University – no validity or reliability issues were identified (Field, 2013). All data were exported to and analyzed in SPSS version 26, and descriptive statistics were reported.

Findings

Data showed that about half of the respondents were interested in learning how hemp products can impact health (52.80%; Table 1). Other common hemp-related areas that respondents were interested in learning more about were the impact of hemp on Nebraska's economy (41.80%) and the differences between hemp and marijuana (36.80%). A minority of respondents said they were not interested in learning more about hemp (9.80%).

Table 1

Respondents Selection of Agricultural Hemp Topics They Wanted to Learn more About

Topic	*f*	%
How hemp products can impact health	264	52.80
Impact of hemp on Nebraska's economy	209	41.80
The difference between hemp and marijuana	184	36.80
Regulation of hemp production	168	33.60
How hemp products are regulated for safety	164	32.80
Impact of hemp production on the environment	151	30.20
Where hemp products can be purchased	123	24.60
I am not interested in learning more about hemp	49	9.80

Discussion, Implications, and Recommendations

Results from this study highlighted that respondents wanted to learn more about hemp. At least one-third of respondents were specifically interested in learning information about the health impacts of hemp products, hemp's economic impact in Nebraska, and differences between hemp and marijuana. Assuming Nebraska residents are in the knowledge stage of the IDP Model based on prior research highlighting a lack of knowledge regarding hemp (Colclasure et al., 2021), Extension and communicators should focus on these key subject areas to encourage further adoption as consumers progress through the remaining four stages of the IDP Model (Rogers, 2003). As Extension and communicators provide tailored outreach programs to their stakeholders, consumers will most likely turn to these groups to seek reliable information related to agricultural hemp, which can help to increase overall knowledge and adoption of hemp. For future research, replications of this study should seek to identify differences between rural and urban populations' understanding of hemp, which would be beneficial to inform targeted communication. These findings could also be compared to actual hemp knowledge to understand if there is consistency between what consumers want to learn about and where they are lacking knowledge. Finally, this study should be replicated in other states to increase the generalizability of the findings and develop comprehensive information campaigns related to agricultural hemp.

References

Cherney, J. H., & Small, E. (2016). Industrial hemp in North America: Production, politics and potential. *Agronomy, 6*(4), 1-24. https://doi.org/10.3390/agronomy6040058

Colclasure, B. C., Ruth, T. K., Brooks, T., & Holmes, A. (2021). Hemp, hemp, hooray: The impact of a hemp educational campaign on college students' attitudes and knowledge of industrial hemp. *Journal of Agricultural Education, 62*(1), 246–259. https://doi.org/10.5032/jae.2021.01246

Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. SAGE.

Hassinger, E. (1959). Stages in the adoption process. *Rural Sociology*, *24*, 52-53.

Nebraska Department of Agriculture (2020). *Hemp program annual summary 2020.*

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.

Ruth, T., Durheim, A., Colclasure, B., Randolph, L., & Rogers-Randolph, T. (2023). *The effect of message (mis)Information on consumers' attitudes toward hemp.* Paper presented at the 2023 American Association for Agricultural Education Southern Region Conference, Oklahoma City, OK.

United States Department of Agriculture (2022). *National hemp report*. https://downloads.usda.library.cornell.edu/usda-esmis/files/gf06h2430/xd07hw825/v692v917t/hempan22.pdf

United States Department of Agriculture. (2023). *Cooperative Extension System*. USDA NIFA. https://www.nifa.usda.gov/about-nifa/how-we-work/extension/cooperative-extension-system

Identifying the Topic Areas Presented in Feature Stories on the Australian Broadcasting Corporation's *Landline*

Dr. Courtney Meyers
Professor
Department of Agricultural Education and Communications
Texas Tech University
courtney.meyers@ttu.edu
Box 42131
Lubbock, TX 79409
806-742-2816

Introduction/Need for Research

In 1991, the Australian Broadcasting Corporation (ABC) launched *Landline,* the "only national agricultural television program covering stories from Australia's rural and regional heartland" (*Landline*, 2022, para. 1). *Landline*'s focus is to provide news about rural current affairs. *Landline* currently airs each Sunday at 12:30 p.m. with a running time just under one hour and no commercial breaks. Each broadcast has a host and includes several pre-recorded segments: feature stories, market/finance report, news, and weather. According to the ABC's 2022 Annual Report, *Landline* consistently receives high scores for both quality and distinctiveness (ABC, 2022, p. 30). While scholars have examined other ABC programming such as *The Country Hour* radio program (Mesikämmen et al., 2021; Waller et al., 2020) and *Four Corners*, a current affairs program (Cordell, 2009; Cullen-Knox, 2019), no studies were identified that explored *Landline*'s content. The purpose of this study was to describe the feature story content on ABC's *Landline* television program during a 6-month period in 2022 (February-July). The research question was: What are the topic areas of feature stories aired on *Landline*?

Theoretical Framework

Agenda setting theory posits the media can influence what topics or issues people view as important. According to McCombs and Shaw (1972), mass media do not tell people what to think, but rather what to think about. First-level agenda setting addresses the amount of coverage an issue receives with the assumption that the media determine what issues the audience know about. Second-level agenda setting assesses the characteristics or salience of those issues as they are presented in the media (Wu & Coleman, 2009).

Methods

This qualitative content analysis (Schreier, 2019) was a first-level agenda setting study of the topic areas presented on *Landline.* Using Informit, a database of Australian free-to-air television news programs, I conducted a search for *Landline* as the source title. The program's season begins in February so that was selected as the beginning month and all segments available through six months (ending in July) were included for analysis (24 episodes). Transcripts are not included in the database, but I was able to manually access 173 segments to record the length and segment descriptions. This process allowed me to determine if the segment was a feature story or other regular segment (i.e., weather, markets, news, or farm fact). I identified 89 feature story segments that varied in length from approximately 6 to 20 minutes. Following Schreier's (2019) recommendations for qualitative content analysis, I reviewed each segment's title and description and grouped the segments into thematic categories using a structuring approach. As I read the first feature story description, I created a subcategory and category to describe the topic area presented. Then as I continued to read each segment description, I determined if it could be assigned to an existing category and subcategory or if new ones were needed. I continued to evaluate each segment based on this process and re-reviewed the assigned codes to constantly reassess the similarity or dissimilarity of the content (Schreier, 2019).

Results

Each of the 24 episodes had either 3 (n = 7) or 4 (n = 17) feature stories. A thematic analysis of the 89 individual feature stories identified 13 categories (Table 1).

Table 1
Frequency of Categories Identified in Landline*'s Feature Stories*

Category	Subcategories	*f*	%
Rural Issues	agrotourism, water use, healthcare, mining, rural internet, mental health	12	13.5
Natural Resources	kangaroos, wild fish, trees, reef, coastal waters, endangered species	11	12.4
Farm Life/Labor	on-farm workers, highlight of specific farm, transport, sheep shearing, using mules, working dogs	10	11.2
Crisis	floods, varroa mite, bushfire, costs, supply chain strain	8	9.0
History	refrigeration, garment patterns, Utes, ghost town, Land Girls, Gold Mill towns	8	9.0
Farm/Farmer Profile	sheep breeder, winery, orchard, cattle and sheep stations	8	9.0
Innovation	big data, social media, new crop varieties, new practices or applications	7	7.9
Produce	potatoes, garlic, macadamias, tomato, local food	7	7.9
Red Meat Industry	live export, market demand, goat meat, cattle hides	4	4.5
Dairy Industry	Family dairies, modern dairies, milk demand, health	4	4.5
Non-farm Profile	artist, sawmill operator, abattoir choir	3	3.4
Seafood	oysters, rock lobster, other oceanic fish	3	3.4
Carbon	sequestration, economy	2	2.2
Ag Ed/Training	Royal Agricultural Society, prison farms	2	2.2

Conclusions/Discussion/Recommendations

ABC's *Landline* has been a mainstay in reporting Australian agriculture for more than 30 years (ABC, 2022). This study was an initial foray into exploring this rich source of information about Australian agriculture and rural life. During this six-month timeframe, *Landline* aired 89 feature stories about a variety of topics. First-level agenda setting posits the media can influence what people view as important issues (Wu & Coleman, 2009). The categories with the most segments were about more comprehensive issues that might interest a broad audience. "Rural Issues" and "Natural Resources" are not limited to a specific farm or commodity while "Farm Life/Labor" may be similar for many in *Landline*'s audience. The feature stories also reflected current events such as natural disasters and highlighted innovations in agriculture. Few stories were dedicated to a commodity-specific topic, but these stories did address diverse industries from garlic to goat meat. These findings suggest that coverage about general interest topics or current events were prioritized over novel or unique stories. The current study was limited to what topics were presented in the feature stories and not the other segments. Additional research of *Landline*'s coverage will provide a more thorough understanding of what topics are reported, which may influence the public agenda. Agenda setting research also requires asking the audience what they view as important issues to compare to the media coverage, which presents another recommendation for research. For practical recommendations, this program would be an ideal example to show in agricultural communications courses to discuss storytelling and video composition as well as international agricultural issues.

References

Australian Broadcasting Corporation. (2022). *Annual Report 2022.* Retrieved from https://about.abc.net.au/wp-content/uploads/2022/10/2021-22-ABC-Annual-Report.pdf

Cordell, M. (2009). What is happening to investigative journalism?: A pilot study of ABC's Four Corners. *Pacific Journalism Review*, *15*(2), 118-131.

Cullen-Knox, C., Fleming, A., Lester, L., & Ogier, E. (2019). Publicised scrutiny and mediatised environmental conflict: The case of Tasmanian salmon aquaculture. *Marine Policy, 100*, 307-315. https://doi.org/10.1016/j.marpol.2018.11.040.

Landline. (2022). *Homepage.* Retrieved from https://iview.abc.net.au/show/landline

Mesikämmen, E., Waller, L., & Burkett, B. (2021). Water wars: A "critical listening in" to rural radio discourse on a river system in trouble. *Environmental Communication, 15*(3), 369-385. https://doi.org/10.1080/17524032.2020.1837901

McCombs, M. E., & Shaw, D. L. (1972). The agenda-setting function of mass media. *Public Opinion Quarterly, 36* (Summer), 176-187.

Schreier, M., (2019). *Content Analysis, Qualitative.* In P. Atkinson, S. Delamont, A. Cernat, J.W. Sakshaug, & R.A. Williams (Eds.), *SAGE Research Methods Foundations.* https://dx.doi.org/10.4135/9781526421036753373

Waller, L., Mesikämmen, E., & Burkett, B. (2020). Rural radio and the everyday politics of settlement on Indigenous land. *Media, Culture & Society, 42*(6), 805-822. https://doi.org/10.1177/0163443719876620

Wu, D., & Coleman, R. (2009). Advancing agenda-setting theory: The comparative strength and new contingent conditions of the two levels of agenda-setting effects. *J&MC Quarterly*, *86*(4), 775-789.

Is Cooperative Extension Prepared to Promote Precision Agriculture Technologies?

Chin-Ling Lee, Ph.D.
Robert Strong, Ph.D.
Gary E. Briers, Ph.D.
Theresa P. Murphrey, Ph.D.
Nithya Rajan, Ph.D.
Texas A&M University

Shelli Rampold, Ph.D.
University of Tennessee

Primary author:
Chin-Ling Lee, Ph.D.
2116 TAMU
College Station, TX. 77843-2116
979-845-1139
cllee1261@tamu.edu
Texas A&M University

Introduction/need for research

Investigating stakeholders' adoption decisions of innovative technologies is the second priority of the American Association for Agricultural Education's *National Research Agenda* (Lindner et al., 2016). Digital transformation has created opportunities for the provision of smart farming tools. While much work remains to be done in smart agriculture, the need for farmers to adopt smart agricultural technologies has been increasing (Monteiro et al., 2021). The promotion of precision farming technologies and increasing their adoption rates will be indispensable for the sustainable development of global agriculture (Bhakta, 2019).

The capacity of precision agriculture Extension professionals is an important part of improving the quality of Extension services to meet farmers' needs (Mikwamba et al., 2021). Farmers may not adopt technology due to Extension professionals' lack of communication of precision agriculture technologies (Lee et al., 2021). Understanding the predictors that can increase the likelihood of Extension professionals promoting precision farming will simultaneously enhance food security and contribute to global Sustainable Development Goals (Seitz et al., 2022).

Theoretical framework

We used the unified theory on the acceptance and use of technology (UTAUT) model (Venkatesh et al., 2003) and Bandura's (1993) theory of self-efficacy in our study. Performance expectancy is the degree to which using technologies improves an individual's performance. Effort expectancy is the perception of ease of use (Venkatesh et al., 2003). Social influence is the extent to which influential people believe that individuals should use technology. Facilitating conditions are the extent to which individuals believe that infrastructure exists to support technology usage. Self-efficacy is an individual's belief in one's ability to produce achievements (Bandura, 1993). The purpose was to assess the effect of self-efficacy, performance expectancy, effort expectancy, social influence, facilitating conditions, age, gender, and years of service on Extension professionals' behavioral intentions to promote precision agriculture technologies.

Methodology

We followed Dillman et al.'s (2014) survey design method of five steps for contacting participants and collecting data. Two hundred fifty-five (n = 255) of 507 Extension professionals responded to a survey with thirty-eight statements measuring six multi-item scales, resulting in a response rate of 50.3%. Criterion validity was assessed by agricultural education and crop sciences scholars. Internal consistency was measured by Cronbach's (1951) alpha coefficient for each construct, yielding coefficients of .93 for self-efficacy, .91 for performance expectancy, .89 for effort expectancy, .75 for facilitating conditions, .86 for social influence, and .95 for behavioral intention. Cronbach (1951) indicated that reliability coefficients of .70 or more are good. A Pearson correlation analysis examined the relationship between each of eight independent variables and behavioral intention. We also conducted multiple regression to investigate the effects of independent variables on behavioral intention.

Results/findings

Zero order correlations were calculated to examine relationships between the primary outcome variable (behavioral intention) and each of the possible predictor variables. A significant positive relationship existed between behavioral intention and performance expectancy ($r = .72$, $p < .01$) indicating a very strong correlation. Social influence ($r = .64$, $p < .01$), self-efficacy ($r = .54$, $p < .01$), and effort expectancy ($r = .50$, $p < .01$) had substantial correlations with behavioral intention. Facilitating conditions ($r = .44$, $p < .01$) was moderately correlated with behavioral intention.

All independent variables were entered into a regression equation to predict behavioral intention. The regression model explained 64% of the variance in behavioral intention ($R^2 = .64$, $F(8, 177) = 37.62$, $p <.01$). The results indicated performance expectancy, social influence, and facilitating conditions significantly ($p <.01$) predicted behavioral intention to promote precision agriculture technologies. On the other hand, self-efficacy ($p = .52$), effort expectancy ($p = .74$), age ($p = .08$), gender ($p = .85$), and years of service ($p = .05$) were not significant predictors of behavioral intention. A reduced regression equation was created using the three statistically significant predictors. Behavioral intention to promote precision agriculture technologies was equal to .45 intercept + .40 × performance expectancy + .32 × social influence + .15 × facilitating conditions, as predicted by Extension professionals.

Conclusions

The extent Extension professionals believed the technologies improve their performance, are adopted, and promoted by credible members in their social system, and if the physical and human infrastructure is provided by the system predicted professionals’ precision agriculture promotions to stakeholders. The symbiosis of the technologies' positive attributes to the professional benefit of change agents' development predicted their promotion of climate-smart technologies to stakeholders. When Extension professionals perceive promoting precision agriculture as beneficial either to themselves or to others, faster behavioral change process may occur. The organizational and technical infrastructure supporting the use of technologies predicted Extension professionals' behavior to promote precision agriculture technologies.

Implications/recommendations/impact on profession

Strategic professional development initiatives would assist Extension professionals to learn the extent to which technologies improve job performance. Further, mentorship programs and professional associations should be utilized to foster the diffusion of precision agriculture technologies to mentees, and Extension organizations should invest in physical and human capital of the technologies to improve professionals’ intention to promote precision agriculture (Venkatesh et al., 2003). It is necessary to strengthen Extension professionals' training in the promotion of precision agriculture technologies to achieve food security for all (Strong et al., 2022). Food insecurity cannot be reduced and agricultural land sustainability cannot be improved without competent professionals serving as change agents, translating agricultural technology research to stakeholders (Lee et al., 2021). The study produced a UTAUT illustration juxtaposed to Venkatesh et al. (2003), informing our profession (Lindner et al., 2016) that technology acceptance and adoption are more multidimensional than previously reported.

References

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28*(2), 117–148. https://doi.org/10.1207/s15326985ep2802_3

Bhakta, I., Phadikar, S., & Majumder, K. (2019). State-of-the-art technologies in precision agriculture: A systematic review. *Journal of the Science of Food and Agriculture*, *99*(11), 4878–4888. https://doi.org/10.1002/jsfa.9693

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*, 297–334. https://doi.org/10.1007/BF02310555

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th ed.). John Wiley & Sons.

Lee, C.-L., Strong, R., & Dooley, K. (2021). Analyzing precision agriculture adoption across the globe: A systematic review of scholarship from 1999–2020. *Sustainability*, *13*(18), 10295. https://doi.org/10.3390/su131810295

Lindner, J. R., Rodriguez, M. T., Strong, R., Jones, D., & Layfield, D. (2016). Research priority area 2: New technologies, practices, and products adoption decisions. In Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). *American Association for Agricultural Education national research agenda: 2016-2020*. Gainesville, FL: Department of Agricultural Education and Communication.

Mikwamba, K., Dessein, J., Kambewa, D., Messely, L. & Strong, R. (2021). Collaborative governance dynamics in innovation platforms: case of Malawi's District Stakeholder Panel. *The Journal of Agricultural Education and Extension, 27*(2), 255-275. https://doi.org/10.1080/1389224X.2020.1844767

Monteiro, A., Santos, S., & Goncalves P. (2021). Precision agriculture for crop and livestock farming–Brief review. *Animals, 11*(8), 1–18. https://doi.org/10.3390/ani11082345

Seitz, P., Strong, R., Hague, S., & Murphrey T. P. (2022). Evaluating agricultural extension agent's sustainable cotton land production competencies: Subject matter discrepancies restricting farmers' information adoption. *Land*, *11*(11), 2075. https://doi.org/10.3390/land11112075

Strong, R., Wynn II, J. T., Lindner, J. R., & Palmer, K. (2022). Evaluating Brazilian agriculturalists' IoT smart agriculture adoption barriers: Understanding stakeholder salience prior to launching an innovation. *Sensors, 22*(18), 6833. https://doi.org/10.3390/s22186833

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478. https://doi.org/10.2307/30036540

Predicting Adopters and Non-Adopters of Precision Agriculture Technologies

Dr. Patterson Hillaire
Dr. Kirk A. Swortzel
Mississippi State University

Predicting Adopters and Non-Adopters of Precision Agriculture Technologies

Introduction

While the adoption literature about precision agriculture technologies continues to be prevalent, sufficient literature is not available to explain recent adoption trends of precision agriculture among row-crop producers in the southern US. Hudson and Hite (2001) surveyed row-crop producers about their use and perceptions of precision agricultural technologies and found that row-crop framers had primarily adopted soil sampling and precision agricultural analysis techniques. However, Hudson and Hite (2001) also found that other precision agriculture technologies, such as GPS guidance and variable rate applications, continued to be adopted at a low rate.

Poindexter (2018) conducted a similar adoption study where he found that farm size and age had a considerable influence on the adoption of auto-steer among row-crop producers in Mississippi. Other adoption studies have included states in the Southeast in their analysis (Edge et al. 2018; Erickson et al., 2017), but their focal populations were not exclusively farmers in those states. To date, little empirical evidence exists that describe the different precision agricultural practices being used, how those practices are being used, and why those practices are being used among row-crop producers in southern US states.

The purpose of this study was to investigate what precision agricultural practices selected row-crop (soybean, wheat, corn, cotton, peanuts, and rice) producers have adopted in selected southern US states. The following were specific research objectives for the study: (1) Predict the likelihood of farmers classified as adopters or non-adopters of precision agriculture by the variables of farm size and age and row crop producers, and (2) Predict the number of precision agricultural technologies adopted by row-crop producers based on the variables of farm size, age, and perceived innovations attributes (relative advantage, compatibility, complexity, observability, and trialability).

Theoretical Framework

Rogers' (2003) Diffusion of Innovations Theory provided the theoretical framework for this study. Diffusion can be defined as "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 2003, p. 35). In comparison, adoption is considered a decision made by an individual or organization to accept, modify, reject, or discontinue a given innovation (Kee, 2017). Rogers (2003) posited that "innovation", "communication channel", "time" and a "social system" are the four fundamental elements of the diffusion of innovations theory (p. 11). Rogers (2003) indicated that based on the characteristics of individuals described above, they can be classified into adopter categories, which he termed "innovators", "early adopters", "early majority", "late majority", and "laggards" (p. 284).

Methodology

For this correlational research study, a convenience sample of row-crop farmers who attended the Mississippi State University Extension 2021 Row Crop Short Course, the Tri-State Soybean Forum, the National Black Growers Council Annual Meeting, and Auburn University Extension 2022 Row Crops Short Course filled out the questionnaire along with farmers on the [experiment station] and US FARM DATA mailing list were emailed a link (n = 151) with 126 usable responses. The instrument was devised using the CropLife/Purdue precision agriculture services dealership questionnaire (Lowenberg-DeBoer & Erickson, 2019) and Moore and Benbasat's (1991) questionnaire designed to measure the perceptions of adopting information technology innovations. Since 1997, the CropLife/Purdue survey has been collecting information concerning the development and adoption of precision agricultural trends (Lowenberg-DeBoer & Erickson, 2019). Additional questions were developed by the research to measure perceived innovation attributes of precision agriculture. The independent variables of farm size and age were entered into a logistic regression model to determine the likelihood of farmers being adopters or non-adopters of precision agriculture practices. Multiple linear regression was also used to predict the number of precision agricultural technologies adopted by row-crop producers based on the variables of farm size, age, and perceived innovations attributes (relative advantage, compatibility, complexity, observability, and trialability).

Results

A logistic regression analysis was conducted to determine whether precision agriculture practices could be predicted by the age of row-crop producers and the amount of total acreage they farmed. A Nagelkerke $R^2 = .163$ for the full model suggested that 16.3% of the variance experienced in the dependent variable could be explained by the independent variables of producers' age and amount of acreage farmed. Results indicated that the predictors, as a pair, can reliably distinguish between adopters of precision agriculture practices compared to non-adopters of precision agriculture practices. Considering the two predictors in the model, only the amount of acreage was a statistically significant predictor for whether a producer adopted or did not adopt precision agriculture as a practice (Wald = 7.07, $df = 1$, $p = .008$). The age of row crop producers as a predictor was not statistically significant, which implied that the odds of adopting or not adopting autosteer remained the same regardless of producers' age. Results from the multiple regression analysis suggested the number of acres respondents farmed, age of the producers, and precision agriculture perceived attributes did not significantly contribute to the total variation as it concerned the amount of precision agricultural technologies adopted, $F(6,93) = 1.194$, $p = .317$. However, the amount of acreage farmed by row-crop producers was a significant predictor of the total amount of precision agricultural technologies adopted ($t = -2.28$, $df = 93$ $p = .019$).

Conclusions

The age of producers and how they perceived precision agriculture was not a significant determinant of whether or not they had adopted precision agriculture. In contrast, the amount of acreage a producer farmed was a significant determinant of whether they had adopted precision agriculture. Furthermore, the number of acres respondents farmed, age of the producers, and precision agriculture perceived attributes did not significantly contribute to the total amount of precision agricultural technologies adopted. However, the amount of acreage farmed by row-crop producers in this survey was a significant predictor of the total amount of precision agricultural technologies adopted.

Implications/Recommendations

Precision agriculture has the potential to improve the efficiency of agriculture (Shannon et al., 2018). While the majority of row-crops producers surveyed had adopted some form of precision agriculture, there is not a full adoption of the precision agriculture practices and technologies. Future research may be beneficial to understand why some farmers were willing to adopt the different precision agriculture practices and technologies and why some did not. Researchers should consider investigating what factors influenced the adoption of precision agriculture other than age, farm size, and perception toward precision agriculture. Future investigations should focus on how the type of crop harvested, PA information source, PA services providers, region, and willingness to pay for PA influence row crop producers' decision to adopt precision agriculture.

References

Edge, B., Velandia, M., Boyer, C., Larson, J., Lambert, D., Roberts, R., & Falconer, L. (2018). Automatic section control technologies and GPS auto-guidance systems adoption in cotton production. *Journal of Agricultural Science*, *10*(7), 282–294.

Erickson, B., Lowenberg-DeBoer, J., & Bradford, J. (2017). *2017 Precision agriculture dealership survey.* Department of Agricultural Economics, Purdue University. https://agribusiness.purdue.edu/wp-content/uploads/2019/07/croplife-purdue-2017-precision-dealer-survey-report.pdf

Hudson, D., & Hite, D. (2001). *Adoption of precision agriculture technology in Mississippi: preliminary results from a producer survey*. Mississippi State University. https://ageconsearch.umn.edu/record/15787/

Kee, K. F. (2017). *Adoption and diffusion.* The international encyclopedia of organizational communication. John Wiley & Sons, Inc. https://www.chapman.edu/research/institutes- and-centers/leatherby-center/_files/research-office-photos/Adoption-and-Diffusion.pdf

Lowenberg-DeBoer, J., & Erickson, B. (2019). Setting the record straight on precision agriculture adoption. *Agronomy Journal*, *111*(4), 1552. https://doi.org/10.2134/agronj2018.12.0779

Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, *2*(3), 192–222. https://doi.org/10.1287/isre.2.3.192

Poindexter, P.J. (2018). *Investigating the adoption of auto-steer by row-crop farmers in [state]* (Publication No. 10841453). [Doctoral dissertation, [state] University]. Proquest Dissertations and Theses Global.

Rogers, E.M. (2003). *Diffusion of innovations.* Free Press.

Shannon, D. K, Clay, D.E, & Sudduth, K.A. (2018) An Introduction to precision agriculture. In (Shannon, D.K., Clay, D.E, & Kitchen, N.R) *Precision agriculture basics*, (1-12). American Society of Agronomy, Inc; Crop Science of America; Soil Science Society of America.

Social Network Analysis of an Agricultural Leadership Program

Laura L. Greenhaw
Department of Agricultural Education and Communication
University of Florida

Matthew Gold
Department of Agricultural Education and Communication
University of Florida

PO Box 110540
Gainesville, FL 32611-0540
352-294-6766
laura.greenhaw@ufl.edu

Introduction/Need for Research

Social networks can be described as structures consisting of individuals (nodes) and their relationships (ties) (Li, 2013). Cullen-Lester et al. (2017), acknowledge the importance of social networks in a "collective's ability to produce leadership" (p. 146). Therefore, leadership development must address relationships in the targeted group. Van De Valk and Constas (2011) found that leadership development programs (LDPs) frequently suggest that participants may increase their networks through program participation. However, a critical analysis of the limited published research revealed inadequate evidence to support causal inference between change in network and LDP participation. The authors advocated for improved LDP evaluation (Van De Valk & Constas, 2011). Hoppe and Reinelt (2010) called specifically for the use of social network analysis (SNA) to evaluate LDPs. Moreover, Cullen-Lester et al. (2017) identified a dearth of research on the development of collective leadership networks. Therefore, the purpose of this study was to explore the network of an LDP cohort before and after the program.

Conceptual or Theoretical Framework

Social network analysis (SNA) applies a structural approach to studying the interaction among social actors in a network (Freeman, 2004). This approach is "grounded in the intuitive notion that the patterning of social ties in which actors are embedded has important consequences for those actors" (Freeman, 2004, p. 2). The research emphasizes the characteristics of the structure, rather than the individual nodes and ties. There are two fundamental approaches to network analysis, whole-network analysis, and personal or ego network analysis. We utilized whole-network analysis, exploring the ties among all pairs of nodes in the network.

Methodology

We used SNA to investigate network changes of one agriculture and natural resources (ANR) LDP cohort. We sought to characterize the structure of the network by understanding the ties between each set of participants in the cohort. We administered a reflective-pre and post survey to participants via Qualtrics at the conclusion of their LDP. Participants indicated the frequency with which they initiated interaction with each of their classmates in their role as an industry leader on a five-point scale with indicators of never, once or twice a year, once or twice a month, at least weekly, and daily. We exported the data from Qualtrics into Microsoft Excel to be cleaned and recoded. We collected participant demographics, or attributes in SNA, including age, gender, industry sector, and geographic region. We analyzed data in UCINET, calculating whole network statistics. Visualizations were created using NetDraw.

Results/Findings

Participants in the Resource Education & Agricultural Leadership (REAL) Oregon program travel to different locations across the state once per month for five months, developing leadership skills and learning about Oregon's agriculture and natural resources (REAL Oregon, 2021). The program cohort included 23 leaders from five agricultural industries. Nine from production agriculture, three from forestry, two from transportation, seven from agricultural support, and two from education. Twelve participants identified as female and eleven as male, with ages ranging from 28 to 60 years old. Whole-network measures characterized the cohesiveness of the cohort. Number of ties represents the total number of ties between nodes in the network and average degree indicates the mean number of ties each node reported. The number of ties in proportion to the number of ties possible indicates density, while connectedness is the proportion of pairs of nodes that can reach each other by some path. Finally, the degree of centralization represents the extent to which the network centers around a single node. Pre- and post- program whole network characteristics can be seen in Table 1 and Figure 1.

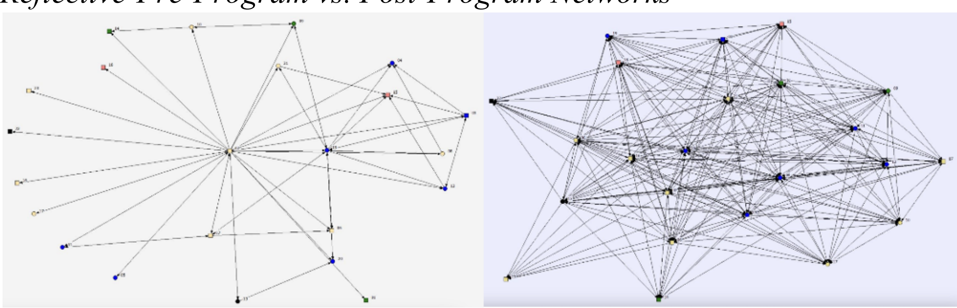
Table 1

Whole Network Measures Pre- vs. Post- Program

Whole Network Measures	Pre-Program	Post-Program
Number of Ties	52	329
Average Degree	2.261	14.304
Density	0.103	0.650
Connectedness	0.439	0.870
Degree of Centralization	0.909	0.190

Figure 1

Reflective-Pre-Program vs. Post-Program Networks



Conclusions

Predictably, cohesiveness of the class increased, indicating that classmates developed new relationships with one another over the course of the program. Moreover, centralization of the network decreased, such that connections were more evenly distributed across pairs of nodes rather than any one participant being a central figure in the network.

Implications/Recommendations/Impact on Profession

ANR LDPs play a crucial role in building collective leadership capacity of the industry (Cullen-Lester et al., 2017). Increased cohesiveness among ANR leaders may support leadership approaches that consider a more holistic view of the industry. Moreover, information and resources can be shared more comprehensively and quickly in a decentralized network, possibly producing more effective systems-thinking approaches to complex problem-solving. We recommend that ANR LDPs emphasize the value and importance of network development to program participants. Additional research should seek to establish causal inference between network change and program participation. Furthermore, this study should be replicated with additional classes in other programs. Finally, qualitative inquiry may uncover meaningful insight into the nature and usefulness of relationships developed through ANR LDPs.

References

Cullen-Lester, K. L., Maupin, C. K., & Carter, D. R. (2017) Incorporating social networks into leadership development: A conceptual model and evaluation of research and practice. *The Leadership Quarterly, 28*(1), 130-152. https://doi.org/10.1016/j.leaqua.2016.10.005

Freeman, L. C. (2004). *The development of social network analysis: A study in the sociology of science*. Empirical Press.

Hoppe, B. & Reinelt, C. (2010). Social network analysis and the evaluation of leadership networks. *The Leadership Quarterly, 21*(4), https://doi.org/10.1016/j.leaqua.2010.06.004

Li, M. (2013). Social network and social capital in leadership and management research: A review of causal methods. *The Leadership Quarterly, 24*(5), 638-665. https://doi.org/10.1016/j.leaqua.2013.04.005

REAL Oregon. (2021). *Resource Education & Agricultural Leadership Oregon.* Retrieved October 9, 2022, from realoregon.net

Van De Valk, L. J. & Constas, M. A. (2011). A methodological review of research on leadership development and social capital: Is there a cause and effect relationship? *Adult Education Quarterly 61*(1), 73-90. https://doi.org/10.1177/0741713610380443

Statistical Power in the *Journal of Agricultural Education*, 2012 – 2022

Henry Akwah
Graduate Assistant
University of Arkansas
1120 W. Maple St.
AFLS E111
Fayetteville, AR 72701
(479) 575-2035
hoakwah@uark.edu

Christopher M. Estepp
Associate Professor
University of Arkansas
1120 W. Maple St.
AFLS E111
Fayetteville, AR 72701
(479) 575-2035
estepp@uark.edu

Donald M. Johnson
University Professor
University of Arkansas
1120 W. Maple St.
AFLS E111
Fayetteville, AR 72701
(479) 575-2035
dmjohnso@uark.edu

Statistical Power in the *Journal of Agricultural Education*, 2012 - 2022

Statistical power has been defined as the probability of finding a statistically significant result with an inferential statistical test when an effect actually exists in the population (Turner & Houle, 2018). Stated differently, statistical power is the probability of avoiding a Type II error, which occurs when a researcher fails to reject the null hypothesis when the null hypothesis is false in the population (Glass & Hopkins, 1996). Statistical power increases as sample size gets larger, the alpha level of the statistical test increases (i.e., from .05 to .10), and when an amplified magnitude of the effect occurs in the population (Glass & Hopkins, 1996). While the latter method of increasing power is outside the direct control of the researcher, the first two can be controlled. Cohen (1988) recommended a minimum power of .80 when conducting inferential statistical tests. However, because increasing the alpha level directly increases the probability of committing a Type I error (rejecting a true null hypothesis), the preferred method of increasing statistical power is to increase sample size (Turner & Houle, 2018).

Theoretical Framework

This research was framed using Ajzen's (1991) Theory of Planned Behavior (TPB). According to the TPD, an individual's decision to engage in a specific behavior depends on their attitude, their subjective norms, and their perceived behavioral control related to the behavior. This research aims to increase the profession's positive attitudes, subjective norms, and perceived behavioral control toward the intended behavior of increased consideration of statistical power when planning and conducting research employing inferential statistics.

Purpose

The purpose of this study was to determine the statistical power (at the small, medium, and large effect sizes) for inferential statistical tests reported in articles published in the *Journal of Agricultural Education* (*JAE*), 2012 – 2022.

Methods

The researchers manually examined each published article in *JAE* between 2012 and 2022, inclusive, and identified all articles where inferential statistics were used. A coding sheet was developed, and the following data was collected for each inferential statistical test reported; the specific statistical tests used, the total number of subjects included in each analysis, the number of subjects per group, and the stated alpha level. For multiple regression, the number of predictor variables in the model were also recorded, and for MANOVA, the number of dependent variables was also recorded. G*Power Version 3.1.9.2 (Faul et al., 2007) software was used to calculate the statistical power for each inferential statistical test at the small, medium, and large effect sizes as summarized by Kotrlik et al. (2011).

Results

Seventy inferential statistical tests (See table 1) were reported in *JAE* for the 11 years between 2012 and 2022. The most frequently reported tests were bivariate correlations (27.1%), independent *t*-tests (24.6%), and one-way ANOVAs (22.9%), while one-way MANOVAs

(2.9%), and bivariate regression (1.4%) were the least commonly reported inferential statistics. At the small effect size, mean statistical power ranged from 0.101 (one-way MANOVA) to 0.625 (paired *t*-test), while at the medium effect size, mean statistical power ranged from 0.310 for factorial ANOVA to 0.989 for paired *t*-tests. Lastly, at the large effect size, mean statistical power ranged from 0.680 (factorial ANOVA) to 1.0 for both paired *t*-tests and bivariate regression.

Table 1

Descriptive Statistics for Mean Power by Test and Effect Size

		Effect size					
		Small		Medium		Large	
Statistical Test	*n*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Independent *t*-test	17	0.314	0.300	0.667	0.332	0.867	0.214
Paired *t*-test	4	0.625	0.305	0.989	0.019	1.000	0.000
One-way ANOVA	16	0.403	0.331	0.812	0.220	0.968	0.068
Factorial ANOVA	3	0.086	0.007	0.310	0.024	0.680	0.012
One-way MANOVA	2	0.101	0.019	0.436	0.095	0.855	0.068
Factorial MANOVA	4	0.428	0.438	0.650	0.433	0.778	0.374
Multiple regression	4	0.415	0.388	0.931	0.076	0.999	0.001
Bivariate correlation	19	0.333	0.291	0.861	0.192	0.986	0.039
Bivariate regression	1	0.346	-	0.990	-	1.000	-

Conclusions and Recommendations

For small effects none of the tests reached the minimum recommended statistical power of 0.80 (Cohen, 1988). The mean power for independent *t*-tests, factorial ANOVA, one-way MANOVA, and Factorial MANOVA were less than the recommended statistical power at the medium effect size; however, paired t-tests, one-way ANOVA, multiple regression, and bivariate regression all had power greater than .80. At the large effect size, factorial ANOVA and factorial MANOVA were the only statistical test reported with a mean power less than Cohen's recommendation. Overall, tests reported in *JAE* between 2012 and 2022 were capable of detecting large effects at an acceptable level, however, were less effective for medium and small effects. Researchers should consider statistical power as studies are planned and select appropriate sample sizes to ensure acceptable power for the anticipated effect size. Additionally, researchers should report statistical power for all inferential analyses. This would enable other researchers to determine if reported non-significant differences were due to no effect in the population or low statistical power.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Erlbaum.

Faul, F., Erdfelder, E., Lang, A.G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175-191.

Glass, G.V., & Hopkins, K.D. (1996). *Statistical methods in education and psychology* (3rd ed.). Allyn & Bacon.

Kotrlik, J.W., Williams, H.A, & Jabor, M.K. (2011). Reporting and interpreting effect size in quantitative agricultural education research. *Journal of Agricultural Education, 52(1), 132-142. https://doi.org/10.5032/jae.2011.01132*

Turner, D., & Houle, T.T. (2018). The importance of statistical power calculations. *The Journal of Head and Face Pain, 58*(8), 1187-1191.

Successful Teaching Methods for Middle School Agricultural Education in Kansas

Ali Herbel
Moundridge Middle/High School
Moundridge, KS 67107
atorr@ksu.edu

Dr. Gaea Hock
Kansas State University
315 Umberger
Manhattan, KS 66506
785-532-1166
ghock@ksu.edu

Dr. Brandie Disberger
Kansas State University
316 Umberger
Manhattan, KS 66506
785-532-1166
ghock@ksu.edu

Dr. Lori Goodson
Kansas State University
006 Bluemont Hall
Manhattan, KS 66506
785-532-5525

Successful Teaching Methods for Middle School Agricultural Education in Kansas

Introduction/Literature Review

Middle schools are unique entities that must be recognized independently from secondary and elementary school because of the nature of their students (Golden et al., 2014). The age range varies, but most define middle school as students in grades six through eight (Jones et al., 2020). Students in this age range are growing and changing in many areas. This is a time when young adolescents are developing their thinking and social skills (Kansky, 2021). These changes impact how they learn and how teachers should teach them. The Association for Middle Level Education (2020) recommends challenging and exploratory curriculum with a focus on active and purposeful instructional activities.

Middle school agricultural education (MSAE) continues to grow and develop (Jones et al., 2020) across the United States. The number of students in middle school programs has grown from 52,968 students in 1992 (Rossetti, 1992) to more than 107,856 students in 2020 (Jones et al., 2020). Although many teachers enjoy teaching middle school students, there is little middle level education instruction required of preservice agricultural education instructors (Jones et al., 2020). This study focused on the teaching strategies of MSAE teachers to identify best practices and make recommendations for future improvements.

Theoretical Framework

Piaget's cognitive development theory (1952) served as the theoretical framework for this study with focus on two stages of development. Learners in the concrete operational stage are developing logic but will still struggle with abstract concepts (Cherry, 2022). The formal operational stage includes adolescence and adulthood with a focus on the ability to think in a more abstract and hypothetical manner (Cherry, 2022). Teachers must help their students transition from the concrete operational stage to formal operational (Brown & Canniff, 2007).

Purpose and Objectives

The purpose of this study was to identify successful methods when teaching middle school agricultural education (MSAE) students. Three research questions guided this study: 1.) What are the instructional strategies teachers use when teaching their MSAE classes?; 2.) What resources and training do MSAE teachers utilize?; 3.) How is instruction different between high school and middle school students?

Methods

A recruitment email was sent to the Kansas agriculture teacher listserv with ten participants agreeing to participate (only nine completed the interview). The participants' teaching experiences ranged from first-year teachers to a veteran teacher (33 years). Participants' MSAE teaching experience ranged from one year to 14 years. Interviews lasted an average of 30 minutes and were recorded on a password protected computer for later transcription. Participants responded to several questions about their agricultural education program and their middle school courses. The website otter.ai was used to help transcribe each interview. Transcriptions were compared to notes and pseudonyms were assigned to each participant to protect their identity. Participant responses were coded and analyzed to define common themes (Taylor et al., 2015). During this process, constant comparisons were made to group common themes together for each research question. Glaser (1967) states the purpose of the constant comparative method is to generate theory more systematically than just analysis. Efforts were made to establish research rigor (Taylor et al., 2015).

Results

Theme 1: Instructional strategies

The first theme that emerged from the data focused on successful teaching strategies for middle school age students. Examples of the methods included: hands-on activities, inquiry-based learning, games, research projects, group projects, discussion-based, student-led presentations, reading strategies, repeating instructions, videos, E-moments, and brain-dumping. Teachers spoke to the need to diversify their methods during each lesson, “I try to change things up throughout the class period, the first part will be some kind of hands-on activity and then we move to something else like Kahoots or project-based learning. Sometimes it is discovery, throwing something out there and they have to figure it out.”

Theme 2: Resources and training

Most teachers expressed the need for more hands-on and activity-based curriculum. Many of the teachers said that they utilize ideas or lessons from multiple different premade curriculums and professional development trainings. Examples: Journey 2050, One Less Thing, CDE materials, Pork Checkoff, MSAE Identification List, CASE AgX and AFNR, Kansas Corn Seed to STEM, Ag Ed Discussion Lab, Germinate and Nutrients for Life. Many teachers used whatever they could find, “Begged, borrowed and stole from everybody. I just follow the guidelines that are set forward by the state.”

Theme 3: Differences between middle school and high school students

Teachers identified several differences between the two groups, one teacher said, “Keeping their attention is different. And that is why I change the instructional strategies five to eight times a (class) period…they just have to be moving all of the time.” Teachers also mentioned that middle school students like to talk during class, they ask many questions, and need instructions repeated. One teacher also spoke to using students to help teach their peers, “If I have students with that agriculture background, I try to pair them or group them with those students who do not have that agriculture background. As they are sitting at the table discussing something, they have input from a fellow student who does have that background.”

Conclusions/Recommendations

Successful teaching of middle school students is accomplished when appropriate instructional strategies are used, when teachers participate in professional development focused on middle-level students in agriculture, and when teachers acknowledge middle school students are developmentally different from high school students (Kansky, 2021; Piaget, 1952; Rappa, 2011) and act upon this knowledge.

Recommendations for practice include more inservice and preservice teacher training, promotion of existing curriculum, developing new curricular resources to meet this unique group of learners (Jones et al., 2020; Rayfield & Croom, 2010), and distribution of a “tip-sheet” to assist current and future agricultural educators successfully teach this specific age group. Research on effective middle school teaching methods, preservice training to teach middle level learners, middle school agriculture programs, and middle school agricultural education students should be done as we continue to increase the number of programs across the nation (Jones et al, 2020).

References

The Association for Middle Level Education (2020). *The Successful Middle School: This We Believe.* https://www.amle.org/wp-content/uploads/2021/01/AMLE_SMS_Summary_Color.pdf

Brown, D. F. & Canniff, M. (2007). Designing Curricular Experiences That Promote Young Adolescents' Cognitive Growth, *Middle School Journal, 39*(1), 16-37, https://doi.org/10.1080/00940771.2007.11461609

Cherry, K. (2022, May 2). *What is Piaget's Theory of Cognitive Development*? Verywell Mind. https://www.verywellmind.com/piagets-stages-of-cognitive-development-2795457#toc-the-concrete-operational-stage

Golden, M. E., Parr, B., & Peake, J. (2014). As Assessment of the Needs of Middle School Agriculture Education Instructors in Georgia. *Journal of Agricultural Education*, *55*(5), 222-234. https://doi.org/10.5032/jae.2014.05222

Jones, S., Doss, W., & Rayfield, J. (2020). Examining the status of middle school agricultural education programs in the United States. *Journal of Agricultural Education, 61*(2), 41-56. https://doi.org/10.5032/jae.2020.02041

Kansky, K. (2021, March 1). *Leveraging the Science Behind the Middle School Brain in your Teaching Strategies*. AMLE. https://www.amle.org/leveraging-the-science-behind-the-middle-school-brain-in-your-teaching-strategies/

Piaget, J. (1952). The origins of intelligence in children. International Universities Press.

Rappa, K. (2011). A Case Study Exploring the Transition to Middle School from the Perspective of Students. *Walden Dissertations and Doctoral Studies*. https://scholarworks.waldenu.edu/dissertations/998

Rayfield, J., & Croom, B. (2010). Program Needs of Middle School Agricultural Education Teachers: A Delphi Study. *Journal of Agricultural Education*, *51*(4), 131-141. https://doi.org/10.5032/jae.2010.04131

Taylor, S.J., Bogdan, R., & DeVault, M. L. (2015). *Introduction to Qualitative Research Methods: A Guidebook and Resource.* John Wiley & Sons.

The value in trust: An exploration of personal values in relation to trust in science

Erica Summerfield
The Ohio State University
200 Agricultural Administration Building
2120 Fyffe Road
Columbus, OH 43210
614-292-6909
summerfield.18@osu.edu

Dr. Cara Lawson
The Ohio State University
200 Agricultural Administration Building
2120 Fyffe Road
Columbus, OH 43210
614-338-9407
lawson.182@osu.edu

Dr. Laura Fischer
Texas Tech University
Box 42131
Lubbock, TX 79409
806-742-2816
laura.fischer@ttu.edu

Introduction

In recent years, the population of individuals who do not trust science-based information has grown (Hendricks et al., 2016). This lack of trust is concerning as research has found trust to be the foundation for public understanding of science (Arimoto & Sato, 2012; Hendricks et al., 2016; Sztompka, 2007). When individuals lack trust in science-based information their ability to make informed decisions is hindered (Weingart & Guenther, 2016). Factors that could explain a person's trust in science include an individual's culture, political beliefs, and cogitative processing abilities (Kraft et al., 2015; Pechar et al., 2018). Some argue science trust is associated with specific issues and not science as a whole (Pechar et al., 2018). Others claim mistrust in science is the result of scientific misconduct, inconsistent communication, conflicting results, discourse between scientists and/or the public, and the separation between real and fake science (Boele-Woelki et al., 2018; Hendriks et al., 2016). Personal values have been used to explore public trust in fields such as business and political sciences (Pechar et al., 2018; Pirson et al., 2017). However, research has not investigated the role of personal values in science trust.

Conceptual Framework

Personal values can influence the ways in which individuals are motivated to behave (Schwartz, 1992). When specific personal values are held to a high importance, they can influence individual motivation and action (Schwartz, 1992). Personal values have been shown to influence trust formation in contexts outside of science (Pechar et al., 2018; Pirson et al., 2017). Schwartz (1992) created a series of scales to measure personal values and ultimately narrowed his scale to include ten basic value categories: power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, and security. In this study, the Schwartz (1992) Theory of Basic Values was used to determine any potential relationship between individual values and trust in science. The first research objective was to determine what values Oregon residents identified as most important, and the second research objective was to determine if their personal values were related to their trust in science.

Methodology

Data analyzed in this study were collected as part of a larger study that sought to explore Oregon residents' perceptions of and experiences during the 2020 Oregon wildfire season. Data were collected from November 3, 2021 to December 11, 2021 through a Qualtrics questionnaire. The population for this study was Oregon residents 18-years or older who were living in Oregon during the 2020 wildfire season. Participants were recruited by Qualtrics Research Services following a quota of 35% rural residents and 65% suburban/urban residents and a gender distribution of approximately 50% males and 50% females (Oregon Office of Rural Health, 2021). The study yielded 434 complete responses. To determine participants' trust in science, a nine-item, Likert-type scale was adapted from Nadelson et al. (2014). Participants rated statements regarding their trust in science using a five-point scale (*strongly disagree* =1 to *strongly agree*=5). The 10-item Short Schwartz (1992) Value Survey was used to measure the importance of participants' personal values. Participants rated each value on an eight-point scale (*opposed to my principles* = 0, to *of supreme importance* = 8). Data were exported from Qualtrics to SPSS for analysis. Inferential and descriptive statistics were used to address the research questions.

Findings

To evaluate research objective one, means were calculated for each personal value. As a group, participants rated "benevolence" as the most important personal value (M= 7.13, SD = 1.91), followed by "self-direction" (M= 6.56, SD = 1.97) and "universalism" (M= 6.36, SD = 2.25). A Pearson correlation revealed significant relationships between participant trust in science and all personal values except "hedonism," "tradition," and "conformity." Significant personal values all showed positive relationships with science trust suggesting as importance placed on these personal values increased, so did trust in science. A significant, moderate association was found between science trust and "universalism" (r = .37) (Davis, 1971). Significant, low associations were found between "power" (r = .11), "achievement" (r = .14), "stimulation" (r = .15), "self-direction" (r = .13), "benevolence" (r = .20) "security" (r = .15).

Conclusions & Implications

This research attempts to start the conversation about the relationship between trust in science and personal values. While the study was limited in scope, important conclusions can be drawn. Participants rated "benevolence" as the most important personal value thereby indicating the importance of concepts such as helpfulness, honesty, forgiveness, loyalty, and responsibility (Schwartz, 1992). "Benevolence" is often associated with an individual's need for affiliation and their concern for others' wellbeing (Schwartz, 2012). Also rated highly were the values of "self-direction," suggesting the importance of freedom and independence, and "universalism," which suggested importance of environmental protection, and unity with and beauty of nature. Participants in this study were surveyed following an historic environmental disaster which may have influenced their connections with these values given the threats to the natural environment and likely concern regarding how to navigate the wildfire effects. Given this finding, personal values should be studied in relationship to other important variables in the context of other events impacting agriculture and natural resources.

Results showed significant positive relationships between science trust and all personal values except hedonism, tradition, and conformity. This finding is interesting considering Schwartz (2012) categorized both "conformity," and "tradition" as values associated with conservation. However, while "hedonism" was grouped in another category of values, "openness to change" (Schwartz, 2012). This finding suggests individuals may interpret personal values differently or apply values in different ways, despite being presented with definitions of each. Therefore, future research should investigate the values further to evaluate participant understandings and the personally redefine values or at least create opportunities for participants to apply the values from a more universally understood or applied perspective.

In this study, "universalism" was the only value to have a moderate association with participant trust in science. All other values with significant relationships showed low associations with science trust. Although "benevolence" was rated most important value to participants, its relationship with science trust also had a low association. There may be a disconnect between individual views on their own values and the actual implications of these values. Future research should investigate further the relationship between science trust and specific personal values to determine potential connections with trust and different value groups as they have in other fields (Pechar et al., 2018; Pirson et al., 2017). An understanding of values in relation to key constructs in agriculture communication will help communicators create messages that resonate with audiences.

References

Arimoto, T., & Sato, Y. (2012). Rebuilding public trust in science for policy-making. *Science.* http://doi.org/10.1126/science.1224004

Boele-Woelki, K., Francisco, J. S., Hahn, U., & Herz, J. (2018). How we can rebuild trust in science—And why we must. *Angewandte Chemie International Edition*, 57, 13696-13697. https://doi.org/10.1002/anie.201805342

Davis, J. A. (1971). *Elementary survey analysis*. Prentice-Hall.

Field, A. (2018). *Discovering statistics using IBM SPSS statistics (5th ed.)*. Sage Publications.

Hendriks, F., Kienhues, D., Bromme, R. (2016). Trust in science and the science of trust. *Trust and Communication in a Digitized World*. 143–159. https://doi.org/10.1007/978-3-319-28059-2_8

Kraft, P. W., Lodge, M., & Taber, C. S. (2015). Why people "don't trust the evidence": motivated reasoning and scientific beliefs. *The ANNALS of the American Academy of Political and Social Science*, *658*(1), 121-133. https://doi.org/10.1177/0002716214554758

Nadelson, L., Jorcyk, C., Yang, D., Jarratt Smith, M., Matson, S., Cornell, K. and Husting, V (2014), Trust in science and scientists. *Sch Sci Math, 114*: 76-86. https://doi.org/10.1111/ssm.12051

Pechar, E., Bernauer, T., & Mayer, F. (2018). Beyond political ideology: The impact of attitudes towards government and corporations on trust in science. *Science Communication, 40*(3), 291-313. https://doi.org/10.1177/1075547018763970

Pirson, M., Martin, K. & Parmar, B. (2017) Formation of stakeholder trust in business and the role of personal values. *J Bus Ethics.* 145, 1–20. https://doi.org/10.1007/s10551-015-2839-2

Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. *Advances in Experimental Social Psychology*, 1–65. https://doi.org/10.1016/s0065-2601(08)60281-6

Schwartz, S. H. (2012). An overview of the Schwartz theory of basic values. *Online Readings in Psychology and Culture*, *2*(1). https://doi.org/10.9707/2307-0919.1116

Sztompka, P. (2007). Trust in science: Robert K. Merton's inspirations. *Journal of Classical Sociology, 7*(2), 211–220. http://doi.org/10.1177/1468795X07078038

Weingart, P. & Guenther, L. (2016). Science communication and the issue of trust. *Journal of Science Communication, 15*(05), 1-11. https://doi.org/10.22323/2.15050301

Research

A Content Analysis of North Central Farm and Ranch Stress Assistance Center Resources

Quentin Carlyle
124 Gentry Hall
Columbia, Missouri 65211
(573) 427-9095
Qr2cfb@mail.missouri.edu

Rebecca Mott
123 Gentry Hall
Columbia, Missouri 65211
(573) 881-0749
mottr@missouri.edu

Kimberly Keller
210 Gentry Hall
Columbia, Missouri 65211
(573) 356-6280
kellerkj@missouri.edu

Abigail Loesing
124 Gentry Hall
Columbia, Missouri, 65211
arlfyf@missouri.edu

A Content Analysis of North Central Farm and Ranch Stress Assistance Center Resources

Introduction

Farmers regularly deal with stressors that are beyond their control such as unexpected weather, unpredictable economic conditions, and extreme work hours (Thelin & Donham, 2016). They also experience higher levels of psychological distress (Yazd et al., 2019) and a higher suicide rate than the general population (Peterson et al., 2020). The North Central Farm and Ranch Stress Assistance Center (NCFRSAC) aims to create and expand mental health resources for agricultural producers and those who support agricultural producers. The center includes collaborators from 12 states in the North Central region. This content analysis research describes NCFRSAC resources in relation to the Farm and Farm Family Risk and Resilience Socio-Ecological Model (Ketterman et al., 2020). This research helps to address the American Association for Agricultural Education National Research Priority 6: Vibrant, Resilient Communities. Particularly, it informs Research Question 1: *How do agricultural leadership, education, and communication teaching, research, and extension programs impact local communities* (Roberts et al., 2016).

Theoretical Framework and Methodology

Previous literature around farm and ranch health and wellness has used the socioecological model as a theoretical framework (Lee, et al., 2017; Mott et al., 2017). For this study, we relied on an expanded version of the socioecological model: the Farm and Farm Family Risk and Resilience Socio-Ecological Model (Ketterman et al., 2020). This model is unique because it places the farm between interpersonal environments and community environments, reinforcing the importance for educators and practitioners to implement a holistic approach to mental health in a way that is relevant to farmers (Ketterman et al., 2020).

The purpose of this content analysis, which is part of a larger study, is to describe the current NCFRSAC resources in relation to the Farm and Farm Family Risk and Socio-Ecological Model (Ketterman et al., 2020). This research contributes to an ongoing national discussion about farmer and rancher mental health. Our team of faculty, graduate student, and undergraduate student researchers analyzed data using a quantitative, conceptual content analysis. This approach seeks to identify the existence of concepts in a text (White & Marsh, 2006). At least two team members coded each item to promote reliability. Additionally, each team member made reflective notes throughout the data analysis process, adding to the study's transparency (Lincoln & Guba, 1985).

Findings

Of the 149 resources developed in years one and two of the NCFRSAC, 79 were aimed at the individual level of the socio-ecological model. Twenty-nine targeted the interpersonal level and only 8 were aimed at the farm level. Four resources were aimed at the community level and 3 targeted the organizational level. For 26 resources we either could not access the resource to determine which level of the model it was targeted toward, or it was unclear to whom the resource was targeted.

Table 1

Number of resources by socio-ecologic model level by year created

Socio-ecological level	Year 1	Year 2	Total
Individual	29	50	79
Interpersonal	14	15	29
Farm	4	4	8
Community	2	2	4
Organizational	2	1	3
Policy	0	0	0
Unknown	18	8	26

Conclusions and Implications

The accuracy and detail of each state's reporting procedures is a limitation to the research. There are resources in the study's scope that were not adequately captured or accurately analyzed. However, we can clearly see that the majority of resources reported in years one and two of the NCFRSAC target the individual and interpersonal levels of the Farm and Farm Family Risk and Socio-Ecological Model (Ketterman et.al, 2020). Supporting the mental health of producers and their immediate families is critical. However, we should not underestimate how providing resources that strengthen mental health literacy to those who interact with farmers in businesses, communities, and organizations can strengthen a mental health safety net (Cuthbertson et al., 2020). While resources assisting at the individual level are meaningful, Cramer and Kapusta propose that addressing each level of the socio-ecologic model is influential in suicide prevention efforts (Cramer & Kapusta, 2017). This content analysis suggests there is room for more resources to be designed supporting the farm, community, organizational, and policy levels of the model.

The results of this content analysis can help guide researchers and practitioners to gaps in resources and services. This analysis can lead to a more informed approach to future work in addressing mental health and wellness of farmers and ranchers in the North Central region of the United States. We recommend that those working to address farmer and rancher stress utilize the Farm and Farm Family Risk and Resilience Socio-Ecological Model to help them consider their own resources and identify potential gaps in service.

References

Centers for Disease Control and Prevention. (2018). Agricultural safety. https://www.cdc.gov/niosh/topics/aginjury/

Cramer R.J, Kapusta N.D.(2017). A Social-Ecological Framework of Theory, Assessment, and Prevention of Suicide. *Frontiers in Psychology*, 8, 1756. https://doi.org/10.3389/fpsyg.2017.01756.

Cuthbertson, C., Brennan, A., Shutske, J., Zierl, A., Bjornstad, A., Macy, K., Schallhorn, P., Shelle, G., Dellifield, J., Leatherman, J., Lin, E, & Skidmore, M. (2020). Developing and implementing farm stress training to address agricultural producer mental health. *Health Promotion Practice.*

Ketterman, J., Braun, B., & Pippidis, M. (2020). Extension Programming Resource for Building Farm and Farm Family Resilience. *The Journal of Extension*, 58(5), Article 4. https://tigerprints.clemson.edu/joe/vol58/iss5/4

Krippendorff, K. (2004). *Content analysis: An introduction to its methodology* (2nd ed.). Sage.

Lee BC, Bendixsen C, Liebman AK, Gallagher SS. Using the Socio-Ecological Model to Frame Agricultural Safety and Health Interventions. *Journal of Agromedicine*. 2017;22(4):298-303. doi: 10.1080/1059924X.2017.1356780. PMID: 28762886.

Lincoln, Y., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage.

Mott, R., Keller, K. & Funkenbusch. (2017). Keep me doing what I love: A photovoice evaluation of the Missouri AgrAbility Project. *Journal of Agromedicine*. 22:4, 425-431. DOI: 10.1080/1059924X.2017.1356778.

Peterson, C., Sussell, A., Li, J., Schumacher, P.K., Yeoman, K. & Stone, D.M. (2020). Suicide rates by industry and occupation: National Violent Death Reporting System, 32 states, 2016. Morbidity and Mortality Weekly Report, 69(3), 57-62. https://doi.org/10.15585/mmwr.mm6903a1.

Roberts, T. G., Harder, A., & Brashears, M.T. (2016). *American Association for Agricultural Education national research agenda: 2016-2020*. Gainesville, FL: Department of Agricultural Education and Communication.

Thelin, A., Donham, K.J. (2016). Psychosocial conditions in agriculture. In Thelin, A., Donham, K.J. (Eds.), *Agricultural medicine* (2nd ed., pp.351-377). Wiley Blackwell.

White, M. D., & Marsh, E. E. (2006*). Content analysis: A flexible methodology*. Library Trends, 55(1),22–45. https://doi.org/10.1353/lib.2006.0053.

A current view from Taiwan's extensionists for future professional development

Pin-Hsueh Lee
Texas Tech University

Amy Boren-Alpizar, Ph.D.
Texas Tech University

Primary Author:
Pin-Hsueh Lee
2500 Broadway
Lubbock, TX 79409
806-742-2011
pinlee@ttu.edu
Texas Tech University

A current view from Taiwan's extensionists for future professional development

Introduction

Agriculture in Taiwan is at an important crossroads in its development. With limited arable land, vulnerability to shifting climatic events, and a shrinking agricultural workforce, Taiwan is grappling with complex problems in the agricultural sector that must be addressed (Food and Fertilizer Technology Center for the Asian and Pacific Region [FFTC-APR], 2020; Lee et al., 2020). As Taiwan wrestles with the need for change in its agricultural milieu, extension professionals find themselves facing the same complexity. Taiwan's extension system has proven invaluable in propelling its agricultural development from labor-intensive, small-scale farming to a modern, digitalized agriculture that maximizes efficiency (Burmeister et al., 2001; Hong, 1970; Wang, 1979; Yueh et al., 2013). As Taiwanese agriculture is facing the future and responding to challenges, Taiwan's extension system will need to do the same to remain effective in its ability to work with producers and communities to solve problems in agriculture and rural development (Lee et al., 2020).

Despite Taiwan's sweeping transformation of the agricultural sector, agricultural research and extension stations have struggled to keep up with the changes (Wang & Chen, 2004). While attempts have been made to spur innovation in Taiwan's extension system (Tseng & Chen, n.d.), the broader impacts of extension are not widely known and researched. Furthermore, a qualitative approach regarding Taiwan's extension has not been undertaken to make future implications for professional development. Hence, this drives the purpose of this study to address the current condition of the agricultural extension system in Taiwan. Considering these conditions, the urgency of understanding the needs of Taiwan's agricultural extension system is conspicuous and indispensable. This study attempts to answer the following research questions: 1) What are the extension workers' challenges? 2) What are the extension workers' opportunities? 3) How do extension workers describe the future of extension?

Theoretical Framework

The theoretical framework used in this study is strategic planning (George et al., 2019). As extension systems around the world grapple with reforming their work to enhance their effectiveness in addressing future challenges (Blum et al. 2020), the need to understand how frontline extension professionals view the current and future trends in extension will be critically important (Donaldson et al. 2022). George wrote that the formality of the strategic planning processes is pivotal to improving organizational performance. The strategic planning process includes internal and external analyses, as well as the formulation of strategies, plans, and goals. However, extension education has been reported to have inadequate extension professionals to improve the extension system's overall performance (Wang & Chen, 2004; Wu et al., 2011). The framing of this study is expected to provide future insights for proceeding toward an effective extension system. Collectively, these suggested that the understanding of current and future trends in extension will play an important role in propagating agriculture.

Methodology

To explore how extension workers overcome challenges and enhance their competence through professional development, a narrative qualitative approach is undertaken. A semi-structured interview was conducted to collect data from the interview with the consent of each participant.

The target population for this research includes extension professionals that work at universities, research extension stations, and agriculture research institutes. To be part of this research, participants must meet the following requirements (1) age must be over 18 years old, (2) work as extensionists or professors, and (3) be willing to share their thoughts and perspectives. The interviews were conducted virtually through a conferencing service Google Meet. The data collection was collected from September to October 2022 using snowball sampling. A total of 12 extensionists participated in this study including 10 men and 2 women. The interview questions were examined by face validity and were originally in English. The interview questions were then translated into participants' native language to investigate their perceptions of working in the extension realm. The interview was recorded after obtaining participants' consent for later transcription and translation purposes. These procedures will be repeated after the qualitative data has met the criterion to analyze the data. Our interview process includes three following procedures: introduction, narrative, and conclusion. Pattern coding were used to analyze data to ensure trustworthiness. We also imbued rigor into the study by embedding within the qualitative standards of quality: (1) credibility, (2) confirmability, (3) dependability, and (4) transferability (Houghton et al., 2013).

Findings

We identified a total of 12 extensionists to participate in our study including 10 men and 2 women. Participants' years of extension experience ranged from 1.5 ~ 34 years and most of them worked at farmer's association. By answering to the first research question, the majority of participants expressed the challenge to communicate and build trust with the farmers, as well as limited funding resources to meet the rapid change in the environment. This challenge has overcome by attending educational training courses from the institutions or universities. The second research question were identified by allowing extensionists' to attend educational training to improve their professional skills to cope with overarching circumstances. It is suggested that the government carry out marketing training courses for extension workers to strengthen their ability and propagate accurate agricultural information. On the other hand, connections with people from the fields, professionals, public and private sectors provide the opportunity to implement resource integration. The third research question was found that funding resources and educational training must keep up with changing environment to provide opportunities for future farmers and extensionists. It is suggested that more studies can draw attention to how extensionists carried out extension works through their role of leadership. We can conclude that extensionists perceive the importance of professional development through the investigation of the study.

Conclusion/Recommendations

Overall, extension professionals' perception regarding future did not vary from different organizations that they worked in. Previous research findings pinpointed that research extension stations heavily rely on innovative research instead of outreach activities (Wang & Chen, 2004). Notably, our research results presented a different viewpoint, demonstrating that extension institutions have shifted their focus to educational training for professional development. Furthermore, extension professionals have recognized the importance of effective communication and sustainable agricultural practices. This study supports the need for developing training opportunities to address and establish novel extension professional programs to provide innovative approaches. Potential strategies and policies can be proposed for future studies to highlight key areas for intervention.

References

Blum, M.L., Cofini, F., & Sumaiman, R.V. (2020). Agricultural extension in transition worldwide: Policies and strategies for reform. Rome: FAO. https://doi.org/10.4060/ca8199en

Burmeister, L., Ranis, G., & Wang, M. (2001). Group behavior and development: A comparison of farmers' organisations in South Korea and Taiwan. Discussion Papers. 836. https://elischolar.library.yale.edu/egcenter-discussion-paper-series/836

Donaldson, J. L., Graham, D. L., Arnold, S., Taylor, L. K., & Jayaratne, K. S. U. (2022). Extension Education Trends and Research Needs: Views from Professionals and Faculty. *Journal of Agricultural Education*, *63*(3), 73 – 82. https://doi.org/105032/jae.2022.03073

Food and Fertilizer Technology Center for the Asian and Pacific Region [FFTC-APR] (2020). Strategic action plan focusing on holding workshops in 2021 – 2024. https://www.fftc.org.tw/en/publications/main/2279

George, B., Walker, R.M., & Monster, J. (2019). Does strategic planning improve organizational performance? A meta-analysis. Public Administration Review, 79(6), 810 – 819. https://doi.org/10.1111/puar.13104.

Hong, P.F. (1970). Characteristics, views held of agricultural extension activities, and communication behavior of Hsien extension supervisors in Taiwan. Unpublished thesis.

Houghton, C., Casey, D., Shaw, D., & Murphy, K. (2013). Rigour in qualitative case-study research. *Nurse researcher*, *20*(4). https://doi.org/10.7748/nr2013.03.20.4.12.e326

Lee, C. H., Liu, C. F., Lin, Y. T., Yain, Y. S., & Lin, C. H. (2020). New agriculture business model in Taiwan. *International Food and Agribusiness Management Review*, *23*(5), 773-782. https://doi.org/10.22434/IFAMR2019.0164

Tseng, C-M. & Chen, C-E. (n.d.). *Innovative extension systems in Taiwan (Republic of China)*. National Report. https://report.nat.gov.tw/ReportFront/PageSystem/reportFileDownload/C10502167.004

Wang, J. S. & Chen, S.R. (2004). Implementation of agricultural extension on Taiwan agricultural research institutes and experimental stations. *Journal of Agriculture and Forestry, 53*(2) 155~172.

Wang, Y. T. (1979). The Roles of Farmers' Associations and Agricultural Development Programmes in Taiwan. *Research in Agriculture & Applied Economics*. https://doi.org/10.22004/ag.econ.182382

Wu, H. Y., Lin, Y. K., & Chang, C. H. (2011). Performance evaluation of extension education centers in universities based on the balanced scorecard. *Evaluation and Program Planning*, *34*(1), 37-50. https://doi.org/10.1016/j.evalprogplan.2010.06.001

Yueh, H. P., Chen, T. L., & Chen, C. T. (2013). A spatial exploration of factors affecting digitalization of farmers' associations in Taiwan. In *Aslib proceedings: New information perspectives*. Emerald Group Publishing Limited. https://doi.org/10.1108/AP-11-2012-0088

Research Poster

A Historical Analysis of the Kansas State Agricultural College and its Influence on the Development of K-State Research and Extension

KaCee James
Kansas State University
317 Umberger Hall
Manhattan, KS 66506
785-418-2618
kaceet@ksu.edu

A Historical Analysis of the Kansas State Agricultural College and its Influence on the Development of K-State Research and Extension

Introduction

With sporadic success and failures in agriculture endeavors in the latter half of the 19th century, Kansas farmers needed guidance and scientific and technical education. The creation of an agricultural college, research station and cooperative extension service were vital in advancing Kansas agriculture and paving a way for life on the prairie. In 1862, the Morrill Act was passed, thus appropriating millions of acres of tribal land to states for the purpose of founding colleges to promote agriculture and mechanical arts (National Archives, 2022). The Morrill Act provided opportunities to thousands of students seeking technical degrees and farmers who had previously been excluded from higher education (National Archives, 2022).

The purpose of this historical research was to document the influence the Kansas State Agricultural College had on the development of the KSU Agricultural Experiment Station and Cooperative Extension Service, in short, K-State Research and Extension. This research also sought to describe the history and role of the experiment station and identify the role of the cooperative extension service and how it has progressed. Exploring the inception of a land grant college, experiment station and extension service gives an understanding of the school's mission and helps to provide a context for the modern institution.

Conceptual Framework

Historical Research: A Guide explains the intrinsic value of writing about historical events as being both educative and entertaining (McDowell, 2002). This research project provided an avenue of learning about the history of a land grant college and the beginning of research and extension in the Midwest from a narrative. It is important to understand and explore the history and philosophies of land grant colleges through this investigation.

Methodology

Historical research methods were used to gather information for this paper. A key primary source for this research was the *History of the Kansas State Agricultural College* written by Professor J.D. Walters (1909), which narrates the founding of the college and the research station. Professor Walters, who was an instructor at KSAC from 1877 until 1917, provided detail regarding the underpinnings agricultural advancements in the early history of the college. Other history was derived from secondary resources through the K-State libraries, K-State libraries digital archives and K-State Research and Extension. Current information about and data relating to K-State Research and Extension was obtained directly from the organization.

Results and Findings

To be designated as the state's land grant college under the Morrill Act, the Kansas State Agricultural College (KSAC) was established in 1863 (Walters, 1909). The Hatch Bill followed in 1887 granting funds to establish an agricultural experiment station and KSAC was selected as the site (Walters, 1909). Cooperative extension was introduced in 1914 through the Smith-Lever Act which provided funds to further educate rural citizens about advances in agriculture practices and technology through outreach programs (National Archives, n.d.). At this time, research data being conducted at KSAC and its experiment station had become easier than ever to get to Kansans to help them improve their farming pursuits.

The impact of KSAC on the Kansas agricultural community was not felt immediately. The founding president of the college favored the classics and agricultural and mechanics courses were not fully implemented until John A. Anderson was elected as president in 1873 (Walters, 1909). Under Anderson's tutelage, admission requirements were lowered, professorships were established, and construction was completed (Walters, 1909). Under the third president of the college, George T. Fairchild, the college began hosting college education outreach courses called Farmers' Institutes, which would grow in popularity across the country (Walters, 1909).

Inexpensive attempts at experiments were conducted during the Fairchild administration, but limited funds of the college prohibited progress (Walters, 1909). The passing of the Hatch Bill in 1887 provided better funding to conduct research, specifically by establishing the experiment station in Hays, two and a half hours west of the main campus (Walters, 1909). The station began experiments in seed and variety testing with a small building and greenhouses (Walters, 1909). The experiment station published five bulletins in its first year in 1888 (Willard, 1940). In addition to the original experiment station there are now research centers, stations and fields in 18 other locations across Kansas (KSRE, n.d.)

Ahead of the Smith-Lever Cooperative Extension Act, the college organized the Division of College Extension in 1912, which had been gradually developed from Farmers' Institutes, to present scientific and technical courses and lectures (Willard, 1940). What started as six Farmers' Institutes grew to more than 300 by 1919 (Walters, 1909). As a result of the Smith-Lever Act, KSAC established county agents for outgrowth work of the college (Teagarden, 1991). Fifty-nine counties had organized extension programs with county agents by 1920 and today all 105 counties have an extension office (Teagarden, 1991).

Conclusions

Kansas State Agricultural College (KSAC) played an important role in influencing agricultural progress in Kansas and abroad since its founding. The college was among the first to take advantage of the Morrill Act to establish a land grant college. Acknowledging the needs of the states' farmers and citizens, KSAC conducted research prior to the passing of the Hatch Act. The college also hosted Farmers' Institutes and employed extension agents well before the Smith-Lever Act to distribute data and information to Kansans.

Implications & Recommendations

Today, Kansas State University describes itself as "a comprehensive, research, land-grant institution serving students and the people of Kansas, the nation, and the world" (Kansas State University, 2022). After 160 years, serving the people is still at the forefront of the college's mission. With KSU's connection to the land-grant mission, students should be made aware of their institution. Students should recognize the storied past and conduct critical analyses of the key historical figures and events that took place in the college's history. Additional research on the impact of KSRE on local communities and counties is also recommended.

References

Kansas State University. (n.d.). *About K-State.* https://www.k-state.edu/about/mission/

K-State Research and Extension. (n.d.). *K-State Research and Extension Statewide Locations. https://www.ksre.k-state.edu/about/statewide-locations.html*

McDowell, W.H. (2002). *Historical research: A guide.* Pearson Education.

National Archives. (n.d.). *Morrill Act (1862).* Milestone Documents. https://www.archives.gov/milestone-documents/morrill-act

National Archives Foundation. (n.d.). *The Smith-Lever Act of 1914.* https://www.archivesfoundation.org/documents/smith-lever-act-1914/#:~:text=The%20mith%2DLever%20Act%20established,in%20agricultural%20practices%20and%20technology

Teagarden, E.H. & Johnson, R.L. (1991). *The Kansas Cooperative Extension Service: Extending to the university people, 1914-1989.* Kansas State University

Walters, J.D. (1909). *History of the Kansas State Agricultural College.* Printing Department of the Kansas State Agricultural College.

Willard, J.T. (1940). *History of the Kansas State College of Agriculture and Applied Sciences.* Kansas State College Press.

A Meta-Analysis of Agricultural Literacy Programs for Youth and Adults

Sarah R. Sprayberry
Doctoral Candidate
Texas A&M University
Department of Agricultural Leadership, Education, and Communications
2147 TAMU
College Station, TX 77843-2147
(210)-838-7485
sprayberry12@tamu.edu

Robert Strong
Texas A&M University
Department of Agricultural Leadership, Education, and Communications
Texas A&M University
2116 TAMU
College Station, TX 77843-2116
Robert.StrongJr@ag.tamu.edu

Theresa Murphrey
Texas A&M University
Department of Agricultural Leadership, Education, and Communications
Texas A&M University
2116 TAMU
College Station, TX 77843-2116
t-murphrey@tamu.edu

A Meta-Analysis of Agricultural Literacy Programs for Youth and Adults

Introduction

Agricultural literacy, identified by *Priority 1: Public and Policy Maker Understanding of Agricultural and Natural Resources* of the *National Research Agenda* (Enns et al., 2016), is a pressing issue as a gap widens between consumers and the farmers that feed them (Cosby et al., 2022). Today, a majority of Americans lack sufficient agricultural literacy levels (Bradford et al., 2019). Agricultural literacy is one's ability to incorporate their foundational agricultural knowledge to process general agriculture information, critically think about local food and fiber systems, and be able to communicate about agriculture with ease (Spielmaker & Leising, 2013).

This project was supported by USDA Hatch project TEX 09890. The purpose of this meta-analysis project was to assess the impact of agricultural literacy programs on participants' knowledge of the farm to fork process. This study aimed to provide the scholarship of agricultural literacy with evidence of the effectiveness of current programs. Specifically, the following research questions guided the project:

1. Is there a measurable difference of participants in agricultural literacy levels after partaking in a program (pre/post test scores)?

2. What program features are associated with improvement of agricultural literacy levels?

Conceptual Framework

Spielmaker and Leising (2013) classified the national learning benchmarks for agricultural literacy into five major themes. The themes entail (a) agriculture and the environment, (b) plants and animals for food, fiber, and energy, (c) food, health, and lifestyle, (d) science, technology, engineering, and mathematics, and (e) culture, society, economy, and geography. This framework guided the determination of a program's agricultural literacy focus.

Methodology

Since the search process should be systematic, effective, and reproducible, it is imperative that comprehensive as well as rigorous databases be selected (Gusenbauer & Haddaway, 2020). Both ERIC and Web of Science were identified as meeting all the required criteria for accurate evidence synthesis to retrieve articles addressing agricultural literacy programs (Gusenbauer & Haddaway, 2020). The addition of Google Scholar was for its massive breadth of research articles; however, it is understood that the searches are not always reproducible. A manual citation search was conducted to collect any possible missed articles.

For an article to be considered, it had to be: (a) published from 2000-2022, (b) published in English, (c) be a research study assessing an agricultural literacy program, and (d) utilize quantitative methods in the research design. The initial search yielded 569 articles. A majority of studies were eliminated for not being an agricultural literacy program or possessing the wrong research design. The final stage consisted of 38 studies in the full-text screening process. Paired with the citation search, 9 articles were included for analysis.

Coding is an essential part of the meta-analysis procedure as it allows for the researcher to understand the scope, methods, and validity of each study (Pigott & Polanin, 2020). Each study was assessed and coded on six main constructs which were (a) article characteristics, (b) participant characteristics, (c) intervention (d) instrumentation, (e) research design, and (f) effect size information. The standardized mean gain of the treatment groups was calculated since a majority of studies did not possess a comparison group. Data was analyzed using Rstudio packages metafor, metaviz, and escalc.

Results

Nine articles assessing the effectiveness of an agricultural literacy program were analyzed (Bradford et al., 2019; Cannon et al., 2006; Fischer, 2017; Hutcheson, 2020; Marks et al., 2021; Pense et al., 2005; Riedel, 2006; Ryu et al., 2021; Vallera & Bodzin, 2020). A majority of the agricultural literacy programs were implemented in a classroom setting (n = 7) with elementary students (n = 5). Three (n = 3) of the studies dealt with populations that were agriculturally-related such as Future Farmers of America (FFA) and 4-H (Cannon et al., 2006; Hutcheson, 2020; Riedel, 2006). Unpublished data was included to assist in alleviating publication bias. There was visual asymmetry in the funnel plot for publication bias, the fail-safe N as well as can Egger's Regression test were conducted to further investigate publication bias. Both the fail-safe N (N = 693 < 70 = False) and Egger's Test (p = .45) depicted zero publication bias.

A random effects model was chosen to address the variation that we see across the included research studies. In this model, the null hypothesis tests a mean effect size of zero. Results indicate that the mean change effect size between participants' agricultural literacy levels before and after being enrolled in the program is -.59 (p= 0.16, CI = [-1.40, 0.23]). Thus, there was not a significant effect due to agricultural literacy programs from participants' pre to posttest scores. Cochran's Q and I^2 were employed to assess effect size homogeneity. The result of Cochran's Q indicates a significant degree of heterogeneity (Q = 285. 4, p < .01) exists. The I^2 for this study was 98.32 % which indicates there is a substantial heterogeneity in this meta-analysis. The between study differences were determined through performing two tests of moderator effects. The Q_{within} (Q_E) tests the homogeneity of effect sizes within groups. To understand the effect sizes across groups, the null hypothesis of $Q_{between}$ (Q_M) was tested. Both moderators, program setting and participants' relation to agriculture, were not significant.

Conclusions

The small number of eligible studies may have contributed to the lack of finding an overall impact of agricultural literacy programs. This study revealed an inherent lack of scientific evidence on the impact these programs have on improving consumers' literacy levels.

Implications/recommendations/impact on profession

These findings should be used as a driving force for practitioners to critically assess the current state of agricultural literacy programs to determine the adjustments that need to be made to programming to elicit change in participants agricultural literacy levels (Cosby et al., 2022). Researchers in the field of agricultural literacy should employ rigorous studies to gain a better understanding of the pitfalls and assets of current agriculture literacy efforts (Cosby et al., 2022).

References

Bradford, T., Hock, G., Greenhaw, L., & Kingery, W. (2019). Comparing experiential learning techniques and direct instruction on student knowledge of agriculture in private school students. *Journal of Agricultural Education*, *60*(3), 80–96. http://doi.org/10.5032/jae.2019.03080

Cannon, J. G., Broyles, T. W., Seibel, G. A., & Anderson, R. (2009). Summer enrichment programs: Providing agricultural literacy and career exploration to gifted and talented students. *Journal of Agricultural Education*, *50*(2), 27–38. http://doi.org/10.5032/jae.2009.02026

Cosby, A., Manning, J., Power, D., & Harreveld, B. (2022). New decade, same concerns: A systematic review of agricultural literacy of school students. *Education Sciences*, *12*(4), 235. http://doi.org/10.3390/educsci12040235

Enns, K., Martin, M., & Spielmaker, D. (2016). Research priority area 1: public and policy maker understanding of agriculture and natural resources. In Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). *American Association for Agricultural Education national research agenda: 2016-2020*. Gainesville, FL: Department of Agricultural Education and Communication.

Gusenbauer, M., & Haddaway, N. R. (2020). Which academic search systems are suitable for systematic reviews or meta-analyses? Evaluating retrieval qualities of Google Scholar, PubMed, and 26 other resources. *Research Synthesis Methods*, *11*(2), 181–217. http://doi.org/10.1002/jrsm.1378

Hutcheson, A. (2020). *Measuring the effectiveness of the Mississippi Agriculture in the Classroom Program on elementary students' agricultural literacy levels*. [Master's thesis, Mississippi State University]. ProQuest.

Marks, D., LaRose, S., Brady, C., Erasmus, M., & Karcher, E. L. (2021). Integrated STEM and poultry science curriculum to increase agricultural literacy. *Poultry Science*, *100*(10), 101319. http://doi.org/10.1016/j.psj.2021.101319

Pense, S. L., Leising, J. G., Portillo, M. T., & Igo, C. G. (2005). Comparative assessment of student agricultural literacy in selected agriculture in the classroom programs. *Journal of Agricultural Education*, *46*(3),107. https://doi.org/10.5032/jae.2005.03107

Pigott, T. D., & Polanin, J. R. (2020). Methodological guidance paper: High-quality meta-analysis in a systematic review. *Review of Educational Research*, *90*(1), 24–46. https://doi.org/10.3102/0034654319877153

Ryu, J. Y., Kim, M. J., & Yun, S. Y. (2021). The effects of agricultural experience program on agricultural literacy and hand function improvement of adolescents living in self-reliance residence hall. *Journal of People, Plants, and Environment*, *24*(3), 277–283. http://doi.org/10.11628/ksppe.2021.24.3.277

Spielmaker, D. M., & Leising, J. G. (2013). National agricultural literacy outcomes. Logan, UT: Utah State University, School of Applied Sciences & Technology. http://agclassroom.org/teacher/matrix

Vallera, F. L., & Bodzin, A. M. (2020). Integrating STEM with AgLIT (agricultural literacy through innovative technology): The efficacy of a project-based curriculum for upper-primary students. *International Journal of Science and Mathematics Education*, *18*(3), 419–439. http://dx.doi.org/10.1007/s10763-019-09979-y

An Analysis of Secondary Students' Understanding of Farmer Suicide Drivers Following a State-Wide Essay Competition

Kelly J. McFarland
Katrina A. Clontz
Stacy K. Vincent

University of Kentucky

Introduction

Multiple studies report a higher risk of suicide among agricultural, forestry, and fishery (AFF) workers than the general population (Kennedy et al., 2021; Klingelschmidt et al., 2022; Monteith et al., 2020). According to analysis of data from the CDC, AFF experiences five times the risk of suicide than the general population (Miller & Rudolphi, 2022). Suicide is not only rising among farmers, but among today's youth as well. In a 2005 study conducted among rural secondary youth in Kentucky and Iowa (Peden, et al. 2005), high level of depressive symptoms within 34% of the sample existed, with 9% reporting they had seriously considered suicide in the last year (Peden, et al. 2005). In 2020, the suicide rate was 14.2% per 100,000 young adults between the ages of 15 and 24 (CDC, 2022). Specifically, 6,062 young adults took their life that year.

Conceptual Framework

The Interpersonal Theory of Suicide (2010) was the framework that guided the scope of the study. The Interpersonal Theory of Suicide is used to explain the relationship between emotional and cognitive states and desire to suicide, and the distinction between desire for suicide and the capability to engage in suicidal behavior. The two primary constructs of desire for suicide are thwarted belongingness and perceived burdensomeness (Van Orden et al., 2010). Thwarted belongingness encapsulates a failure for an individual to perceive connections to other people; the need for belonging is unmet (Van Orden et al., 2010). Social isolation is one of the most reliable predictors of suicidal ideation, attempts, and lethal suicidal behavior (Calati et al., 2019). Perceived burdensomeness involves the perception that the individual is a burden to those they are close to – the individual experiences beliefs that they are so flawed they are a liability to others and experiences thoughts of self-hatred (Van Orden et al., 2010). Sentiments indicating burdensomeness might include shame, self-blame, and feelings of unwantedness or expendability.

Methodology

The Kentucky Department of Agriculture facilitates an annual essay contest for high school students with two prompt options: to write a letter to a farmer either thanking them or to extend support in light of the mental health crisis ("Think of Me, We're Thinking of You"). The researchers only analyzed the letters on the latter: approximately 120 essays. Original essays were numbered and copied.

The two researchers coded the essays through the lens of the 2010 Interpersonal Theory of Suicide to examine the research question: How do secondary students express understanding of thwarted belongingness and perceived burdensomeness? Some key constructs under thwarted belongingness, as identified by the theory, included loneliness, social isolation, pessimism, and low levels of social support. Key words and phrases the researchers identified as relating to thwarted belongingness included: recognition of isolation; “lonely,” and “long hours alone.” Some of the theoretical constructs of perceived burdensomeness include liability, self-hate, physical illness, uselessness, belief that they are unwanted/unneeded, and a belief that they make things worse and are flawed. Based on these concepts, the researchers identified phrases relating to burdensomeness including burden, needed, wanted, and living up to expectations, among others. Key terms were also identified which were on the positive spectrum of each construct: these included efforts at increasing social connection for belongingness, and use of phrases such as “thank you” and “you are appreciated” for burdensomeness. The researchers used this process to independently code each essay, highlighting the phrases mentioned above, and then compared results. Interrater reliability was calculated at 80% for 15 randomly selected essay pairs.

Results

Students both identified drivers for suicide (negative factors) and offered support against those drivers (positive factors) for both perceived burdensomeness and thwarted belongingness within their essays. For perceived burdensomeness, student engagement occurred in the form of both external and internal factors. Internal factors include indications of empathy by the student for the pressure and stress the farmer is under and the feelings of worthlessness which may result. External factors are defined as occupational conditions which may contribute to feelings of burdensomeness, such as financial hardship and strenuous work. The researchers did not code for external factors as they are not unique to those experiencing suicidal thoughts, however we feel as though they should be included due to the overwhelming number of essays which described these factors. Students often recognized external factors but did not often recognize positive factors.

Negative factors for thwarted belongingness included a recognition of loneliness, isolation, and sacrifice of social time to complete work. Students tended to offer more support (positive factors) for thwarted belongingness than perceived burdensomeness. Students frequently stated a need for the farmer to interact with family, friends, and even to have the author come over and visit (for letters written to a known farmer). Many also suggested that the farmer reach out to a therapist or counselor, and additionally recognized the stigma surrounding support-seeking. While more students recognized negative factors for belongingness than burdensomeness, the emphasis was still placed on positive factors.

Conclusions, Implications, and Recommendations

Many students were able to identify components relating to both burdensomeness and belongingness. However, their help-giving advice for belongingness was generally more substantive than that for burdensomeness. The age and life stage of high school students is a possible reason for this divide, as many of the factors relating to the burdensomeness farmers feel come with a level of maturity and responsibility most highschoolers have not experienced. However, most students have probably experienced some form of social isolation and loneliness, and this may have been easier for them to identify and try to support. Students were generally able to connect, at least partially, with the concepts of burdensomeness and belongingness with no prior training or education on the topic of farmer suicide. In order to increase the effectiveness of their engagement, it is recommended that a program, such as the QPR Institute's Question, Persuade, Refer training or LivingWork's SafeTALK training, be implemented.

References

Calati, R., Ferrari, C., Brittner, M., Oasi, O., Olié, E., Carvalho, A. F., & Courtet, P. (2019). Suicidal thoughts and behaviors and social isolation: A narrative review of the literature. *Journal of affective disorders*, *245*, 653-667.

Centers for Disease Control and Prevention. (2022). *Suicide data and statistics*. Centers for Disease Control and Prevention. https://www.cdc.gov/suicide/suicide-data-statistics.html

Kennedy, Cerel, J., Kheibari, A., Leske, S., & Watts, J. (2021). A comparison of farming- and non-farming-related suicides from the United States' National Violent Deaths Reporting System, 2003–2016. Suicide & Life-Threatening Behavior, 51(3), 504–514.

Klingelschmidt, Milner, A., Khireddine-Medouni, I., Witt, K., Alexopoulos, E. C., Toivanen, S., LaMontagne, A. D., Chastang, J.-F., & Niedhammer, I. (2018). Suicide among agricultural, forestry, and fishery workers: A systematic literature review and meta-analysis. Scandinavian Journal of Work, Environment & Health, 44(1), 3–15.

Miller, & Rudolphi, J. M. (2022). Characteristics of suicide among farmers and ranchers: Using the CDC NVDRS 2003–2018. American Journal of Industrial Medicine, 65(8), 675–689. https://doi.org/10.1002/ajim.23399

Monteith, Smith, N. B., Holliday, R., Dorsey Holliman, B. A., LoFaro, C. T., & Mohatt, N. V. (2020). "We're afraid to say suicide": Stigma as a barrier to implementing a community-based suicide prevention program for rural veterans. The Journal of Nervous and Mental Disease, 208(5), 371–376. https://doi.org/10.1097/NMD.0000000000001139

Peden, A., Reed, D., Rayens, M., (2005). Depressive Symptoms in Adolescents Living in Rural America. *The Journal of Rural Health*, 21(4), 310-316.

Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S. R., Selby, E. A., & Joiner, T. E., Jr (2010). The interpersonal theory of suicide. Psychological review, 117(2), 575–600. https://doi.org/10.1037/a0018697

An Exploration of Expert Opinion on Animal Welfare and Ethics

Shayne J.B. White
Box 42131
Lubbock, TX 79409
806-742-2816
shaywhit@ttu.edu

Dr. Laura Fischer
Box 42131
Lubbock, TX 79409
806-742-2816
laura.fischer@ttu.edu

Dr. Christy Bratcher
Box 42123
Lubbock, TX 79409
806-742-2808
christy.bratcher@ttu.edu

Introduction and Theoretical Framework

In 2015, the American Veterinary Medical Association released eight "Principles of Veterinary Medical Ethics." The principles include treating animals with respect and compassion, and respecting the rights of colleagues, other health professionals, and clients. Although veterinarians take an oath to implement recommended principles in the profession, the general public may not always agree with these recommended welfare practices. For example, according to Pieper et al. (2016), consumer perceptions regarding hormone use in reproductive management should not be underestimated because this public perception may impact the viability of certain management practices for future industry use. Degeling and Johnson (2015) found the practice of animal welfare has shifted the focus from the science of animal production to the politics of consumption, and thus, public opinion has the potential to sway accepted management practices despite expert opinions. It is crucial to communicate knowledgeable expert opinions to those who potentially disagree from a less informed perspective. By better understanding expert opinion, effective communication strategies can be identified so knowledge can be shared in an effective manner and basic concerns can be addressed. The social exchange theory (SET) was used to guide this study. Lianf et al. (2008) described SET as a basis to understanding individual knowledge-sharing behavior. Experts should be able to communicate their area of knowledge to those with differing opinions and perspectives. SET, sharing knowledge can be seen as social interaction amongst those of both similar and different interests.

Purpose and Objectives

In an effort to better understand how to communicate between veterinarians and the general public, the purpose of this study was to obtain expert opinions on the topic of animal welfare and management ethics. In turn, we can identify the information to be shared with the public and formulate a plan to address inadequacies. Therefore, we investigated the following questions:
RQ1: What are the expert opinions regarding animal welfare and ethics?
RQ2: What needs are there for education and communication on animal welfare and ethics?

Methods

A qualitative study was conducted using six semi-structured interviews. According to Longhurst (2003), semi-structured interviews allow for complex behaviors, opinions, and emotions to be investigated. Recruitment emails were sent to the target population of veterinary science experts, including veterinarians, animal behavior and welfare professors, veterinary science professors, and a former veterinary technician. The research team created and reviewed an interview guide to ensure questions were relevant and applicable to research interests. Fourteen questions were postulated, with prompts and follow-up questions to help clarify answers. The interviews were scheduled via Zoom or in-person (45 to 60 minutes); all interviews were recorded and transcribed with Otter.ai. The questions were segmented into five areas: background and opinion, working with producers, human medicine and veterinary medicine and science, veterinary ethics, and education in veterinary medicine and science. To analyze the data open, axial, and selective coding were used to create emergent themes. An audit trail detailed definitions and theme formation for dependability and transferability (Erlandson et al., 1993).

Findings

We sought to understand the experts' opinion on animal welfare and ethics. The first theme that emerged was *Animal Rights are Different from Animal Welfare.* The public often misinterprets them for being the same. Participant 1 noted, "a lot of people get animal welfare confused with animal rights." Animal rights groups further blur the lines through influence on social media." Participant 2 stated, "as owners or caretakers of animals, animals do not have rights, but we as animal owners or caretakers are responsible for their health and welfare." The second emerging theme was *Animal Welfare Practices Should be Based on Science* as scientific practices ensure the safety and well-being of animals. Participant 4 stated, "perceived welfare in our industry should be based on science and not just your human feelings of what you think is better or not." The third theme was *Animal Welfare Practices Impact on Animal Health & Behavior* as it is a critical aspect of practicing animal welfare. Participant 5 stated, "to practice animal welfare, you have to know about animal behavior, not only about animal health… knowing how the normal behavior of the animals is and what is abnormal, recognizing this".

We evaluated the need for communication and education strategies. The first theme was *Experts are Concerned with Public Opinion.* The conversations indicated that both experts and consumers play a role in the communication block within the agriculture industry, Participant 1 noted, "it's the fact that the public doesn't understand or has lost touch with what happens in agriculture and science." Participant 6 said, "I think communication (is the problem)....we're realizing communication is an issue, but a lot of veterinarians have very poor communication skills." Secondly, *Experts Believed Communication is Key.* For example, participant 3 spoke about how experts need to be trained to communicate, "I think the issue is that while we're taught not to post those things (social media), we need to be educated on how to educate the public and teach them exactly how it does work and what we do."

Conclusions & Recommendations

To communicate with the public regarding ethical animal management practices, it was first necessary to understand how the experts perceive these topics. This study determined first, experts should attempt to define animal welfare and how to address the subject. According to experts in this study, animals do not have rights and it is up to the caretaker to ensure proper welfare using scientific practices rather than human feelings regarding care. To help educate others about the relevant science, SET can be applied as it focuses on the individual's behavior within the process of resource exchange (Yan et al., 2016). Individuals seek to exchange resources with others so they can receive knowledge through contact (Yan et al.,2016). To exchange knowledge from experts to the public, educators should train scientists in communication techniques so they are fully prepared to enter the workforce and are able to share knowledgeable information and perspectives from the experts based on current science and research in the field. With scientific communication training, veterinarians could become expert opinion leaders and routinely communicate animal welfare practices and ethics to the public. For example, veterinarians could be trained on how to communicate the importance of using antibiotics to heal animals, answering questions and concerns, revealing scientific studies as the basis for improved animal health and welfare. Future research should explore public perspectives of animal welfare and their trusted sources of information.

Reference

American Veterinary Medical Association. (2015, February). *Principals of veterinary medical ethics.* https://www.avma.org/javma-news/2015-03-01/principles-veterinary-medical-ethics-revised

Degeling, C., & Johnson, J. (2015). Citizens, consumers and animals: What role do experts assign to public values in establishing animal welfare standards?. *Journal of Agricultural and Environmental Ethics*, *28*(5), 961-976. doi: doi.org/10.1007/s10806-015-9571-x

Erlandson, D. A., Harris, E. L., Skipper, B. L., & Allen, S. D. (1993). *Doing naturalistic inquiry: A guide to methods*. Sage.

Liang T.P., Liu C.C. & Wu, C.H. (2008). Can social exchange theory explain individual knowledge-sharing behavior? A meta-analysis. *ICIS 2008 Proceedings.* AIS Electronic Library. https://aisel.aisnet.org/icis2008/17/

Longhurst, R.(2003).Semi-structured interviews and focus groups. Clifford C.,Cope M., Gillespie T., & French S. (Ed.), *Key Methods in Geography*, (3rd ed.,Vol. 2, pp.143-156). Sage.

Morris, O., Miller, J. D., & Whitehead, I. (2019). A website content analysis of corporate animal welfare messaging. *Journal of Applied Communications*, *103*(4), 1-18. doi: https://doi.org/10.4148/1051-0834.2268

Pieper, L., Doherr, M.G., & Heuwieser, W. (2016). Consumers' attitudes about milk quality and fertilization methods in dairy cows in Germany. *Journal of Dairy Science, 99*(4), 3162 – 3170. https://doi.org/10.3168/jds.2015-10169

Wu, S., Lin, C. S., & Lin, T. C. (2006, January). Exploring knowledge sharing in virtual teams: A social exchange theory perspective. In Proceedings of the 39th Annual Hawaii International Conference on System Sciences. https://ieeexplore.ieee.org/abstract/document/1579345

Yan, Z., Wang, T., Chen, Y., & Zhang, H. (2016). Knowledge sharing in online health communities: A social exchange theory perspective. *Information & Management*, *53*(5), 643-653. doi: http://dx.doi.org/10.1016/j.im.2016.02.001

An Inquiry Into Preflections on Students' Participation in Global Service-Learning

Samuel Ikendi, Ph.D.
Academic Coordinator for Climate Smart Agriculture
University of California
Division of Agriculture and Natural Resources
University of California - Merced
427 SRE Building
5200 N. Lake Road, Merced, CA 95343
sikendi@ucanr.edu

Author Note: This interpretivist inquiry was conducted when I was a Ph.D. Student at Iowa State University in the Department of Agricultural Education and Studies.

An Inquiry Into Preflections on Students' Participation in Global Service-Learning

Introduction/Need for the Study

Preflections describe the learning phase of educational activities before learners engage in those activities (Jones & Bjelland, 2004; Ikendi et al., 2022). In multicultural global learning programs, an examination of preflections detects preconceptions that affect learners' time abroad. The past decade saw an increase in students' participation in global service-learning (Bringle & Hatcher, 2011; Ikendi, 2022). Institutions embracing these programs increasingly begun to understand the importance of preparing students to have effective learning as they reciprocally provide services to communities. Students who go through preflections are believed to have preconceived ideas and perceptions about their programs and the processes; gaining this knowledge guarantees a qualitative investigation. The overarching question of this inquiry was what perceptions students have regarding preflections in preparing them for global service-learning programs.

Conceptual/Theoretical Framework

Preflections provide a connection between the experience and learning from the activity itself in the actual implementation. A preflective stage provides a starting point for Kolb's experiential cycle (Kolb, 2015), beginning not with the experience itself, but with a conscious assessment of pre-existing thoughts that may impact the learning process. Kolb (2015) attests that learning is a process than an outcome because it develops out of learning and re-learning. According to Kolb (2015), experiential learning highlights the fundamental role that experience plays in the learning process, "the process whereby knowledge is created through the transformation of experience" (p. 49). In this aspect, we embrace involvement in specific experiences, reflecting on them, intellectualizing those experiences, and actively participating in experimenting with those experiences. Learners learn and re-learn from their experience in the hands-on activities resulting in mastery of concepts through assimilation and accommodation processes. The historical records that are gained from the learning activities represent the learning outcomes.

Methodology/Procedures

We based on a constructivist orientation that focuses exclusively on the meaning-making activity of the individual mind (Crotty, 1998) to conduct this inquiry. We employed a case study as a research methodology where each participant was treated as a case/unit of analysis which, in turn, allowed us to collect and analyze data on an individual case basis. Further, we utilized across case approach to data analysis considering our participants as members of a community (Creswell & Poth 2018). The potential participants were seven students who were undergoing orientations for a Spring Break Service-learning trip to Uganda in March 2020, which was canceled due to COVID-19 but three had participated in one-on-one in-depth interviews. All three participants were female (pseudo names used), two were seniors in Agronomy and Animal Sciences; both grew up in town. The third was a sophomore in Agriculture Communications and grew up in rural farming. I first created a rapport with the students by attending the trip orientations upon request for this study and invitation by their instructors. I engaged in in-depth personal interviews with observations and field notes taking both during the orientation and interviews. The interview guide had four questions focusing on a particular category e.g. farming systems and sub-questions for probing. Interviews took place in a secured office space where each participant was welcomed, consent was sought related to the study purpose and signed, and voice recording consented to. Each interview took 30 minutes including effective recording time and pre-and post-rapport building and discussions. During analysis, I first played the audio for each case and transcription was done word by word while actively listening to the audio, keeping note of the relay time that potentially signified a change of theme or a need for clarification. I engaged in a dialogue with the data seeking to recognize and classify commonalities across the cases and perspectives that appeared distinct. I wrote analytic memos to reflect on emerging unique ideas and triangulated them with the observation notes that formed the themes (Lincoln & Guba, 1985; Saldana, 2016). I shared drafts among peers for reviews to help in conclusions.

Findings

Thematic analysis and extraction of verbatims were adopted on a case-by-case basis for each of the four guiding questions here termed as the categories. Themes emerged inductively for each category as coding progressed. In the motivation category, eight themes emerged including academics, skills, knowledge, community service, cultural diversity, career, inspiration, and adventure as their motivators to participation in the program. Students, for instance, were driven by the motive to provide community service, *"… what stuck out to me about the trip to [country] was the service part. …, and I just like doing the service stuff…*" Zari. Regarding the orientation category, six themes emerged including satisfaction, structure, awareness, team-based learning, current affairs, and health. Students expressed satisfaction with the preflections as this created awareness, *"… it's a good experience, I am glad we learned about all we are going to be doing and what to expect…*" Rona. In the agricultural systems category, seven themes emerged including the scale of production, technology, gender, crop improvement, livestock, food security, and infrastructure. Through preflections, Agronomy majors, for instance, had ideas related to exploring a remedy for food insecurity through crop improvement. "*…. I want to know their perceptions of GMOs as if there would be GMO seeds available to them if they would be receptive to it or resist…*" Rona. Related to the challenges and barriers category, for internal barriers, eight themes including cultural shock, homesickness, vaccination, personal security, commitment, personal shyness, environment, and parent restriction emerged. Students expressed homesickness, *"… I am also a little fearful of traveling so far away… I will be away from home on spring break… I sometimes find myself feeling selfish about going away…*" Nia. Four themes emerged from external barriers including financial, diseases, healthcare, and travel bans. *"….the external barrier that almost made me reconsider the trip is the expense. I can pay for myself to go, but I sometimes found myself trying to decide if I should …*" Zari.

Conclusions

Despite being their first trip to Uganda and Africa, students' readiness to participate in this service-learning trip was clearly expressed. Findings revealed that students had preconceived ideas about the program which motivated their participation. They also expressed a high level of satisfaction with preflections. Students had preconceived ideas about the agricultural systems in Uganda as well as internal and external barriers that were likely to impend their participation. Some of the ideas were informed by their experiences during preflections, however, some of these preconceived ideas changed while engaging with instructors and guests during preflections.

Implications

Quality education prepares students for lifelong learning. Students must participate in global programs to experience a new array of environments in preparation to work in a globalized world. Learning about students' motivation and existing knowledge are vital indicators for the success of preflections and experiential learning programs. Preconceived ideas cause fictional barriers which impend participation in global programs and the perceptions of threats are graver to learning (Zull, 2002). Conducting preflections with experienced instructors in global programs and guest speakers like alumni address such perceptions to allow learning to proceed smoothly.

References

Bringle, R. G., & Hatcher, J. A. (2011). International service learning. In R. G. Bringle, J. A. Hatcher, & S. G. Jones. (Eds.), *International service-learning: Conceptual frameworks and research* (pp. 3-28). Stylus.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches*. Sage.

Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*. Sage.

Ikendi, S. (2022). *Exploring changes in academics, skills, and intercultural competence development of global service-learning students* (Doctoral Dissertation, Iowa State University). Graduate Theses and Dissertations. https://dr.lib.iastate.edu/handle/20.500.12876/JvNVO1Xv

Ikendi, S., Retallick, M., & Nonnecke, G. (2022 October 6-8). Pre-departure orientations: The architectural founding of learning in global service-learning. *Conference Poster Proceedings of The 2022 North Central Region Agricultural Education Research Conference* (pp. 55-61), Columbia, MO.

Jones, L., & Bjelland, D. (2004). International experiential learning in agriculture (Conference Paper Proceedings). *The 20th Annual Conference, Association for International Agricultural and Extension Education* (pp. 963-964). Dublin, Ireland.

Kolb, D. A. (2015). *Experiential learning: Experience as a source of learning and development*. Prentice-Hall.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage.

Saldana, J. (2016). *The coding manual for qualitative researchers*. Sage.

Zull, J. E. (2002). *The art of changing the brain*. Stylus.

An Interdisciplinary Approach to Experiential Learning in Cybersecurity and Agriculture Through Workforce Development

Kellie Johnson (Kelliej@vt.edu)
Dr. Tiffany Drape (Tdrape@vt.edu)
Dr. Joseph Oakes (Jcoakes@vt.edu)
Dr. Joseph Simpson (Jjsimpson@vt.edu)
Dr. Anne M. Brown (Ambrown7@vt.edu)
Dr. Donna Westfall-Rudd (mooredm@vt.edu)
Dr. Susan Duncan

Virginia Polytechnic Institute and State University
Agricultural Leadership and Community Education

175 West Campus Drive
Blacksburg, VA 24061
(404) 643-0063

Introduction

Cybersecurity in food and agriculture (F+A) is a steadily growing industry that increasingly needs individuals to enter the workforce. The increase in vulnerabilities of the current food supply can potentially threaten the global food system (Duncan et al., 2019). To combat these potential threats, professionals should have the necessary training and ability to build relationships and communicate across multiple disciplines and organizations to develop solutions (Richardson et al., 2019). However, due to the high advancement of technologies in cybersecurity in F+A, gaps exist in the training and development for professionals entering the field. Students enrolled in colleges of agriculture and life sciences have limited opportunities to integrate data management and security into (F+A) areas of study. There is a growing need for individuals in agricultural and life sciences fields to be more prepared and versed in topics related to data and cybersecurity (Drape et al., 2020). These gaps can lead to data security risks and information transfer in various technologies. Studies show that graduates from cyber studies should possess the necessary soft skills, critical thinking, and capabilities to solve problems and obtain transferable skills needed in the workforce (Jones et al., 2018, as cited in Payne et al., 2020).

This qualitative study aimed to deliver an experiential learning-focused course that integrated the interdisciplinary areas of data sciences and agriculture with early-career undergraduates interested in learning about and pursuing a career around cybersecurity in F+A. The research questions guiding this study were: What do students seek to understand about cybersecurity in F+A and workforce development? How do students conceptualize which skills learned in class to be transferable to the workforce?

Theoretical Framework

The theoretical framework for this study relies on the Experiential Learning Theory (EL) developed by David Kolb (1984). EL theory theorizes the process of learning and obtaining knowledge cultivated through experiences, perception, and cognitive behavior (Kolb, 1984, as cited in Fai Ng et al., 2018). Kolb proposed a four-stage cycle model of knowledge and development; concrete experience, reflective observation, abstract conceptualization, and active experimentation (Yardley et al., 2012). This study proposed to use a scalable EL-based course to integrate data science, F+A, and industry partners in a novel learning experience. This study utilized the first three steps of the model; concrete experience, reflective observation, and abstract conceptualization.

Methodology

This study population consisted of nine undergraduate students from Virginia Tech who participated in a course taught alternately by the professor of record, teaching assistant, workforce and career development professionals, and F+A cybersecurity experts. Weekly reflections were assigned at the end of each class. The data consisted of 12 weeks of responses, geared toward different aspects of the course content. As part of the coding process, *in vivo* was conducted to determine what meaningful patterns were emerging to make up sub-categories of data based on the conversation and other audio-based recordings and by-products collected using Atlas ti (Charmaz, 2006). The data was first open-coded, categorized into major themes, and then focused coding was conducted to identify any repeating patterns to understand the multi-layer meaning (Creswell et.al., 2007). The resulting codes began to explain larger data segments related to perceptions of cybersecurity in F+A. Focused coding helped determine the adequacy of the *in vivo* codes (Charmaz, 2014). Axial coding was conducted as the final step of the coding process, helping the researchers bring all the data together and determine themes based on the research questions (Corbin and Strauss, 2008). The development of the codebook emphasized the action-oriented nature of language in which participants discussed experiences of being a participant in this interdisciplinary course from their viewpoint (Roth, 2008).

Findings

Three themes emerged from the data: 1) students gained industry knowledge related to their academic engagement, 2) students established internship expectations and aspirations, and 3) workforce training and development were essential for students to succeed in future career placement. A participant articulated a gain in industry knowledge by stating, “It was most helpful to have discussions with industry professionals and hear their opinions and experiences from a professional point of view.” Additionally, a participant was able to identify internship expectations by stating, “Having clear guidance and understanding of the day-to-day functions of the organization and supervisory support is important”. Lastly, a participant found that workforce training and development were essential by stating, “Resume building, internship performance, and effective communication skills in the workplace were the most important tools needed to enhance their all-around development for entering the workforce.” The results of the experiential learning course consisted of an overview and analysis of the workforce development training in the area of cybersecurity in F+A and how those skills transfer over into students' internship experience.

Conclusions and Recommendations

The interplay between students across disciplines is essential for careers in cybersecurity within food supply chains, technology adoption, and efficiencies in F+A. Considering the lack of knowledge and training available for young professionals entering the cybersecurity workforce in F+A, future professionals need to integrate more experiential learning teaching and learning strategies around agriculture, cybersecurity, and training (Drape et al., 2020; Duncan et al., 2019). Therefore, engagement with industry professionals, workforce development workshops and training, and autonomy in addressing professional needs to be successful in the workforce are important themes to consider when building an experiential learning-based experience for students in higher education. Developing a knowledgeable workforce will benefit several sectors in cybersecurity-related fields and expand workforce development opportunities for students when they complete their degree programs and enter the workforce.

References

Angyalos, Z., Botos, S., & Szilagyi, R. (2022). The importance of cybersecurity in modern agriculture. *Journal of Agricultural Informatics*, 12(2). https://doi.org/10.17700/jai.2021.12.2.604 (Original work published June 15, 2021)

Charmaz, K. (2014). *Constructing grounded theory*. Sage Publications.

Corbin, J., & Strauss, A. (2008). Strategies for qualitative data analysis. *Basics of Qualitative Research. Techniques and procedures for developing grounded theory*, *3 195-228*

Creswell, J., & Plano Clark, V. (2007). *We are designing and conducting mixed-methods research*. Sage Publications.

Duncan, S. E., Reinhard, R., Williams, R. C., Ramsey, F., Thomason, W., Lee, K., Dudek, N., Mostaghimi, S., Colbert, E., & Murch, R. (2019). Cyberbiosecurity: A new perspective on protecting U.S. food and agricultural system. *Frontiers in Bioengineering and Biotechnology*, *7*. https://doi.org/10.3389/fbioe.2019.00063

Drape, T., Magerkorth, N., Sen, A., Simpson, J., Seibel, M., Murch, R. S., & Duncan, S. E. (2020). Assessing the role of cyberbiosecurity in agriculture: A Case Study. *Frontiers in Bioengineering and Biotechnology*, *9*. https://doi.org/10.3389/fbioe.2021.737927

Fai Ng, Y., Chan, K. K., Lei, H., Mok, P., and Leung, S. Y. (2019). Pedagogy and innovation in science education: A case study of an experiential learning science undergraduate course. *The European Journal of Social & Behavioral Sciences* Issue 2. https://doi.org/10.15405/ejsbs.254.

Jones, K. S., Namin, A. S., and Armstrong, M. E.(2018). The core cyber-defense knowledge, skills, and abilities that cybersecurity students should learn in school: Results from interviews with cybersecurity professionals. *ACM Trans. Comput. Educ.* 18, no. 3. https://doi.org/10.1145/3152893.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, N.J: Prentice‐Hall.

LeClair, J. (2015). *Protecting Our Future, Volume 2: Educating a Cybersecurity Workforce.* v. 3. Hudson Whitman/ Excelsior College Press. https://books.google.com/books?id=bgVCzQEACAAJ.

Payne, B. K., Cross, B., and Vandecar-Burdin, T. (2022). Faculty and advisor advice for cybersecurity students: Liberal arts, interdisciplinarity, experience, lifelong learning, technical skills, and hard work, *Journal of Cybersecurity Education, Research and Practice,* 2021, 17.

Richardson, L. C., Lewis, S. M., & Burnette, R. N. (2019). Building capacity for cyberbiosecurity training. *Frontiers in Bioengineering and Biotechnology,* 7. https://doi.org/10.3389/fbioe.2019.00112

Roth, W. M. (2008). The nature of scientific conceptions: A discursive psychological perspective. *Educational Research Review*, *3*(1), 30-50.

Yardley, S., Teunissen, P. W. & Dornan, T. (2012) Experiential learning: AMEE Guide No. 63, *Medical Teacher,* 34:2, e102-e115, DOI: 10.3109/0142159X.2012.650741

Analyzing Graduate Student Member Benefits and Challenges within Agricultural Education, Communication, and Leadership Professional Organizations

Kameron Rinehart, MS
Kristine Schechinger
Courtney Gibson, Ph.D.
Jason Headrick, Ph.D.

Davis College – Agricultural Education & Communications 15th Street Lubbock, TX 79409

740-505-2805

Kameron.rinehart@ttu.edu

Kschechi@ttu.edu

Courtney.d.gibson@ttu.edu

Jason.headrick@ttu.edu

Analyzing Graduate Student Member Benefits and Challenges within Agricultural Education, Communication, and Leadership Professional Organizations

Introduction/Need for Research

Professional organizations have been part of the agricultural education profession since the early 1900s (Connors, 2021). Membership in these organizations has been promoted as a critical career development component (Cottrell et al., 2009). Graduate students (GS) are important members of these organizations and develop skills that will benefit their future careers (Desmond & Symens, 1997). This study investigated GS member benefits compared to the general members within organizations in the agricultural education, communication, and leadership discipline (AECL). This study aimed to determine the membership roles of GS members in six organizations representing AECL and compare GS member benefits.

Conceptual or Theoretical Framework

Participative leadership (PL) encourages organizational leaders to include employees in decision-making processes (Wang et al., 2022). Leaders can build a dynamic environment when employees are involved in decision-making (Wang et al., 2022). When leaders adopt a PL style, employees are encouraged to continue the organization's success (Huang et al., 2006). The participatory style provides a sense of ownership and makes members feel responsible for the organization (Wang et al., 2022). It is critical that all members feel a sense of ownership. GSs can contribute to the organization's continuation and success by participating in decision-making processes. GSs who engage early in their career will likely continue their membership and service long after graduate school (Escoffery et al., 2015).

Methodology

A content analysis approach was used that focused on selected organizations' constitutions, bylaws, and websites. A convenience sample within the AECL discipline was selected for this study: American Association of Agricultural Education (AAAE), Association of Communication Excellence (ACE), Association of International Agricultural and Extension Education (AIAEE), Association of Leadership Educators (ALE), National Agricultural Communication Symposium (NACS), and North American Colleges and Teachers of Agriculture (NACTA). The constitutions and bylaws were obtained from the organizational websites. Researchers created a codebook and code sheet to review membership levels, benefits, and ability to participate in organization functions. Inductive coding allowed researchers to determine codes surrounding membership, dues, GS, and member roles. Validity was ensured through in-depth descriptions from the code sheet, audit trails, and researcher positionality (Creswell & Poth, 2018).

Results/Findings

Considerable differences regarding GS membership were found. Table 1 shows significant factors that are different, such as graduate student membership costs, the ability of GS voting rights, the ability to run for or hold a leadership position, and the designated representation of graduate students on a board of directors. GS members in two organizations do not have the right to participate in organizational operations. ACE allows these members to vote but not the opportunity to seek office. Three organizations allow members to vote and seek a leadership position, with two designating a seat on their board specifically for a GS representative.

Table 1. Graduate Student Membership Benefits

Organization Name	Graduate Student Dues	The Right to Vote on Official Business	Ability to Hold Office	Graduate Student Representative on Board of Directors
NACTA	$25	No	No	No
AAAE	$30	No	No	No
ACE	$80	Yes	No	No
ALE	$50	Yes	Yes	No
AIAEE	$73.50	Yes	Yes	Yes
NACS	$75	Yes	Yes	Yes

Conclusions & Implication

The organizations we evaluated offer GSs networking and educational opportunities, yet obstacles may prevent GSs from joining. Half of the organizations' dues for GSs fall above $50, which could financially burden those with limited monthly income. Four organizations offer GSs more significant benefits that align closely with the general membership. Two organizations do not provide GSs with opportunities outside of attending national conferences. The advantages of voting and holding leadership positions may encourage GSs to apply for membership. Organizations that involve GSs in decision-making use a participative leadership approach and provide a sense of ownership (Wang et al., 2022). When organizations allow GSs to partake in the organization, it shows them that the organization is invested in them and wants them to be involved (Myers, 2022).

Recommendations

Based on the results, several recommendations can be made. For practice, organizations should establish a special committee to investigate GS membership and rights within their organizations and be given the opportunity to be represented within leadership. This would allow GS voices to be part of decision-making processes within organizations. Future studies investigate GSs sense of belonging within these organizations and the impact that GS representatives have when serving in a leadership role. Member satisfaction surveys should be deployed on a regular basis to best understand organizational buy-in and member engagement.

References

A history of professional associations for teacher educators in agriculture:1929 to present. (2021). *Journal of Agricultural Education*, *62*(3). https://doi.org/10.5032/jae.2021.03248

Cottrell, R. R., Girvan, J. T., & McKenzie, J. F. (2009). *Principles and foundations of health promotion and education* (4th ed.). San Francisco, CA: Pearson Benjamin Cummings.

Creswell, J.W. and Poth, C.N. (2018). *Qualitative Inquiry and research design choosing among five approaches, 4th edition, SAGE* Publications, Inc., Thousand Oaks.

Desmond, S. A., & Symens, A. M. (1997). Promoting Graduate Students' Membership in Professional Organizations. *Teaching Sociology*, *25*(2), 176. https://doi.org/10.2307/1318663

Escoffery, C., Kenzig, M., & Hyden, C. (2015). Getting the Most Out of Professional Associations. *Health Promotion Practice*, *16*(3), 309–312. https://doi.org/10.1177/1524839914566654

Huang, X., Shi, K., Zhang, Z., & Cheung, Y. W. (2006). The impact of participative leadership behavior on psychological empowerment and organizational commitment in Chinese state-owned enterprises: the moderating role of organizational tenure. *Asia Pacific Journal of Management*, *23*(3), 345–367. https://doi.org/10.1007/s10490-006-9006-3

Myers, E. (2022, August 26). *Participative Leadership Theory and Decision-making Style*. https://www.simplypsychology.org/participative-leadership.html

Wang, Q., Hou, H., & Li, Z. (2022). Participative Leadership: A Literature Review and Prospects for Future Research. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.924357

Analyzing the Sources of Knowledge and Pedagogical Content Knowledge of SBAE Teachers by Licensure Type

Matthew J. Wood

Utah State University

2300 Old Main Hill

Logan, Utah 84322-2300

matthew.wood@usu.edu

Tyson J. Sorensen

Utah State University

2300 Old Main Hill

Logan, Utah 84322-2300

tyson.sorensen@usu.edu

Analyzing the Sources of Knowledge and Pedagogical Content Knowledge of SBAE Teachers by Licensure Type

Introduction/Need for Research

With attrition rates on the rise and an influx of novice and alternatively certified (AC) teachers entering the profession, it has become imperative to assess the knowledge base of school-based agricultural education (SBAE) teachers and their pedagogical abilities (Rice & Kitchel, 2015). While possessing content knowledge is important, communicating that knowledge effectively to students is what makes a quality teacher (Okpala & Ellis, 2005). Quality teachers possess high levels of Pedagogical Content Knowledge (PCK). PCK is one of the most influential pieces of teacher knowledge and is critical to teacher development (Baumert et al., 2010; Loughran et al., 2012). PCK is a culmination of Common Content Knowledge, Horizon Content Knowledge, Specialized Content Knowledge, Knowledge of Content and Students, Knowledge of Content and Teaching, and Knowledge of Curriculum (Hill et al., 2008). PCK research has aided in creating a picture of what teachers do when teaching and has further established that content knowledge alone does not make an individual qualified to teach (Rice & Kitchel, 2018). Outside of SBAE, the science and math fields have indicated deficiencies in the PCK of teachers (Ball et al., 2008; Halim & Meerah, 2002). To support a new wave of SBAE teachers entering the profession, identifying their knowledge base and PCK is crucial.

Theoretical Framework and Literature Review

Self-efficacy, a concept first developed by Albert Bandura, postulates that human achievement depends on the individual's experiences (Bandura, 1977). The more an individual is exposed to something, the more confident they become in their abilities to address it. Related to teaching, research shows that teachers with high levels of self-efficacy are more open to new methods of teaching, challenge themselves more, and exhibit greater confidence in planning, solving problems, and seeking assistance (Lazarides & Warner, 2020).

Similarly, the development of an educator's Pedagogical Content Knowledge (PCK) coincides with Bandura's theory. Theorized by Lee Shulman (1986), PCK, in the context of agricultural education, is where educators put their content knowledge expertise to practice. Previous literature in agricultural education has studied traditionally certified (TC) and AC teachers independently, but few have examined both cohorts of teachers together. Rice & Kitchel (2018) identified a need for additional research as PCK in agricultural education has yet to be defined. Moreover, examining "what shapes PCK specifically in agriculture teachers can serve as the starting point for future PCK development studies" (p. 66). Identifying the sources of knowledge of both cohorts of teachers and their PCK will paint a clearer picture of how SBAE teachers can be better supported in the classroom.

Methodology

This study's purpose and primary objective was to describe the sources of knowledge and the differences in Pedagogical Content Knowledge by licensure type. As part of a larger descriptive relational study, the target population was all SBAE teachers from the Northeast region of the United States (NAAE Regions IV and VI) who were actively teaching during the 2021-2022 school year. During June of 2022, an online survey instrument (i.e., Qualtrics) was administered. The survey instrument for this specific analysis consisted of respondents addressing statements on sources of knowledge and a series of statements, each linked to a PCK construct using a five-point Likert-type scale. Respondents used a unit they felt confident teaching as a frame of reference when addressing the statements related to PCK. The study was then repeated using a unit teachers felt less confident teaching. As part of a larger study, four hundred and eighty-five participants participated in the survey, with 73.6% (N = 357) identifying as TC and 28.4% (N = 128) identifying as AC.

Results/Findings

Regarding the sources of knowledge, 92.5% of TC SBAE teachers and 80.6% of AC SBAE teachers agreed or strongly agreed with the statement, "my teaching experience is a source of knowledge that has a great impact on my ability to be effective at teaching." Additionally, 73.3% of TC SBAE teachers and 85.3% of AC teachers agreed or strongly agreed with the statement, "my previous employment in agriculture is a source of knowledge that has a great impact on my ability to be effective at teaching." While some similarities exist among sources of knowledge, the two cohorts were split on their third highest source of knowledge. 74.9% of TC SBAE teachers agreed or strongly agreed with the statement, "experts within the field are a source of knowledge that has a great impact on my ability to be effective at teaching." In comparison, 75.7% of AC SBAE teachers agreed or strongly agreed with the statement, "the internet and textbooks are sources of knowledge that has a great impact on my ability to be effective at teaching."

Regarding the Pedagogical Content Knowledge of both cohorts of teachers, our findings suggest TC teachers claim to have higher Horizon Content Knowledge (M = 4.41, SD = 0.65) and Knowledge of Content and Students (M = 3.79, SD = 0.75). In contrast, AC teachers claim to have higher Common Content Knowledge (M = 4.06, SD = 0.74) and Specialized Content Knowledge (M = 3.92, SD = 0.74). Mean and standard deviation figures were determined by averaging the reported values for each trial (confident vs. not confident).

Conclusions/Recommendations/Impacts

Our findings show similarities among both cohorts of SBAE teachers concerning sources of knowledge but clear differences in PCK. Moreover, a relationship exists between licensure type and the construct areas SBAE teachers ranked more favorably. TC teachers claim to be proficient at knowing their students. This includes understanding where their students are developmentally and identifying items that will be challenging for them. Additionally, they reported proficiency in sequencing material, locating teaching resources, and designing curricula.

On the other hand, AC teachers claim to be proficient in identifying when students give incorrect answers, understand why students make certain errors in their work, and feel they can easily explain why answers are correct or incorrect.

As a result, individualized professional development would best address each cohort's content and pedagogical gaps. Doing so will help develop these teachers' self-efficacy and pedagogical content knowledge, allowing them to be more effective in the classroom. This recommendation is supported by the theories of Bandura (1977) and Shulman (1986). Additionally, state staff should work with their SBAE teachers to provide content-specific professional development for their TC teachers and professional development in pedagogical practices for their AC teachers. Finally, the researchers would like to expand this study to other parts of the United States to see if other regions would generate similar results.

References

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191–215. https://doi.org/10.1037/0033-295x.84.2.191

Ball, D., Thames, M. H., & Phelps, G. (2008). Content knowledge for teaching. *Journal of Teacher Education*, *59*(5), 389–407. https://doi.org/10.1177/0022487108324554

Baumert, J., Kunter, M., Blum, W., Brunner, M., Voss, T., Jordan, A., Klusmann, U., Krauss, S., Neubrand, M., & Tsai, Y. M. (2010). Teachers' mathematical knowledge, cognitive activation in the classroom, and student progress. *American Educational Research Journal*, *47*(1), 133–180. https://doi.org/10.3102/0002831209345157

Halim, L., & Meerah, S. M. (2002). Science trainee teachers' pedagogical content knowledge and its influence on physics teaching. *Research in Science &Technological Education*, *20*(2), 215–225. https://doi.org/10.1080/0263514022000030462

Hill, H. C., Ball, D. L., & Schilling, S. G. (2008). Unpacking pedagogical content knowledge: Conceptualizing and measuring teachers' topic-specific knowledge of students. *Journal for Research in Mathematics Education*, *39*(4), 372–400. https://doi.org/10.5951/jresematheduc.39.4.0372

Lazarides, R., & Warner, L. M. (2020). Teacher Self-Efficacy. *Oxford Research Encyclopedia of Education*. https://doi.org/10.1093/acrefore/9780190264093.013.890

Loewenberg Ball, D., Thames, M. H., & Phelps, G. (2008). Content knowledge for teaching: What makes it special? *Journal of Teacher Education*, *59*(5), 389–407. https://doi.org/10.1177/0022487108324554

Loughran, J., Berry, A., & Mulhall, P. (Eds.). (2012). Understanding and developing science teachers' pedagogical content knowledge. *Sense Publishers*. https://doi.org/10.1007/978-94-6091-821-6

Okpala, C. O., & Ellis, R. (2004). The perceptions of college students on teacher quality: A focus on teacher qualifications. *Education 3-13*, *126*(2), 374–383. https://eric.ed.gov/?id=EJ765687

Rice, A., & Kitchel, T. (2015). Preservice agricultural education teachers' experiences in and anticipation of content knowledge preparation. *Journal of Agricultural Education*, *56*(3), 90–104. https://doi.org/10.5032/jae.2015.03090

Rice, A., & Kitchel, T. (2018). Agriculture teachers' integrated belief systems and its influence on their pedagogical content knowledge. *Journal of Agricultural Education*, *59*(1), 21–69. https://doi.org/10.5032/jae.2018.01059

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, *15*(2), 4–14. https://doi.org/10.3102/0013189x015002004

Assessing Preservice SBAE Teacher Needs for Working with English Language Learners

Maggie R. Pfeiffer Salem, Ed.D.
P.O. Box 3011
Commerce, TX 75429
Maggie.Saelm@tamuc.edu
903-886-5357

Will Doss, Ph.D.
1120 West Maple
AFLS E-108
University of Arkansas
Fayetteville, AR 72701
479-575-2035
wd009@uark.edu

Assessing Preservice SBAE Teacher Needs for Working with English Language Learners

Introduction/Theoretical Framework

The purpose of this study was to determine preservice teacher needs at Texas A&M University-Commerce for working with English language learners. English Language Learners (ELL) refers to students who do not possess English as their first language. They are linguistically, culturally, and educationally diverse, with various proficiencies of the English language. Additionally, they have the burden of needing to increase their proficiency in English while simultaneously meeting academic demands, presented in English (Roy-Campbell, 2013). The vast majority, 77.8% of ELLs identify as Hispanic or Latino with Spanish being the most commonly spoken language at home (United States Department of Education [USDOE], 2022). Ten percent of all students are ELL and between 2009 and 2015, the number of ELL students increased in more than half of the states with five states seeing increases of over 40 percent. In 2015, there were more than 4.8 million ELLs in the educational system (USDOE, 2022). As revealed in previous research, SBAE teachers share a lack of confidence in educating and developing educationally relevant relationships with ELL's (Roy-Campbell, 2013; Salem, 2021).

The theoretical framework for this study uses a merger of the human capital theory (HCT), self-efficacy theory (SET), and social cognitive theory (SCT). HCT theorizes individuals are capable increasing their various capacities through experiences (Haynes et al., 2014). Teacher preparation programs have the opportunity to develop those capacities via coursework and guided experiences (Haynes et al., 2014). Self-efficacy is a person's own perceptions concerning their ability to facilitate certain activities (Bandura, 1977). This means, a teacher's experiences influence their perceptions of their own ability to teach (Eck et al., 2019). Social cognitive theory suggests an individual's acquisition of knowledge is related to the observation of others (Bandura, 2005). Consequently, teacher experiences can be improved even through an indirect positive experience (Bandura, 1977).

Methods

This study served as the pilot for a future larger study with a similar purpose and also served to describe preservice teachers needs in our own program. To accomplish this purpose, all students enrolled in junior and senior level agricultural education courses at Texas A&M University-Commerce were asked to take an online survey administered through Qualtrics. Of those students, there were (n = 13) responses. The instrument had 11 demographic questions. Participants also rated their perceived importance and competence for 25 skills under the construct of teaching and learning with ELLs and for 16 skills under the construct of working with ELLs. Skills related to each of these constructs were identified through a previous qualitative study on the topic as well as a review of literature (Salem et al., 2022). Content validity of the questionnaire was established by a panel of experts in agriculture teacher education with experience in working with ELLs. To establish reliability of the instrument, those responding from the first administration were asked to take the questionnaire again two weeks later. Test-retest reliability was calculated from seven usable responses for a stability coefficient of r = .81. This reliability analysis is appropriate for reporting results for single items

(Warmbrod, 2014). Data were analyzed in Microsoft Excel where a mean weighted discrepancy score (MWDS) was calculated, as described by Borich (1980) for each skill based on difference in perceived importance and competence. MWDS was then used to rank the need for each ELL skill.

Findings

Demographic items indicated there were 10 female and three male preservice teachers. Ethnicities ranged from White/Caucasian (*n* = 9), multi/biracial (*n* = 2), Hispanic/Latino (*n* = 1), and Native American (*n* = 1). Concerning specific preservice teacher needs for working with ELLs, the top and bottom two ranking needs for skills in each of the two constructs are presented in Table 1 along with average reported importance and competence.

Table 1
Ranking of Preservice Teacher Needs for Working with English Language Learners (N = 13)

Skill	Importance Mean	Competence Mean	MWDS
Skills for Teaching and Learning with ELLs			
General Strategies for Teaching ELLs	4.38	2.15	9.93
Developing Materials to Aid ELLs' Comprehension	4.46	2.15	9.07
Identifying Cultural Identities to Facilitate Learning	4.38	2.23	3.61
Identifying Linguistic Identities to Facilitate Learning	4.31	2.15	3.22
Skills for Working with ELLs			
Communicating with Parents of ELL Students	4.46	1.92	10.31
Recruiting Students who Speak Non-English Language	4.46	2.15	9.73
Communicating with ELL Students	4.54	2.00	4.59
Determining Language Spoken in the Home of ELLs	4.38	2.23	4.49

Note. Scale: Importance 1 = *Not Important* to 5 = *Very Important;* Competence 1 = *Not Competent* to 5 = *Very Competent*.

Conclusions/Implications/Recommendations

This study identified the lack of SBAE preservice teacher self-efficacy and the need for SBAE teacher preparation programs to provide a more practical set of knowledge, skills, and experiences to pre-service agricultural education students in the areas of providing meaningful education to ELL's. The study demonstrates a need for teacher preparation programs to provide training and experience in the areas of teaching ELL students and in developing materials to aid in ELL instruction. The study also revealed a need for teacher preparation programs to assist in the develop of the competencies needed to identify cultural and linguistic identities to facilitate ELL learning, training in the areas of communicating with ELL students and their parents, recruiting ELL students, and in determining what language is spoken at the home of ELL's.

We recommend similar studies be replicated regionally to determine if other groups of pre-service teachers experience similar issues. SBAE teacher preparation programs should include more practical learning environments, methodologies, and skillset development opportunities in the areas of ELL education.

References

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191-215. doi:10.1037/0033-295X.84.2.191

Bandura, A. (2005). The evolution of social-cognitive theory. In K. J. Smith & M. A. Hitt (Eds.) *Great minds in management.* (pp. 9-35). Oxford: Oxford University Press.

Borich, G. (1980). A needs assessment model for conducting follow-up studies. *Journal of Teacher Education*, *31*(3), 39-42. https://doi.org/10.1177/002248718003100310

Eck, C. J, Robinson, J. S., Ramsey, J. W., & Cole, K. L. (2019). Identifying the characteristics of an effective agricultural education teacher: A national study. *Journal of Agricultural Education, 60(4*), 1-18. doi: 10.5032/jae.2019.04001

Hayes, J. C., Gill, B. E., Chumbley, S. B., & Slater, T. F. (2014). A cross-case comparison of the academic integration human capital pre-service agricultural educators retain prior to their teaching internship. *Journal of Agricultural Education*, *55(5*), 191-206. doi: 10.5032/jae.2014.05191

Roy-Campbell, Z.M. (2013). Who educates teacher educators about English language learners?. Journal of Literacy and Language Arts, 52(3), 255-280. Retrieved from chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://scholarworks.wmich.edu/cgi/viewcontent.cgi?article=3087&context=reading_horizons

Salem, M. (2021). A phenomenological investigation into agricultural education teacher preparation student and early career teaching experience. (28772959). [Doctoral dissertation, Texas A&M University-Commerce]. ProQuest.

Salem, M. R. P, Frost, K. J., Doss, W., & Rodriguez, S. L. (2022). Early career teachers' struggles with ELL/ESL stakeholders in SBAE: A phenomenological investigation. In AAAE, *Paper Proceedings of the Southern Region Conference of the AAAE* (pp. 176-185). http://aaaeonline.org/resources/Documents/Southern%20Region/2022SouthernConference/2022SouthernAAAE_ResearchProceedings.pdf

Short, D. & Echevarria, J. (2004). Teacher skills to support English language learners. *Educational Leadership*, 62(4), 8-13. Retrieved from chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/http://www.sadil.ws/bitstream/handle/123456789/142/Teacher%20skills%20to%20support.pdf?sequence=1&isAllowed=y

United States Department of Education. (2022, July 15). Our nation's English learners. https://www2.ed.gov/datastory/el-characteristics/index.html

Warmbrod, J. R. (2014). Reporting and interpreting scores derived from Likert-type scale. *Journal of Agricultural Education, 55*(5), 30-47. https://doi.org/10.5032/jae.2014.05030

Beer Me: Investigating Midwest Craft Brewery Demand for Locally-Grown Hops

Grace Dowding
Doane University
Undergraduate Student

Kate Bruns
Doane University
Undergraduate Student

Nate Hostetler
Doane University
Undergraduate Student

Brett Meyer
Doane University
Undergraduate Student

Blake C. Colclasure
Doane University
1014 Boswell Ave.
Crete, NE 68333
(402) 826-6728
blake.colclasure@doane.edu

Introduction

Unprecedented growth of U.S. craft breweries was observed in the last decade due to rising consumer interest in unique and locally brewed beer (Brewers Association, 2022). A major ingredient in beer brewing is hops. In 2022, there were over 60,000 acres of hops grown in the United States (USDA, 2022). Although over 98% of hops are grown in the Pacific Northwest, hops can be successfully grown in a variety of climates including those in the Midwest (Krebs, 2019). The opportunity for locally brewed beer to be produced from locally grown (LG) hops can support economic and environmental sustainability (Dobis et al., 2019). The purpose of this exploratory research was to identify the factors that influence the use of LG hops by midwestern craft breweries. Research results can inform program development to strengthen Midwest hop farming. Four objectives were used in this research: (1) determine breweries' attitudes, perceived behavioral control, and subjective normative beliefs toward brewing beer from LG hops; (2) classify breweries based on the concept of neolocalism; (3) predict factors that influence breweries' intent to brew beer from LG hops; and, (4) rank breweries' perceptions of barriers to brew beer from LG hops.

Theoretical Framework

The Theory of Planned Behavior (TPB) (Ajzen, 1991) was the leading theory used to guide this research. According to TPB, an individual's likelihood to engage in a specific behavior is related to their intent to complete the behavior. Constructs that influence an individual's intention include attitude toward the behavior, belief of others' attitude toward the behavior, and perceived ability to complete the behavior. Additionally, the concept of neolocalism in craft breweries was utilized (Graefe et al., 2017). Neolocalism can be defined as an intended effort for a business to foster a community-based atmosphere through utilizing local names and images, environmental sustainability, and social and community engagement (Holtkamp et al., 2016). Breweries' purchasing of LG hops may enrich their neolocalism identity.

Methods

A sampling frame of craft breweries was developed through a web search of breweries in 7 midwestern states. Brewery names and email addresses were collected for 214 breweries. A survey instrument was developed and administered through Qualtrics. The survey included 7 sections and 50 questions. Two faculty members in agribusiness and agricultural economics served as panel experts (Rubio, 2005) to review the survey for content validity. Personalized emails and survey links were sent to each brewery using the tailored design method (Dillman et al., 2014). Two questions were used to collect breweries' prior purchasing of LG hops and premium paid. Brewery attitude toward brewing beer from LG hops was collected through a 5-point, 8-item bipolar semantic differential scale modified from Ruth et al. (2019). Perceived behavioral control of brewing beer from LG hops was assessed through 6 items using a 5-point Likert scale (e.g., I would be able to incorporate LG hops in my operation if I desired). Subjective normative belief was assessed through a similar 4-item, 5-point scale (e.g., my local business community would have a favorable view toward us brewing beer from LG hops). Intention to brew beer from LG hops was assessed through a 4-item, 5-point scale. All TPB scales were found to be reliable (.821, .717, .810, .977). Brewery neolocalism characteristics were assessed through 10 Yes/No statements borrowed from Holtkamp et al. (2016). Example statements include "my brewery is named after a local reference" and "local images are used in beer labeling." A rank-order question was used to determine breweries' largest perceived barriers to brewing beer from LG hops (product quality, product taste, consistency of supply, price, aroma, availability). Lastly, size of enterprise (micro, small, large) and years in operation were collected. The study was approved by Doane University IRB.

Results

We received a total of 23 responses for a response rate of 10.7%. Of the 23 responses, 20 were fully completed for a survey completion rate of 87%. Of the respondents, 14 (60.9%) had purchased LG hops in the past 2 years. Of those who purchased LG hops previously, an average premium of 21.5% (*SD*=20.75) was paid for them, and LG hops accounted for 8.86% (*SD*=6.25) of all hops purchased. **Objective 1.** On average, breweries held a slightly favorable attitude toward brewing beer from LG hops (*M*=3.32, *SD* = .73), believed they had the ability to brew beer from LG hops (*M*=3.73, *SD*=.86), and believed others in their community held favorable views toward them brewing beer from LG hops (*M*=3.61, *SD*=.80). Breweries also had an intent to brew beer from LG hops in the future (*M*=3.50), although relatively high variance was observed between breweries (*SD*=1.38). **Objective 2.** Out of the ten neolocalsim characteristics, breweries averaged having 5.05 (*SD*=1.80) characteristics. The most common characteristics were engagement with other local businesses (91.3%) and naming beers using local names and references (65%), while few breweries had sustainability plans implemented (21.7%). **Objective 3.** Constructs related to the TPB and neolocalism were used in a linear regression model to predict breweries' future intent to brew beer from LG hops. The regression model was significant and could be used to explain 68.4% of the variance. The model is illustrated in Table 1 below. Despite the model's significance the only significant predictor variable was attitude.

Table 1. *Characteristics of TPB and Neolocalism on Brewery Intent to Brew with LG Hops*

Predictor Variable	*B (coefficient)*	SE_B	β	*t*	*p*
(Constant)	-2.738	1.267		-2.161	.046*
Attitude	.973	.374	.525	2.598	.019*
Perceived Behavioral Control	.182	.233	.113	.780	.447
Subjective Norm	.559	.343	.342	1.628	.123
Neolocalism	.060	.110	.078	.541	.596

Objective 4. Breweries were asked to complete a rank-order of their largest barriers to them using LG hops. With a maximum possible ranking value of 6, results indicate the product quality (*M*=4.35, *SD*=1.72), product taste (*M*=3.85, *SD*=1.50), and aroma (*M*=3.55, *SD*=1.40) were the largest barriers. The smallest barrier was consistency of supply (*M*=2.85, *SD*=1.31).

Conclusions, Implications, and Recommendations

Our results indicated that breweries held favorable attitudes toward brewing beer from LG hops and believed that others in their community also held favorable attitudes. In addition, they believed they had the ability brew beer from LG hops. Breweries' future intent to brew beer from LG was high. A significant model was produced to predict brewer's future intent to brew beer from LG hops, however, the only significant predictor variable was brewers' attitude. These findings illustrate that brewer attitudes toward LG hops play a significant role in them using LG hops. In addition, the ranking of barriers illustrate that product quality, taste, and aroma are larger barriers over price, available, and consistency of supply. Therefore, these preliminary findings may point toward gaps in the product quality of LG hops. More research and development to improve midwestern hop varieties may be important to improve hop quality. Additional research on consumer preference for purchasing craft beer from LG hops may be beneficial to influence brewers' use of them. The largest limitation to this study was a low response rate. Future research surveying brewery decision-makers may benefit by using alternative methods to collect survey responses.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, *50*(2), 179-211. https://doi.org/10.1016/0749-5978(91)90020-T

Brewers Association (2022). *National beer sales & production data*. https://www.brewersassociation.org/statistics-and-data/national-beer-stats/

Dobis, E. A., Reid, N., Schmidt, C., & Goetz, S. J. (2019). The role of craft breweries in expanding (local) hop production. *Journal of Wine Economics*, *14*(4), 374-382. https://doi.org/10.1017/jwe.2019.17

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method*. John Wiley & Sons, Inc.

Graefe, D., Mowen, A., & Graefe, A. (2017). Craft beer enthusiasts' support for neolocalism and environmental causes. *Craft Beverages and Tourism*, *2*, 27-47. https://doi.org/10.1007/978-3-319-57189-8_3

Holtkamp, C., Shelton, T., Daly, G., Hiner, C. C., & Hagelman, R. R. (2016). Assessing neolocalism in microbreweries. *Papers in Applied Geography*, *2*(1), 66-68. https://doi.org/10.1080/23754931.2015.1114514

Krebs, C. (2019). Hops: a viable alternative crop for the central/southern plains? *Crops & Soil*, *52*(4), 4-6. https://doi.org/10.2134/cs2019.52.0405

Rubio, D. M. (2005). Content validity. In K. Kimberly (Ed.), *Encyclopedia of Social Measurement*. https://www.sciencedirect.com/referencework/9780123693983/encyclopedia-of-social-measurement#book-description

Ruth, T. K., Rumble, J. N., Lamm, A. J., Irani, T., & Ellis, J. D. (2019). Are American's attitudes toward GM science really negative? An academic examination of attitudes and willingness to expose attitudes. *Science Communication*, *41*(1), 113-131. https://doi.org/10.1177/1075547018819935

USDA (2022, December). *2022 USDA-NASS national hop report*. National Agricultural Statistics Service. https://www.usahops.org/img/blog_pdf/434.pdf

Community Education for Behavioral Change Towards Food and Nutrition Security

Samuel Ikendi, Ph.D.
Academic Coordinator for Climate Smart Agriculture
University of California
Division of Agriculture and Natural Resources
University of California - Merced
427 SRE Building
5200 N. Lake Road, Merced, CA 95343
209-228-4400
sikendi@ucanr.edu

Francis Owusu, Ph.D.
Professor and Chair
Department of Community and Regional Planning
Iowa State University
146 College of Design
715 Bissell Road Ames, IA 50011
515-294-7769
fowusu@iastate.edu

Dorothy Masinde, Ph.D.
Professor
Global Resource Systems
Department of Horticulture
Associate Director for Nutrition Education Programs
Center for Sustainable Rural Livelihoods
245 Horticulture
2206 Osborn Dr, Ames, IA 50011
515-294-0029
masinde@iastate.edu

Community Education for Behavioral Change Towards Food and Nutrition Security

Introduction/Need for the Study

Food and nutrition insecurity is still a global problem despite attempts by governments and organizations to address it (FAO et al., 2022). Uganda, our case study is among the seriously ill-nourished nations (von Grebmer et al., 2022); and the "current path scenario" prediction indicates that Uganda may not achieve food security by 2050 (Hedden et al., 2018). However, Uganda has a historical track of strategies for food and nutrition security since 1991 when she embarked on drafting a comprehensive Uganda Food and Nutrition Policy that was completed in 2001 (MAAIF & MoH, 2005). Part of the strategies in the policy included the promotion of private-public partnerships. This strategy was adopted and adapted by Iowa State University (ISU) through its Center for Sustainable Rural Livelihoods (CSRL) in 2003 when it set up a livelihood program to uplift the status of communities in Kamuli, district, Uganda (Butler & McMillan, 2015; Ikendi & Retallick, 2023a; 2023b). The CSRL uses a community-based approach to the management of malnutrition through nutrition education centers (NECs). The NECs are community centers where at-risk for malnutrition breastfeeding and pregnant mothers and children of 0-59 months of age are enrolled for rehabilitation through nutrition therapy (Ikendi, 2019). This study was conducted to assess the outcomes of the education programs.

Conceptual/Theoretical Framework

This study was grounded in the theory of planned behavior (Ajzen, 1985) which evolved after the theory of reasoned action (Fishbein & Ajzen, 1975). The theory supposes that when we plan to do something, then we do it. The theory was built on three intentions i.e., behavior attitude, subjective norm, and perceived behavioral control. The behavior attitude ascribes to how we think and feel about behavior which relates to two concepts – affective attitude describing a belief about the attitude (behavior to be enjoyable or not); and instrumental attitude – belief about the attitude (behavior whether beneficial or harmful). The subjective norms relate to the support given significantly by others e.g. family and friends; and it has two concepts i.e., the injunctive norms (do others encourage you to the behavior?) and the descriptive norms (do others in the group engage in the same behavior or not?). The perceived behavioral control relates to the feeling capable and confident to do a behavior which requires that there must be capability and intention to overcome barriers and challenges. In sum, when all three intentions are fulfilled, we feel strong and more likely to engage in the behavior. This theory infuses into the operation of the NECs under study for which the training is organized within communities responding to nutrition or water, or health issues e.g. malnutrition (Ikendi, 2019). The NECs where training is conducted are managed by community-based trainers who have undergone rehabilitation through the NECs; and are trained by the program coordinators and government Nurses which influences how the community perceives the training and the subsequent implementation of the practices.

Methodology

This study was part of a larger cross-sectional survey carried out in Kamuli, Uganda where the CSRL implements programs emphasizing capacity building towards behavioral changes for food and nutrition security (Ikendi, 2019). The target population was 1,503 who were clients of the NECs who had undergone consecutive training since 2014 in nutrition, infant feeding, water, public health, and/or received services like therapeutic porridge, immunization, family planning, HIV counseling, etc. Using a 95% C.I., we established a sample size of 306 potential participants who were randomly drawn. Approval to conduct the study was obtained from the IRB (IRB-18-356-01). With the help of the NEC community-based trainers to locate NEC clients, we intended to survey a trained household with a corresponding non-trained neighbor in a quarter-mile radius for comparison. Participants were presented with the consent forms, read in the local "Lusoga" dialect, the native language of the Co-PI and research assistants. Only participants who provided verbal consent proceeded with the survey. A total of 454 households were surveyed, out of whom 253 (82.7%) NEC households were accessed, and 201 non-NEC households. We collected data on what program did the client train for and whether the trained themes were implemented. We employed a bivariate analysis specifically Chai-square to compare the rate of implementation of trained themes between trained and non-trained to assess the behavioral change over time.

Findings

Overall, 316 (69.6%) of 454 households participated in community education programs and/or received complementary services from the CSRL program. Receiving services had the highest proportion 283 (89.6%) with most of the households having received nutrient-dense porridge, participated in clinic days for immunization, HIV/AIDS testing and counseling, and family planning, where the program works with government Nurses. Water and public health education had 250 (79.1%) and most participants were trained in water, health, hygiene, and sanitation (WASH), sexually transmitted diseases/infections, pregnancy health, and jigger and rat controls. We established that trained households had a 65.6% likelihood of having at least four of the WASH facilities including latrines, bathrooms, kitchens, rubbish pits, plate stands, and/or tippy taps than 57.4% of non-trained households. Similarly, trained were less likely to have WASH-related diseases including diarrhea, dysentery, malaria, and cough. Nutrition and infant feeding had 248 (78.5%) where the majority participated in training for complementary feeding and balanced diet, breast/exclusive breastfeeding. Also, themes of clinical signs of malnutrition and gender-based violence were trained. We established 65.1% of the trainees were more likely to go for antenatal care atleast four times as compared to 45.6% of non-trained mothers. However, non-trained were 86.0% more likely to exclusively breastfeed than 76.9% of trained households.

Conclusions

Household participation in nutrition and health education is a prerequisite to behavioral change toward good healthy living. The training modules arose out of a consensus between the program coordinators, the community they work with, and the government Nurses' advice. Education of mothers, for instance, on pregnancy health is a move towards improving the management of pregnancy and childbirth; one of the strategies to achieving 70 per 100,000 live birth by 2030 as set by the SDGs (WHO, 2019). Training on water is paramount to understanding the use of water for irrigation and livestock which directly contribute to food production (Ikendi et al., 2023).

Implications/Recommendations

Achieving behavioral changes in essential nutrition and health practices for food and nutrition security requires continuous education in a multifaceted approach in both the government and private sectors. The community-based education programs in this study yielded positive behavioral changes in nutrition and infant feeding, maternal, reproductive, and public health practices for which a healthy community can ably contribute to food and nutrition health. This study recommends more partnerships in monitoring implementation and assessment of the practices between program community extensionists and the government. Similarly, more mobilization of households to participate in the training programs to tap this knowledge resource.

References

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In: Kuhl, J., Beckmann, J. (eds), *Action Control* (pp. 11-39). Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-69746-3_2

Butler, L. M., & McMillan, D. E. (2015). *Tapping philanthropy for development: lessons learned from a public-private partnership in rural Uganda*. Kumarian Press Inc.

FAO, IFAD, UNICEF, WFP and WHO (2022). *The state of food security and nutrition in the world 2022. Repurposing food and agricultural policies to make healthy diets more affordable*. Rome, FAO. https://doi.org/10.4060/cc0639en

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Addison-Wesley.

Hedden, S., Rafa, M., & Moyer, J. D. (2018). *Achieving food security in Uganda*. USAID http://drupalwebsitepardee.s3.amazonaws.com/pardee/public/Pardee_Food_Security_report_v1.pdf

Ikendi, S. (2019). *Impact of nutrition education centers on food and nutrition security in Kamuli District, Uganda* (Master's Thesis, Iowa State University). Graduate Theses and Dissertations. https://lib.dr.iastate.edu/etd/17032/

Ikendi, S., & Retallick, M. (2023a, 15-18 May). Improving managerial and leadership effectiveness in multistakeholder organizations. *Research Paper Proceedings of the 2023 National American Association for Agricultural Education Research Conference*, Raleigh, NC.

Ikendi, S., & Retallick, M. (2023b, 26-29 April). Exported through the theory of change: An inquiry into the compatibility of the U.S. land grant philosophy in Uganda. *Research Poster Proceedings the 2023 Association of International Agricultural and Extension Education Annual Conference*, Guelph, Canada.

Ikendi, S., Owusu, F, Masinde, D., Bain, C., & Oberhauser, A. (2023, 15-18 May). Assessment of agronomy extension education on farmers' empowerment towards food Production in rural Uganda. *Research Paper Proceedings of the 2023 National American Association for Agricultural Education Research Conference*, Raleigh, NC.

Ministry of Agriculture Animal Industry and Fisheries (MAAIF) & Ministry of Health (MoH), (2005). *The National Food and Nutrition Strategy. Final Draft*. Kampala, Uganda.

von Grebmer, K., Bernstein, J., Wiemers, M., Schiffer, T., Hanano, A., Towey, O., …, & Fritschel, H. (2022). *2022 global hunger index: Food systems transformation and local governance*. Welthungerhilfe: Bonn; and Concern Worldwide: Dublin.

World Health Organization (WHO), (2019). *Trends in maternal mortality 2000 to 2017: estimates by WHO, UNICEF, UNFPA, World Bank Group, and the United Nations Population Division.* WHO, Geneva, Switzerland.

Comparison of Sampling Methods in Survey Research: An Exploratory Study

Brooke L. Thiel[1], Christopher J. Eck[2], and Kellie Claflin[3]

1- North Dakota State University; PO Box 6050, Dept 2625, Fargo ND, 58108; 701-231-5839; brooke.thiel@ndsu.edu
2- Oklahoma State University; 457 Agricultural Hall, Stillwater OK, 74078; 405-744-8027; chris.eck@okstate.edu
3- Ohio State University; 200U Agricultural Administration, 2120 Fyffe Road, Columbus OH, 43210; 614-688-0610; claflin.11@osu.edu

Introduction/Need for Research

Research focusing on school-based agricultural education (SBAE) teachers is most commonly carried out through survey research designs (Doss et al., 2021; Dyer et al., 2003). Although this form of data collection is common practice, a reduction in response rates has been reported over the past 20 years (Johnson & Shoulders, 2017). Therefore, researchers are regularly looking for ways to increase response rate, including the investigation of response mode and response incentives (Doss et al., 2022). As data collection occurs more frequently via the internet, researchers are looking at the feasibility of using social media platforms to recruit participants (Rife et al., 2016). Within SBAE, the Ag Education Discussion Lab (2020) was established as a Facebook group for pre-service and in-service SBAE teachers to share resources in August of 2015. While the Ag Education Discussion Lab has been established for over seven years, there is limited research evaluating the usage of the group as a data collection platform. Therefore, this study aimed to compare the response rates of survey research between email distribution and posts within the Ag Education Discussion Lab. To determine this, the following objectives were established: describe the personal and professional characteristics of participants by sampling method and determine if differences in perceptions of the importance of pre-service teacher dispositions exist between the two samples.

Theoretical Framework

This study was undergirded by the theory of planned behavior (Ajzen, 1991), as an individual's behavior as it relates to responding to a research survey questionnaire is impacted by their attitude toward, perceived behavioral control of, and subjective norms associated with the behavior (Ajzen, 1991). Specifically, factors associated with the theory of planned behavior have the potential to impact SBAE teachers' willingness to participate in a survey research study based on the recruitment method for the research (i.e., email or social media distribution).

Methodology

This study employed a non-experimental survey research design (Gay et al., 2012). The population of interest was current in service SBAE teachers across the United States (N = 13,349; Foster et al., 2022). To reach this population of interest, two contact methods were implemented in the distribution of an instrument on preservice SBAE teacher dispositions. The first method utilized a randomized sample of 750 SBAE teachers' email addresses provided by the National FFA Organization and the second method utilized posts in the *Ag Education Discussion Lab* on Facebook via an initial invitation and three follow-up reminders. The study resulted in responses from 272 SBAE teachers nationwide. Of those responses, 160 were complete responses with 116 coming from the random national sample (16.5% response rate) and 44 coming from the posts in the *Ag Education Discussion Lab* (estimated <1% response rate). Independent samples t-tests were used to analyze differences between the means of perceptions of the importance of preservice dispositions between the two groups of participants. Assumptions were checked prior to analysis and were met in all cases except for the Levene's Test for Equality of Variance, which was significant when comparing the means of perceptions of the importance of the emotional maturity disposition between the two groups ($F(1, 158) = 5.26$, $p = .023$). Thus, the reported t-test for emotional maturity does not assume equal variances (Field, 2018).

Results

Objective 1: Describe the personal and professional characteristics of the SBAE teacher respondents based upon sampling method.

One-hundred and sixteen SBAE teachers responded to the email request from 35 different states, participants ranged in age from 21 to over 60 years of age, with an even split between male and female respondents. The majority were traditionally certified (n = 82) and held a bachelor's degree (n = 60), with 1-30 years of teaching experience. The social media posts only produced 44 responses spanning 24 states, with the majority being female (n = 38), ranging in age from 21-60 years old. Similarly, the majority of social media respondents were traditionally certified (n = 34) and represented a range of teaching experience from first year to over 30 years of SBAE teaching and the majority of respondents having a master's degree (n = 24).

Objective 2: Determine if differences in perceptions of the importance of pre-service teacher dispositions exist between the two samples.

Five independent samples t-tests were performed to compare perceptions of the five dispositions of the group of participants from Facebook and the group of participants from the random national sample. There were no significant differences in the perceptions of any of the five dispositions between the two groups (see Table 1).

Table 1
Differences of Perceptions of the Importance of Preservice Dispositions Between Sample Groups

Disposition	Facebook		Random Sample		*t*(158)	*p*	Cohen's *d*
	M	*SD*	*M*	*SD*			
Empathetic and Considerate	5.42	.45	5.43	.46	-.020	.981	.45
Directed	5.70	.42	5.66	.44	.589	.556	.43
Engaged and Attentive	5.50	.50	5.54	.44	-.460	.645	.46
Personal Integrity	5.46	.47	5.40	.55	6.74	.501	.53
Emotional Maturity*	5.40	.54	5.56	.38	-1.84	.071	.43

Note. *Equal variances not assumed; *df* = 60.

Conclusions, Implications, and Recommendations

Overall, participants had similar personal and professional characteristics and perceptions of professional dispositions regardless of sampling method. However, there were noticeable differences in gender (48.3% male compared to 50.0% female for the email group and 11.4% male compared to 86.4% female from Facebook), career stage (60.4% of respondents from the email group had 10 or fewer years of experience to 40.9% from Facebook). Additionally, the email method of sampling appeared to reach a greater number of early career teachers with 60.4% of the respondents reporting 10 or fewer years of experience compared to 40.9% reporting the same years of experience when recruited via Facebook. While the email distribution frame was limited to 750 email address and the social media post had a much broader potential reach, interestingly, the email sample produced a greater response. Could it be that SBAE teachers in the social media group prefer to collaborate, generate ideas, and seek advice from their peers (Hart & Steinbrecher, 2011; Kelly & Antonio, 2016) instead of participating in research online? Additional research is needed to determine the interest of SBAE teachers in participating in social media groups to further inform future data collection.

References

Ag Education Discussion Lab. (2020). *Ag Education Discussion Lab*.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed- mode surveys: The tailored design method* (4th ed.). Wiley.

Doss, W., Rayfield, J., Lawver, D., & Burris, S. (2022). Determining the effects of response mode and incentives on survey response rates of school-based agricultural education teachers: An experimental study. *Journal of Agricultural Education, 63*(4), 151–167 https://doi.org/10.5032/jae.2022.04151

Dyer, J. E., Haase-Wittler, P. S., & Washburn, S. G. (2003). Structuring agricultural education research using conceptual and theoretical frameworks. *Journal of Agricultural Education, 44*(2), 61–74. https://doi.org/10.5032/jae.2003.02061

Field, A. (2018). *Discovering statistics using SPSS* (5th ed.). Sage.

Foster, D., Lawver, R., Smith, A., & Poeschl, E. (2022). *2021 Agriculture Teacher Supply and Demand Overview: Nationwide NAAE*. https://www.naae.org/whoweare/NSD/2021-NSD-NAAERegion.pdf

Gay, L. R., Mills, G. E., & Airasian, P. (2012). *Educational research: Competencies for analysis and applications* (10th ed.). Pearson Education Inc.

Hart, J. E., & Steinbrecher, T. (2011). OMG! Exploring and learning from teachers' personal and professional uses of Facebook. *Action in Teacher Education, 33*(4), 320–328. https://doi.org/10.1080/01626620.2011.620515

Johnson, D. M., & Shoulders, C. W. (2017). Power of statistical tests used to address nonresponse error in the *Journal of Agricultural Education*. *Journal of Agricultural Education, 58*(1), 300–312. https://doi.org/10.5032/jae.2017.01300

Kelly, N., & Antonio, A. (2016). Teacher peer support in social network sites. *Teaching and Teacher Education, 56*, 138–149. https://doi.org/10.1016/j.tate.2016.02.007

Privitera, G. J. (2017). *Research methods for the behavioral sciences (2nd ed.).* Sage

Rife, S. C., Cate, K. L., Kosinski, M., & Stillwell, D. (2016). Participant recruitment and data collection through Facebook: The role of personality factors. *International journal of social research methodology, 19*(1), 69-83.

Comparison of Self-Efficacy Toward Technical Skills and Motivation to Teach Content Prior to and After Three Agricultural Systems Technology Courses

Kristopher R. L. Rankin III
459 Agricultural Hall,
Oklahoma State University,
Stillwater, OK 74078
(573)-808-1855
kris.rankin@okstate.edu

Nathan A. Smith
456 Agricultural Hall
Oklahoma State University
Stillwater, OK 74078
(405) 744-3686
nathan.smith@okstate.edu

Introduction & Theoretical Framework

Teacher preparation programs must undertake precaution when creating, executing, and evaluation learning activities and course materials (Voges et al., 2020). This could be considered exceptionally true in relation to technical skills development within the area of agricultural mechanics. Agricultural mechanics and related courses have long been an important aspect of school-based agricultural education (SBAE) programs (Burris et al., 2005; Hubert & Leising, 2000). It is important to consider the technical skills pre-service teachers have been instructed on within their teacher preparation program as credit hours for degree completion have lowered over time (Hubert & Leising, 2000). Wells et al. (2013) identified that secondary students who were exposed to agricultural mechanics related courses, and pursued a degree in agricultural education, were influenced in their course selection in relation to agricultural mechanics, as well as potential subjects they choose to incorporate into their curriculum. In alignment with the American Association for Agricultural Education (AAAE) Research Agenda priority number five: Efficient and Effective Agricultural Education Programs (Thoron et al., 2016), this study sought to investigate pre-service teachers' self-efficacy towards and motivation to teach agricultural mechanics content prior to and after completing three Agricultural Systems Technology (AST) courses.

"Planning a quality educational activity begins with knowledge of the students for whom it is designed" (Roberts & Dyer, 2005, p. 12). With this statement in mind, Bandura's Theory of Self-Efficacy was used to undergird this study. Bandura (1997) identified four components that individuals must analyze to identify their own personal efficacy on a given task: 1) performance outcomes (prior experiences), 2) vicarious experiences (seeing other individual's experiences), 3) verbal persuasion (dis/encouragement from others) and 4) physiological feedback (emotional feedback). "An efficacy expectation, or self-efficacy, concerns the confidence in one's capability to produce the behavior" (Lenz & Shortridge-Baggett, 2002, p. 10). It is important to understand pre-service teachers' self-efficacy because individuals are more likely to experience success if their self-efficacy is high in relation to their tasks (Bandura, 1997; Gates et al., 2020).

Methodology

Pre-service teachers enrolled in AST 3211 (n=43), AST 3011 (n=40), and AST 4101 (n=22) during the 2021-22 and fall 2022 academic years at Oklahoma State University (OSU) were the population of interest for this study. Data were collected at the conclusion of each course utilizing a then-now research methodology. The instrument was developed within Qualtrics® and distributed through a quick response (QR) code where pre-service teachers could access the instrument using their personal electronic devices. Pre-service teachers were asked to rank themselves on a five-point Likert Scale (i.e., *1 = very low self-efficacy/motivation to teach to 5 = very high self-efficacy/motivation to teach*) on their motivation to teach technical skills from the course, and their self-efficacy in relation to the technical skills. The technical skills were chosen based upon a cross reference of the objectives identified by the course instructor and the laboratory projects conducted within each course to the National AFNR Power, Structural and Technical Systems Career Pathway standards (The Council, 2018). AST 3211 & 4101 assessed 10 competencies while 3011 assessed 11.

Findings

After data were analyzed, it was found that there were significant changes in the pre-service teachers' self-efficacy and motivation to teach content during the courses. For 3211, examples are: *Demonstrate components of an internal combustion engine* and *Evaluate service and repair needs for internal combustion engines*. For 3011, examples include: Design *project plans* and *analyze/evaluate project plans.* For 4101, technical skill examples are: Design *electrical diagrams* and *install electrical control systems (e.g., single pole switch, etc.)*. Each of these technical skills showed an increase of one ranked position minimum (e.g., a score of three prior to the course to a rank of two after the course based upon the mean scores from the five-point Likert Scale).

It was found that the largest ranked drop in self-efficacy for 3211, 3011, and 4101 were *Identify tools within the agricultural power field, construct AFNR structures using wood materials,* and *compare/contrast alternating and direct current*, respectively. Each of these technical skills were shown to have been displaced from prior to the course by at minimum of two ranked positions (e.g., from a five prior to the course to a rank of seven after). The largest ranked drop in motivation to teach content for each of the three courses were identified as: *Facilitate disassembly and reassembly of an internal combustion engine, Analyze and evaluate a bill of materials, Identify alternating and direct currents circuits* for 3211, 3011, and 4101, respectively.

AST 3011 showed the least change in the ranked order of technical skills prior to and after the course regarding self-efficacy. All skills either rose or fell a maximum of two positions from prior to and after the course. AST 4101 showed the least change in the ranked order of technical skills prior to and after the course regarding motivation to teach content. All skills either rose or fell a maximum of three positions from prior to and after the course.

Conclusions, Implications, Recommendations

It was concluded that pre-service teachers from 3211, 3011, and 4101 identified many changes in their perceived self-efficacy and motivation to teach technical skill content from before to after the courses. These changes in their perceived abilities and motivation could be tied back to Bandura's (1997) Theory of Self-Efficacy based upon their performance outcomes and their vicarious experiences within each of the three courses. Implications from these ranked lists should be considered when reviewing and altering course syllabi and content taught.

It is recommended that this study and the instruments used within the courses be administered in future semesters and perform continuous data analysis after each semester. In doing so, faculty and teaching assistants at OSU can potentially identify trends in pre-service teacher self-efficacy and motivation to teach content regarding related agricultural mechanics topics. It is also recommended that other agricultural education teacher preparation programs work to identify current technical skills being taught within all agricultural content courses for degree completion in agricultural education. Assessing the self-efficacy and motivation to teach the content from these courses can lead to teacher preparation program review of required and recommended courses based upon the responses of the pre-service teachers. Technical skills taught within university agricultural content courses, especially those required for degree completion, should align with standards, content, and technical skills pre-service teachers are expected to teach in their future careers.

References

Bandura, A. (1997). *Self-efficacy the exercise of Control*. Freeman.

Burris, S., Robinson, J. S., & Terry, Jr., R. (2005). Preparation of pre-service teachers in agricultural mechanics. *Journal of Agricultural Education, 46*(3), 23-34. https://doi.org/10.5032/jae.2005.03023

Gates, H. R., Shoulders, C. W., Johnson, D. M., Edgar, D., & Blythe, J. M. (2020). Preservice agricultural education and secondary education teachers' self-efficacy and professional identity. *Journal of Agricultural Education, 61*(3), 112-127. https://doi.org/10.5032/jae.2020.03112

Hubert, D. J., & Leising, J. (2000). An assessment of agricultural mechanics course requirements in agriculture teacher education programs in the United States. *Journal of Southern Agricultural Education Research, 50*(1), 24-31. Retrieved 2022, from http://www.jsaer.org/pdf/vol50Whole.pdf.

Lenz, E. R., & Shortridge-Baggett, L. M. (2002). *Self-efficacy in nursing: Research and measurement perspectives*. Springer Pub.

Roberts, T. G., & Dyer, J. E. (2005). The relationship of self-efficacy, motivation, and critical thinking disposition to achievement and attitudes when an illustrated web lecture is used in an online learning environment. *Journal of Agricultural Education, 46*(2), 12-23. https://doi.org/10.5032/jae.2005.02012

The Council. (2018, August 24). *AFNR documents*. https://ffa.app.box.com/s/n6jfkamfof0spttqjvhddzolyevpo3qn

Voges, S., Rayfield, J., Doss, W., Lawver, D., & Ritz, R. (2020). A comparison of early career agricultural teacher training received, current practices and perceptions of instructional methods. *Journal of Agricultural Education, 61*(3), 182-193. https://doi.org/10.5032/jae.2020.03182

Thoron, A. C., Myers, B. E., & Barrick, R. K. (2016). Research priority 5: Efficient and effective agricultural education programs. In T. G. Roberts, A. Harder, & M. T. Brashears (Eds). *American Association for Agricultural Education national research agenda: 2016-2020* (pp. 41-45). Gainesville, FL: Department of Agricultural Education and Communication.

Wells, T., Perry, D., Anderson, R., Shultz, M., & Paulsen, T. (2013). Does prior experience in secondary agricultural mechanics affect pre-service agricultural education teachers' intentions to enroll in post-secondary agricultural mechanics coursework? *Journal of Agricultural Education*, 222-23. https://doi.org/10.5032/jae.2013.04222

Compliance with Safe Food Handling Practices: What Influences Intention in U.S. Households?

Dharmendra Kalauni
Department of Agricultural Education and Communication, University of Florida
PO Box 110540
Gainesville, FL 32611
(352) 709 4556
kalauni.d@ufl.edu

Laura A. Warner,
Department of Agricultural Education and Communication, University of Florida
PO Box 110540
Gainesville, FL 32611
(352) 273 0202
lsanagorski@ufl.edu

Arati Joshi
Department of Agricultural Education and Communication, University of Florida
PO Box 110540
Gainesville, FL 32611
aratijoshi@ufl.edu
(352) 664 0254

Ashley McLeod-Morin
Public Issues Education in Agriculture and Natural Resources, University of Florida
1408 Sabal Palm Dr.
Gainesville, FL 32611
ashleynmcleod@ufl.edu
(850) 902 3888

Sandra Anderson
Public Issues Education in Agriculture and Natural Resources, University of Florida
1408 Sabal Palm Dr., Bldg 60, Level 2
Gainesville, FL 32611
sanderson11@ufl.edu
352-294-2778

Compliance with Safe Food Handling Practices: What Influences Intention in U.S. Households?

Introduction

Globally, foodborne disease accounts for 600 million illnesses and 420,000 deaths annually (Bhaskar, 2017; Devleesschauwer et al., 2018; Lee & Yoon, 2021; World Health Organization, 2022). In the United States (U.S.), 9.4 million cases of foodborne illness were reported annually with 55,961 cases of hospitalization and 1,351 deaths (Scallan et al., 2011). The economic burden of U.S. foodborne diseases reached $17.6 billion in 2018 (Hoffmann & Ahn, 2021). About one-fifth of foodborne infections in the U.S. are caused by improper food handling procedures at home (Centers for Disease Control and Prevention, 2006). Lacking food safety practices while handling and preparing food as one of the major reasons behind food-borne diseases (Salleh et al., 2017). Inadequate cooking, inappropriate storage, and reusing improperly rinsed cutting boards and knives are some of the unsafe food handling practices that cause cross-contamination (Bonny et al., 2018; Malcolm et al., 2018), and these types of practices are ideal targets for food safety Extension programs. Because safe food handling at different stages is imperative to ensure the hygiene of food, this study was designed to understand U.S. residents' intention to comply with such practices at the household level.

Theoretical Framework

The Theory of Planned Behavior (TPB) describes how attitudes, subjective norms, perceived behavioral control, and behavioral intention are related (Ajzen, 1991). This study considered the relationship between these core variables and personal norms and demographics which were also added to the TPB framework to analyze their effect on safe food handling intention.

Purpose and Objectives

The purpose of this study was to investigate the most salient predictors of safe home food handling among U.S. residents. Specific objectives were to: 1) Determine attitudes, subjective norms, perceived behavioral control, and personal norms among U.S. residents pertaining to safe home food handling practices and 2) Determine to which extent demographics, attitudes, subjective norms, perceived behavioral control, and personal norms influence safe home food handling intention among U.S. residents.

Methods

A non-experimental cross-sectional research design was used, and an electronic survey instrument was employed to collect data. Non-probability purposive sampling was used to access the study sample (N = 1,528) (Baker et al., 2013; Lamm & Lamm, 2019). Quota sampling was used to ensure participants meet their states and territories (Alabama, Florida, Georgia, Mississippi, North Carolina, Puerto Rico, South Carolina, and Virgin Islands) age, sex, race, and ethnicity proportions according to U.S. census data (Baker et al., 2013). Descriptive statistics were used to analyze participants' attitudes, perceived behavioral control, subjective norms, personal norm, and behavioral intent. In addition, stepwise hierarchical regression was employed to see how core TPB variables, personal norms, and demographics affect behavioral intention. Three models were used where Model 1 = demographics, Model 2 = Model 1 + TPB variables, and Model 3 = Model 2 + personal norms.

Results and Conclusion

Central tendency measures revealed that attitudes (*M* = 3.68, *S.D.* = 0.62), perceived behavioral control (*M* = 3.59, *S.D.* = 0.69), personal norms (*M* = 3.55, *S.D.* = 0.75), subjective norms (*M* = 3.41, *S.D.* = 0.84) and behavioral intent (*M* = 3.39, *S.D.* = 0.83) were all positive and strong given a potential range from 0 to 4 for all variables. Hierarchical regression showed that demographic variables predicted 5.3% of the variance (F (4, 1523) = 22.415, p <.001, R^2 = 0.053) in behavioral intent where gender (β = -0.118, t (1523) = -4.588, p < 0.001), age (β = 0.218, t (1523) = 8.511, p < 0.001) were significant at p < .001. Education (β = 0.047, t (1523) = 1.68, p = 0.092) was significant at p = .10 whereas income was not significant (β = 0.002, t (1523) = 0.077, p = 0.938). TPB variables were introduced in second model (F(3, 1520) = 441.15, p <.001, R^2 = 0.493) which predicted 49.3% of the variance in safe food handling intention, and when the personal norms were added, the third model (F(1, 1519) = 210.390, p <.001, R^2 = 0.554) fit the data best, predicting 55.4% of the variance in behavioral intention. Four variables were significant in Model 3: attitudes (β = 0.070, t (1519) = 2.70 , p = 0.007) were significant at a 5% level, whereas subjective norm (β = 0.193, t (1519) = 7.06, p = < 0.001), personal norms (β = 0.438, t (1519) = 14.505, p < 0.001) and perceived behavioral control (β = 0.143, t (1519) = 5.489, p < 0.001) were significant at 1%. Among all those highly significant variables, personal norms had a larger effect size.

Recommendations and Implications

Among all constructs in our extended TPB framework, attitude was found to be the most positive, followed by perceived behavioral control, personal norms, subjective norms, and behavioral intent among participants Despite significance in initial models, demographics such as age, education, income, and gender were found not significant determinants of behavioral intention once theory-based variables were introduced. In the final model, attitudes, subjective norms, perceived behavioral control, and personal norms significantly predict behavioral intention to comply with safe food handling practices, with personal norm having the greatest effect size indicating that an individual's personal obligations to engage food safety practices is the most important determinant regarding safe food handling compliance. So, intervention programs should prioritize facilitating the internalization of social norms related to safe food handling as these will contribute to developing favorable personal norms about safe food handling. Making people aware of how inappropriate food handling practices could cause cross-contamination of food resulting in lethal food-borne disease, would be helpful in developing a positive attitude toward safe food handling practices. In addition to the education, providing people with some experience which might be in a demonstration kitchen or through a virtual demonstration, could be helpful in complementing their perceived self-efficacy. Also, communicating with people about the need to comply with safe food handling is not merely essential to their referent group but is crucial for their own health and well-being and will help strengthen their perceived controllability and subjective norm.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Baker, R., J. M. Brick, N. A. Bates, M. Battaglia, M., M. P. Couper, J. A. Dever, K. J. Gile, and R. Tourangeau. (2013). *Report of the AAPOR task force on non-probability sampling.* https://www.aapor.org/aapor_main/media/mainsitefiles/nps_tf_report_final_7_revised_fnl_6_22_13.pdf

Bhaskar, S. V. (2017). Foodborne diseases-disease burden. In P. Dudeja, R. K. Gupta, & A. S. Minhas, *Food safety in the 21st century* (pp. 1-10). Academic Press. https://doi.org/10.1016/B978-0-12-801773-9.00001-7

Bonny, S. Q., Hossain, M. A. M., Lin, T. K., & Ali, M. E. (2018). Multiplex MPN-PCR for the enumeration of three major Vibrios in raw fishes in Malaysia. *Food Control, 90,* 459–465. https://doi.org/10.1016/j.foodcont.2018.02.034

Centers for Disease Control and Prevention. (2006). Summary statistics for foodborne outbreaks, 2006. http:www.cdc.gov/foodborneoutbreaks/documents/2006_line_list/2006_line_list.pdf

Devleesschauwer, B., Haagsma, J. A., Mangen, M. J., Lake, R. J., & Havelaar, A. H. (2018). The global burden of foodborne disease. In T. (. Roberts, *Food safety economics: Incentive for a safer food supply* (pp. pp. 107-122). Springer. https://doi.org/10.1007/978-3-319-92138-9_7

Hoffmann, S., & Ahn, J. W. (2021). *Updating economic burden of foodborne diseases estimates for inflation and income growth.* Economic Research Service, United States Department of Agriculture. https://ers.usda.gov/webdocs/publications/102640/err297_summary.pdf?v=6143.5

Lamm, A. J., and K. W. Lamm. (2019). The use of nonprobability sampling methods in agricultural and extension education research. *Journal of International Agricultural and Extension Education 26* (1): 52–59. https://doi.org/10.5191/jiaee.2019.26105

Lee, H., & Yoon, Y. (2021). Etiological agents implicated in foodborne illness worldwide. *Food Science of Animal Resources, 41*(1), https://doi.org/10.5851/kosfa.2020.e75

Malcolm, T. T. H., San Chang, W., Loo, Y. Y., Cheah, Y. K., Radzi, C. W. J. W. M., Kantilal, H. K., & Son, R. (2018). Simulation of improper food hygiene practices: A quantitative assessment of Vibrio parahaemolyticus distribution. International journal of food microbiology, 284, 112-119. https://doi.org/10.1016/j.ijfoodmicro.2018.08.012

Salleh, W., Lani, M. N., Wan Abdullah, W. Z., Tuan Chilek, T. Z., & Hassan, Z. (2017). A review on incidences of foodborne diseases and interventions for a better national food safety system in Malaysia. *Malaysian Applied Biology, 46*(3), 1–7. https://www.scopus.com/inward/record.uri?eid=2-s2.085031127410&partnerID=40&md5=0f4ed66f843e356ae31a7592775a3d65

Scallan, E., Griffin, P. M., Angulo, F. J., Tauxe, R., & Hoekstra, R. M. (2011). Foodborne Illness Acquired in the United States—Unspecified Agents. *Emerging Infectious Diseases, 17*(1), 16-22. https://doi.org/10.3201/eid1701.p21101

World Health Organization. (2022). *Food Safety.* World Health Organization https://www.who.int/health-topics/food-safety

Conceptions of the Agriculture Industry: How Students Draw Agricultural Professionals

Sarah Dodoo
University of Illinois at Urbana-Champaign
dodoo2@illinois.edu

Kelly Gill
University of Illinois at Urbana-Champaign
kellylg2@illinois.edu

Amy Leman
University of Illinois at Urbana-Champaign
bunselme@illinois.edu

Ruth Kaggwa
Donald Danforth Plant Science Center
rkaggwa@danforthcenter.org

Lisa Walsh
Donald Danforth Plant Science Center
lwalsh@danforthcenter.org

Kristine Callis-Duehl
Donald Danforth Plant Science Center
kcallis-Duehl@danforthcenter.org

Introduction

Among many things, nonformal education programs serve many purposes, including offering discipline-specific knowledge and skills while serving as a pipeline for career paths (Affeldt et al., 2017). A food and agricultural-technology nonformal education program was implemented during the summer of 2022 to (1) increase youth understanding of the roles that technology and science play in agriculture, (2) foster their agency to employ agricultural science innovations to solve agricultural and community problems, and (3) increase their interest in the agricultural profession as a potential career path. Participants from both an urban and a rural community in a Midwestern state were engaged in practical learning activities as part of this program, including the use of FarmBots, drones, and PheNodes, harvesting and collecting corn data, interacting with agricultural professionals, and embarking on field trips.

Theoretical Framework

Social Cognitive Career Theory (SCCT) attempts to explain how individuals develop an interest in careers, make choices to pursue specific careers, and perceive themselves as successful in those careers (Lent et al., 2002). SCCT explains that an individual's construct of a career is based on a combination of (1) self-efficacy, or a person's belief that they can or want to perform the career expectations, (2) outcome expectations, or the consequences of attaining a career, and (3) personal goals for career development (Lent et al., 2002). These concepts are all formed and revised through experiences. Therefore, students may change their views on a career in agriculture based on experiences that change their perceptions of this career. The SCCT was used to study the perceptions of careers in agriculture from urban high school students (Henry et al., 2014) and to understand the career decision-making of undergraduate students in an agricultural college in Iran (Rajabi et al., 2012).

Methodology

Drawn images are important in assessing youth's understanding of the world around them, including their perceptions of a specific profession (Knight & Cunningham, 2004). As youth change their perceptions of a profession, they should change their drawing of that profession. To assess participants' perceptions of the agricultural profession, we used visual evaluation measures, specifically a Draw an Agricultural Professional (DAAP) worksheet. The DAAP is an adaption of the Draw-a-Scientist Test (Chambers, 1983) and Draw-an-Engineer Test (Knight & Cunningham, 2004) developed to evaluate perceptions about scientists and engineers using drawn images. Draw-a-Scientist tests have been used to discover stereotypes related to students' perceptions of scientists (Ferguson & Lezotte, 2018) and media influences on perceptions of female scientists (Stienke et al., 2007).

In this study, the DAAP worksheet was administered to participants, ages 11-15, in pre and post sessions. Participants were also asked if they knew an agricultural professional and if so, to write who that agricultural professional was. Although twenty-five worksheets were completed in the pre-session and eleven were completed post-session, eleven drawings from students who participated in both pre-and-post sessions are included in this study. Drawn images and written responses were coded. The study implored a deductive coding strategy using the researchers' pre-established codes and with guidance from previous research asking participants to draw engineers (Fralick et al., 2009). Systematic data coding and analysis were completed between three coders using the Dedoose qualitative analysis software. Codes were used to assess instances of human presence/absence, depictions of gender, location, objects/tools/artifacts, inferences of action, unrelated items, and whether participants knew an agricultural professional and, if so, who they were. Code tally results were imported from Dedoose, and percentages were calculated using Microsoft Excel. The researchers then conducted further analysis to assess participants' perceptions of the agricultural profession.

Results

Drawings were first assessed for any instances of human presence as depicted using a stick figure or humanoid figure. In the pre-session, 10 drawings (91%) had a human while in the post-session, 9 drawings (82%) had a human. There were no visible depictions of gender in any of the drawings. Some elements that helped to assess the conceptions of an agricultural profession included the tools, objects, or artifacts that were drawn. These included field crops (pre-session=18%; post-session=36%), machines (pre-session=27%; post-session=36%), plants and seeds (pre-session=45%; post-session=27%), among others. Inferences of actions were also assessed to gain an understanding of what agricultural professionals do. Seven drawings in the pre-session (64%) suggested actions including farmer's market sales, planting seeds, and using a drone, among others. Six drawings (55%) of the drawings in the post-session suggested actions including the use of a FarmBot, harvesting, and researching, among others. Beyond the coded data that provide general group insights, pre-post drawings were also assessed to identify program impact at the individual level. As an example, the impact noticed for one participant included a shift from a 'blank page' in the pre-session to the drawing of an agricultural professional using a FarmBot in the post-session. Other gains identified included the diversity in the drawings which were captured by the increase in elements in those drawings.

When asked if they knew any agricultural professional, 27% (*n*=3) of participants responded with a 'Yes' in the pre-session and 64% (*n*=7) in the post-session. Conversely, the number of participants who had responded with a 'No' decreased from 55% (*n*=6) in the pre-session drawings to 37% (*n*=6) in the post-session drawings. Participants who identified a program staff as an agricultural professional increased from 9% (*n*=1) in the pre-session to 36% (*n*=4) in the post-session.

Conclusions

The nonformal education program evaluated with the DAAP was designed to increase the interest of participants in agricultural science as a career path, specifically, careers outside of the traditional role of a farmer. The DAAP offered a glimpse into the participants' definition of an agricultural professional and if the program was successful in including examples youth could use as they construct their views of future career possibilities. While the participants changed their images of an agricultural professional, not all altered their perceptions to include more science and technology. However, the participants were more likely to report knowing an agricultural profession and identifying teachers in the program as agricultural professionals by the end of the experience.

Implications/Recommendations/Impact on the Profession

In nonformal education programs with career aspirations as an outcome, it is important to think about the pictures and images presented to the participants. Are they seeing and experiencing things that allow them to construct an image of themselves in that career? Even more so, are program facilitators specifically discussing career connections in their activities?

This study was designed on the assumption that drawings are related to the career aspirations of program participants. However, recent work on the Draw-a-Scientist-Test with students in Columbia found that stereotypical drawings of scientists were made by the students most likely to want a career as a scientist and that gender was not an indicator (Toma et al., 2022). Therefore, future research should consider the assumption that student drawings are specifically related to career aspirations as agricultural professionals.

References

Affeldt, F., Tolppanen, S., Aksela, M., & Eilks, I. (2017). The potential of the non-formal educational sector for supporting chemistry learning and sustainability education for all students–a joint perspective from two cases in Finland and Germany. *Chemistry Education Research and Practice*, *18*(1), 13-25. https://doi.org/10.1039/c6rp00212a

Chambers, D. W. (1983). Stereotypic images of the scientist: The draw-a-scientist test. *Science education*, *67*(2), 255-265. https://doi.org/10.1002/sce.3730670213

Ferguson, S. L., & Lezotte, S. M. (2019). Exploring the state of science stereotypes: Systematic review and meta-analysis of the Draw-A Scientist Checklist. *School Science and Mathematics, 120*, 55-65. https://doi.org/10.1111/ssm.12382

Fralick, B., Kearn, J., Thompson, S., & Lyons, J. (2009). How middle schoolers draw engineers and scientists. *Journal of Science Education and Technology*, *18*, 60-73. https://doi.org/10.1007/s10956-008-9133-3

Henry, K. A., Talbert, B. A., & Morris, P. V. (2014). Agricultural education in an urban charter school: Perspectives and challenges. *Journal of Agricultural Education, 55*(3), 89-102. https://doi.org/10.5032/jae.2014.03089

Knight, M., & Cunningham, C. (2004, June). Draw an engineer test (DAET): Development of a tool to investigate students' ideas about engineers and engineering. In *ASEE annual conference and exposition* (Vol. 19). https://doi.org/10.18260/1-2--12831

Lent, R. W., Brown, S. D., & Hackett, G. (2002). Social cognitive career theory. In D. Brown & Associates (Eds.), *Career choice and development* (4th ed., pp. 255-311). Jossey-Bass Publishing.

Rajabi, S., Papzan, A., & Zahedi, G. (2012). Application of social cognitive career theory to investigate the effective factors of the career decision-making intention in Iranian agriculture students by using ANN. *SAGE Open, 2*(4), 1-12. https://doi.org/10.1177/2158244012467024

Steinke, J., Lapinski, M. K., Crocker, N., Zietsman-Thomas, A., Williams, Y., Evergreen, S. H., Kuchibhotla, S. (2007). Assessing media influences on middle-school aged children's perceptions of women in science using the Draw-a-Scientist Test (DAST). *Science Communication, 29*(1), 35-64. https://doi.org/10.1177/1075547007306508

Toma, R. B., Orozco-Gomez, M. C., Molano Nino, A. B., Obando-Correal, N. C., & Suarez Roman, R. C. (2022). Testing assumptions of the Draw-a-Scientist-Test (DAST): Do stereotyped views affect career aspirations? *International Journal of Sciene Education, 44*(16), 2423-2441. https://doi.org/10.1080/09500693.2022.2126738

Costs Associated with Work-Life Balance as Perceived by Preservice School-Based Agricultural Education Teachers

Jessica M. Toombs
California State University, Chico
400 W 1st St
Chico, CA 95929
816-294-6572
jmtoombs@csuchico.edu

Ryann C. Vierra
California State University, Chico
400 W 1st St
Chico, CA 95929
209-710-7967
rcvierra@csuchico.edu

Work-life balance has shown to be both a hinderance for graduates entering the school-based agricultural education (SBAE) profession (Eck et al., 2021) and a factor in teacher attrition (Solomonson et al., 2018; Sorensen et al., 2016). As SBAE teachers have duties beyond the traditional classroom tasks (Smalley & Rank, 2019), they often report 50-plus hour work weeks including evenings and weekends (Clemons et al., 2021; Hopkins et al., 2020). These additional work hours take time and energy away from personal and family commitments (Hopkins et al., 2020). A positive work-life balance has been correlated with higher rates of teacher retention, job satisfaction, and teacher effectiveness (Clemons et al., 2021). With the career implications, work-life balance should be discussed and studied within teacher preparation programs (Aydan, 2021).

This study was grounded in the theoretical framework of expectancy value theory (EVT). EVT models motivation around expectations of success and subjective task value, including incentives, utility, and cost (Wigfield & Eccles, 2000). Tasks which are associated with greater expectations of success along with more benefits and fewer costs are more likely to be approached with greater motivation and persistence (Wigfield & Eccles, 2000). Most of the existing research in EVT focused on perceived ability (self-efficacy) and task value, with a fleeting or overlooked description of cost (Flake et al., 2015; Raczkoski, 2018). An individual may feel a high likelihood of success and find value in the task, yet a high perceived cost is likely to damper motivation (Raczkoski, 2018). As such, cost is a valuable construct and should be measured independently of other EVT components (Flake et al., 2015).

Purpose and Research Objectives

The purpose of this study was to examine the perceived work-life balance costs associated with a career in SBAE. The research objectives were to…

1. Describe alternative career choices of seniors in agricultural education at California State University Chico.
2. Describe the relative work-life balance costs in a SBAE teaching career as perceived by seniors in agricultural education at California State University Chico.

Methods and Procedures

This descriptive pilot study utilized a quantitative survey method. The instrument was constructed as a replication of Tan-Wilcon's and Stamp's (2015) work in work-life balance in STEM careers. This study replaced the wording "research based STEM career" with "career as an agricultural education teacher" in Likert-type item stems. Face and construct validity was addressed with review by experts in SBAE. As a limitation of the study, additional replications and larger sample sizes will increase the reliability and validity of the instrument.

The population of interest in this study was seniors majoring in agricultural education at California State University Chico. The class consisted of 9 males and 24 females, with most in their early 20s. Of the 33 students enrolled during the Spring 2022 semester, 27 completed the instrument for a response rate of 81.82%. Due to the high response rate, no attempt was made to control for nonresponse error (Lindner et al., 2001). Means and standard deviations were calculated using IBM's SPSS version 26. Negative means were associated with items perceived to be easier or less costly to achieve as a SBAE teacher while items with positive means were perceived to be harder or more costly to achieve (Tan-Wilcon & Stamp, 2015).

Findings

Research Objective 1 was accomplished by an open-ended response survey item which asked, "If you didn't teach agricultural education what is/are the next career choice(s) you would pursue?". Roughly 50% (n = 12) of respondents were interested in alternative careers in the broad agricultural industry. The remaining portions were equally split (n = 7 for both) between education and other or undecided. Research Objective 2 is addressed in Table 1. It is important to also note the relatively high standard deviations, indicating some variability across participants.

Table 1.
Descriptive Statistics (N = 27)

Using the career choice(s) you identified, compare each of the following items to a career as an agricultural education teacher.	M	SD
Engaging in community organizations and activities	-1.54	1.24
Feeling fulfilled in your professional life	-1.15	1.52
Feeling fulfilled in your personal life	-0.09	1.30
Living in your chosen geographical area	0.00	1.85
Meeting your personal wellness goals	0.27	1.08
Meeting your financial goals	0.74	1.24
Balancing quality time between work demands and family/personal demands	1.60	1.35

Note. Negative means indicate areas perceived to be easier to accomplish as a SBAE teacher.

Conclusions, Implications, and Recommendations

Agricultural industry and other teaching credential areas represented nearly three-quarters of career interests outside of SBAE for study participants. These career options represented the valued alternatives that would be lost upon entrance into the SBAE profession (Flake et al., 2015). What is the perceived additional value in industry or other education fields? How can SBAE address these deficiencies to continue to recruit highly qualified teachers? Solomonson et al. (2018) suggested decreasing expectations of SBAE teachers and providing them with additional instructional and program management support.

Three items were thought to be less costly to achieve as a SBAE teacher. These findings concur with other works in altruism (Eck et al., 2021) and professional fulfillment (Solomonson et al., 2018). Another three items were perceived as more costly for SBAE teachers and are decreasing the value of choosing a career in SBAE (Eck et al., 2021; Tan-Wilcon & Stamp, 2015; Traini et al., 2019). Perhaps inservice SBAE teachers who are proficient in balancing work and home life could serve as cooperating teachers and guest speakers. Barring a paradigm shift in SBAE, teacher work-life balance will continue to be an area of concern in the recruitment and retention of SBAE teachers (Clemons et al., 2021; Traini et al., 2019).

References

Aydan, O. (2021). Mediating role of work-life balance and job satisfaction in the relationship between person-job fit and life satisfaction among teachers. Psycho-Educational Research Reviews, 10(2), 29-41. https://www.journals.lapub.co.uk/index.php/PERR

Clemons, C. A., Hall, M., & Lindner, J. (2021). What is the real cost of professional success? A qualitative analysis of work and life balance in agricultural education. *Journal of Agricultural Education, 62*(1), 95-113. https://doi.org/10.5032/jae.2021.01095

Eck, C. J., Toombs, J. M., & Robinson, J. S. (2021). Intent to teach: Perspectives from pre-service agricultural education teachers. *Journal of Agricultural Education, 62*(1), 212-226. https://doi.org/10.5032/jae.2021.01212

Flake, J. K., Barron, K. E., Hulleman, C., McCoach, B. D., & Welsh, M. E. (2015). Measuring cost: The forgotten component of expectancy-value theory. *Contemporary Educational Psychology, 41,* 232-244. https://doi.org/10.1016/j.cedpsych.2015.03.002

Hopkins, N., Sorensen, T. J., Burrows, M., & Lawver, R. G. (2020). Happy spouse, happy greenhouse: Perceptions of the SBAE teacher's spouse regarding agricultural education as a career. *Journal of Agricultural Education, 61*(3), 194-213. https://doi.org/10.5032/jae.2020.03194

Lindner, J. R., Murphy, T. H., & Briers, G. E. (2001). Handling nonresponse in social science research. *Journal of Agricultural Education, 42*(4), 43-53. https://doi.org/10.5032/jae.2001.04043

Raczkoski, B. M. (2018). *Examining predictors of student motivation to enroll in a study abroad course from a relative costs perspective* [Doctoral dissertation, Oklahoma State University]. https://shareok.org/bitstream/handle/11244/317666/Raczkoski_okstate_0664D_15925.pdf?sequence=1&isAllowed=y

Smalley, S. W., & Rank, B. D. (2019). Preservice teacher perceptions of the role of an agriculture teacher during their early field experience. *Journal of Agricultural Education, 60*(2), 99-108. https://doi.org/10.5032/jae.2019.02099

Solomonson, J. K., Korte, D. S., Thieman, E. B., Retallick, M. S., & Keating, K. H. (2018). Factors contributing to Illinois school-based agriculture teachers' final decision to leave the classroom. *Journal of Agricultural Education, 59*(2), 321-342. https://doi.org/10.5032/jae.2018.01321

Sorensen, T. J., McKim, A. J., & Velez, J. J. (2016). Why agricultural teacher leave: A national examination of turnover intentions and work-family conflict. *Journal of Agricultural Education, 57*(4), 186-201. https://doi.org/10.5032/jae.2016.04186

Tan-Wilson, A., & Stamp, N. (2015). College students' views of work-life balance in STEM research careers: Addressing negative preconceptions. *CBE-Life Sciences Education, 14*(5), 1-13. https://doi.org/10.1187.cbe.14-11-0210

Traini, H. Q., Claflin, K., Stewart, J., & Velez, J. J. (2019). Success, balance, but never both: Exploring reified forms of success in school-based agricultural education. *Journal of Agricultural Education, 60*(4), 240-254. https://doi.org/10.5032/jae.2019.04240

Wigfield, A., & Eccles, J. S. (2000). Expectancy-value theory of achievement motivation. *Contemporary Educational Psychology, 25,* 68-81. https://doi.org/10.1006/ceps.1999.1015

Creating Climate Change and Adaptation Awareness through International Agricultural Study Tours

Andrew Waaswa
North Carolina State University
NCSU Campus Box 7607
Raleigh, NC 27695
awaaswa@ncsu.edu
(919)515-6077

Joy Morgan
North Carolina State University
NCSU Campus Box 7607
Raleigh, NC 27695
jemorga2@ncsu.edu

Introduction/Need for Research

The North Carolina Agricultural Leadership Development Program is a College of Agriculture and Life Sciences leadership program at NC State University that develops personal and civic leadership skills in early and mid-career farmers and agricultural professionals (Radford, 2020). The program involves in-depth leadership training, executive coaching, advocacy and policy development, and agricultural-based learning opportunities throughout the state, United States, and in a global agriculture component. As the program seeks to empower NC farmers and agricultural professionals, many misconceptions about agriculture require informed leaders to avoid diverting from the agricultural development agendas and calmly handling conflicting views (Earthscan, 2011). One misconception with conflicting views surrounds climate change awareness, how it affects agriculture, and the different adaptation strategies. The program employs an international agricultural study tour to allow participants to gain a better understanding of another country's agriculture and impact. During the latest study tour to Brazil, climate change was discussed throughout the study tour specifically how climate change affects agricultural productivity. and the adaptation strategies used by farmers and other agricultural professionals elsewhere in the world.

Conceptual Framework

This study was based on the International Agricultural Study Tour (IAST) concept, which is one of the ways the program develops its participants' awareness of global challenges affecting agriculture and strong leadership competencies for successful agricultural and community development programs in their respective organizations (NC Cooperative Extension, n.d). The future of agriculture depends on local leaders directing advocacy efforts connected to change; thus, agricultural leaders must be able to work despite the challenges and advance the communities (Diem & Nikola, 2005). According to Kelsey and Wall (2003), agricultural leadership programs have existed in the United States for over 75 years. However, the Kellogg Farmers Study Program (KFSP), which started at Michigan State University in 1965, is where most of the material currently available on contemporary agricultural leadership programs finds its inspiration (Carter & Rudd, 2000). The KFSP's founders saw that agriculture was becoming more complex and that strong leadership was required to safeguard and direct the industry's future. Workshops and travel seminars designed to provide participants with a better understanding of the social, economic, cultural, and political elements of public problems were the foundation of the KFSP from the start (Black, 2006), and continue to serve as a solid foundation for the existing agricultural leadership programs today. As current programs strive to provide agricultural leaders with an increased skillset to lead in their communities, careers, and organizations, program leaders must also assist these future leaders with developing the skills needed to advocate and address challenging issues impacting agriculture.

Methodology

Following the international study tour, an online survey was created and distributed to the NCTTFC ALDP cohort who participated in the international agricultural study tour to Brazil in January 2023. A census sampling technique was used, and all 23 participants were contacted electronically and invited to participate in the study voluntarily. The survey instrument contained 20 questions that centered around the participant's increase in knowledge and skills as a result of the study tour. Questions were designed based on the study tour's objectives and a literature review based on study abroad impacts. Because of the researcher's specific interest in climate change, five out of the 20 questions were directly focused on climate change. Each participant's identity was kept confidential because their responses were entered into an online electronic survey in an anonymous form. The survey received a response rate of 50% from 12 respondents. The responses were analyzed using descriptive statistics to yield major conclusions.

Results/Findings

Engagement with the international agricultural study tour gave the participants a better understanding of how climate change affects people globally. Participants (55.6%) selected an emphasis on seeing or hearing about climate change through hotter temperatures, followed by decreased soil fertility (44.4%) and unpredictable weather patterns (44.4%). While 33.3% stated that they perceived Brazil's farmers discussing reduced crop yields, and 22.2% noticed more discussion on health risks. In addition, reduced ground and surface water, increased drought, loss of valuable plant and animal species, and reduced food availability were each reported by 11.1% of the participants. No participant acknowledged lowered livestock productivity and increased poverty and displacements in an attempt to open up more land for agriculture. The survey results revealed some additional interesting insights. For example, when asked to compare the climate change adaptation strategies that Brazilian farmers use to adapt to climate change to what participants use on their farms, 60% of the respondents rated their adaptive strategies as 3, 30% rated 4, and 10% rated 2 on a scale of 5. This was based on a scale of 1 to 5 with 1 being less effective and 5 most effective climate change adaptation strategies.

Conclusion

As climate change continues to be at the forefront, agriculturalists are and will continue to be tasked with adapting practices to combat climate change. Agricultural leadership development program leaders should include this major topic in their programs to provide participants with knowledge and opportunities to experience strategies that are being used by others that can be implemented on their farms and operations. The NCTTFC ALDP participants observed different ways climate change manifests and learned about the adaptive strategies used by the Brazilian farmers, giving them a global perspective. Participants could compare climate change adaptation strategies used on their farms with what the Brazilian farmers use to adjust their agricultural production systems from climate change shock. Engagement in the IASTs gives participants an understanding of the snares imposed by climate change on the agricultural production systems and teaches them about new adaptation strategies. The IAST showcased innovative ideas that could also be profitable in addressing climate change.

Implications

It is essential to carefully prepare and include learning through IASTs in the agricultural leadership programs. Intentional planning allows the participants to see and absorb information from various contexts that are related to participant needs and global issues. The IAST helped the NCTTFC ALDP participants observe climate change effects in Brazil. By seeing and talking with the farmers in Brazil who have implemented climate change adaption practices, United States farmers can ask questions related to profits and productivity which are important components of their livelihood. Visiting farmers during the IAST was key to providing an opportunity for increased discussions that provided a stronger understanding of climate change globally.

References

Black, A. M. (2006). *Evaluating the effectiveness of an Ohio statewide agricultural leadership program* [Doctoral Thesis]. The Ohio State University.

Carter, H., & Rudd, R. D. (2000). Evaluation of the Florida leadership program for agriculture and natural resources. *Journal of Southern Agricultural Education Research*, *50*(1), 199–205.

Diem, K. G., & Nikola, M. P. (2005). Evaluating the impact of a community agricultural leadership development program. *The Journal of Extension*, *43*(6), 13.

Earthscan (Ed.). (2011). *The state of the world's land and water resources for food and agriculture: Managing systems at risk* (1st ed). Earthscan.

Kelsey, K. D., & Wall, L. J. (2003). Do Agricultural Leadership Programs Produce Community Leaders? A Case Study Of The Impact An Agricultural Leadership Program On Participants' Community Involvement. *Journal of Agricultural Education*, *44*(4), 35–46. https://doi.org/10.5032/jae.2003.04035

[State] Cooperative Extension. (n.d). *Needs Assessment*. https://evaluation.[State].edu/needs-assessment/

Radford, D. A. (2020). *The effectiveness of the North Carolina Tobacco Trust Fund Commission Agricultural Leadership Development Program in developing leadership Skills* [Master of Sciences]. North Carolina State University.

Defining Fidelity in the Curriculum for Agricultural Science Education (CASE)

Scott W. Smalley
Iowa State University
217 Curtiss Hall
Ames, IA 50201
(515) 294-0047
smalle16@iastate.edu

Mark S. Hainline
Sam Houston State University
1019 Bowers Blvd.
Huntsville, TX 77340
(936) 294-1186
msh004@shsu.edu

Introduction/Conceptual Framework

The Curriculum for Agricultural Science Education (CASE) is a project by the National Council of Agricultural Education, managed by the National Association of Agricultural Educators, who are affiliates of the STEM Education Coalition. CASE is a student directed and inquiry-based curriculum aligned to the national standards of Agriculture, Food, and Natural Resources (AFNR), science, mathematics, and English with every lesson. As this curriculum has been implemented, a new question arises; how can one say the CASE curriculum is being taught to the fullest potential? How is fidelity defined in the classroom? Moncher and Prinz (1991), Yeaton and Sechrest (1981), and de Leeuw et al. (2020) suggest fidelity of implementation is the degree to which a treatment/intervention is implemented as intended. A direct correlation between fidelity and student outcomes have been reported (Al Otaiba & Fuchs, 2006; Carroll et al., 2007; Durlak & DuPre, 2008; Kaderavek & Justice, 2010); however, the term is loosely defined, and measurements are varied across the field of education (Durlak, 2010; Durlak & DuPre, 2008; Green, 2001). When fidelity is missing, one can only assume curriculum is not being delivered adequately with the measurements intended. Measuring fidelity has meaning when making claims of the effectiveness in the classroom (Vartuli & Rohs, 2009).

Chen's (1998) key domains affecting curriculum fidelity served framework to guide this study. This framework has four components, (1) school context, (2) curriculum implementation systems, (3) curriculum implementers, and (4) audiences targeted. All four parts play a role in curriculum fidelity. School context deals with the type of school (private vs public), the school size, and school climate. The curriculum implementation systems include the barriers to implementing the curriculum and the availability of training for educators to use the curriculum. The purpose of this study was to explore the definition of fidelity in the delivery of the CASE.

Method and Procedures

This study employed a basic qualitative design (Merriam, 2009) and included all members of the CASE executive committee, which consisted of teacher educators, secondary educators, and state leaders for agricultural education. We conducted 30–40-minute phone interviews with each participant using an interview protocol with six questions. A comparative method of data analysis was used to identify themes (Merriam, 2009). Interviews were transcribed, data was coded, and themes were delineated to provide validation of analysis. Trustworthiness and reliability of data were established through a research log, peer review of data analysis, and member checks (Lincoln & Guba, 1985). Braun and Clark (2006) thematic analysis was used in reviewing the transcripts.

Findings

Several benefits of CASE curriculum were identified by the participants of this study. The benefits identified included inquiry-based learning, resources for educators, and assistance for novice educators. A heavy focus was placed on inquiry-based learning. Jake indicated, "CASE gives teachers a tool to do what agricultural education has claimed it's done forever, which is hands-on problems-based teaching." Participants saw significant value in the resources CASE provided to educators. Patrick indicated, "CASE cuts down on teacher prep time and is a support for teachers. This support is from having high quality curriculum and quality professional development which can enhance the classroom experience for students." Natalie highlighted, "CASE as being turn-key, which provides young and experienced teachers with valuable resources to enhance classroom teaching." The participants noted the value of the curriculum for beginning teachers. Jake spoke about novice teachers at length and stated, "teachers might be more motivated and stick around longer. I have had a 30 year plus veteran, tell me they are so excited to teach another 8-10 years."

The participants believed the CASE curriculum can be delivered in several ways but emphasized the importance of the spiraling and scaffolding of the curriculum. Natalie stated, "it can be adjusted to fit the local environment or local needs." Tanna added that the curriculum can be augmented to meet the interest of your students. Natalie shared, "the concepts in CASE are solid, but the delivery can be augmented to fit the needs of the program."

A final theme identified by participants focused on the assessment and the high expectation by CASE for the curriculum. As a teacher when delivering CASE, Patrick stated, "CASE is not saying that every single APP, is the absolute best way to teach everything, but it's a solid place to start." In addition, Patrick shared, "if someone could get through half the curriculum, but if they are delivering the curriculum as intended, I view that as being done with fidelity." Natalie believes the true assessment is the end of course assessment and states, "they are delivering the lessons in the course sequentially, as its been designed in the program, they have the appropriate equipment and supplies… and the teacher is properly trained or certified…they are assessing the students at the end of the course, so we have data." Natalie also shared, "It should be 100 percent… if the assessments are based on the course, and the students take the assessment, if they don't finish the course, they are certainly not going to score well on the assessments at the end of the course."

Conclusions/Recommendations/Implications

This study helps to shed some light on defining fidelity for CASE as it presents some unique benefits and challenges of delivery that could affect fidelity. Overall, participants believed the curriculum was beneficial to agricultural educators no matter if they were beginning their career or are established professionals. This aligns with Chen's (1998) key domains affecting curriculum development because the curriculum implementer's attitudes towards CASE are positive allowing for the delivery to be with fidelity. The professional development events provided allow the curriculum implementation systems to play a part to ensure the curriculum has fidelity (Chen, 1998). With a heavy focus within the curriculum being directed towards inquiry-based instruction, the participants believed the curriculum was beneficial for students in the agricultural education class. As highlighted in Zohar and Nemet (2002) study, inquiry-based learning groups performed higher on assessments as opposed to the traditional group. When inquiry-based instruction is utilized in the classroom, students gain a higher level of understanding of the material being taught in the classroom and allows for practice of the scientific inquiry (Skelton et al., 2018; Witt, 2010).

Among participants, there was a coherent agreement to use the curriculum with fidelity, but it was not clear if a teacher could pick and choose which lesson they delivered or if the curriculum would need to be presented from the beginning to end. The variation largely could be due to the standards that are adapted by each state, as some states do not follow specific state standards. As there was not one simple definition of fidelity, one can assume the CASE curriculum is being delivered adequately with how it is intended to be delivered. Fidelity can be measured by the effectiveness of the curriculum in the classroom (Vartuli & Rohs, 2009).

Future research should focus on how the lead teachers view the delivery of the CASE curriculum and to what level the curriculum needs to be delivered to reach teaching it with fidelity. As leaders of SBAE, we must understand the needs of teachers and work to provide the highest quality of professional development possible.

References

Al Otaiba, S., & Fuchs, D. (2006). Who are the young children for whom best practices in reading are ineffective? An experimental and longitudinal study, *Journal of Learning Disabilities*, *39*, 414-431. https://doi:10.1177/00222194060390050401

Braun, V., & Clark, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 15-35. https://doi:10.1191/1478088706qp063oa

Carroll, C, Patterson, M., Wood, S., Booth, A., Rick, J., & Balain, S. (2007). A conceptual Framework For implementation Fidelity. *Implementation Science*, *2*, 40. https://doi: 10.1186/1748-5908-2-40

Chen H, T. (1998). Theory-driven evaluations. *Adv Educ Productivity* 7:15-34.

de Leeuw, R.R., de Boar, A.A., Minnaert, A.E.M.G. (2020). The proof of the intervention is in the implementation; a systematic review about implementation fidelity of classroom-based interventions facilitating social participation of students with social-emotional problems or behavioral difficulties. *International Journal of Educational Research. Volume 1.* https://doi.org/10.1016/j.ijedro.2020.100002.

Durlak, J. A., & DuPre, E. P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the Factors affecting implementation. *American Journal of Community Psychology*, *41*, 327-350. https://doi:10.1007/s10464-008-9165-0

Durlak, J. A. (2010). The importance of doing well in whatever you do: A commentary on the special section, "implementation research in early childhood education." *Early Childhood Research Quarterly*, *25*, 348-357. https://doi:10.1016/j.ecresq.2010.03.003

Green, L. W. (2001). From research to "best practices" in other settings and populations. *American Journal of Health Behavior*, *25*, 165-178. https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.537.7374&rep=rep1&type=pdf

Kaderavek, J. N., & Justice, L. M. (2010). Fidelity: An essential component of evidence-based practice in speech-language pathology. *American Journal of Speech Language Pathology*, *19*, 369-379. https://doi: 10.1044/1058-0360(2010/09-0097)

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry*. Newbury Park, CA: Sage Publications.

Merriam, S. B. (2009). *Qualitative Research: A guide to design and implementation.* California: Jossey-Bass, Inc.

Moncher, F. J., & Prinz, R. J. (1991). Treatment fidelity in outcome studies. *Clinical Psychology Review*, *11*, 247-266. https://doi:10.1016/0272-7358(91)90103-2

Skelton, P., Blackburn, J. J., Stair, K. S., Levy, N., & Dormody, T. J. (2018). Agriscience education through inquiry-based learning: Investigating factors that influence the science competence of middle school students. Journal of Agricultural Education, 59(1), 223-237. https://doi.org/10.5032/jae.2018.01223

Vartuli, S., & Rohs, J. (2009) Assurance of Outcome Evaluation: Curriculum Fidelity, *Journal of Research in Childhood Education*, *23:4*, 502-512. https://doi:10.1080/02568540909594677

Witt, C. (2010). *The impact of inquiry-based learning on the academic achievement of middle school students.* Paper presented at the Western American Association of Agriculture Educators Research Conference, Great Falls, MT.

Yeaton, W. M., & Sechrest, L. (1981). Critical dimensions in the choice and maintenance of successful treatments: Strength, integrity, and effectiveness. Journal of Consulting and Clinical Psychology, 49, 156-167. https://doi:10.1037/0022-006X.49.2.156

Zohar, A., & Nemet, F. (2002). Fostering students' knowledge and argumentation skills through dilemmas in human genetics. *Journal of Research in Science Teaching*, 39*(1)*, 35-62. https://doi:10.1002/tea.10008

Research Poster

Describing the Relationship between Trust in Science and Support for Climate Change Policy

Maci Loving
Graduate Student
Department of Agricultural Education & Communications
Texas Tech University
Maci.j.loving@ttu.edu

Kindle Catching
Graduate Student
Department of Agricultural Education & Communications
Texas Tech University
Kindle.catching@ttu.edu

Laura Fischer, Ph.D.
Assistant Professor
Department of Agricultural Education & Communications
Texas Tech University
Laura.fischer@ttu.edu

Ginger Orton, M.S.
Doctoral Student
Department of Agricultural Education & Communications
Texas Tech University
gorton@ttu.edu

Cara Lawson, Ph.D.
Assistant Professor
Department of Agricultural Communication, Education, and Leadership
The Ohio State University
Lawson.182@osu.edu

Describing the Relationship between Trust in Science and Support for Climate Change Policy

Introduction and Need for Research

Climate change has been described as a change in climate patterns attributed to increased levels of atmospheric carbon dioxide (Oxford Dictionary, 2020), and it has been cited as the "most significant of the five primary adaptive challenges" that threaten human wellbeing, agricultural production, and global sustainability (Andenoro et al., 2016). As climate change threatens the agricultural industry, and initiatives are sparked for sustainability, there is an increasing need for policy support to mitigate the effects of climate change. The USDA (United States Department of Agriculture) and other organizations are in support of efforts to reduce or alleviate the effects of climate change through policy support; however, sustainability efforts within the agricultural industry are dependent on the public's understanding and opinion of climate change in policy and decision-making (Eigenbrode et al., 2014). Currently, there is a need for a discussion revolving around trust in science (Nadelson et al., 2014), and how it can impact decisions on policy efforts.

Conceptual Framework

An essential component in the relationship between scientists and the public is trust (Rumble et al., 2020). Trust encapsulates personal belief and/or knowledge in the dependability and honesty of situations, ideas, institutions, and people (Simpson et al., 1989). Trust in science and its relation to policymaking "has grown ever more important in recent years, in parallel with the dramatic increase in the complexity and uncertainty of the ways in which science and technology interact with society and economy" at the local, national, and global levels (Arimoto & Sato, 2012). To meet society's current and future challenges, it is important to evaluate the public's trust in science and their acceptance of scientific topics and to determine how they could potentially influence policy decisions (Rumble et al., 2020). Telg et al. (2018) indicated a dominant theme of climate change acceptance was trust, and lack of trust with scientists and media may influence future acceptance and policy support. Trust in science within the public could potentially be increased through exposure to science-based education, communication, and engagement (Nadelson et al., 2014). If agricultural educators and communicators make advancements in educating the public and encouraging engagement in science, a deeper public trust in science could be instilled. If the public develops a stronger trust in science, it could potentially allow them to be more supportive of climate change and sustainability policy efforts (Sanders et al., 2022). The purpose of this study is to determine the relationship between perceived trust in science and climate change policy support.

Methods

An online survey instrument was used to examine Texas residents' opinions on science trust and their support for climate change policy. Qualtrics is a third-party company that was consulted to gather a non-probability sample of Texas residents 18 years or older and match census data for community type and age. The participants in the sample were presented with questions to measure their perceived trust in science and support of climate change and sustainability policy. Previous researchers have utilized non-probability sampling techniques to make population estimates (Baker et al., 2013), and it has previously been used to explore and examine public opinion on emerging issues (Lamm & Lamm, 2019). This sampling procedure is appropriate due to increased internet access, low sampling costs, and ease of reaching members of the population (Lamm & Lamm, 2019). A total of 486 responses were collected in November 2021 that were usable. Science trust was measured using an adaptation of the Nadelson et al. (2014) trust in science scale ($a = .86$) with nine, 5-point

Likert-type items. Policy support was measured by assessing the respondents' support of climate change mitigation policies (Nadelson et al, 2014). To do so, the respondents were asked a series of 5-point Likert scale items (1 = *Strongly oppose*, 2 = *oppose*, 3 = *unsure*, 4 = *support*, 5 = *Strongly support*) to the question "To what degree do you support or oppose the following policy proposals." After data were collected for this study, all data were exported to SPSS Version 28. Data were analyzed via descriptive statistics and correlations following Field's (2018) statistical procedures.

Results

A Pearson correlation was conducted to assess the linear relationship between trust in science and each of the support toward climate change policy statements. As seen in Table 1, we found substantial, significant correlations between trust in science and each policy statement (Kotrlik et al., 2011).

Table 1

Intercorrelations for Trust in Science and Support for Climate Change Policy

Measure	1	2	3	4	5
1. Trust in Science	-				
2. Regulate Carbon Dioxide as a Pollutant	.523**	-			
3. Require electric utilities to produce at least 20% of electricity from solar, wind or other renewable energy sources	.516**	.626**	-		
4. Require automakers to increase fuel efficiency of cars, trucks, and SUVs	.498**	.584**	.681**	-	
5. Fund more research into renewable energy sources	.517**	.576**	.576**	.602**	-
6. Provide tax rebates for energy efficient vehicles, solar panels	.550**	.600**	.502**	.553**	.703**

Note: ** Correlation is significant at the .01 level

Conclusions, Implications, and Recommendations

Although academics in agricultural communications and education have begun to research the topic of climate change and sustainability policy, there has been little research to describe the impact of trust in science and how it impacts policy (Andenoro et al., 2016). These measures allowed us to understand how the respondents' level of perceived trust in science impacted their support of climate change policy efforts. We found that if an individual views science as trustworthy, the more likely they are to support climate change and sustainability policy. Moving forward, it is recommended that agricultural communicators and educators develop strategies to enhance the public's trust in science to generate support for climate change efforts in policy and government. Practitioners should implement educational programs and communication messaging focused on increasing trust in science. Communication strategies should highlight scientific research pertaining to agricultural practices and policy to present factual information that will reach the target audience. Furthermore, agricultural educators of all levels should emphasize the importance of research in curriculum to create a more scientific literate public. If the public develops a deeper trust in science, they will be more likely to participate in and support climate change and sustainability policy efforts.

References

Andenero, A. C., Baker, M., Stedman, N. L. P., & Weeks, P. P. (2016). Research priority 7: Addressing complex problems in Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). *American Association for Agricultural Education national research agenda: 2016-2020*. Department of Agricultural Education and Communication. University of Florida.

Arimoto, T., & Sato, Y. (2012). Rebuilding public trust in science for policy-making. *American Association for the Advancement of Science, 337(*6099), 1176-1177. https://doi.org/10.1126/science.1224004

Baker, R., Brick, J. M., Bates, N. A., Battaglia, M., Couper, M. P., Dever, J. A., Gile, K. J., & Tourangeau, R. (2013). Report of the AAPOR task force on non-probability sampling. *American Association for Public Opinion Research. https://www-archive.aapor.org/AAPOR_Main/media/MainSiteFiles/NPS_TF_Report_Final_7_revised_FNL_6_22_13.pdf*

Eigenbrode, S. D., Morton, L. W., & Martin, T. A. (2014). Big interdisciplinarity to address climate change and agriculture: Lessons from three USDA coordinated agricultural projects. *Journal of Soil and Water Conservation, 69*(6), 170A-175A. https://doi.org/10.2489/jswc.69.6.170A

Field, A. (2018). *Discovering statistics using IBM SPSS statistics*. (5th ed.). SAGE Publications.

Lamm, A. J., & Lamm, K. W. (2019). Using non-probability sampling methods in agricultural and extension education research. *Journal of International Agricultural and Extension Education, 26*(1), 52-59. https://fycs.ifas.ufl.edu/swisher/00_6800_22_CNV/Non-Probability%20Sampling%20Methods%20in%20Ag_Lamm.pdf

Kotrlik, J. W., Williams, H. A., Jabor, M. K. (2011). Reporting and interpreting effect size in quantitative agricultural education research. *Journal of Agricultural Education, 52*(1), 132-142. https://doi.org/10.5032/jae.2011.01132

Nadelson, L., Jorcyk, C., Yang, D., Smith, M. J., Matson, S., Cornell, K., & Husting, V. (2014). I just don't trust them: The development and validation of an assessment instrument to measure trust in science and scientists. *School of Science and Mathematics, 114*(2), 76-86. https://doi.org/10.1111/ssm.12051

Oxford Dictionary (n.d.). *Oxford English dictionary.* Retrieved April 17, 2023, from https://www.oed.com/

Rumble, J. N., Wu, Y., Tully, K., Ruth, T. K., Ellis, J. D., & Lamm, A. (2020). A mixed-methods comparison of self-reported and conversational trust in science. *Journal of Applied Communications, 104*(4). https://doi.org/10.4148/1051-0834.2371

Sanders, C. E., Gibson, K., & Lamm, A. J. (2022) Perceived government control and its influence on climate change knowledge and perceptions: Applications for effective communication. *Journal of Applied Communications, 106(*3). https://doi.org/10.4148/1051-0834.2441

Simpson, J. A., Weiner, E. S. C., & Oxford University Press. (1989). "Trust". *The oxford english dictionary* (2nd ed.). Clarendon Press.

Telg, R. W., Lundy, L., Wandersee, C., Mukhtar, S., Smith, D., & Stokes, P. (2018). Perceptions of trust: Communicating climate change to cattle producers. *Journal of Applied Communications, 102*(3). https://doi.org/10.4148/1051-0834.2207

Developing Future Educators through an Educationally Purposeful High Impact Experience: A Phenomenological Examination

Authors:

Gavin Voelckers
875 Perimeter Drive, MS 2040
Moscow, ID 83844
208-885-6358
Voel8172@vandals.uidaho.edu

Audie Cherry
audiec@g.clemson.edu

Kasee Smith
klsmith@uidaho.edu

Jeremy Falk
jfalk@uidaho.edu

Daniel Foster
Ddf12@psu.edu

Melanie Miller Foster
Mjm727@psu.edu

Developing Future Educators through an Educationally Purposeful High Impact Experience: A Phenomenological Examination

Introduction

Post-secondary schools embrace learning opportunities outside of the classroom intended to extend knowledge, expand opportunity, and curate skills in students beyond content comprehension (Kuh, 2008). High Impact Experiences (HIE)s, a category of experiential learning opportunities involving practical skills application, give undergraduate students these opportunities. HIE curriculum requires extensive planning and funding to offer above-average instruction to a relatively small student population. Information on HIE return-on-investment is limited as perceived HIE esteem and efficacy grow. Participating in HIEs has noted benefits. Participation can help students become “effective agents for their own lifelong learning and personal development” (Chickering, 1994, p 50). Students who participate in HIEs can develop higher levels of social literacy than their classmates who do not participate in HIEs. (Riehle & Weiner, 2013).

This study allowed us to explore how participation in a Spring 2022 high-impact teaching immersion increased professional accountability and accelerated professional maturity in a cohort of undergraduate pre-service teachers. This study addresses AAAE research priority 5 by inspecting how agricultural leadership, education, and communication teachers can collaborate to deliver cost-effective educational programs. Results will inform the continuing design of high-impact immersion curriculum, budget prioritization, and cross-institutional collaboration.

Framework

This study was founded on a theoretical model for HIE involvement as proposed by Buck (2020). Buck proposed that components of HIEs have the ability to impact student satisfaction, engagement, and persistence which can contribute to student acquisition of the essential skills as outlined by the Association of American Colleges and Universities (AAC&U). Building purposeful educational activities allows students to grow and develop through HIEs. Wolf-Wendel et al. (2009) noted that many post-secondary institutions state they are following Kuh’s (2008) HIE recommendations, even when claiming to implement HIEs.

Methodology

This study was conducted as a qualitative phenomenology, using reflections of students who participated in a one-week immersive study-away program. The population of this study (n = 12) were pre-service agricultural educators at University of Idaho and Penn State who participated in the 2021-2022 [Program]. Students participated in a three-credit course with a one week immersive experience in Fall semester 2021 and a three credit Spring 2022 course which included a one week immersive teaching experience. The Fall 2021 course and experience prepared students with usable content, lesson planning, and instructional feedback so that they could effectively deliver agricultural lessons in secondary agricultural classrooms. Students were responsible for managing travel funds, planning lessons, teaching, and collaborating with peers to handle all immersion logistics and responsibilities. The data for this study were collected during the spring immersion; students traveled in pairs and reflected on their experiences.

Flip (formerly Flipgrid) was used to collect data with daily video reflection prompts. Prompts were designed to stimulate participant reflection on their experiences in an open format. Each prompt read: *Please share what you learned today about: 1. Content Area, 2. Students, 3. Yourself as a teacher.* Students completed assignments prior to the Spring immersion to orient them to the video recording platform. Students spent six to eight days in their locations and completed N = 82 video reflections. Video reflections were transcribed verbatim using both the onboard Flip transcription tool and individual cross-checking for completeness.

Creswell and Creswell's (2017) suggested phenomenological analysis should take place in five steps: 1) describing personal experiences of the researchers with the phenomenon, 2) developing a list of significant statements, 3) condensing significant statements into "meaning units" or themes, 4) writing descriptions of what and how the phenomenon was experienced, 5) and developing a composite description of the phenomenon. Reflexivity statements were developed by the members of the data analysis team (three members of the research team) who had no previous interaction with the 2021-2022 [Program] in order to ensure trustworthiness (Creswell & Creswell, 2017; Lincoln & Guba, 1985).

Results/Findings

Through the examination, it was determined that there were 4 main concepts participants universally experienced. The emergent themes (ET) included: ET1: Recognizing personal growth through adversity, ET2: Importance of being exposed to unfamiliar environments, ET3: Merit of flexibility in mindset and action ET4: Benefit of supportive and caring mentors and professional community.

Conclusions

The purpose of this study was to explain how high-impact teaching immersions increase professional accountability and accelerate professional maturity. As a result, we concluded that the experience offered growth and solidified students' futures as life-long learners and reflective educators. Based on the emerging themes we can conclude that both internal and external professional growth occurred. Emerging themes 1, 2, and 3 all support the conclusion that internal self-efficacy and resilience were gained through the HIE. Emerging theme 4 highlighted the growth of awareness of the usefulness of the professional education community as a resource. Therefore, we conclude that the students developed skills and dispositions during their HIE that are desired in teacher preparation programs.

Implications/Recommendations/Impact

Students who participated in the [Program] showed personal growth and self-efficacy in several areas. The HIE provided to students has shown to align with the research (Chickering, 1994; Buck, 2020; Wolf-Wendel et al., 2009; Kuh, 2008). Therefore, it is recommended that institutions of higher education seek to provide more access to opportunities for students to participate in HIEs that can help develop them personally and professionally. We also recommend that a longitudinal study be conducted to determine if the growth experienced in this HIE transfers into these students' future careers.

References

Buck, David. (2020, July 6). What even is an HIP? [Blog Post]. Retrieved from https://www.centerforengagedlearning.org/What-Even-is-a-HIP

Chickering, A. W. (1994). Empowering lifelong self-development. *NACADA Journal*, *14*(2), 50-53. https://doi.org/10.12930/0271-9517-14.2.50

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Kuh, G. D. (2008). High-impact educational practices: What they are, who has access to them, and why they matter. AAC&U, Washington, D. C. 34 pp.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage publications.

Riehle, C. F., & Weiner, S. A. (2013). High-impact educational practices: An exploration of the role of information literacy. *College & Undergraduate Libraries*, *20*(2), 127-143. https://doi.org/10.1080/10691316.2013.789658

Wolf-Wendel, L., Ward, K., & Kinzie, J. (2009). A tangled web of terms: The overlap and unique contribution of involvement, engagement, and integration to understanding college student success. *Journal of College Student Development*, *50*(4), 407-428. https://doi.org/10.1353/csd.0.0077

Development and Validation of a Middle School Agricultural Literacy Instrument: Grades 6-8

Rose Judd-Murray, Assistant Professor
Applied Sciences, Technology & Education Department
Utah State University
6000 Old Main Hill
Logan, UT 84322-6000
rose.juddmurray@usu.edu
(435) 512-4706

Michelle S. Burrows, Assistant Professor
Applied Sciences, Technology & Education Department
Utah State University
2300 Old Main Hill
Logan, UT 84322-2300
michelle.burrows@usu.edu
(435) 797-1193

Development and Validation of a Middle School Agricultural Literacy Instrument: Grades 6-8

Introduction

An agriculturally literate citizenry is imperative to meet the demands of a growing global population. The National Research Council (NRC) recognized this in their recommendations that all students, urban, suburban, or rural, receive education about agriculture in their classes (NRC, 1988). Since the NRC recommendations, agricultural literacy efforts have been underway in grades K-12 (Kovar & Ball, 2013). However, these efforts have focused more on the early grades of K-6, and secondary grades of 9-12, with less focus on the middle grades of 6-8 (Kovar & Ball, 2013; Cosby et al., 2022). In their review of 49 agricultural literacy research studies spanning 1988 – 2011, Kovar & Ball (2013) found only four focused on students in grades 6-8. More recently, Cosby et al. (2022) found in their review of research assessing students' agricultural literacy, of the 12 studies which focused on K-12 students, six concentrated on grades 3-6, while the other six studies were aimed at grades 9-12. Additionally, of the nearly 500 lessons on the NAITC Curriculum Matrix, only 131 are indicated explicitly for grades 6-8. This evidence suggests a gap in understanding students' agricultural literacy in grades 6-8 and a lack of available educational resources. Thus far, agricultural literacy efforts have been primarily geared toward elementary and secondary grades. In contrast, those students in the middle school grades 6-8 have been potentially underserved in agricultural literacy efforts. This study aimed to lessen the gap by developing an assessment instrument that can identify agricultural literacy knowledge and subsequently use that information to determine programs and resources that meet areas of knowledge deficiency.

Purpose and Objectives

This study aimed to develop an age-appropriate instrument for grades 6-8 that could be used as a formative and summative assessment to measure agricultural literacy. This instrument could be used by agricultural stakeholders and educators when developing educational programming and instruction. The following research questions informed the process of this research study:

1. Is the Agricultural Literacy Instrument 6-8 (ALI 6-8) a valid and reliable measure of National Literacy Outcomes?
2. Does the Agricultural Literacy Instrument 6-8 (ALI 6-8) effectively distinguish between proficiency stages of agricultural literacy in the 6-8th grade band?

Methods

The theoretical framework marries Sadler and Zeidler's (2009) Programme for International Student Assessment (PISA), a science literacy evaluation with the National Agricultural Literacy Outcomes (NALOs). The NALOs are constructed from national common core scientific, health, and social science standards to provide standardized benchmarks for agricultural literacy in K-12 students (Spielmaker & Leising, 2013). Additionally, the study framework relies upon the use of assessment theory and the incorporation of proficiency levels. Proficiency levels show what a student can do in a range of development rather than a standardized score (OECD: Programme for International Student Assessment, 2016). Most importantly, the study explicitly followed the methodology of previously completed Longhurst et al. (2019) and Judd-Murray et al. (2019) agricultural literacy assessments.

Phase One: Instrument Construction. The development of the Agricultural Literacy Instrument (ALI) 6-8 assessment items followed a modified Delphi format. The Delphi group comprised 18 education and agricultural content specialists selected nationwide. The iterative writing and ranking process resulted in 48 questions validated summatively by 8th-grade students (n = 375) in five states.

Phase Two: Instrument Validation. The validation analyses were determined using exploratory factor analysis (EFA), confirmatory factor analysis (CFA), item analysis (IA), and discriminant analysis (DA) through SAS (SAS Version 9.4). The analyses resulted in the validation and reliability of two 15-item agricultural literacy instruments.

Results

Research Question 1: Prior literature provides evidence that the standardized nature of the NALOs, measures using a proficiency scale, and Delphi instrument construction give the assumption of content and construct validity to the instrument items as they relate to NALO benchmark demands (Goodman, 1987; Jacobs, 1996; Messick, 1993; Sireci, 1998; Taylor & Judd, 1989). Based on these factors, the two instruments can effectively measure the 6-8th grade benchmarks of the NALOs.

Research Question 2: The maximum score determined the participant proficiency stages (max = 30, min = 6, M = 19.69, SD = 6.78, N = 372). Participants who scored ≥ 80% of the maximum score represented proficient participants; those between ≥ 50-79% represented factual literacy participants, and those below ≤ 49% were at the exposure level. The proficiency stage results defined the parameters for EFA, which then showed the relationships between stages and determined which survey items were in the correct proficiency stage. The CFA established the final items included in the instrument. A regression analysis was conducted to lend structural relevance to the linear model. There were enough items to produce two instruments, each with one assessment item for each proficiency level in the five NALO themes. Discriminant analysis was used to clarify the results of the CFA. Both instruments were sufficient in their classification accuracy and well within the range of $p < .05$, cross-validation results confirmed this information. Based on these outcomes, the proficiency stages were properly classified.

Conclusions and Recommendations

This study sought to develop a reliable and valid instrument to measure the agricultural literacy of students in grades 6-8, within the NALO themes. The instruments developed effectively measure agricultural literacy levels of 6-8th grade students in exposure, literate, and proficient levels. Given the dearth of agricultural literacy efforts targeting middle school grades of 6-8, further research should be conducted using the ALI 6-8 instruments to identify gaps in resources and knowledge of students in grades 6-8.

References

Cosby, A., Manning, J., Power, D. & Harreveld, B. (2022). New decade, same concerns: A systematic review of agricultural literacy of school students. *Education Sciences*, pp. 12, 235. http://doiorg/10.339/edusci12040235

Goodman, C. M. (1987). The Delphi technique: A critique. *Journal of Advanced Nursing*, *12*(6), 726–734.

Jacobs, J. M. (1996). *Essential assessment criteria for physical education teacher education programs: A Delphi study* [Unpublished doctoral dissertation].

Judd-Murray, R., Warnick, B. A., Longhurst, M., Coster, D. C., Spielmaker, D. M., & Stewart, C. D. (2019). *Development and Validation of an Agricultural Literacy Instrument Using the National Agricultural Literacy Outcomes* [Ph.D. Dissertation].

Kovar, K. A. & Ball, A. L. (2013). Two decades of agricultural literacy research: A synthesis of the literature. *Journal of Agricultural Education*, *54*(1), 167-178. https://doi: 10.5032/jae.2013.01167

Longhurst, M., & Judd-Murray, R. (2019). The Development and Validation of a K-5 Agricultural Assessment Using the NALOs. *Manuscript Submitted for Publication*.

Messick, S. (1993). In R. L. Linn (Ed.), *Educational Measurement* (2nd ed., pp. 13–104). American Council on Education and Oryx Press.

National Research Council. (1988). *Understanding agriculture: New directions for education*. (1988). Washington, D.C.: National Academy Press.

OECD: Programme for International Student Assessment. (2016). *PISA 2015: Technical Report*. Organization for Economic Co-operation and Development (OECD). http://www.oecd.org/pisa/sitedocument/PISA-2015-technical-report-final.pdf

Sireci, S. G. (1998). The construct of content validity. *Social Indicators Research*, *45*(1), 83–117.

Spielmaker, D. M., & Leising, J. G. (2013). *National agricultural literacy outcomes.* Utah State University, School of Applied Sciences and Technology. http://agclassroom.org/teacher/matrix

Taylor, R. E., & Judd, L. L. (1989). Delphi method applied to tourism. In S. Witt & L. Moutinho (Eds.), *Gazing into the oracle: The Delphi method and its application to social policy and public health* (pp. 56–88). Jessica Kingsley Publishers.

Research

Does a One Size Fits All Approach Work?: Comparing the Professional Development Needs of Alternatively Certified and Traditionally Certified SBAE Teachers

Matthew J. Wood

Utah State University

2300 Old Main Hill

Logan, Utah 84322-2300

matthew.wood@usu.edu

Tyson J. Sorensen

Utah State University

2300 Old Main Hill

Logan, Utah 84322-2300

tyson.sorensen@usu.edu

Does a One Size Fits All Approach Work?: Comparing the Professional Development Needs of Alternatively Certified and Traditionally Certified SBAE Teachers

Introduction/Need for Research

As enrollment in school-based agricultural education (SBAE) continues to trend upward (Jones et al., 2020), the challenge of finding qualified teachers to fill teacher vacancies has become more evident (Eck & Edwards, 2019). With less than 50% of all traditionally certified pre-service teachers accepting teaching positions immediately following graduation (Cowan et al., 2016) and teacher turnover continuing to grow, more and more individuals are entering the classroom through alternative means (Claflin et al., 2020). While some have looked to alternative certification as a remedy to the ongoing teacher shortage, others have been quick to call out alternative certification, as these teachers enter the classroom with little to no pedagogical skills and are presented with far more challenges than their traditionally certified colleagues (Bowling & Ball, 2018; Hoerst & Whittington, 2009; Porter, 2011; Roberts & Dyer, 2004; Stair et al., 2018; Touchstone, 2015). If alternative certification is going to be a viable solution in addressing teacher recruitment and retention, considering the developmental needs of all SBAE teachers will be important (Bowling & Ball, 2018). Offering professional development based on their needs will impact their behaviors and improve their effectiveness as educators (Darling-Hammond & Richardson, 2009; Wenglinsky & Silverstein, 2006).

Theoretical Framework and Literature Review

Fessler and Christensen's (1992) teacher career cycle model served as the framework for this study. This model focuses on adult growth and development with teacher career phases, and personal and organizational ecologies serving as influencers. This model, which has been referenced in previous literature, suggests that the professional development needs of teachers vary based on their career phase and experiences (Smalley & Smith, 2017; Sorensen et al., 2014). While a myriad of research exists on the professional development needs of SBAE teachers, specifically as it relates to the pedagogical and content-based training needs (Layfield & Dobbins, 2002; Myers et al., 2005; Boone & Boone, 2007; McKim & Saucier, 2011; Sorensen et al., 2014) there still appears to be limited research examining the professional development needs of SBAE teachers by career phase and licensure type. Identifying the career phase and path to licensure of SBAE teachers may prove valuable in determining their professional development needs, ensuring that provided professional development is worthwhile.

Methodology

This study's purpose and primary objective was to describe the professional development needs of traditionally certified and alternatively certified SBAE teachers through survey feedback. As part of a larger descriptive relational study, the target population was all SBAE teachers from the Northeast region of the United States (NAAE Regions IV and VI) who were actively teaching during the 2021-2022 school year. During June of 2022, an online survey instrument (i.e., Qualtrics) was administered. The survey instrument for this specific analysis consisted of one open-ended question asking participants about their professional development needs. Participants had the option to omit this question or type a response. As part of a larger study, four hundred eighty-five participants participated, with 73.6% (N = 357) identifying as traditionally certified and 28.4% (N = 128) identifying as alternatively certified. From the survey, 81.2% (N = 290) of traditionally certified teachers and 98.4% (N = 126) of alternatively certified teachers provided commentary on their individual professional development needs. Comments were categorized and thematically coded into professional development topic areas.

Results/Findings

Participant comments were categorized into professional development topics (see Table 1).

Table 1

Professional Development Needs of TC (N = 290) and AC (N = 126) SBAE Teachers

Professional Development Area	**TC *f***	**TC %**	**AC *f***	**AC %**
Content-Specific Topics (ex., Ag Mechanics)	137	47.24	46	36.51
Curriculum Development	28	9.66	19	15.08
FFA & SAE	25	8.62	12	9.52
Technology (ex., integrating technology in the classroom)	21	7.24	4	3.17
Classroom Management & Student Engagement	19	6.55	9	7.14
Instructional Strategies/Teaching Methods	13	4.48	17	13.49
Supporting Students (ex. EL learners, SEL, Spec. Ed)	10	3.45	6	4.76
Burnout/Work-Life Balance	9	3.10	1	0.79
Retirement	7	2.41	2	1.59
Standards/Industry Alignment	7	2.41	1	0.79
Work-Based Learning/Project-Based Learning	6	2.07	4	3.17
Funding (ex., grant writing, permissible use of grants)	3	1.03	0	0.00
Program Direction	3	1.03	3	2.38
Community Involvement	1	0.34	0	0.00
Time Management	1	0.34	2	1.59

Conclusions/Recommendations/Impacts

Our findings show that traditionally certified teachers reported Content-Specific Topics, Curriculum Development, FFA & SAE, Technology, and Classroom Management & Student Engagement/Motivation as the areas of greatest need. On the contrary, alternatively certified teachers reported Content-Specific Topics, Curriculum Development, Instructional Strategies/Teaching Methods, FFA & SAE, and Classroom Management & Student Engagement/Motivation as the areas of greatest need. While both groups of teachers reported needing professional development in similar areas, traditionally certified teachers placed greater emphasis on the areas of Content-Specific Topics and Technology, whereas alternatively certified teachers placed greater emphasis on the areas of Curriculum Development and Instructional Strategies/Teaching Methods.

Professional development in these areas would impact both groups of SBAE teachers the greatest. Therefore, as a recommendation, teacher preparation programs should continue to work with pre-service teachers in the areas of greatest need. Furthermore, state staff should work closely with their SBAE teachers, offering tailored professional development opportunities to meet their individualized needs. Lastly, it is recommended that this study be replicated with TC and AC teachers at different career phases to determine if the areas of greatest need remain the same for each cohort.

References

Boone, H., & Boone, D. (2007). Problems Faced By High School Agricultural Education Teachers. *Journal of Agricultural Education*, *48*(2), 36–45. https://doi.org/10.5032/jae.2007.02036

Bowling, A., & Ball, A. (2018). Alternative Certification: A Solution or an Alternative Problem? *Journal of Agricultural Education*, *59*(2), 109–122. https://doi.org/10.5032/jae.2018.02109

Claflin, K., Lambert, M. D., & Stewart, J. (2020). An investigation of the routes to certification and turnover intentions of Wisconsin agriculture teachers. *Journal of Agricultural Education*, *61*(1). https://doi.org/10.5032/jae.2020.01128

Cowan, J., Goldhaber, D., Hayes, K., & Theobald, R. (2016). Missing Elements in the Discussion of Teacher Shortages. *Educational Researcher*, *45*(8), 460–462. https://doi.org/10.3102/0013189x16679145

Darling-Hammond, L., & Richardson, N. (2009). Teacher learning: What matters? Educational Leadership, 66(5), 46-53.

Eck, C., & Edwards, M. C. (2019). Teacher Shortage in School-Based, Agricultural Education (SBAE): A Historical Review. *Journal of Agricultural Education*, *60*(4), 223–239. https://doi.org/10.5032/jae.2019.04223

Fessler, R., & Christensen, J.C. (1992).The teacher career cycle: Understanding and guiding the professional development of teachers. Needham Heights, MA: Allyn and Bacon.

Hoerst, C., & Whittington, S. (2009). The Current Status of Classroom Inclusion Activities of Secondary Agriculture Teachers. *Journal of Agricultural Education*, *50*(2), 38–51. https://doi.org/10.5032/jae.2009.02038

Jones, S., Doss, W., & Rayfield, J. (2020). Examining the status of middle school agricultural education programs in the United States. *Journal of Agricultural Education, 61*(2), 41-56. https://doi.org/10.5032/jae.2020.02041

Layfield, K. D., & Dobbins, T. R. (2002). Inservice Needs And Perceived Competencies Of South Carolina Agricultural Educators. *Journal of Agricultural Education*, *43*(4), 46–55. https://doi.org/10.5032/jae.2002.04046

McKim, B., & Saucier, R. (2011). Agricultural Mechanics Laboratory Management Professional Development Needs of Wyoming Secondary Agriculture Teachers. *Journal of Agricultural Education*, *52*(3), 75–86. https://doi.org/10.5032/jae.2011.03075

Myers, B. E., Dyer, J. E., & Washburn, S. G. (2005). Problems Facing Beginning Agriculture Teachers. *Journal of Agricultural Education*, *46*(3), 47–55. https://doi.org/10.5032/jae.2005.03047

Porter, M. D. (2011). Professional development for the novice teacher: One university's initiative to support the alternatively certified educator. Journal of the National Association for Alternative Certification, 6(2), 11–30.

Roberts, T. G., & Dyer, J. E. (2004). Inservice Needs Of Traditionally And Alternatively Certified Agriculture Teachers. *Journal of Agricultural Education*, *45*(4), 57–70. https://doi.org/10.5032/jae.2004.04057

Smalley, S. W., & Smith, A. R. (2017). Professional Development Needs of Mid-Career Agriculture Teachers. *Journal of Agricultural Education*, *58*(4), 282–290. https://doi.org/10.5032/jae.2017.04282

Sorensen, T. J., Lambert, M. D., & McKim, A. J. (2014). Examining Oregon Agriculture Teachers' Professional Development Needs by Career Phase. *Journal of Agricultural Education*, *55*(5), 140–154. https://doi.org/10.5032/jae.2014.05140

Stair, K., Figland, W., Blackburn, J., & Smith, E. (2019). Describing the Differences in the Professional Development needs of Traditionally and Alternatively Certified Agriculture Teachers in Louisiana. *Journal of Agricultural Education*, *60*(3). https://doi.org/10.5032/jae.2019.03262

Touchstone, A. (2015). Professional Development Needs of Beginning Agricultural Education Teachers in Idaho. *Journal of Agricultural Education*, *56*(2), 170–187. https://doi.org/10.5032/jae.2015.02170

Wenglinsky, H., & Silverstein, S. (2006). The science training teachers need. Educational Leadership, 64(4), 24-29.

Eco-Friendly Products: Do I Really Know Them?

Sidney Schnor

Fally Masambuka-Kanchewa, Ph.D.

Iowa State University

513 FarmHouse Lane,

Ames,

Iowa, 50010

Telephone: 515-2948943

Sidney24@iastate.edu

Fallymk@iastate.edu

Introduction

Green marketing and greenwashing are popular buzzwords among consumers. The term “green marketing” has grown tenfold from 2000 to 2014 (Leonidou & Skarmeas, 2017). Green marketing is a strategy used by firms and companies to provide consumers with information about the product and the company’s environmental practices (Yazdanifard & Mercy, 2011). Green marketing includes using eco-friendly labels to communicate with consumers about eco-friendly practices (FuiYeng, 2015). These eco-labels are used to attract environmentally conscious consumers; however, not all companies that participate in greenwashing follow through with the eco-practices they claim to promote (Montero-Navarro et al., 2021).

Greenwashing is the use of green marketing strategies to deceive the consumer and make them believe that a product is more environmentally friendly than it is (Dahl, 2020; Montero-Navarro et al.,2021). Greenwashed products have led consumers to distrust companies and green product labeling as well as the agriculture industry at large (Dahl, 2010). The growing mistrust between producers and consumers over green marketing and greenwashing has led to increased lawsuits filed against the Food and Drug Administration (FDA) (Negowetti, 2015). Absence of a clear definition of “natural” and standardized labelling contributes towards consumers’ confusion (Negowetti, 2015). Greenwashing not only hurts the companies involved in the practice but hurts other honest companies and the agricultural sector. Assessing college-age respondents’ ability to authenticate labels and perceptions on purchasing green-marketed products will assist in identifying ways of educating the public about greenwashing and establishing the authenticity of the product labels, thereby restoring trust and confidence among consumers.

Theoretical Framework

This study was guided by two theories: competitive altruism and social identity theory. Competitive altruism theory describes how people strive to gain a reputation of being generous (Hardy & Vugt, 2006). People use generosity to elevate their status among their peers (Hardy & Vugt, 2006). Prakash etal., (2019) in their study that was conducted in India, reported that young consumers purchase green-marketed products to prove their generosity and commitment to save the planet. However, there is limited research in the United Stated focusing on young consumers motivations for purchasing eco-friendly products.

On the other hand, social-identity theory talks about how people strive to improve their self-image by creating associations based on their personal identity or affiliation to a specific group (Tajfe & Turner, 2004). For example, people create groups based on similar interests and purchasing decisions thereby forming in-groups and out-groups (Stets & Burke, 2000). To show their allegiance to the group, people may avoid specific brands or products (Xiao et al., 2022). College-aged students may wish to identify themselves in a particular way as such making them associate themselves with specific behaviors such as purchase and consumption of eco-friendly products. However, their knowledge and perceptions of what these eco-friendly products represent based on the product labels may conflict with what these products represent which may contribute towards distrust of these products.

Purpose and Specific Objectives

The study sought to assess college students’ knowledge and perceptions of eco-friendly products. The specific objectives of the study were to:

- Establish respondents’ ability to decipher authenticity of labels.
- Identify factors influencing purchase of products.

Methods

A quantitative exploratory study was conducted among students at Iowa State University from February to April 2022 through a Qualtrics survey. A total of 49 students responded to the questionnaire. The first question on the questionnaire asked respondents to indicate whether they purchased eco-friendly products or not. Half of the respondents indicated purchasing eco-friendly products. All respondents who indicated that they purchased eco-friendly products were included in an experiment where they were asked to group labels into two categories, authentic and inauthentic. In the experiment pictures of five inauthentic (researcher generated) and four authentic (from existing firms) eco-labels were presented to the respondents. The survey also contained questions asking respondents to rank the factors influencing their purchase of eco-friendly products. The data was evaluated using SPPS version 28 where descriptive statistics were run.

Results

The results indicated that most respondents (90.5%) correctly labeled the USDA Organic label as authentic out of the four authentic choices. Most respondents (85.7%) incorrectly identified an inauthentic label as being authentic while a considerable majority failed to decipher the rest of the labels. Price was ranked as number one (44%) factor influencing purchase of eco-friendly products. The least important purchasing factor was peer influence, with 51% choosing it as their last choice. Product label was ranked as the third most important factor, with 24% choosing it as their third choice.

Conclusion

The results revealed that respondents could not distinguish between authentic and inauthentic eco-labels, except for the USDA label. From these results, it can be concluded that consumers may easily fall into greenwashing practices as they are not knowledgeable about authenticity of the eco-friendly labels. Price was ranked as the major factor influencing purchase of eco-friendly products while peer influence was ranked as a least factor. The respondents in this study did not consider their peers' eco-friendly purchase behaviors to decide whether to buy eco-friendly products or not. As such it may be concluded that purchase of eco-friendly products was more about the respondents' personal identity than association with a specific group (Tajfe & Turner, 2004).

Implications/recommendations/impact on profession

The USDA Organic label is certified by USDA following a rigorous process based on set standards (McEvoy, 2020). The results support the idea that having a heavily regulated label can protect consumers from deceptive behaviors. It is recommended that Agricultural communicators should work in collaboration with the FDA to educate the public on label identification by providing information through blogs and infographics. An app could be developed by the FDA or a third party to help consumers establish authenticity of eco-labels while shopping. Peer influence was ranked as the lowest factor. These results are contrary to findings from other studies which reported that purchase of eco-friendly products is driven by the desire among people to be associated with a specific group or as a way of proving their generosity (Hardy & Vugt, 2006; Prakash etal., 2019; Tajfe & Turner, 2004).The research implies that more research employing mixed methods design should be conducted to identify factors that influence purchase of eco-friendly products among young people.

References

Dahl, R. (2010). Green washing. *Environmental Health Perspectives*, *118*(6). https://doi.org/10.1289/ehp.118-a246

FuiYeng, W., & Yazdanifard, R. (2015). Green marketing: A study of consumers' buying behavior in relation to green products. Global Journal of Management and Business Research: E Marketing, 15(5), 16-23.

Hardy, C., & Van Vugt, M. (2006). Nice guys finish first: The competitive altruism hypothesis. Personality and Social Psychology Bulletin, 32(10), 1402–1413. https://doi.org/10.1177/0146167206291006

Leonidou, C. N., & Skarmeas, D. (2015). Gray shades of green: Causes and consequences of green skepticism. *Journal of Business Ethics*, *144*(2), 401–415. https://doi.org/10.1007/s10551-015-2829-4

McEvoy, P. by M. (2020, December 14). *Organic 101: Five steps to organic certification*. USDA. Retrieved October 10, 2022, from https://www.usda.gov/media/blog/2012/ 10/10/organic-101-five-steps-organic-certification

Montero-Navarro, A., González-Torres, T., Rodríguez-Sánchez, J.-L., & Gallego-Losada, R. (2021). A bibliometric analysis of greenwashing research: A closer look at agriculture, https://doi.org/10.1108/BFJ-06-2021-0708

Negowetti, N. E. (2015). Food Labeling Litigation: Exposing Gaps in the FDA's Resources and Regulatory Authority. *Brookings Institution*, 1–31.

Prakash, G., Choudhary, S., Kumar, A., Garza-Reyes, J. A., Khan, S. A. R., & Panda, T. K. (2019). Do altruistic and egoistic values influence consumers' attitudes and purchase intentions towards eco-friendly packaged products? An empirical investigation. *Journal of Retailing and Consumer Services*, *50*, 163-169. https://doi.org/10.1016/j.jretconser.2019.05.011

Stets, J. E., & Burke, P. J. (2000). Identity theory and social identity theory. Social Psychology Quarterly, 63(3), 224. https://doi.org/10.2307/2695870

Tajfel, H., & Turner, J. C. (2004). The social identity theory of intergroup behavior. In Political psychology (pp. 276-293). Psychology Press. https://doi.org/10.4324/9780203505984-16

Yazdanifard, R., & Mercy, I. E. (2011, June). The impact of green marketing on customer satisfaction and environmental safety. In 2011 International Conference on Computer Communication and Management 5(1), p. 637-641

Xiao, Z., Wang, Y., & Guo, D. (2022). Will greenwashing result in brand avoidance? A moderated mediation model. Sustainability, 14(12), 7204.

Effective SAE Implementation: Evaluating Agricultural Educator's Competence in Integrating SAE and AET in the Classroom

Dr. William Norris
Assistant Professor
Department of Agricultural and Extension Education
New Mexico State University
PO Box 30003 MSC 3501
Las Cruces, NM 88003
(575) 646-4539
wnorris1@nmsu.edu

Dr. Don Edgar
Professor
Department of Agricultural and Extension Education
New Mexico State University
PO Box 30003 MSC 3501
Las Cruces, NM 88003
(575) 646-3713
dedgar@nmsu.edu

Introduction

According to Croom (2008), Supervised Agricultural Experience (SAE) is one of the three components of School-Based Agricultural Education (SBAE) and has been an integral part of SBAE since its inception. While SAE has been an essential element of SBAE for decades, agricultural educators report being unconfident in their ability to implement SAE in their programs (Sorensen et al., 2014). Additionally, improving the implementation of SAE in SBAE programs directly relates to the fifth priority research area in the national research agenda which is "Efficient and Effective Agricultural Education Programs" (Roberts et al., 2016). Furthermore, record keeping in the Agricultural Experience Tracker (AET), assisting students who are applying for proficiency awards, and aiding students applying for State and American FFA degrees have been listed as some of the duties agricultural educators feel the least confident in implementing (Sorensen et al., 2014). According to Sorensen et al. (2014), additional professional development should be provided to educators to support them in these areas.

Theoretical Framework, Purpose, and Objectives

The theoretical underlayment for this study is Bandura's (1994) Self-Efficacy theory. This theory describes "…people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (Bandura, 1994, p. 74). The purpose of this study was to evaluate the effects of a workshop on the ability of agricultural educators to assist students with record-keeping in the AET and support students applying for proficiency awards. This workshop has the potential to improve participating agricultural educator's "… capabilities to produce designated levels of performance…" in these areas (Bandura, 1994, p. 74). The following research objective was assessed:

1.) Assess the effects of a two-day workshop on the perceived importance of agricultural educators and their competence to assist students with record keeping in the AET and support students applying for proficiency awards.

Methods

In this study, the researchers utilized a descriptive correlational design. The instrument assessed the perceptions of agricultural educators in [State A] on the importance of various aspects of SAE implementation and their competence to integrate these factors into their classrooms. The instrument utilized a Likert type scale ranging from 1 = None, 2 = Below Average, 3 = Average, 4 = Above Average, and 5 = Exceptional for the importance and competence scale. The instrument was distributed as a paper survey at the 2022 New Mexico State University AET and Proficiency Award Workshop. The instrument utilized a Borich scale to measure perceived importance and competence of SAE implementation (Borich, 1980). The instrument was distributed on a pre-test and post-test basis before and after the workshop. The instrument reliability was assessed post hoc using Cronbach's alpha. The reliability coefficients for the importance and competence scales in the pre-test and post-test ranged from .932 - .951. According to Gliem and Gliem (2003), a reliability coefficient of .7 or higher is considered acceptable. The Cronbach's Alpha test results suggest that there are no reliability concerns with the instrument. The researchers implemented a convenience sample which consisted of the active agricultural educators and pre-service educators present at the workshop. The total sample for this study consisted of (n = 22) workshop participants with 20 of them being active agricultural educators in New Mexico and 2 being pre-service educators.

Results

The results from the data analysis are listed in Table 1. The items that saw the largest decrease in Mean Weighted Discrepancy Scores (MWDS) from the workshop include "Assisting students in making their applications measurable" and "Assisting students in entering barters, etc. into AET" with a decrease of 4.3 and 3.9 respectively. Furthermore, the items with the highest post-test competence scores include "visiting student's SAE's" and "Assisting students in evaluating pictures for a proficiency award".

Table 1

Pre-Test and Post-Test Descriptive Statistics for Proficiency Award Workshop (n = 23)
Note. IR = Importance Rating; CR = Competency Rating; S = Mean Weighted Discrepancy Scores

Conclusions and Recommendations

	Pre-Test			Post-Test		
	IR	CR	S	IR	CR	S
Visiting student's SAE's.	4.2	3.7	2.4	4.5	4.1	1.9
Assisting students with SAE record keeping.	4.5	3.2	6.2	4.5	3.6	4.4
Motivating students to complete proficiency award applications.	3.8	2.5	5.8	4.3	3.7	3.1
Assisting students with the writing of a proficiency award.	4.0	2.7	5.0	4.3	3.8	2.7
Assisting students with the financial portions of a prof. award.	4.1	2.8	5.9	4.3	3.6	3.2
Assisting students in evaluating pictures for a proficiency award.	3.7	3.2	2.5	4.4	4.0	2.1
Assisting students in making their applications measurable.	4.4	2.6	8.5	4.5	3.6	4.2
Assisting students in entering income/expenses into AET.	4.1	2.9	5.4	4.3	3.7	2.7
Assisting students in entering non-current inventory into AET.	4.0	2.7	5.8	4.3	3.5	3.3
Assisting students in entering current inventory into AET.	4.1	2.8	5.6	4.3	3.6	3.0
Assisting students in entering barters, etc. into AET.	4.0	2.4	6.9	4.1	3.4	3.0

Assisting students with proficiency awards and AET record keeping has been cited as some of the areas of SBAE that agricultural educators feel the least confident in implementing (Sorensen et al., 2014). The results from this study suggest that the workshop was successful in increasing agricultural educator's "…capabilities to produce designated levels of performance" in assisting students with proficiency awards and AET record-keeping since the MWDS decreased between 0.5 - 4.3 from the pre-test to the post-test (Bandura, 1994, p. 74). The areas assessed with the largest gain in knowledge include "Assisting students in making their applications measurable" and "Assisting students in entering barters, etc. into AET". The researchers recommend continuing to provide professional development in this area to improve the competence of agricultural educators in this area.

References

Bandura, A. (1994). Self-efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of human behavior* (Vol. 4, pp. 71-81). New York: Academic Press.

Borich, G. D. (1980). A needs assessment model for conducting follow-up studies. *Journal of Teacher Education, 31*(3), 39–42. https://doi.org/10.1177/002248718003100310

Croom, D. B. (2008). Development of the integrated three–component model of agricultural education. *Journal of Agricultural Education, 49*(1), 110–120. doi: 10.5032/jae.2008.01110

Gliem, J. A & Gliem, R. R. (2003). *Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales.* Midwest Research to Practice Conference in Adult, Continuing, and Community Education, https://scholarworks.iupui.edu/bitstream/handle/1805/344/Gliem%20%26%20Gliem.pdf?%20sequence=1&isAllowed=y

Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). *American Association for Agricultural Education national research agenda: 2016-2020*. Gainesville, FL: Department of Agricultural Education and Communication.

Sorensen, T. J., Lambert, M. D. & McKim, A. J. (2014). Examining Oregon agriculture teachers' professional development needs by career phase. *Journal of Agricultural Education*, *55*(5), 140-154. doi: 10.5032/jae.2014.05140

Effective Teaching Practices According to Elementary Agriculture Educators: A Modified Delphi Approach

Maria Helm
University of Georgia
405 College Station Road Athens, GA 30602
301.710.8572
maria.helm@uga.edu

Nicholas Fuhrman
University of Georgia
180 E Green St, Athens, Ga 30602
352.226.1199
fuhrman@uga.edu

Jason Peake
University of Georgia
405 College Station Road Athens, GA 30602
229.392.6097
jpeake@uga.edu

Effective Teaching Practices According to Elementary Agriculture Educators: A Modified Delphi Approach

Introduction

In today's ever changing and increasingly complicated world, we face constant and rapid global changes that create enormous pressure to solve the global challenges of food security, sustainable natural resources, and poverty reduction (National Research Council, 2012). These challenges lead many educational programs to focus on science, technology, engineering, and mathematics (STEM) to train students to apply knowledge and to solve environmental problems (Astuti et al., 2021). In the United States, few students are involved in STEM subjects (Maltese & Tai, 2011). From an agricultural education perspective, some suggest that teachers should select strategies that contextualize STEM in the world of agriculture to influence students' engagement in STEM education and career (Scherer et al., 2019). A more practical approach, such as agricultural education, has long been known to promote achievement in science, mathematics, technology, and other areas (Scherer et al., 2019; Stubbs & Myers, 2015). However, little is known about the ability of *elementary* agricultural educators to inspire similar outcomes and prompted this study. Teacher's understanding of how to lead immersive, project-based assignments and discussions could help students think critically (Dukkipati & Novak-Herzog, 2021). In Georgia, elementary agriculture education (EAE) was introduced in 2019 and much still remains unclear on the teaching practices viewed as most effective by elementary agriculture educators.

Theoretical Framework

The study of the characteristics of effective educators has been a subject of investigation for more than half a century (Rosenshine & Furst, 1971). However, teaching practices at the elementary-level are less well known. This study aims to address this gap by investigating an effective approach to integrating agricultural education at the elementary level. According to Piaget's (1950), theory of cognitive development, the third stage, which spans from ages 7 to 11, is the concrete operational stage, during which students learn how to think more abstractly and more logically about concrete things. In addition, these learners prefer inductive logic which involves going from a certain experience to a broad principle. During this stage, a student can begin thinking about others and use their experiences to gather information and make informed decisions. Constructivists believe that individuals construct what they learn, understand, and integrate the latest information into the framework of their previous knowledge to build understanding within their environment (Pritchard & Woodlard, 2010). Constructivist theory guided the questions posed of EAE teachers sampled in this study.

Methodology

Participants were selected from the Georgia agricultural education website and EAE teacher contact information acquired from a professor of agricultural education at the University of Georgia using convenience sampling. At the time of this study, there were 30 EAE teachers in Georgia. A recruitment email was sent that included information about the research and data collection methods to be used, time and place of data collection, responsibilities as a respondent (online survey and in-person participation) and a $350 gift card honorarium to compensate for their time. In order to reach a reliable consensus among the experts, the Delphi method, which includes three rounds, was used (Sourani & Sohail, 2015). In the first round, participants were asked to answer open-ended and some demographic questions via an online survey platform (Qualtrics). The second and third rounds were conducted in-person and lasted 180 minutes each. For the second round, the summarized list of answers from round one was shared via Qualtrics. The panel was asked to rate each statement using a 7-point Likert scale which, according to Taherdoost (2019), tends to reflect respondent's true subjective assessment of a usability questionnaire. Statements that received an average rating of five and above were moved to the third round. Finally, the third round was reached through panel discussions to arrive at a group consensus. In a study by Vernon (2009), a 70 percent agreement among panel members was considered the standard and was met in this study. Qualitative thematic analysis using MAXQDA 2022 was used to organize and summarize the data.

Results

Fifteen out of thirty EAE teachers participated in the first Delphi round. These statements were moved to the next round to answer the first research question on the components of effective teaching for EAE, while 16 statements were moved forward to answer the second question on teaching methods to be used in EAE. Six teachers personally took part in the second and third rounds of the Delphi. Three themes emerged as the panel discussed and brainstormed ideas to define the components of effective EAE teaching, including *affective personality, experiential learning, and reflective teaching.* Four themes emerged while the panel discussed effective methodologies in teaching EAE, including: *make it conversational, make it collaborative, make it meaningful,* and *reinforce values and soft skills.*

Conclusions and Recommendations

The panel's consensus on effective teaching practices for EAE highlighted the importance of positively impacting students' lives while promoting community awareness. This can be achieved through linking agriculture to other subjects that encouraging the development of problem-solving skills through inquiry, discovery and applications to one's own experiences. Furthermore, effective EAE teaching should always be an experiential learning endeavor and should involve continuous reflection for action for change and flexibility if something unexpected arise. The panel also underscored the significance of interactions and collaborations between and among students and teachers, reinforcing the importance of relational interactions in the classroom for different age groups. Based on these findings, the authors recommend (a) examining issues pertaining to teachers' beliefs that will enhance EAE teaching behaviors and (b) process and collect data on the relationship between EAE teaching techniques and students' self-efficacy and content knowledge in the classroom.

References

Astuti, N. H., Rusilowatti, A., & Subali, B. (2021). STEM-based learning analysis to improve students' problem -solving abilities in science subject: A literature review. *Journal of Innovative Science Education, 10*(1), 79-86. https://journal.unnes.ac.id/sju/index.php/jise/article/view/38505/16063

Dukkipati, N., & Novak-Herzog, M. (2021). STEM Interest in Elementary School Children. *Journal of Student Research*, *10*(4). https://doi.org/10.47611/jsrhs.v10i4.2274

Maltese, A.V. & Tai, R.H. (2011) Pipeline Persistence: Examining the Association of Educational Experiences with Earned Degrees in STEM among US. *Students. Science Education, 95,* 877-907. https://doi.org/10.1002/sce.20441

National Research Council. (2012). *A framework for K-12 science education: Practices, crosscutting concepts, and core ideas*. The National Academies Press.

Piaget, J. (1950). Explanation in sociology. In J. Piaget (Ed.), *Sociological studies* (pp. 30-36). Routledge.

Pritchard, A, & Woodlard, J. (2010). *Psychology for the classroom: Constructivism and social earning.* Routledge.

Rosenshine, B., & Furst, N. (1971). *Research on teacher performance criteria.* In B.O. Smith (ED), Research in Teacher Education. Prentice Hall.

Scherer, H. H., McKim, A. J., Wang, H., DiBenedetto, C. A. & Robinson, K. (2019). Making sense of the buzz: A systematic review of "STEM" in agriculture, food, and natural resources education literature. *Journal of Agricultural Education 60*(2), 28-53. https://doi.org/10.5032/jae.2019.02028

Sourani, A., & Sohail, M. (2015). The Delphi method: Review and use in construction management research. *International Journal of Construction Education and Research, 11*(1), 54-76. https://doi.org/10.1080/15578771.2014.917132

Stubbs, E.A., & Myers, B.E. (2015). Multiple case study of STEM in school-based agricultural education. *Journal of Agricultural Education*, *56*(2), 188-203. Doi:10.5032/jae.2015.02188

Taherdoost, H. (2019). What is the best response scale for survey and questionnaire design; review of different lengths of rating scale/attitude scale/ Likert scale. *International Journal of Academic Research in Management 8*(1), 1-10. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3588604

Vernon, W. (2009). A Delphi technique: A review. *International Journal of Therapy and Rehabilitation*, *16*(2), 69-76. https://doi.org/10.12968/ijtr.2009.16.2.38892

Evaluating Hispanic Students' Sense of Belonging in a College of Agriculture

Kameron Rinehart, MS
Jason Headrick, Ph.D.
Hannah Ford, MS

Davis College – Agricultural Education & Communications 15th Street Lubbock, TX 79409

740-505-2805

Kameron.rinehart@ttu.edu

Jason.headrick@ttu.edu

Hannford@ttu.edu

Evaluating Hispanic Students' Sense of Belonging in a College of Agriculture

Introduction

Texas Tech University achieved Hispanic Serving Institution (HSI) status in 2019 and has focused the institution's recruitment and programming efforts on retaining and serving the 29.7% undergraduate Hispanic student population (TTU, 2022). Texas Tech acknowledges the importance of the support and promotion of DEI (diversity, equity, and inclusion) in higher education. Few studies have focused on Hispanic students in agricultural colleges. Hispanic students have lower retention rates than peers, urging universities to focus on a more welcoming environment for their retention and well-being (Schwartz et al., 2022).

Need for Research

Research has begun to look past pre-entry demographics and characteristics to understand better the impact of structural and cultural institutional factors on the retention of Hispanic students (Hernandez & Lopez, 2004; Crisp et al., 2015). A 2022 HSI study found that opportunities, such as undergraduate research, are the "best predictor of graduation rates" rather than pre-college characteristics such as academic backgrounds or socioeconomic differences (Caraballo-Cueto et al., 2022, p. 2). The inability to achieve workforce diversity in STEM fields is due to institutional barriers that need to be removed (Estrada et al., 2017). The focus should be on students' ability and commitment to persist in STEM fields and majors. An institutional push to grow the Hispanic undergraduate population within agricultural colleges brings an opportunity to assess Hispanic students' sense of belonging on campus.

Theoretical Framework

Utilizing Lane's (2016) Model for Programmatic Impact on Retention and Degree Attainment among Underrepresented students in STEM, researchers found that a sense of belonging - "students' feelings of connectedness or sense of mattering on campus" - was hard to achieve for minorities in STEM, but was important in fostering retention (Abrica et al., 2020, p. 230; Strayhorn, 2012). In terms of retention, AAAE states, "Individual student factors that lead to successful completion of [degrees] need to be investigated" (AAAE, 2020, p. 45). To study the perceived sense of belonging among Hispanic agricultural students, a Qualtrics survey utilized an 18-statement SOB framework (Giorgi, 2020).

Methodology

This study is a secondary analysis of a 2021 agricultural college-wide DEI Qualtrics survey assessing Davis College students' perceived sense of belonging. A total of 323 respondents (N = 323) responded, as well as indicated by their Hispanic or non-Hispanic origin. A previous study found significant differences in first-generation students' perception of equal opportunities to their peers (Ford & Headrick, 2022). This study took the existing data and, using SPSS, stratified for data on Hispanic students compared to their non-Hispanic peers. A four-point Likert scale was used for the survey (1 = *Strongly Disagree*, 4 = *Strongly Agree*). Levene's (1960) Test of equality of variances was utilized, with t statistics not assuming homogeneity of variance computed for any violated assumptions.

Results

18.9% of students (n = 61) identified as having a Hispanic origin, and 81.1% did not. Table 1 shows the comparative means of students' belonging statements by Hispanic origin that were found to have significant differences.

Table 1

*Comparative Means of Students' Belonging Statements by Hispanic Origin (*N *= 323)*

	Hispanic		Non		
Belonging Statement (I feel…)	*M*	*SD*	*M*	*SD*	*p*
I belong in CASNR	3.0	0.8	3.4	0.7	**>.001****
Most of my peers in CASNR are like me.	2.2	0.8	2.8	0.8	**>.001****
Most faculty members are like me.	2.2	0.8	2.7	0.8	**>.001****
Most staff members are like me.	2.2	0.8	2.8	0.7	**>.001****
CASNR allows me to be my authentic self.	3.0	0.8	3.3	0.7	**.004***
Diversity is valued and celebrated within CASNR.	2.7	0.9	3.0	0.8	**.005***
CASNR leadership understands that diversity is critical to success.	3.0	0.7	3.2	0.6	**.006***
I have connections with other Texas Tech students.	3.2	0.8	3.4	0.7	**.02***
I feel a sense of belonging at Texas Tech.	3.0	0.8	3.3	0.7	**.02***
I can engage with students, staff, and faculty from other cultures.	3.1	0.8	3.3	0.7	**.02***
My unique background and identity are valued in CASNR.	2.9	0.8	3.2	0.8	**.03***
I have connections with Texas Tech faculty.	3.0	0.8	3.2	0.7	**.04***
I belong in my major.	3.2	0.8	3.4	0.6	**.04***

$^{*}p < .05$, $^{**}p < .001$

The alpha level was set at .05 *a priori.* The statements in Table 1 all showed statistical significance. The mean score for each statement of belonging was higher among non-Hispanic students than Hispanic students. The statements "I have connections in my major" and "I belong in my major" had the highest mean score among Hispanic students (*M* = 3.2), while non-Hispanic students showed a higher mean score (*M* = 3.4). The statements with the lowest mean score for Hispanic students were: "Most of my peers in CASNR are like me," "Most faculty members are like me," and "Most staff members are like me" (*M* = 2.2). For non-Hispanic students, the statements "Most of my peers in CASNR are like me" and "Most staff members are like me" shared the same mean (*M* = 2.8), and the statement "Most faculty members are like me" had a slightly lower mean (*M* = 2.7).

Conclusions

18.1% of respondents identified as Hispanic or of Hispanic origin. It is important to recognize the individual colleges' role and the individual majors and departments in addressing the needs and support offered to Hispanic students.

Implications & Impact

More work must be done to support agricultural Hispanic and other underrepresented students. To properly address students' challenges, universities must first be aware of their experiences. We suggest replicating surveys, such as this one, to help investigate the current state of student belonging and involvement and assist in decision-making for the best resources and support. Students who feel they belong are more likely to continue in their major and be empowered to impact the agricultural industry and profession.

References

AAAE. (2020). American association for agricultural education national research agenda. http://aaaeonline.org/resources/Documents/AAAE_National_Research_Agenda_2016-2020.pdf

Abrica, E. J., Lane, T. B., Zobach, S., & Collins, E. (2020). Sense of belonging and community building within a STEM intervention program: A focus on Latino male undergraduates' experiences. Journal of Hispanic Higher Education, *21*(2), 228–242. https://doi.org/10.1177/1538192720974884

Caraballo-Cueto, J., Godreau, I., & Tremblay, R. L. (2022).From undergraduate research to graduation: Measuring the robustness of the pathway at a Hispanic-serving institution. J*ournal of Hispanic Higher Education*, 1-14. https://doi.org/10.1177/15381927221074026

Crisp, G., Taggart, A., & Nora, A. (2015). Undergraduate Latina/o students: A systematic review of research identifying factors contributing to academic success outcomes. *Review of Educational Research*, *85*(2), 249–274. https://doi.org/10.3102/0034654314551064

Estrada, M., Hernandez, P. R., & Schultz, P. W. (2018). A longitudinal study of how quality mentorship and research experience integrate underrepresented minorities into STEM careers. *CBE—Life Sciences Education*, *17*(1). https://doi.org/10.1187/cbe.17-04-0066

Ford, H. L., Headrick, J. (2022, May). Assessing sense of belonging in first generation students at an agricultural university [Poster presentation]. National American Association for Agricultural Education Conference, Oklahoma City, OK.

Giorgi, A. J. (2020). A national and university multi-decade description of college of agriculture and related sciences student behaviors regarding postsecondary education (Publication No. 28216187) [Doctoral dissertation, Ohio State University]. ProQuest Dissertations Publishing. https://www.proquest.com/dissertations-theses/nationaluniversity-multi-decade-description/docview/2468669457/se-2?accountid=7098

Hernandez, J. C., & Lopez, M. A. (2004). Leaking pipeline: Issues impacting Latino/a college student retention. *Journal of College Student Retention: Research, Theory & Practice*, *6*(1), 37–60. https://doi.org/10.2190/FBLY-0UAF-EE7W-QJD2

Lane, T. B. (2016). Beyond academic and social integration: Understanding the impact of a STEM enrichment program on the retention and degree attainment of underrepresented students. *CBE—Life Sciences Education*, 15(3). https://doi.org/10.1187/cbe.16-01-0070

Levene, H. (1960) Robust tests for equality of variances. Stanford University Press.

Schwartz, S. J., Waterman, A. S., Cobb, C. L., Cano, M. A., Scaramutti, C., Meca, A., Ozer, S., Ward, C., Puente-Durán, S., Lorenzo-Blanco, E. I., Unger, J. B., Duque, M. C., Vos, S. R., Zeledon, I., Garcia, M. F., & Martinez, C. R. (2022). Cultural stress, daily well-being, and internalizing and externalizing symptoms among Hispanic college students. *Journal of Counseling Psychology, 69*(4), 416–429. https://doi.org/10.1037/cou0000604

Strayhorn, T. L. (2012). College students' sense of belonging: A key to educational success for all students. Routledge. https://doi.org/10.4324/9781315297293

TTU. (2022). *Hispanic serving institution.* https://www.depts.ttu.edu/diversity/institutional-diversity/hispanic-serving/

Evaluating Self-Assessed Versus CWI Welding Scores by Gender

Rhett A. Sykora
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-2130
ras246@txstate.edu

Ryan G. Anderson
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-3325
r_a461@txstate.edu

Bradley D. Borges
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-7106
b_b518@txstate.edu

Marshall Swafford
Arkansas Tech University
123C Dean Hall
402 West O St.
Russellville, AR. 72801
479-968-0251
mswafford@atu.edu

Evaluating Self-Assessed Versus CWI Welding Scores by Gender

Introduction

As several researchers have suggested, welding is a highly demanded skill that is prevalent throughout many industries including agricultural mechanics (Abrams et al., 1974; Stone et al. 2011; Wells & Miller, 2020). Abrams et al. (1974) indicated that evaluation is necessary in the welding training process to accurately identify successful performance. Through self-evaluations, students display comprehensive knowledge that requires high cognition when critically evaluating the quality of their own work, specifically when engaging in a task, in this case, welding (Ghaicha, 2016). However, males have been identified to overestimate the quality of their self-perceived performance both prior to and after completing a task when compared to actual performance as evaluated by an expert; conversely, women have been identified to underestimate the quality of their self-perceived performance both prior to and after completing a task when compared to actual performance as evaluated by an expert (Reuben et al., 2014). In a recent study, undergraduate physics students were asked to evaluate their self-efficacy related to physics, where it was revealed that self-efficacy towards course success was derived more from students' perceptions rather than actual performance, with males identifying their own performance higher than the actual quality displayed (Marshman et al., 2018). Lichtenstein et al. (1982) also found men to be overconfident in their success in uncertain situations and their relative performance in a task. As such, researchers determined benefit would be provided by comparing self-assessed welding scores to a Certified Welding Inspector (CWI), by gender, as no such studies currently exist.

Theoretical Framework

The underlying theoretical framework that guided this study was constructed using the self-efficacy model. This model focuses on perceiving one's capabilities, performance, and confidence when performing tasks (Bandura, 1983). Self-efficacy is known to be influenced by the behaviors of the environment, goal achievements, feedback from instructors, and comparison among their peers by their performance (Schunk, 2012). Negative and positive feedback can affect self-efficacy but will not change the interpretation of one's capabilities (Schunk, 2012). To achieve adequate skills and attain a positive learning experience, self-efficacy is the key to motivate, self-evaluate, and achieve their goals in a task or situation (Schunk, 2012). Multiple behaviors can influence the increase or decrease of one's self-efficacy, affecting how one perceives their capabilities.

Purpose and Objectives

The purpose of this study was to compare the self-assessed welding scores of students, by gender, when compared to the CWI assessment. This study aligns with the American Association for Agricultural Education National Research Agenda Research Priority Area 4: Meaningful, Engaged Learning in All Environments (Roberts et al., 2016). Providing a meaningful and engaging learning experience to beginner welders by practicing self-evaluation and developing welding skills will be beneficial in advancing welding education. The objectives for this study are (1) determine if a difference exists between female and male scores on self-assessments of their welding performance (2) determine if a difference exists between the self-assessment and CWI welding scores for both females and males.

Methods

Participants were exclusively students enrolled in the Introduction to Agricultural Engineering course (n = 42), and were allowed one, one-hour-and-fifty-minute lab period to practice welding using ¼" mild steel in the 2F position. The students were granted access to a virtually unlimited supply of steel and were encouraged to produce as many welds as possible during the lab, submitting their highest quality weld for grading. At the conclusion of the lab period, a grading criterion developed by Herren (2009), was used independently by the students, course instructor, and an American Welding Society (AWS) accredited certified welding inspector (CWI) to score the submitted weld. Scores provided by the students and CWI were stored, then analyzed via an independent T test to accurately compare between values of multiple data sets.

Results

This study collected data from 42 participants, with a majority identifying as female (f = 23; 52.3%). Table 1 reports the mean scores between males and females for the self-assessment of their own welds. Males presented a higher self-assessed score of (M = 86.32, SD = 10.33) compared female self-assessed scores (M = 72.70, SD = 18.89). There was a statistically significant ($p < 0.05$) difference between the male and female self-assessed scores.

Table 1

Self-Assessment of Welding Scores by Gender

Gender	*n*	*M*	*SD*	*t*	*df*	*p*
Male	19	86.32	10.33	2.81	40	0.01
Female	23	72.70	18.89			

Table 2 reports the mean scores between males and females for the CWI's evaluation. On average, males presented a higher self-assessed score (M = 86.32) than the welding score provided by the CWI (M = 84.68). In comparison, the females evaluated their welds lower (M = 72.70) than the score assessed by the CWI (M = 79.00).

Table 2

Welding Scores by Gender as Assessed by Certified Welding Inspector (CWI)

Gender	*n*	*M*	*SD*	*t*	*df*	*p*
Male	19	84.68	6.47	1.79	40	0.08
Female	23	79.00	12.50			

Conclusion, Discussion, and Recommendation

Although there were no statistically significant differences identified in performance of males and females when compared to an industry expert's evaluation, on average, male self-assessment scores were higher than actual performance and female self-assessment scores were lower than actual performance. As such, researchers concluded that females are more critical of their own performance when compared to males. It is recommended to replicate the study with a larger sample size to accurately draw conclusions regarding the population. It is also recommended to target participants with more extensive welding knowledge and experience.

References

Abrams, M. L., Schow, H. B., & Riedel, J. A. (1974). Acquisition of a psychomotor skill using simulated-task, augmented feedback (evaluation of a welding training simulator). NPRDC-TR-75-13

Bandura, A. (1983). Self-efficacy determinants of anticipated fears and calamities. *Journal of Personality and Social Psychology, 45*(2), 464–469. https://doi.org/10.1037/0022-3514.45.2.464

Cullinane, A. (2009). Bloom's taxonomy and its use in classroom assessment. *National Centre for Excellence in Mathematics and Science Teaching and Learning, Resource & Research Guides, 1(13),* 1–4.

Ghaicha, A. (2016). Theoretical framework for educational assessment: A synoptic review. *Journal of Educational Practice, 7*(24). 212-231

Herren, R. (2009). *Agricultural mechanics: fundamentals and applications* (6th ed.). Cengage Learning.

Lichtenstein, S., Fischhoff, B., & Phillips, L. (1982). Calibration of probabilities: the state of the art to 1980. *Journal of Educational Psychology*. 6-16. https://doi.org/10.1017/CBO9780511809477.023

Marshman, E. M., Kalender, Z. Y., Nokes-Malach, T., Schunn, C., & Singh, C. (2018). Female students with A's have similar physics self-efficacy as male students with C's in introductory courses: A cause for alarm? *Physical Review Physic Education Research 14*(2). 1-17. https://10.1103/PhysRevPhysEducRes.14.020123/

Reuben, E., Sapienza, P., & Zingales, L. (2014). How stereotypes impair women's careers in science. *Proceedings of the National Academy of Sciences*, *111*(12), 4403–4408. https://doi.org/10.1073/pnas.1314788111

Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). American Association for Agricultural Education national research agenda: 2016-2020. Gainesville, FL: Department of Agricultural Education and Communication.

Schunk, D. H., & Usher, E. L. (2012). Social cognitive theory and motivation. In R. M. Ryan (Ed.), *The Oxford handbook of human motivation* (pp. 13-27). Oxford University Press.

Stone, R. T., Watts, K. P., Zhong, P., & Wei, C. (2011). Physical and cognitive effects of virtual reality integrated training. *Human Factors*, *53*(5), 558-572. https://doi:10.1177/0012720811413389

Wells, T. & Miller. G. (2020). The effect of virtual reality technology on welding skill performance. *Journal of Agricultural Education*, *61*(1) 152-171. http://10.5032/jae.2020.01152

Evaluating the Preparation of Pre-Service School-Based Agricultural Education Teachers in Laboratory-Based Courses

Kevin Sanders
Northeast Alabama Community College
138 AL Highway 35
Rainsville, AL 35986
(256) 638-2512
sandersk@nacc.edu

Scott W. Smalley
Iowa State University
217 Curtiss Hall
Ames, IA 50201
(515) 294-0047
smalle16@iastate.edu

Mark S. Hainline
Sam Houston State University
1019 Bowers Blvd.
Huntsville, TX 77340
(936) 294-1186
msh004@shsu.edu

Introduction/Conceptual Framework

This study sought to examine laboratory-based instruction for pre-service school-based agricultural education (SBAE) teachers at various institutions across the nation. While research has indicated that laboratory-based instruction in SBAE programs is commonplace (Shoulders & Meyers, 2012), a myriad of literature has noted SBAE teachers are not adequately prepared to teach, manage, and facilitate learning activities in SBAE laboratories upon completing their teacher education programs (Burris et al., 2005; Hainline & Wells, 2019; Shoulders & Meyers, 2012). Wells et al. (2021) agricultural teacher education and agricultural industry partnership model served as a guide to examine technical and pedagogical course offerings at institutions across the nation.

Method and Procedures

This study sought to determine the laboratory-based courses offered at SBAE teacher education preparation institutions and determine SBAE teacher educators' perceptions regarding possible needs or changes regarding preparing pre-service teachers associated with laboratory competencies. A 25-item Qualtrics instrument was developed and sent to all teacher educators (N = 107) listed on the NAAE "find a college" map. A total of 33 (response rate = 30.8%) teacher educators, representing 33 unique institutions, responded to this survey instrument. Validity was established via a review from a panel of experts and reliability was assessed by way of a pilot study. Descriptive statistics were conducted using IBM® Statistical Package for the Social Sciences (SPSS©).

Findings

Of the Agricultural Education teacher educators which responded in this study, 15 (45.5%) were on faculty at Land-grant universities, 11 (33.3%) worked at regional (public) universities, four (12.1%) led the teacher education program at private universities, two (6.1%) were at 1890 (HBCU) universities, and one faculty member (3.0%) worked at a Hispanic serving institution. These institutions reported an average of 118.8 (SD = 23.9) credit hours for a bachelor's degree and an average of 53.5 (SD = 84.4) credit hours for a master's degree in Agricultural Education.

Objective two sought to identify the availability of laboratory-based courses offered at the SBAE teacher education preparation institutions and determine if each course was required and had a pedagogical focus. Concerning course offerings in agricultural mechanics, the courses which were most frequently offered as a stand-alone course for preservice teachers were general agricultural mechanics (n = 28; 84.8%) and welding/metal fabrication (n = 18; 56.3%). Agricultural mechanics was reported as a required course by 96.9 of the schools and over half (51.6%) of the respondents indicated this course had a pedagogy focus.

For plant science, the most common standalone courses at the universities were greenhouse management (64.5%), turf grass management (51.6%), and landscape design (38.7%). The greenhouse management course was the plant systems course that was most frequently required by universities (46.7%) and contained a pedagogical component (n = 6, 19.4%).

Livestock management (n = 25; 78.1%), equine science (n = 24; 75%), and wildlife management (n = 18; 56.3%) were the courses that were most commonly offered as stand-alone courses at the responding universities. Over 64% of the respondents indicated their school required teacher certification students to take livestock management, and it was also the course that most frequently had integrated pedagogy (9.4%).

Concerning food science coursework, a meat science course was offered as a stand-alone course for 71.9% of respondents, and a general food science class was offered as a stand-alone course by 56.6% of the universities surveyed. Around a quarter of the institutions required preservice teachers to take these courses (meat science, 29%; food science, 22.6%) and only one institution reported their meat/food science course had a pedagogy focus.

The third research objective was to determine the teacher educators' perceptions regarding possible needs or changes regarding laboratory-based training and related course offerings. For each laboratory-based course / content, the respondents were asked to gauge their perceptions for the need of expansion of instruction on each topic on a five-point scale (1 = *No Need* (*NN*), 2 = *Limited Need* (*LN*), 3 = *Moderate Need* (*MN*), 4 = *Significant Need (SN),* 5 = *Very Significant Need* (*VSN*)).

The course with the highest need for expansion was Metal / Welding Fabrication, which also had a split mode of five, *Very Significant Need* (*VSN*) and three, *Moderate Need* (*MN*). Following Metal / Welding Fabrication, Agricultural Mechanics, Poultry Science, and Carpentry were the other courses that teacher educators perceived the largest need for expansion.

A total of seven courses/areas of content (i.e., Nursery / Orchard / Grove Management; Viticulture; Turf Grass Management; Apiculture (Beekeeping); Livestock Management; Forestry; Farm Power) had a mode of two, which indicated the teacher educators perceived a *Limited Need* for expansion on these topics.

Conclusions/Recommendations/Implications

This study produced an extensive list of laboratory-based courses that were offered to prepare pre-service SBAE teachers to teach, manage and facilitate learning activities in secondary agricultural education laboratories. The most commonly offered laboratory-based coursework for preservice teachers were Agricultural mechanics (*n* = 33, %) Livestock Management (*n* = 20, 64.5%). The teacher educators' responses regarding the laboratory-based course offerings and degree requirements for preservice teachers coincide with the laboratories which are most commonly found in SBAE programs (Franklin, 2008; Phipps et al., 2008; Shoulders & Myers, 2012; Twenter & Edwards, 2017).

While all teacher education programs in this study offered an agricultural mechanics course, and 96.9% of the programs required preservice teachers to take these courses as part of their certification requirements, the teacher educators still noted the need for expansion associated with agricultural mechanics training. In fact, 23.3% of the teacher educators signified there was a *Very Significant Need* to expand instruction in Welding / Metal Fabrication. This notion for the need of the expansion of agricultural mechanics courses reverberates findings and recommendations from former studies (Burris et al., 2005; Ford et al., 2008). Aside from agricultural mechanics training, the teacher educators also expressed a need for expansion on preservice preparation in greenhouse management. Over a quarter of the respondents noted there was a *Very Significant Need* for expansion. Franklin (2008) recommended that the training on greenhouse management should focus on the components and operation of a greenhouse along with pedagogical aspects.

We recommend that teacher education programs use this list of laboratory-based courses as a guide to reframe their curriculum to help close the gap in laboratory deficiencies found in their pre-service teachers. We further recommend that this study be conducted using a probabilistic sample so the results can be made generalizable and inferred upon the population.

References

Burris, S., Robinson, J. S., & Terry, Jr., R. (2005). Preparation of pre-service teachers in agricultural mechanics. *Journal of Agricultural Education*, *46*(3), 23–34. https://doi.org/10.5032/jae.2005.03023

Ford, R. K., Shinn, G. C., & Lawver, D. E. (2008). Perspectives of successful agricultural science and technology teachers on their preparation to teach agricultural mechanics. *Journal of Southern Agricultural Education Research 58*(1), 18-31. http://jsaer.org/wp-content/uploads/2020/06/Volume-58-Full-Issue.pdf

Franklin, E. (2008). Description of the use of greenhouse facilities by secondary agricultural education instructors in Arizona. *Journal of Agricultural Education*, *49*(3), 34–45. https://doi.org/10.5032/jae.2008.03034

Hainline, M., & Wells, T. (2019). Identifying the agricultural mechanics knowledge and skills needed by Iowa school-based agricultural education teachers. *Journal of Agricultural Education*, *60*(1), 59–79. https://doi.org/10.5032/jae.2019.01004

Phipps, L. J., Osborne, E. W., Dyer, J. E., & Ball, A. (2008). Handbook on agricultural education in public schools (6th ed.). Thomson Delmar Learning.

Shoulders, C. W., & Myers, B. E. (2012). Teachers' use of agricultural laboratories in secondary agricultural education. *Journal of Agricultural Education*, *53*(2), 124–138. https://doi.org/10.5032/jae.2012.02124

Twenter, J. P., & Edwards, M. C. (2017) Facilities in school-based, agricultural education (SBAE): A historical inquiry. *Journal of Agricultural Education, 58*(3), 275-292. https://doi.org/10.5032/jae.2017.03275

Evaluation of Welding Assessment Scores Using Triangulation

Rhett A. Sykora
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-2130
ras246@txstate.edu

Ryan G. Anderson
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-3325
r_a461@txstate.edu

Marshall Swafford
Arkansas Tech University
123C Dean Hall
402 West O St.
Russellville, AR. 72801
479-968-0251
mswafford@atu.edu

Bradley D. Borges
Texas State University
601 University Dr.
San Marcos, TX. 78666
512-245-7106
b_b518@txstate.edu

Evaluation of Welding Assessment Scores Using Triangulation

Introduction

The welding process is prevalent and crucial to agricultural mechanics (Stone et al. 2011a). Abrams et al. (1974) identified that corrective feedback is necessary for the development of the psychomotor skills required to perform an acceptable weld. In the feedback stage, the instructor must first assess the quality of work provided by the learner. Assessment is the stage of the educational process in which the instructor collects, analyzes, and interprets information regarding students' work, and assigns numerical grades based on criterion relating to quality (Ghaincha, 2016). Performance assessments evaluate the quality of work of students' engaging in a task with a desired outcome, in this case, producing a quality weld (Ghaincha, 2016). In previous studies (Abrams et al., 1974; Byrd et al., 2015; Stone et al., 2011b; Stone et al. 2013; Wells & Miller, 2020) welding assessment was conducted by Certified Welding Instructors (CWIs), however there was no attempt to include self-assessments from the student, nor did they collect assessments from the instructors. As noted by Ghaincha (2016), self-assessment can be beneficial to further develop effective curriculum and overcome the high variability in instructor assessment.

Conceptual Framework

The underlying conceptual framework for this study was constructed using Bloom's Taxonomy (Cullinane, 2009). Bloom's Taxonomy suggests that learning can be achieved through a hierarchical structure of learning objectives composed of knowledge, comprehension, application, analysis, synthesis, and evaluation. According to Bloom's Taxonomy, evaluation requires the highest level of cognition due to its complexity and inclusion of all other objectives. Through evaluation, students assess performance and draw conclusions relating to quality (Cullinane, 2009)

Purpose and Objectives

The purpose of this study was to compare the self-assessed welding scores submitted by the students to the assessment scores provided by the course instructor and the CWI. This study aligns with the American Association for Agricultural Education's (AAAE) National Research Agenda (NRA) Priority Area 4: Meaningful, Engaged Learning in All Environments (Roberts et al., 2016). Roberts et al. (2016) suggest that in order for learning to be meaningful, the learner must engage in the learning process, as opposed to solely receiving knowledge. This study also aligns with the National Career and Technical Education Research Agenda Framework Model (Lambeth et al., 2018) by providing meaningful, personalized learning. As such, including the learners in the evaluation process may provide increased meaning. The objective of this study is to determine if any statistical differences exist between student, instructor, and CWI weld evaluations.

Methods

Students in an Introduction to Agricultural Engineering course at Texas State University (n = 44) were allowed one, one-hour and fifty-minute lab period to practice welding, using 1/4" mild steel in the 2F position, and submitting their highest quality weld for grading. After the conclusion of the lab, using a grading criterion developed by Herren (2009), students were asked to complete a self-evaluation on their submitted weld. The submitted weld was also graded by the course instructor as well as an American Welding Society (AWS) accredited CWI using the same grading criterion as the student. The grading criteria for the weld included general appearance, proper travel and work angles, uniform height and width of weld, and appropriate penetration. Data were analyzed utilizing an independent T test, a T test allows us to compare the values of the two data sets. Data sets consisted of the weld evaluations from the student, instructor, and CWI.

Results

Forty-four participants, the course instructor, and an AWS accredited CWI provided data for our study. The CWI had the highest mean score of 80.66 (*SD* = 11.12), while the course instructor had the lowest mean score of 77.41 (*SD* = 13.71). The t-scores for students compared to CWI was -0.78, the t-scores for instructor compared to CWI was -1.57, the t-scores for students compared to the instructor was 0.51. The degrees of freedom for student compared to instructor and CWI and instructor compared to CWI was 43. No statistically significant differences ($p > .05$) in weld scores were identified.

Table 1.

Comparison of Student and Course Instructor Welding Scores to Certified Welding Inspector (CWI) Score

Grade	*N*	*M*	*SD*	*t*	*df*	*p*
Student vs CWI	44	78.68	16.76	-0.78	43	0.44
Instructor vs CWI	44	77.41	13.71	-1.57	43	0.12
Student vs Instructor	44	78.68	16.76	0.51	43	0.61
Instructor vs Student	44	77.41	13.71			

Note. CWI *M* = 80.66; *SD* = 11.12

Conclusions, Discussions, Recommendations

Although no statistically significant differences were identified between weld scores provided by the student, course instructor, and CWI, the mean scores were relatively consistent between evaluations. We conclude this consistency displays that students and the course instructor, both possess adequate knowledge to evaluate welds on par with industry standards. It is also important to note that the students and the course instructor had higher standard deviations than the CWI. Given this, we recommend that students and the course instructor continue to practice welding evaluation to decrease the variability in their evaluations. We recommend replicating this study with an industry validated evaluation sheet. An industry validated sheet might provide more specific criteria that align the industry standards and reduces variability within evaluation scores.

References

Abrams, M. L., Schow, H. B., & Riedel, J. A. (1974). Acquisition of a psychomotor skill using simulated-task, augmented feedback (evaluation of a welding training simulator). NPRDC-TR-75-13

Byrd, A. P. (2014). *Identifying the effects of human factors and training methods on a weld training program.* Retrieved from Iowa State University Digital Repository Graduate Theses and Dissertations. (Paper 13991)

Byrd, A. P., Stone, R. T., Anderson, R. G., & Woltjer, K. (2015). The use of virtual welding simulators to evaluate experienced welders. *Welding Journal, 94*(12), 389-395

Cullinane, A. (2009). Bloom's taxonomy and its use in classroom assessment. *National Centre for Excellence in Mathematics and Science Teaching and Learning, Resource & Research Guides, 1(13),* 1–4.

Ghaicha, A. (2016). Theoretical framework for educational assesment: A synoptic review. *Journal of Educational Practice, 7*(24). 212-231

Herren, R. (2009). *Agricultural mechanics: fundamentals and applications* (6th ed.). Cengage Learning.

Lambeth, J. M., Joerger, R. M, & Elliot, J. (2018). Merits of creating a revised CTE National Research Agenda for 2020. Journal of Research in Technical Careers, 2(1). https://digitalscholarship.unlv.edu/cgi/viewcontent.cgi?article=1035&context=jrtc

Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). *American Association for Agricultural Education national research agenda: 2016-2020.* Gainesville, FL: Department of Agricultural Education and Communication. 19-28.

Stone, R. T., Watts, K. P., Zhong, P., & Wei, C. (2011a). Physical and cognitive effects of virtual reality integrated training. *Human Factors, 53*(5), 558-572. doi:10.1177/0012720811413389

Stone, R T., McLaurin, E., Zhong, P., & Watts, K. P. (2013). Full virtual reality vs. integrated virtual reality training in welding. *Industrial and Manufacturing Systems Engineering Publications, 92*(6), 167s-174s

Stone, R. T., Watts, K., & Zhong, P. (2011b). Virtual reality integrated welder training. *Welding Journal, 90*(7), 136s-141s

Wells, T. & Miller. G. (2020). The effect of virtual reality technology on welding skill performance. *Journal of Agricultural Education, 61*(1) 152-171. http://10.5032/jae.2020.01152

Examining College Students' Trust in Sources for Scientific Information

Ginger Orton, M.S.

Laura Fischer, Ph.D.

Katelynn Butler Horton, M.S.

Skylar Elmore, M.S.

Texas Tech University

gorton@ttu.edu

Box 42131-Lubbock, TX 79409-2131

806.742.2816

Examining College Students' Trust in Sources for Scientific Information

Introduction/ Need for Research

Scholars and citizens alike have noticed a growing divide between the opinion of scientists and the public on several topics considered "settled" in the scientific community. Examples include human-caused climate change, the efficacy of vaccines, evolution, and the safety of genetically modified foods (Cook et al., 2018; Dixon, 2016; van der Linden et al., 2015). Despite the consensus in the scientific community, many Americans hold contrary perceptions that defy the current scientific understanding. In response to this phenomena, practitioners and scholars have been determined to craft the most impactful messages that incite understanding or action (e.g., reduce carbon footprint, get vaccinated). When considering scientific topics, individuals rely on conduits like news media, interpersonal communication, or social media to learn about salient scientific issues or breakthroughs due to the limited first-hand experience most people have with the scientific process and seminal scientific work (Antilla, 2010; Nelkin, 1987). However, science communication from non-science communicators is ripe for various interpretations of the empirical scientific work with room for perpetuation of the scientific consensus and misinformation (Weingart & Geunther, 2016). Recently, scientists and their respective organizations (e.g., CDC) are taking to social media and being hosted as expert voices on news platforms to communicate directly with the public. This should be a positive note for science communication, as research has identified a consensus heuristic that represents the tendency to defer to the consensus of experts for understanding, particularly in cases of complex or unfamiliar information (Chaiken, 1980; Darke et al., 1998). However, this heuristic hinges on an individual finding the expert to be trustworthy.

Other scholarship has also acknowledged the key role trust plays in message processing when communicating science (Brewer & Ley, 2012; Cheng & Gonzalez, 2021; Robinson et al., 2020). Within agricultural education, efforts have investigated trust in sources and channels for policy engagement (Warwick et al., 2021), water-related information (Deward et al., 2018), and food safety (Whatley et al., 2005). In a time where misinformation runs rampant and distrust in scientific institutions is at an all-time high (Krishna, 2021), it's important to strategically craft messages from sources audience members trust to foster maximum message impact. The study at hand investigated college students' level of trust in sources for scientific information and addresses the National AAAE Research Agenda priorities one (public and policy maker understanding of agriculture and natural resources) and seven (addressing complex problems).

Conceptual Framework

Trust has been generally defined as "to rely on the truthfulness or accuracy of something" (Merriam-Webster, 2022). Renn and Levine (1991, p. 179) coined the term *trust in communication* to specifically refer to the concept of believing a message is "true and reliable and that the communicator demonstrates competence and honesty by conveying accurate, objective, and complete information." As Lee et al. (2005) said, trust "makes information processing more efficient" (p. 246). Understandably, individuals are more likely to process messages positively from a trusted source and are more likely to automatically refute information from untrusted sources (e.g., backfire effect: Kahan et al., 2011).

Methods

To measure trust in scientific sources, a Qualtrics survey was distributed through SONA, an online portal at Texas Tech University that connects students seeking extra credit with ongoing research projects. Data were collected from November to May 2022, with 105 usable responses. The data reported were part of a larger study investigating college students' perceptions of scientific communication due to the understanding that this age group has been and will continue aging in a society rampant with various portrayals of science communication. *Trust in source for scientific information* was measured by prompting, "Indicate the level of trust you place on the following sources regarding scientific information" for each source in Table 1 (1 = *completely distrus*t, 5 = *completely trust*). Data were analyzed using descriptive statistics in SPSS. Real limits were statistically established to categorize means as follows: 1-1.49, distrust; 1.5-2.49, somewhat distrust; 2.5 - 3.49, neither distrust nor trust; 3.5 - 4.49, somewhat trust; 4.5-5, trust.

Findings

Medical doctors, academic scientists, family members, the FDA, peers, and governmental scientists were all considered somewhat trusted. The CDC, industry scientists, and news reporters were neither trusted nor distrusted. Social media influencers and bloggers were considered somewhat distrusted.

Table 1
Average Trust in Source for Scientific Information (*N* = 105)

Source	M	SD
Medical Doctor	4.2	0.82
Academic Scientist, University Researcher, and Extension Agent	3.9	0.84
Family Member	3.9	1.04
U.S. Food and Drug Administration (FDA)	3.6	1.1
Peers, Friends, and Those in your community	3.6	0.91
Governmental Scientist (Scientists who work for government agencies such as the FDA, NASA, CDC, NOAA, USDA, etc.)	3.5	1.01
Center of Disease Control & Prevention (CDC)	3.3	1.24
Industry Scientist (Scientists who work for for-profit organizations such as Bayer, Pfizer, Tyson, Cargill, etc.)	3.1	1.11
News Reporter/Journalist	2.8	1.09
Social Media Influencers and Bloggers	2.3	0.98

Conclusions/ Recommendations

When communicating about scientific topics of high complexity and/or novelty, it is important that messages portraying the scientific consensus or the desired action be delivered from trusted sources or the messages could do more harm than good (Kahan et al., 2011). Furthermore, messages from trusted sources are more compelling. Considering that college students trusted medical doctors, academic scientists, and family members, these may be prime sources to deliver information around complex, controversial topics like genetically modified foods or climate change. Perhaps the relatively low trust in the CDC is a response to media coverage of the institution during the COVID-19 pandemic. Future research should investigate why people trust certain sources across specific scientific topics (i.e., climate change, vaccines, GMOs, livestock production).

References

Antilla, L. (2010). Self-censorship and science: A geographical review of media coverage of climate tipping points. *Public Understanding of Science, 19*(2), 240-256. https://doi.org/10.1177%2F0963662508094099

Brewer, P. R. & Ley, B. L. (2012). Whose science do you believe? Explaining trust in sources of scientific information about the environment. *Science Communication, 35*(1),115-137. http://scx.sagepub.com/content/35/1/115

Chaiken, S. (1980). Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of Personality and Social Psychology*, *39*(5), https://doi.org/10.1037/0022-3514.39.5.752

Cheng, H., & Gonzalez-Ramirez, J. (2021). Trust and the media: Perceptions of climate change news sources among US college students. *Postdigit Sci Education, 3,* 910–933.

Cook, J., van der Linden, S., Maibach, E., & Lewandowsky, S. (2018). *The consensus handbook.* https://www.climatechangecommunication.org/wp-content/uploads/2018/03/Consensus_Handbook-1

Darke, P. R., Chaiken, S., Bohner, G., Einwiller, S., Erb, H. P., & Hazlewood, J. D. (1998). Accuracy motivation, consensus information, and the law of large numbers: Effects on attitude judgment in the absence of argumentation. *Personality and Social Psychology Bulletin*, *24*(11), 1205-1215. https://doi.org/10.1177%2F01461672982411007

Kahan, D. M., Jenkins-Smith, H., & Braman, D. (2011). Cultural cognition of scientific consensus. *Journal of Risk Research*, *14*(2), 147-174.

Krishna, A. (2021). Understanding the differences between climate change deniers and believers' knowledge, media use, and trust in related information sources. *Public Relations Review, 47*(1), 1-8. https://doi-org.lib-e2.lib.ttu.edu/10.1016/j.pubrev.2020.101986

Lee, C., Scheufele, D. A., Lewenstein, B. V. (2005). Public attitudes toward emerging technologies: Examining the interactive effects of cognitions and affect on public attitudes toward nanotechnology. *Science Communication, 27,* 240-267.

Nelkin, D. (1987). *Selling science: How the press covers science and technology.* W. H. Freeman

Merriam-Webster. (2022). *Trust.* https://www.merriam-webster.com/dictionary/trust

Renn, O., & Levine, D. (1991). *Trust and credibility in risk communication.* In R. E. Kasperson & P. J. M. Stallen (Eds.), Communicating Risks to the Public (pp. 175-218). Norwell, MA: Kluwer Academic.

Robinson, C. R.; Ruth, T. K.; Easterly, R.G.; Franzoy, F.; & Lillywhite, J. (2020). Examining consumers' trust in the food supply chain, *Journal of Applied Communications, 104*(2). https://doi.org/10.4148/1051-0834.2298

Rumble, J. N.; Wu, Y.; Tully, Ke.; Ruth, T. K.; Ellis, J.D.; & Lamm, A. J. (2020). A mixed-methods comparison of self-reported and conversational trust in science, *Journal of Applied Communications, 104*(4). https://doi.org/10.4148/1051-0834.2371

van der Linden, S. L., Clarke, C. E., & Maibach, E. W. (2015). Highlighting consensus among medical scientists increases public support for vaccines: evidence from a randomized experiment. *BMC public health*, *15*(1), 1-5. https://www.scopus.com/record/display.uri?eid=2-s2.0-85016519697&origin=inward

Weingart, P. & Guenther, L. (2016). Science communication and the issue of trust. *Journal of Science Communication, 15*(5). https://pdfs.semanticscholar.org/a71c/528c24a785b072d14f6cf206ef1d17ba4200.pdf

Research

Examining the Lived Experiences of California Hispanic Agriculture Teachers

Authors

Samuel Rodriguez, Ed. D
California State University Fresno, CA 93740
559-278-6794
smrodrig@mail.fresnostate.edu

Christian A. Wandeler, Ph.D.
California State University Fresno, CA 93740
559-278-0355
cwandera@mail.fresnostate.edu

Examining the Lived Experiences of California Hispanic Agriculture Teachers

Introduction

Even with an increase of ethnic and racial diversity there continues to be a lack of ethnic and racial diversity in the teaching profession in the U.S. Teachers of color are generally underrepresented in California. Teachers of color are also especially missing from Career and Technical Education (CTE), particularly when considering high school Agriculture teachers in California. According to the California Agriculture Education Supervisor (personal communication, October 3, 2018) there were only 62 Hispanic Agriculture teachers in the state out of the 1222 total Agriculture teachers in academic year 2018. It is a concerning reality, because the number of students with diverse cultural backgrounds in the P-12 schools is rapidly growing. The percentage of those high school students who identify as Hispanic is 54.9 % (3,381,198), while 22.4% (1,381,737) identify as White not Hispanic. With growth in the number of Hispanic students in California, the increase is not mirrored in the number of Hispanic Agriculture Education teachers in California High Schools, Community Colleges, and Universities. The lack of representation in California is alarming as it this also creates a lack of student mentorship by teachers who look like them. The Center for American Progress (2019) shared that the number of students of color entering teacher preparation programs in institutions of higher education has decreased in recent years, reflecting an overall national trend.

Framework

Self-Determination Theory (SDT) (Deci & Ryan, 1985) served to determine how the sense of autonomy, competence, and relatedness of current Hispanic agriculture teachers is essential to their persistence and success in the teaching profession. In addition, Self-Efficacy theory (SE) (Bandura, 1977) was leaned on to explore how Hispanic Agriculture education students that complete their teacher preparation programs and enter the Agriculture Education can build agency in their ability to successfully fulfill the duties of Agriculture teacher. These two theories were complemented with the Funds of Knowledge theory (FK) by Moll et al. (1992). Funds of knowledge theory refers to the “historically accumulated and culturally developed bodies of knowledge and skills essential for household or individual functioning and well-being” (Moll et al., 1992, p. 133).

Methodology

A constant comparative approach was used during the qualitative portion of this mixed-method investigation (Merriam & Tisdell, 2016). The transcribed responses from focus group participants were compared and coded in the data collection process. Focus group participants were divided by years of teaching experience. The first group consisted of nine agriculture teachers, three males, and six females, with 1-10 years of teaching experience. The second group comprised of seven agriculture teachers, six male and one female, with 11 or more years of teaching experience. Pseudonyms were created for participants. The semi-structured, open-ended questions that took place via videoconferencing. Questions discuss the lived experiences that steered them into agriculture teaching as a career, perceived barriers face in pre-service and active teaching. Axial coding was used to categorize data initially by framework (SDT), (SE), and (FK). Triangulation of video recordings, transcripts, and participant verification was used to ensure trustworthiness. Merriam and Tisdell (2016) states that triangulation—whether making use of more than one data collection method, multiple sources of data, multiple investigators, or multiple theories—is a powerful strategy for increasing the credibility or internal validity of research.

Findings

Analysis of focus group interview responses yielded three themes that represent their lived experiences as agricultural educators: (1) support through teacher preparation program and career, (2) pressure to succeed, and (3) the need for mentorship.

In the first theme participants shared how they developed socioemotional support systems while completing their teacher preparation program and while actively teaching and other supports they wished they had. They explained how finding fellow Hispanic students and Hispanic faculty helped them to develop agency and navigate the college experience. Vanessa shared that working with Dr. Sanchez at State College helped her to feel at home: "seeing Dr. Sanchez as a Hispanic, being a professor and he was so kind to everyone. I felt at home when I needed to find a piece of home." They shared how their students that enter agriculture education get turned off of by faculty and leave the major. "Some of us produce some really good quality students that just didn't have opportunities like that and they're just as good. But they get lost and they get demotivated and they move to other majors because hey, nobody took an interest in them." Participants had similar perspectives in the second theme in that they felt they had to constantly prove their professional competence. There was added pressure to succeed from being one of the few Hispanics in agriculture education teacher preparation, and as new teachers entering the profession. Pedro felt the pressure to constantly show colleagues that he was worthy, saying "we have a little more pressure than everybody else because we have to show them that we can succeed. In the third theme participants in the group with more years of experience shared that abilities to perform professionally developed over time. They also shared that they try to mentor younger teachers to help them build their competence and autonomy as professionals. Members of the group with 1-10 years of experience shared that they reach out to their former agriculture teachers and other Hispanic agriculture teachers for mentorship and advice while building their autonomy. Adrian shares that he understands that he has moved into a role of a mentor over time. "I feel comfortable being there for those teachers, that kind of asked for help and the ones that are close that I can help them."

Conclusions/Implications/Recommendations/Impact on the Profession

This study explored the lived experiences of Hispanic agriculture teachers in California. These findings reveal the challenges these teachers face including finding support through their teacher preparation program career, pressure to succeed, and the need for mentorship. Recruiting and retaining Hispanic agriculture teachers will require changes in practices to develop a sense of belonging in the profession. Deci and Ryan (2000) found that a direct corollary of the SDT perspective is that people will tend to pursue goals, domains, and relationships that allow or support their needs satisfaction Moving forward we recommend that state agriculture teacher association develop professional development opportunities focused on inclusion and mentorship for Hispanic members. We recommend future research on Hispanic female agriculture teachers self-determination as they are growing demographic in the profession. Last but not least, we urge increased focus on creating a pipeline of Hispanic agricultural teachers in order to attract more Hispanic high school and college agriculture students to the field.

References

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191-215. https://doi.org/10.1037/0033-295x.84.2.191

Center for American Progress (2017). What to Make of Declining Enrollment in Teacher Preparation Programs. December 3. Partelow, Lisette. (2019). https:// www americanprogress org/issues/education-k-12/reports/2019/12/03/477311/ make-declining-enrollment-teacher- preparation-programs/.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*(4), 227-268. https://doi.org/10.1207/s15327965pli1104_01

Deci, E. L., & Ryan, R. M. (1985). Intrinsic motivation and self-determination in human behavior. https://doi.org/10.1007/978-1-4899-2271-7

Diller, J., & Moule, J. (2005). *Cultural competence: A primer for educators*. Thomson Wadsworth.

Knobloch, N. A., & Whittington, M. S. (2003). Differences in teacher efficacy related to career commitment of novice agriculture teachers. *Journal of Career and Technical Education, 20*(1), 1-11.

Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation*. John Wiley & Sons

Moll, L. C., Amanti, C., Neff, D., & Gonzalez, N. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. *Theory Into Practice*, *31*(2), 132- 141. https://doi.org/10.1080/00405849209543534

Research Poster

Exploring Generational Perceptions Toward Sustainable Agricultural Foods & Products

Kylie Farmer
Undergraduate Student
Department of Agricultural Education & Communications
Texas Tech University
Kylie.farmer@ttu.edu

Laura Fischer, Ph.D.
Assistant Professor
Department of Agricultural Education & Communications
Texas Tech University
Laura.fischer@ttu.edu

Ginger Orton, M.S.
Doctoral Student
Department of Agricultural Education & Communications
Texas Tech University
Ginger.orton@ttu.edu

Cara Lawson, Ph.D.
Assistant Professor
Department of Agricultural Communication, Education, and Leadership
The Ohio State University
Lawson.182@osu.edu

Exploring Generational Perceptions Toward Sustainable Agricultural Foods & Products

Introduction/Need for Research

Consumers are trending toward buying more sustainable products. Since the onset of the COVID-19 pandemic, products marketed as sustainable have increased in market share in the consumer market (Kronthal-Sacco & Whelan, 2022). This market growth may be explained by the growing need for consumers to want to purchase products due to their impact on society and the environment (IFIC, 2022). Similarly, the USDA is committed to improving the economic, social, and environmental impacts of the agricultural industry. In line with the USDA's approach, many organizations in the agricultural industry are creating strategic goals and programs focused on sustainability efforts, like the many climate-smart partnerships through the USDA and Cotton 2040 (USDA, 2023; Forum for the Future, n.d.). Additionally, some agricultural commodities, such as dairy and cotton, have already begun marketing their products as sustainable to consumers (Kronthal-Sacco & Whelan, 2022). However, within the agricultural industry, limited research has explored how the public perceives sustainability. In alignment with Priority 1 (Enns et al., 2016), public and policymaker understanding of agriculture and natural resources, the purpose of this study was to examine the publics' perception of sustainable products and sustainable food products and how it varies by generation. The results of this study aim to better inform communication about agricultural sustainability to targeted audiences.

Conceptual Framework

Social marketing is a framework to better inform communication to influence behavior and attitude change toward controversial topics (Warner & Murphrey, 2015). A key component of social marketing is substantial audience analysis to appeal to the audience's values and likelihood of changing their behavior (Lee & Kotler, 2011). By using audience segmentation, splitting the audience into groups based on similar characteristics, the most important groups within an audience can be identified (Lee & Kotler, 2011; McKenzie-Mohr et al., 2012). Scholars have explored how generations perceive genetic modification (GM) science and found communication preferences varied among the generations (Beattie et al., 2019). Additionally, differences between the perceptions of Millennials and Generation X'ers have been found when researching food safety at farmer's markets (Yu, et al., 2017). The Pew Research Center has defined the current generations as the following: Silent Generation, born 1928-1945; Baby Boomers, born 1946-1964; Generation X, born 1965-1980; Millennials, born 1981-1996; and Gen. Z, born 1997-2005 (Parker & Igielnik, 2020). Typically, Millennials and Gen. Z are more concerned about environmental sustainability and demand more sustainable retail products (Tyson et al., 2021; Oesterreicher, et al., 2018).

Methods

The purpose of this study was to explore the how Americans' attitudes toward sustainable products and sustainable food products varied by generation. A total of 1,441 useable responses to a Qualtrics questionnaire were collected in October 2022. Qualtrics, a third-party company, was consulted to gather a non-probability sample of U.S. residents 18-years or older. Non-probability opt-in sampling is a technique that allows groups of people to sign up to participate in Internet studies and are recruited to participate in study based on specific characteristics (Lamm & Lamm, 2019). We recruited U.S. residents who matched U.S. census characteristics for age, gender, regionality, and race to participate in the study. The respondents were asked questions, adapted from Burnier et al., 2021, regarding their attitude toward sustainable products ($\alpha = .85$) and sustainable food products ($\alpha = .88$). These questions were measured on a 5-point, Likert scale (1 = *Strongly Disagree*, 5 = *Strongly Agree*). The attitude toward sustainable products items included statements such as "I do not buy a product when I know the possible damage they can cause to the environment." The attitude toward sustainable food products included statements items such as "I prefer foods that are produced respecting the environment." Respondents were asked to enter the age in years, which was converted into a categorical classification based on their respective generations (Parker & Igielnik, 2020). Data were analyzed via one-way ANOVA in SPSS Version 29 following Field's (2018) guidelines for statistical procedures.

Results

As seen in Table 1, we did not find significant main effects for generation type on attitude toward sustainable products, $F(4,1422) = 1.35$, $p = .25$. However, we did find significant main effects for generation type on attitude toward sustainable food products, $F(4,1422) = 4.02$, $p < .001$, $\eta^2 = .011$. Bonferroni post hoc comparisons revealed the attitude toward sustainable food products was only statistically different for the Millennial generation in comparison to the Baby Boomer generation, $p < .001$.

One Way Analysis of Variance between Attitude by Generation Type (N = 1,441)

	Gen Z.		Millennial		Gen X.		Baby Boomer		Silent				
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*	η^2
Products	3.44	.91	3.53	.93	3.45	.95	3.39	.96	3.40	.96	1.35	.25	.004
Food	3.46	.88	**3.56**	.89	3.43	.93	**3.32**	.93	3.33	.92	4.02	.003*	.011

Conclusions

Communicators should consider generational differences when forming messaging around sustainable goods to better understand their target audience and their likelihood to change behavior. Our results indicated communicators should focus their communications efforts about sustainable foods toward Millennials. Millennials' concern for sustainability and the environment supported prior research on perceptions of the beef industry (Oesterreicher, et al., 2018). When communicating about sustainable products, communicators should know that if they are segmenting their audience based on generation, there is more variance among the generations about sustainable foods than sustainable products. Oesterreicher, et al.'s 2018 findings that Millennials tend to have negative perceptions of the beef industry's environmental impact and that foods are more likely to be agriculturally produced may explain the difference between perceptions of sustainable products and foods.

Implications/Recommendations/Impact on Profession

Audience segmentation is a critical tool in communicating. Researchers in agricultural communications use audience segmentation in their research efforts, especially for public audiences. In terms of consumer attitudes toward sustainability, future research should explore consumers' likelihood of purchasing sustainable foods and products with different labels and verbiage. Future research should consider producer perceptions, including barriers to adoption, effectiveness of incentive programs, and return on investment of sustainable farming practices.

References

Beattie, P. N., Lamm, A. J., Rumble, J. N., & Ellis, J.D. (2018). Identifying generational differences to target extension programming when discussing genetic modification. *Journal of Agricultural Education, 59*(3), 154-168. https://doi.org/10.5032/jae.2018.03154

Burnier, P.C., Guerra, D.S., & Spers, E.E. (2021). Measuring consumer perceptions over beef good practices and sustainable production process, *British Food Journal*, *123*(4), 1362-1383. https://doi.org/10.1108/BFJ-12-2019-0904

Enns, K., Martin, M., & Spielmaker, D. (2016). Research priority 1: Public and Policy Maker Understanding of Agriculture. In Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). American Association for Agricultural Education national research agenda: 2016-2020. Gainesville, FL: Department of Agricultural Education and Communication.

International Food Information Council. (2022). Food and health survey. https://foodinsight.org/2022-food-and-health-survey/

Field, A. (2017). *Discovering statistics using IBM SPSS statistics (5th Edition).* Sage.

Forum for the Future. (n.d.). Cotton 2040. https://www.forumforthefuture.org/cotton-2040

Kronthal-Sacco, R., & Whelan, T. (2022). Sustainable market share index: 2021 Report. *Center for Stainable Business.* https://www.stern.nyu.edu/sites/default/files/assets/documents/FINAL%202021%20CSB%20Practice%20Forum%20website_0.pdf

Lamm, A. J., & Lamm, K. W. (2019). Using non-probability sampling methods in agricultural and extension education research. *Journal of International Agricultural and Extension Education, 26*(1), https://doi.org/10.5191/jiaee.2019.26105

Lee, N. R., & Kotler, P. A. (2011). Social marketing: Influencing behavior for good (4th ed.). Thousand Oaks, CA: Sage Publications.

McKenzie-Mohr D., Lee N. R., Schultz P. W., & Kotler, P. (2012). Social marketing to protect the environment. Thousand Oaks, CA: Sage Publications.

Oesterreicher, S., Lundy, L. K., Rumble, J. N., & Telg, R. W. (2018). Collegiate Millenials' perceptions of locally produced beef. *Journal of Applied Communications, 102*(4), https://doi.org/10.4148/1051-0834.2226

Parker, J., & Igielnik, R. (2020). On the cusp of adulthood and facing an uncertain future: What we know about Gen Z so far. *Pew Research Center.* https://www.pewresearch.org/social-trends/2020/05/14/on-the-cusp-of-adulthood-and-facing-an-uncertain-future-what-we-know-about-gen-z-so-far-2/

Tyson, A., Kennedy, B., & Funk, C. (2021). Gen Z, Millennials stand out for climate change activism, social media engagement with issue. *Pew Research Center.* https://www.pewresearch.org/science/2021/05/26/gen-z-millennials-stand-out-for-climate-change-activism-social-media-engagement-with-issue/

United States Department of Agriculture (USDA). (2023). Partnerships for climate-smart commodities. https://www.usda.gov/climate-solutions/climate-smart-commodities

Warner, L., & Murphrey, T. (2015). An examination of the framework of social marketing to achieve environmental sustainability in international agricultural and extension education. *Journal of International Agricultural and Extension Education, 22*(2), 20–36. doi:10.5191/jiaee.2015.22202

Yu, H., Gibson, K. E., Wright, K. G., Neal, J. A., & Sirsat, S. A. (2017). Food safety and food quality perceptions of farmers' market consumers in the United States. *Food Control, 79*, 266–271. https://doi.org/10.1016/j.foodcont.2017.04.010.

Exploring Rural Georgia Residents' Extension Needs for Improving Food Access

Kristin E. Gibson
University of Georgia
Kristin.gibson@uga.edu

Catherine E. Sanders
North Carolina State University
Catherine_sanders@ncsu.edu

Tatevik Markosyan
University of Georgia
Tatevik.Markosyan@uga.edu

Allison R. Byrd
University of Georgia
afortner@uga.edu

Alexa J. Lamm
University of Georgia
alamm@uga.edu

Exploring Rural Georgia Residents' Extension Needs for Improving Food Access

Introduction

Extension helps build resilient rural communities by increasing access to healthy food, acting as a bridge between educational, activist, and economic-based institutions for food systems change (Morgan & Fitzgerald, 2014). There is an opportunity to create long-term, sustainable Extension programs that promote food access in rural communities, but the needs of residents must first be determined for successful implementation (Garst & McCawley, 2015). Extension does not often have opportunities to evaluate community needs prior to program implementation, yet achieving community-based health intervention outcomes requires assessment in early stages (Benge & Warner, 2019). Investigating Extension resources needed by rural residents to build healthy and resilient communities is relevant to the 2016-2020 American Association for Agricultural Education National Research Agenda, as priority area six calls for vibrant and resilient communities, especially in rural areas.

Conceptual Framework

Audience segmentation is a marketing strategy commonly used in agricultural education research to increase the effectiveness of programs for specific groups (Chaudhary et al., 2017; Slater, 1996; Warner et al., 2016). Audience segmentation identifies homogeneous subgroups within a population based on shared characteristics (Grunig, 1989; Lee & Kotler, 2011). Extension programs can benefit from audience segmentation approaches because programs can be tailored to the needs, motivations, values, beliefs, and interests of a specific subgroup (e.g., Andreasen, 2006; Carroll et al., 2022; Gibson et al., 2020; Huang et al., 2017; Lamm et al., 2019). Therefore, the purpose of this study was to identify specific subgroups of rural Georgia residents related to food access and availability based on preferred Extension program and resources.

Methods

Data were collected in November 2022 from rural Georgia residents aged 18 and older using an online questionnaire ($N = 780$). Respondents were recruited using non-probability opt-in sampling methods (Baker et al., 2013). The sample collected was based on rurality and did not incorporate other demographic characteristics, which limits the findings and generalizability of the study. The research design was approved by the University of Georgia Institutional Review Board (IRB #00005553).

Respondents were asked to indicate the likelihood of using the following Extension resources if they were available in their community: free cooking classes, farmers' market coupons, free classes on home gardening, free or discounted weekly box of fresh fruits and vegetables, fresh fruits and vegetables available in gas stations/ convenience stores, mobile trucks or food markets, community gardens, free nutrition classes, free programs to help prevent and/ or manage chronic disease, like diabetes, heart disease, and cancer, and free exercise classes. Items were adapted from the Missoula Food Bank (2021) and measured on a five-point Likert scale (1 = *never*; 5 = *all of the time*).

Descriptive statistics were used to rank the likelihood of using the listed Extension resources if available in respondents' communities. Hierarchical cluster analysis with Ward's method and squared Euclidian distance was conducted to identify specific subgroups based on expressed needs. Three subgroups were identified from the resulting dendrogram. Subsequently, K-means clustering was conducted with Ward's method to divide the dataset into the appropriate subgroups. Chi-squared analysis was conducted to determine if there were associations between the cluster groups based on need and respondents' demographic characteristics.

Results

Overall, respondents were likely to use free or discounted weekly box of fresh fruits and vegetables (M = 3.96, SD = 1.16), farmers' market coupons (M = 3.75, SD = 1.17), and mobile trucks or food markets (M = 3.75, SD = 1.17). Respondents were neither likely nor unlikely to use free cooking classes (M = 3.16, SD = 1.35), free classes on home gardening (M = 3.25, SD = 1.31), and free nutrition classes (M = 3.39, SD = 1.29).

Three distinct clusters emerged from the analysis and were named low (n = 144), medium (n = 323), and high (n = 313) likelihood of using Extension resources. Chi-squared analysis indicated significant differences between cluster groups' demographic characteristics, including sex (X^2 = 8.78, p = .01, Φ = 0.11), age (X^2 = 57.01, p < .001, Φ = 0.19), marital status (X^2 = 19.85, p = .03, Φ = 0.11), employment (X^2 = 53.40, p < .001, Φ = 0.19), receiving SNAP benefits (X^2 = 11.86, p = .02, Φ = 0.08), and educational level (X^2 = 31.14, p < .001, Φ = 0.14). Members of the high likelihood cluster were likely to be younger, employed full time, and received SNAP benefits. Members of the medium likelihood cluster were likely to be between 28 to 67 years old and employed part-time. Members of the low likelihood cluster were likely to be older and retired or unemployed but not looking for work.

Conclusions and Recommendations

Respondents were most interested in Extension resources that provided coupons or other market-based solutions to alleviate the financial stress of purchasing healthy foods. Extension should partner with economic resource organizations to enhance community resilience related to food access given this result. It is possible the likelihood of purchasing fruits and vegetables in gas stations/convenience stores would also increase if price was not a barrier.

Respondents represented in the high likelihood cluster were fully employed individuals likely to receive SNAP benefits who may benefit most from Extension resources. Extension should target members of the high likelihood cluster with interventions that provide coupons or other market-based solutions. Extension programs for the high likelihood cluster should be held outside of this cluster's normal working hours, which could be determined by future questionnaires. Programs should provide tangible resources, like the ingredients to cook a meal, to encourage the high likelihood cluster to attend.

Respondents in the low and medium likelihood clusters may have more opportunities to engage in programs considering their work schedules are less time consuming. It is also possible respondents in the low and medium likelihood cluster are more food secure as they do not receive SNAP benefits as often as the high likelihood cluster. The low and medium likelihood clusters may be interested in helping with a community garden or food pantry, also benefitting the high likelihood cluster. Future studies should further examine available Extension resources to determine if subgroups need different support depending on their demographic characteristics to create targeted and effective programs.

References

Andreasen, A. R. (2006). *Social marketing in the 21st century*. Sage Publications.

Baker, R., Brick, J. M., Bates, N. A., Battaglia, M., Couper, M. P., Dever, J. A., Gile, K. J., & Tourangeau, R. (2013). Summary report of the AAPOR task force on non-probability sampling. *Journal of Survey Statistics and Methodology, 1*(2), 90-136. https://doi.org/10.1093/jssam/smt008

Benge, M., & Warner, L. (2019). Conducting the Needs Assessment #2: Using Needs Assessments in Extension Programming. *EDIS*. https://doi.org/10.32473/edis-wc347-2019

Carroll, A. A., Lamm, K. W., & Borron, A. (2022). Finding the right channel: An analysis of communication channel preferences amongst potential extension clientele. *Journal of Agricultural Education, 63*(2), 131-149

Chaudhary, A. K., Warner, L., & Stofer, K. (2017). Online certificate program moves participants to advanced stages of concern for social marketing. *Journal of Agricultural Education*, *58*(4), 210–224. https://doi.org/10.5032/jae.2017.04210

Garst, B. A., & McCawley, P. F. (2015). Solving problems, ensuring relevance, and facilitating change: The evolution of needs assessment within Cooperative Extension. *Journal of Human Sciences and Extension, 3*(2), 4. https://doi.org/10.54718/FLSF2021

Gibson, K. E., Lamm, A. J., Lamm, K. W., & Warner, L. A. (2020). Communicating with diverse audiences about sustainable farming: Does rurality matter? *Journal of Agricultural Education, 61*(4), 156-174. http://doi.org/10.5032/jae.2020.04156

Grunig, J. (1989). Publics, audiences, and market segments: Segmentation principles for campaigns. In C. Salmon (Ed.), *Information campaigns: Balancing social values and social change* (pp. 199–228). Sage.

Huang, P., Lamm, A. J., & Dukes, M. D. (2017). Enhancing Extension program effectiveness by examining regional differences in high water users. *Journal of Human Sciences and Extension, 5*(1), 4. https://doi.org/10.54718/SGZX7930

Lamm, K. W., Borron, A., Holt, J., & Lamm, A. J. (2019). Communication channel preferences: A descriptive audience segmentation evaluation. *Journal of Applied Communications, 103*(3). https://doi.org/10.4148/1051-0834.2238

Lee, N. R., & Kotler, P. A. (2011). *Social marketing: Influencing behavior for good* (4th ed.). SAGE Publishing.

Missoula Food Bank. (2021). *Annual report*. https://missoulafoodbank.org/about-us/data

Morgan, K. T., & Fitzgerald, N. (2014). Thinking collectively: Using a food systems approach to improve public health. *Journal of Extension, 52*(3), 3COM3. https://tigerprints.clemson.edu/joe/vol52/iss3/25/

Slater, M. D. (1996). Theory and method in health audience segmentation. *Journal of Health Communication, 1*(3), 267-283. https://doi.org/10.1080/108107396128059

Warner, L., Stubbs, E., Murphrey, T., & Huynh, P. (2016). Identification of the competencies needed to apply social marketing to extension programming: Results of a Delphi study. *Journal of Agricultural Education*, *57*(2), 14–32. https://doi.org/10.5032/jae.2016.02014

Exploring SBAE Teacher Professional Development Experiences: A National Study

Dr. Aaron J. Giorgi
Aaron.giorgi@mail.wvu.edu

Kayla Y. Giorgi
Kayla.Giorgi@mail.wvu.edu

West Virginia University
1194 Evansdale Dr.
Morgantown, WV 26505
304-293-5705

Tyler J. Price
tyler.price10@okstate.edu

Dr. Quisto Settle
qsettle@okstate.edu

Oklahoma State University
Agricultural Hall 441
Stillwater, OK 74078
405-744-6548

Introduction, Literature Review, and Frameworks

Historically, an overwhelming majority of teachers in the United States have participated in professional development (PD) events (Darling-Hammond et al., 2009). The structure of PD implementation has followed a predictable trend where teachers attend a series of formal, workshop-style events targeting content knowledge (Mizell, 2010; Yopp, et al., 2020). While attendance is high, resulting change in educational practices has not been effectively increased (Darling-Hammond et al., 2009). Smalley et al. (2019) posited that teachers engaging in professional development are seeking content-related professional growth opportunities.

Within the context of school-based agricultural education (SBAE) research related to PD effectiveness is lacking. In a study conducted by Easterly and Myers (2019), SBAE teachers in several states reported a high level of engagement in a variety of PD formats but did not subsequently implement educational practices from those events. It was also found that PD engagement was correlated with career satisfaction (Easterly & Myers, 2019). PD, as a component of professional commitment, had been previously linked with career satisfaction (Sorensen &McKim, 2014). This study sought to fill the gap in the literature related to SBAE teacher satisfaction with PD sources and motivations to engage in PD.

This study was guided by the interconnected model of professional growth (Clarke & Hollingsworth, 2002). According to Clarke and Hollingsworth (2002), teacher professional growth is experienced in four interconnected domains: personal, external, practice, and consequence. Growth in these domains is purported to be a function of enactment and reflection from experiences within each domain (Clarke & Hollingsworth, 2002).

Purpose and Objectives

The purpose of this study is to explore professional development event experiences of SBAE teachers. The following objectives guides this exploration:

1. Describe SBAE teachers' level of satisfaction with professional development providers.
2. Describe SBAE teachers' motivations to attend profession developments.

Methods

This descriptive study consisted of a researcher-developed online survey of SBAE teachers in the United States. A cluster random sample of 40 FFA advisors per state was provided by the National FFA Organization. All advisors were included in the sample for states fewer than 40 FFA advisors. The final sample was 251, resulting in a response rate of 13.4%. This low response rate has been documented for this population and sampling frame (e.g., Hile, 2019; McKim & Sorensen, 2020). Respondents answered questions about PD satisfaction and how opportunities were identified. Descriptive statistics were computed to organize and summarize the phenomenon (Ary et al., 2010). This research is part of a larger project on SBAE teacher PD.

Results and Conclusions

There were respondents from all 50 states (*N* = 250), ranging from 1 to 14 respondents per state in the final sample. Average age of respondents was 38.6 years (*SD* = 12.04), with a range of 21 to 82 years of age. Respondents were predominately White (91.6%), female (62.5 %), not ethnically Hispanic or Latino (92%). Respondents reported an average of 12.4 years of teaching experience (*SD* = 10.3), with 37.1% (*n* = 93) teaching 5 or fewer years, 29.9% (*n* = 75), between 5 and 15 years, 27.1% (*n* = 68) between 15 and 30 years, and 6.0% (*n* = 15) over 30 years. A majority of SBAE teachers (78.5%) were found to be traditionally licensed through an agricultural education undergraduate program.

PD Satisfaction

SBAE teachers were asked to rate their satisfaction with various providers of professional develop if they had utilized that provider. The two providers utilized by less than 50% of SBAE teachers within the sample were the Association of Career & Technical Education and United States Department of Education. A majority of SBAE teachers reported overall satisfaction for those providers who are directly related to agricultural education or agricultural content. Additionally, while local teaching organizations was utilized the most (*n* = 228), SBAE teachers reported over 2:1 mixed or dissatisfied versus satisfied experiences with this provider.

SBAE Teacher Motivating Factors

To answer the research question two, SBAE teachers were asked to rank and report their motivations for participation. SBAE teachers ranked PD topics as interesting as their leading motivator (*M* = 2.11) for participation. Additionally, on average SBAE ranked provided curriculum materials and resources (*M* = 2.59) and provided materials and supplies (*M* = 3.36) as higher motivating factors. Non-financial incentives, for example provided meals or raffles, was ranked the least motivating (*M* = 5.85).

Discussions and Recommendations

Based on the findings, teachers find more satisfaction with PD opportunities provided by more locally focused agencies as opposed to national bodies. Anecdotally, this phenomenon may be a result of beliefs that education is locally controlled. Additionally, SBAE teachers reported higher satisfaction with agriculturally related PD opportunities and providers mirroring Smalley et al.'s (2019) assertions. While content knowledge development is one facet of PD, providers seeking to perpetuate educational reform within SBAE programs will need to imbed pedagogical and pedagogical content knowledge into content focused PD events. SBAE teachers reported motivation by content, resources, and peer engagement as highly influential. We assert that this demonstrates the strong SBAE culture of community. This sense of community offers an avenue to design intentional collaborations that would encourage constructive reflection on teaching enhancements (Clarke & Hollingsworth, 2002). It is recommended for practice that PD provides work to structure intentional community of practice engagement for quality reflection on PD content. It is recommended for research that effects of PD on SBAE teacher's educational practices be studied.

References

Ary, D., Jacobs, L. C., Sorensen Irvine, C. K., & Walker, D. A. (2019). *Introduction to research in education* (10th ed.). Cengage.

Darling-Hammond, L., Wei, R. C., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession: A status report of teacher development in the United States and abroad.* National Staff Development Council.

Clark, D. J., & Hollingsworth, H. (2002). Elaborating a model of teacher professional growth. *Teaching and Teacher Education*, *18*(8), 947-967. https://doi.org10.1016/S0742-051X(02)00053-7

Easterly, R. G. & Myers B. E. (2019). Professional Development and Engagement and Career Satisfaction of Agriscience Teachers. *Journal of Agricultural Education, 60(*2*)*, 69-84. https://doi.org/10.5032/jae.2019.02069

Hile, O. M. (2019). *Agriculture teacher attitudes regarding gifted education and teaching gifted students in the agriculture classroom.* [Unpublished master's thesis]. Utah State University.

McKim, A. J., & Sorensen, T. J. (2020). Agricultural educators and the pandemic: An evaluation of work life variables. *Journal of Agricultural Education, 61*(4), 214-228. https://doi.org/10.5032/jae.2020/04214

Mizell, H. (2010). Why professional development matters. Retrieved from www.learningforward.org/

Smalley, S., Hainline, M. S., & Sands, K. (2019). School-based agricultural education teachers' perceived professional development needs associated with teaching, classroom management, and technical agriculture. *Journal of Agricultural Education, 60*(2), 85-98. https://doi.org/10.5032/jae.2019.02085

Sorensen, T. J. & McKim, A. J. (2014). Perceived work-life balance ability, job satisfaction, and professional commitment among agriculture teachers. *Journal of Agricultural Education, 55* (4), 116-132. https://doi.org/10.5032/jae.2014.0116

Sorensen, T. J., Tarpley, R.S., & Warwick, B. K. (2010). In-service needs of Utah agriculture teachers. *Journal of Agricultural Education, 51*(3), 1-11. https://doi.org/10.5032/jae.2010.03001

Yopp, A. M., Edgar, D., & Croom, D. B. (2020). Technical in-service needs of agriculture teachers in Georgia by career pathway. *Journal of Agricultural Education, 61*(2), 1-19/ https://doi.org/10.5032/jae.2020.02001

Exploring Student Perceptions of an Asynchronous Oral Communication Course

Emoni White
Christopher Stripling
Molly West
Victoria Beasley
The University of Tennessee

320 Morgan Hall
2621 Morgan Circle Drive
Knoxville, TN 37996-4511
865-974-7371
Ewhite71@vols.utk.edu

Exploring Student Perceptions of an Asynchronous Oral Communication Course

Introduction/Need for Study

Online courses provide students with flexible learning opportunities, and the Covid-19 pandemic accelerated the number of undergraduate students taking at least one course online (National Center for Educational Statistics, 2022). Additionally, the emergence of online degree programs has led the communication discipline and instructors to experiment with teaching performance-based courses such as oral communication online (Dendy, 2020; Ward, 2016). However, there is limited research regarding teaching oral communications online and associated student learning outcomes. Having a greater understanding of the effects of such courses would benefit higher education, specifically undergraduate students, and their employers (Dendy, 2020). Therefore, the purpose of the study was to describe undergraduate students' perceptions of an asynchronous oral communication course in a college of agriculture in hopes of gaining an increased understanding of how the educational experience can be improved and inform future asynchronous teaching practices. Additionally, this study was not designed to be generalized to broader populations, but rather to understand student experiences based on the context in which they occurred. The following research question guided the study: How do students who have completed an asynchronous oral communication course perceive the course and their oral communication skill development?

Theoretical or Conceptual Framework

The theoretical perspective that encompassed this study was constructivism. Constructivism supports the idea that multiple truths exist based on individual experiences with a phenomenon, meaning that individual experiences produce different meanings (Crotty, 1998). According to Crotty (1998), an individual becomes a knower of truth as they interpret the world. In the context of this study, the students have constructed knowledge pertaining to the asynchronous oral communication course based on their experiences and knowledge.

Methodology

This qualitative study purposively recruited undergraduate students enrolled in a sophomore level asynchronous oral communication course in a college of agriculture at the University of Tennessee. All students (n = 48) enrolled in the course received four invitations to participate in individual, semi-structured interviews through the Canvas course management system and their university email. Invitations stopped after data saturation, and 16 individual interviews were conducted. Each interview session lasted approximately 30 to 45 minutes. Participants ranged in age from 18 to 21, and 12 identified as female and four as male. Varying levels of online course experience was found among participants as a result of the COVID-19 pandemic. To establish trustworthiness, interviews were audio-recorded through Zoom, and Zoom's automatic transcriptions were exported to Microsoft Word. Then, transcripts were listened to, and corrections were made to the transcriptions if necessary. Once the transcriptions were completed, recordings were listened to a second time to verify accuracy (Merriam, 1998). Additionally, member checks were completed to increase credibility, and audit trails were created to ensure dependability (Dooley, 2007). Data were analyzed using domain analysis, which is a type of thematic analysis that seeks to discover and organize parts or elements of cultural meaning (Spradley, 1980). Spradley (1980) identified these elements of cultural meaning as domains and indicated that each domain consists of relationships between included terms (data provided by the participants) and cover terms (created by the researcher). Domain analysis is accomplished by reading the transcript and searching for included terms of interest. Once included terms were identified, they are grouped with related included terms and subsequently given a cover term which described and identified each group. Transcripts were analyzed separately, but analyses were combined to give final findings, thereby including a method of researcher triangulation in the data analysis (Dooley, 2007).

Results/Findings

Data analysis led to the following four domains: (a) decision to enroll, (b) quality indicators, (c) learning outcomes, and (d) limitations. Participants described two factors that led to enrollment in the course – the course is a university requirement and content was delivered asynchronously. Students enrolled because an oral communication course fulfilled a graduation requirement and perceived asynchronous courses allowed them to complete course requirements on their own time around other courses, work schedules, and social activities. Regarding the domain of quality indicators, participants perceived quality to be influenced by course navigation, course technology, course material, and instructional variety. Participants perceived the repetitive nature of Canvas modules as contributing to the ease of course navigation; technology tools such as Nearpod and Panopto promoted learner engagement; course material being relevant to course objectives and real-world application; and varying instructional strategies (e.g., speech modeling, speech outline discussions, speech critics, and individual and group speeches) aided skill building. Participants also believed the course resulted in three overall learning outcomes – planning, technology, and public speaking skills. They felt more proficient in planning for and structuring speeches; utilizing technology for speaking in digital contexts; and minimizing filler words, maintaining eye contact, and becoming a more confident speaker. Limitations were no live audience to gauge peer perceptions of their speeches and not receiving immediate feedback, which impacted teacher and student immediacy.

Conclusions

Participants' perceptions of an asynchronous oral communication course and their skill development were shaped by four domains: (a) decision to enroll, (b) quality indicators, (c) learning outcomes, and (d) limitations. Overall, participants were satisfied with their learning experience and believe their oral communication skills improved, and the skills gained will be beneficial in-person and in digital contexts. Participants perceived identified limitations as minimal with real-world applications and skill development outweighing asynchronous constraints. Participants' perceptions are supported by Ward (2016) and Dendy (2020).

Implications/Recommendations/Impact on Profession

Based on this study, the importance of oral communication and the increasing need to effectively communicate in digital contexts, colleges of agriculture should consider if there is a need to offer an oral communication course specific to digital contexts. Future research should determine curricular needs related to digital contexts and continue to investigate the efficacy of asynchronous oral communication courses seeking to replicate an in-person oral communication course. For this course, we recommend students are allowed to post select course assignments to tools such as discussion boards or Panopto to allow for peer feedback. We also recommend virtual office hours or establishing a course GroupMe, which can increase student-to-student and teacher-student interactions to improve student and teacher immediacy (Estepp et al., 2013).

References

Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process.* SAGE Publications.

Dendy, C. B. (2020). *Online or face-to-face? A study of communication education modalities among non-traditional students* (Publication No. 27668963) [Doctoral dissertation Trevecca Nazarene University]. ProQuest Dissertations and Theses Global.

Dooley, K. E. (2007). Viewing agricultural education research through a qualitative lens. *Journal of Agricultural Education, 48*(4), 32–42. https://doi.org/10.5032/jae.2007.04032

Estepp, C. M., Stripling, C. T., Conner, N. W., Giorgi, A., & Roberts, T. G. (2013). An examination of the learning activities, cognitive level of instruction, and teacher immediacy behaviors of successful instructors in a college of agriculture. *Journal of Agricultural Education, 54*(2), 15–28. https://doi.org/10.5032/jae.2013.02015

Merriam, S. B. (1998). *Qualitative research and case study applications in education*. Jossey-Bass.

National Center for Education Statistics. (2022). *Undergraduate Enrollment*. U.S. Department of Education, Institute of Education Sciences. https://nces.ed.gov/programs/coe/indicator/cha

Spradley, J. P. (1980). *Participant observation*. Holt, Rinehart, and Winston.

Ward, S. (2016). It’s not the same thing: Considering a path forward for teaching public speaking online. *Review of Communication, 16*(2-3), 222–235. https://doi.org/10.1080/15358593.2016.1187458

Exploring Teachers' Intent to Use Inquiry-Based Learning in the Classroom After a Prolonged Professional Development

Kasey Harmon
University of Nebraska-Lincoln
PO Box 830947; Filley Hall 143
Lincoln, NE 68583-0947
402-472-8738
Kharmon3@unl.edu

Taylor Ruth
University of Nebraska-Lincoln
PO Box 830947; Filley Hall 143
Lincoln, NE 68583-0947
402-472-8738
Taylor.ruth@unl.edu

Nathan Conner
University of Nebraska-Lincoln
PO Box 830947; Filley Hall 143
Lincoln, NE 68583-0947
402-472-3938
Nconner2@unl.edu

Bryan Reiling
University of Nebraska-Lincoln
PO Box 830908; C203 ANSC
Lincoln, NE 68583-0908
402-472-8960
Breiling2@unl.edu

Christopher Stripling
University of Tennessee, Knoxville
320 Morgan Hall, 2621 Morgan Circle Drive
Knoxville, TN 37996-4511
Cstripli@utk.edu

Exploring Teachers' Intent to Use Inquiry-Based Learning in the Classroom After a Prolonged Professional Development

Introduction

In 2019, 41% of 12th grade students in the United States were not proficient in science (National Center for Education Statistics, 2019). Inquiry-based learning (IBL) can be used as a strategy for teaching science because it allows students to develop their knowledge, understanding, and interest in science (Calalb, 2018). "Inquiry-based teaching is a teaching method that can be used to combine the curiosity of students and the scientific method to enhance the development of critical thinking skills while learning science (Warner & Myers, 2011, p.1). Although IBL has great benefits, teachers believe they are not well prepared to teach and facilitate IBL lessons (DiBiase & McDonald, 2015). Researchers have also found that efficient professional development (PD) is needed to alter teachers' attitude toward the IBL teaching approach and increase teachers' confidence using IBL (Guskey, 2002; Kreifels et al., 2021). Therefore, the purpose of this study was to explore teachers' intent to integrate IBL animal science concepts into science and agriscience curriculum after completing an IBL PD.

Theoretical Framework

The theory of planned behavior (TPB) provided the theoretical framework for this study to better understand motivating factors of teachers' intent in utilizing IBL animal science concepts after participating in a professional development (Ajzen, 1991). According to TPB, attitude, subjective norms, and perceived behavioral control are predictive of behavioral intent (Ajzen, 1991; 2012). Attitude refers to having a favorable or unfavorable perception of a behavior (Ajzen, 1991). Additionally, subjective norms are social pressure and norms that influence behavioral performance, and perceived behavioral control is one's perception of their own ability to perform and control a behavior (Ajzen, 1991). Factors related to TPB elements including supportive administration, class sizes, state curriculum pressure, and limited access to resources act as barriers to teachers' intent of using IBL (DiBiase & McDonald, 2015). The PD was assumed to have positively addressed the TPB variables, so this portion of the project has focused on teachers' intent to integrate IBL animal science concepts into curricula since intent is predictive of actual behavior (Ajzen, 1991).

Methodology

A total of 30 agriscience and science teachers from [TN] and [NE] participated in a year-long PD program that began in the summer of 2022. The teachers completed three, online modules related to using IBL before participating in a 5-day in-person PD program. During the PD, the teachers gained experience from both the student and teacher perspective with the following six IBL animal science concepts: animal health, breeding and genetics, management, meat science, nutrition, and reproductive physiology. Each animal science concept related to a basic scientific concept to allow for collaboration between science and agriscience teachers. Following Desimone's (2009) principles, participants were also given the resources needed to implement the IBL animal science concepts in the classroom to enable them to facilitate the activities throughout the school year. Using qualitative methodology, data were collected through focus groups. Participants were broken into two focus groups per state (four focus groups in total) after the in-person PD program was concluded to discuss their experience. Using a semi-structured moderator's guide, the participants were asked questions related to their confidence, motivation, and intent to integrate IBL animal science concepts. Each focus group consisted of six to nine participants, lasted 60 minutes, and were recorded and transcribed for accuracy. The transcriptions were analyzed using *a priori* coding to identify participants' intent to use IBL in the future (Ajzen, 1991). The researcher used multiple validation strategies that included an audit trail and peer debriefing (Creswell & Poth, 2018).

Findings

Many participants expressed their intent to use the IBL animal science concepts after the PD. Participant 9 (TN) said, "I've actually planned to use a lot these activities in [my ecology] class where I might not have the time to put them into my biology [class], which is state tested." When participants were asked if they would continue using agriculture as a context for teaching science, Participant 7 (NE) said, "Yes. I feel [agricultural concepts] make learning more real." Additionally, Participant 16 (NE) explained, "I like to be intentional with my time...When I think about spending time to form those [science and agriculture] cross curriculum bonds, this is something I see as intentional." Although many participants had immediate intentions to integrate IBL animal science concepts into their curriculum, others stated they became more aware of it. Participant 13 (TN) shared "If not motivated [to use animal science concepts], the right word might be just more aware and inspired to incorporate into my own anatomy and physiology teaching." Later, Participant 13 (TN) added, "I might be much more aware of [linking] everything towards animal science [context]...Maybe that'll be a hook [for students]."

Conclusions, Implications & Recommendations

Concluding the PD, participants intended to integrate the IBL animal science concepts that they learned into their curriculum. They also had a better understanding of the need for IBL and how to connect science and agriculture. After the PD, the participants expressed positive attitudes toward the PD and explained that they now feel prepared to teach IBL lessons; however, their intent was less when perceived barriers, like state standards, were present. Furthermore, the participants concluded that they have a better understanding of IBL, and that they intend to integrate the IBL animal science concepts into their curriculum. Overall, participating in an IBL PD positively impacted teachers' intent to use IBL in the classroom, which will likely lead to actual implementation of IBL when teaching animal science concepts in the future (Ajzen, 1991).

When creating future PD programs, it would be beneficial to ensure that teachers are given the opportunity to collaborate with other teachers. Collaboration between science and agriscience teachers allows each teacher to gain a different perspective and positively impact the planning and facilitation of lessons. Furthermore, as students' science proficiency remains low, high school administrations should encourage their teachers to pursue at least one IBL PD. There could also be value in replicating a similar IBL PD that focuses on other agricultural areas such as plant science, agricultural mechanics, or agribusiness. To further explore the impacts that an IBL PD program has on agricultural and science teachers' intent to use IBL nationwide, this study should be conducted at other universities and states.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179-211. https://doi.org/10.1016/0749-5978(91)90020-t

Ajzen, I. (2012). The theory of planned behavior. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (pp. 438–459). Sage Publications Ltd. https://doi.org/10.4135/9781446249215.n22

Calalb, M. (2018, June 28-29). *The impact of inquiry based science education on the formation of lifelong learning skills* [Paper presentation]. The Future of Education International Conference, Florence, Italy. https://conference.pixel-online.net/FOE/ICT4LL/files/foe/ed0008/FP/4851-SOE3224-FP-FOE8.pdf

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches*. SAGE Publications.

Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher, 38*(3), 181-199. https://doi:10.3102/0013189X08331140

DiBiase, W., & McDonald, J.R. (2015). Science teacher attitudes toward inquiry-based teaching and learning. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas, 88*(2), 29-38. https://doi.org/10.1080/00098655.2014.987717

Guskey, T. R. (2002). Professional development and teacher change. *Teachers and Teaching, 8*(3), 381–391. https://doi.org/10.1080/135406002100000512

Kreifels, M., Conner, N., Reiling, B., Stripling, C., & Balschweid, M. (2021). Teacher perceptions of facilitating inquiry-based instruction following a 12-month professional development experience. *Advancements in Agricultural Development*, *2*(3), 14–24. https://doi.org/10.37433/aad.v2i3.119

National Center for Education Statistics. (2019). *Digest of Education Statistics.* https://nces.ed.gov/programs/digest/d21/tables/dt21_223.10.asp

Warner, A. J., & Myers, B. E. (2011). What is inquiry-based instruction? IFAS Extension. https://edis.ifas.ufl.edu/pdffiles/WC/WC07500.pdf

Exploring the Public's Perception of Beef Sustainability: Implications for Values-Based Messaging

McKenna Pavelock
Undergraduate Student
Department of Agricultural Education & Communications
Texas Tech University
Mckenna.pavelock@ttu.edu

Laura Fischer, Ph.D.
Assistant Professor
Department of Agricultural Education & Communications
Texas Tech University
Laura.fischer@ttu.edu

Cara Lawson, Ph.D.
Assistant Professor
Department of Agricultural Communication, Education, and Leadership
The Ohio State University
Lawson.182@osu.edu

Exploring the Public's Perception of Beef Sustainability: Implications for Values-Based Messaging

Introduction/Need for Research

Known for their active involvement in the climate change movement (Versace & Abyss, 2023), Generation Z and Millennials are interested in "sustainability-first buying decisions" (Wood, 2022, para. 1). Demanding sustainable products, these generations are fully prepared to change their buying habits if a product is not deemed sustainable (Versace & Abssy, 2023). However, mixed feelings arise when people hear the word "sustainable" because there is no clear definition attached to it (Gosnell et al., 2021; Mancini et al., 2019). To best define sustainability, a three-pillar concept has been developed to include economic development, social equity, and environmental protection (Gosnell et al., 2021; Mancini et al., 2019). Unlike consumers, producers have a different perception of sustainability, and research has shown that they tend to shy away from the thought of sustainability despite growing concerns (Meng et al., 2022). Apprehensions about costs and additional unknowns that arise from change in operations have producers unsure of sustainability (Gibson et al., 2020). However, consumers are driving the sustainability industry forward despite these hesitations from producers (Petro, 2022). With a willingness to pay more for sustainable products, Petro (2022) adds that it's crucial for the producer to "become aligned with these consumers before it's too late" (para. 8). A united front between the producer and consumer allows for trust, which correlates positively to their relationship (Mancini et al., 2019). Agricultural communicators can communicate to audiences by understanding their perceptions of sustainability and their personal values to create more effective messaging.

Theoretical Framework

Personal values were used as the framework for this study. Values-based messaging can be used by agricultural communicators to appeal to the consumers by connecting with the values they rate as important in their lives (Dwyer et al., 2023; Fischer et al., 2020). Schwartz (2012) identified that humans have different value priorities, similar to how we each have different cultures.

There is a strong need to understand these values that shape consumers' perceptions of sustainability in the beef industry and how to communicate with them. Developing messages that align with someone's values gives them the opportunity to resonate and absorb more of a message (Fischer et al., 2020). By developing these tailored messages, communicators can more effectively discuss topics such as sustainability (Gibson et al., 2020; Lawrence, 2015).

Methods

The purpose of this study was to examine the relationships between the publics' perceptions of environmental responsibility for the beef industry, attitudes toward sustainable consumption, and personal values. Data were collected through an online survey instrument that was distributed to a population of U.S. residents. Through Qualtrics, a third-party company, we gathered a non-probability sample of 1,441 useable responses from U.S. residents 18-years or older who aligned with U.S. census characteristics for age, gender, region, and race to participate in the study. The respondents answered a series of questions related to their perceptions of environmental responsibility for the beef industry ($\alpha = .84$), their attitude toward sustainable consumption ($\alpha = .88$), and their personal values ($\alpha = .88$) that were adapted from the prior literature (Burnier et al., 2020; Schwartz, 2012). To understand perceptions of environmental responsibility and attitudes toward sustainable products, respondents were asked to rate their level of agreement on a 5-point Likert Scale (1 = *Strongly Disagree;* 5 = *Strongly Agree*). For environmental responsibility, respondents rated statements such as: “I am concerned if producers adopt practices that reduce greenhouse gas emissions.” To measure sustainable consumption attitude, respondents rated their agreement toward five statements such as “I would be willing to stop buying products from companies guilty of polluting the environment. Personal values were collected using Schwartz’s (2012) short value scale, which asked respondents to rate their levels of importance of 10 values on an 8-point Likert scale where 0 = *opposed to your principles* and 8 = *of supreme importance for you*. Data were analyzed in SPSS Version 29 using correlations following Field’s (2018) guidelines for statistical procedures and correlation coefficient effects following nomenclature from Kotrlik et al. (2011).

Results/Findings

As seen in Table 1, a series of correlations were assessed to examine the relationships between the participants’ values, the perceived environmental responsibility of the beef industry, and sustainable consumption behavior.

Table 1

Pearson Correlation Coefficients between Personal Values, Environmental Responsibility, and Sustainable Consumption Behavior

Measure	Environmental Responsibility	Sustainable Consumption
Power	.198**	.245**
Achievement	.175**	.206**
Hedonism	.201**	.206**
Stimulation	.209**	.254**
Self-Direction	.233**	.246**
Universalism	.357**	.412**
Benevolence	.228**	.247**
Tradition	.185**	.184**
Conformity	.201**	.206**
Security	.165**	.213**
Sustainable Consumption Behavior	.642**	-

Note: ** Correlation is significant at the .01 level

Conclusions and Recommendations

These findings confirm prior literature that differing personal values affect the consumer relationship and sustainable buying decisions (Lawrence, 2015). We found the values of universalism, self-direction, and benevolence are of higher importance to the public. When we communicate about beef sustainability efforts, we need to focus on highlighting how the beef industry relates to these values. Appealing to these values with targeted messages allows us to make information about the agricultural industry and its sustainable efforts relevant to the public (Fischer et al., 2021). There is a need to conduct more research on the publics’ and producers’ perception of agricultural sustainability, and what shapes these perceptions. Specifically, what messages could be developed to resonate more effectively with these audiences.

References

Dwyer, K., Lawson, C., & Fischer, L.M. (2023). An Exploratory Study of Risk Experience and Personal Values on Support for Climate Change Policies. Paper presented at the National Agricultural Communications Symposium, Oklahoma City, Oklahoma.

Fischer, L.M., Opat, K., Jennings, K., and Meyers, C. (2021). "Visualizing Values: A Content Analysis to Conceptualize Value Congruent Video Messages Used in Agricultural Communications," *Journal of Applied Communications*: Vol. 105: Iss. 2. https://doi.org/10.4148/ 1051-0834.2368

Food Insight (2023). Food trends for 2023 include wellness drinks, gut health, confusion around new labels and terminology. *Food Insight*, 1-5 https://foodinsight.org/food-trends-for-2023/

Gosnell, H., Emard, K., & Hyde, E. (2021). Taking Stock of Social Sustainability and the U.S. Beef Industry. *Sustainability*, *13*(21), 11860. https://doi.org/10.3390/su132111860

Lawrence, M., (2015). Incorporating values into sustainability decision-making, Journal of Cleaner Production, Volume 105, 146-156, ISSN 0959-6526, https://doi.org/10.1016/j.jclepro.2015.04.014.

Mancini, M.C., Menozzi, D., Donati, M., Biasini, B., Veneziani, M., Arfini, F. (2019). Producers' and Consumers' Perception of the Sustainability of Short Food Supply Chains: The Case of Parmigiano Reggiano PDO. *Sustainability*, *11*, 721. https://doi.org/10.3390/su11030721

Meng, F., Chen, H., Yu, Z., Xiao, W., & Tan, Y. (2022). What Drives Farmers to Participate in Rural Environmental Governance? Evidence from Villages in Sandu Town, Eastern China. *Sustainability*, *14*(6), 3394. MDPI AG. http://dx.doi.org/10.3390/su14063394

Petro, G. (2022). Consumers Demand Sustainable Products and Shopping Formats. *Forbes, 1-6.* https://www.forbes.com/sites/gregpetro/2022/03/11/consumers-demand-sustainable-products-and-shopping-formats/?sh=52ea3f1f6a06

Schwartz, S. H. (2012). An Overview of the Schwartz Theory of Basic Values. *Online Readings in Psychology and Culture*, 2(1). https://doi.org/10.9707/2307-0919.1116

Versace, C., & Abssy, M. (2022). How millennials and gen Z are driving growth behind ESG. *Nasdaq, 2-3.* https://www.nasdaq.com/articles/how-millennials-and-gen-z-are-driving-growth-behind-esg#:~:text=Why%3F,to%20favor%20environmentally%2Dfriendly%20products.

Wood, J. (2022,). Gen Z cares about sustainability more than anyone else – and is starting to make others feel the same way. *World Economic Forum, 2-4.* https://www.weforum.org/agenda/2022/03/generation-z-sustainability-lifestyle-buying-decisions/

Exploring the Role of Positive Emotions in Leadership Learning

Haley Q. Traini
108 Strand Ag Hall
Oregon State University
Corvallis, OR 97331
541-737-2661
Haley.Traini@oregonstate.edu

Katherine McKee
1 Lampe Dr. (Ricks Hall)
NC State University
Raleigh, NC 27695-7607
kemckee@ncsu.edu
919-515-2707

Dave Rosch
137 Bevier Hall
905 S Goodwin Ave
Urbana 61801
(217) 244-2134
dmrosch@illinois.edu

Jennifer Smist
174 Bevier Hall
905 S. Goodwin Ave
Urbana, IL 61801
217-333-3165
jsmist@illinois.edu

Robert Klein
174 Bevier Hall
905 S. Goodwin Ave
Urbana, IL 61801
217-333-3165
rcklein2@illinois.edu

Exploring the Role of Positive Emotions in Leadership Learning

Introduction/Need for Research

Research regarding the influence of emotions on learning demonstrates a strong relationship between positive emotions and learning (Fredrickson, 1998; Pekrun, et al., 2002; Rowe, et al., 2015; Schmidt, 2020; Vail, 1994). Specifically, positive emotions of joy and interest have been shown to enhance students' memory and concentration and supported students' interpersonal communication (Rowe et al., 2015). Researchers have also found correlations between positive emotions and academic task performance and achievement (Pekrun et al., 2002). However, previous studies have yet to explore how students connect emotions to their experience and learning process within the context of a postsecondary leadership course.

Classroom instruction and social environments influence students' academic emotions related to their perceptions of control and value in a classroom environment (Pekrun et al., 2002). Active learning through simulations, role-play, problem-based learning, other experiential learning activities, and psychologically safe classrooms positively contribute to learning and retention (Wolfe, 2006). Leadership educators frequently employ these collaborative and experiential learning strategies along with creating supportive and psychologically safe learning communities in leadership courses (Guthrie & Jenkins, 2018; Jenkins, 2020). In this study, we address the gap in leadership education literature regarding how leadership courses unlock students' learning and development by exploring the role of positive emotions in fostering leadership learning. Two research questions guided our inquiry: 1) *Do students experience positive emotions throughout their engagement in a postsecondary leadership course?* and 2) *In what ways do students attribute positive emotions to their experience in a leadership course*?

Theoretical Framework

We utilized Fredrickson's (1998) broaden-and-build theory of positive emotions as a lens to explore how students in a postsecondary leadership class connect the emotions they felt during class to their leadership learning. Positive emotions are "brief, multisystem responses to some change in the way people interpret-or appraise-their current circumstance" (Fredrickson, 2013, p. 3). Fredrickson's (2013) work identifies ten key positive emotions: joy, gratitude, serenity, interest, hope, pride, amusement, inspiration, awe, and love. The broaden-and-build theory postulates that experiencing positive emotions sparks current and future effects and results in enhanced well-being or flourishing. Positive emotions broaden one's thought-action repertoire in the moment, which may ignite novel ideas, boost creative thinking, and spark generosity, among other reactions. Positive emotions also build durable social, emotional, intellectual, and psychological resources that can be drawn upon and put to use in the future (Fredrickson, 2013).

Methods

All data was collected at the University of Illinois Urbana-Champaign from the Fall 2020 semester to the Spring 2022 semester. Students enrolled in leadership courses during these terms were invited to complete a questionnaire at the end of each academic semester within each course. The questionnaire included two open-ended items, "Think about how you FELT when you participated in this leadership course. What emotions come to mind?" and "How did these emotions affect your learning about leadership?" Two members of the research team began by using Fredrickson's (2013) ten representative positive emotions as provisional codes to analyze student responses to the two open-response survey items listed above (Saldaña, 2009). We then engaged in a series of initial and focused coding cycles to build an understanding of how reported positive emotions contributed to student leadership learning (Saldaña, 2009; Strauss & Corbin, 1998).

Findings

Of the 309 participants, 244 identified their primary emotion as positive, of which 225 were coded into Fredrickson's (2013) ten representative positive emotions. The most salient emotions were interest ($f = 75$), joy ($f = 49$), serenity ($f = 48$), and pride ($f = 35$). Participants attributed the positive emotions to their leadership learning in multiple and unique ways. However, three salient ideas consistently appeared which resulted in the construction of three respective themes. Theme one was *Gateway to Engagement.* Students attributed positive emotions to motivation to attend class, pay attention, and engage in the learning process. Feeling interested, happy, calm, hopeful, and amused created a desire to show up every day, eager for a new, joyful, and interesting learning experience. Experiences of joy, serenity, and hope prompted students to be more comfortable participating during class. Students also connected feelings of serenity to an increased willingness and ability to express their thoughts freely during class discussions. This was attributed to a comfortable and positive atmosphere, feeling cared for and seen, and feeling like peers and instructors valued their opinions. Theme two was *Deepening Desire to Learn*. Experiencing emotions of joy, interest, inspiration, serenity, and pride instilled a desire and drive to learn leadership concepts. Students used words like "curious", "intrigued", "confident", and "happy", among others, to capture how these emotions motivated them to understand the material taught in class, work harder on coursework, and become "eager to learn more" (interest). Theme three was *Motivation for Application*. Emotions of awe, interest, joy, pride, and inspiration allowed students to think beyond their engagement in their leadership course and begin to consider how they can use their new learning in their own lives. These emotions motivated students to change their behavior, consider future leadership opportunities, and apply their learning in numerous and diverse ways. Students felt excited, invigorated, open-minded, confident, and contemplative and these emotions sparked a desire to apply the content "within and outside of this course" (pride), make changes in their lives, and become the best leader they can be.

Conclusions/Implications/Recommendations

This study provides insight into how positive emotions might impact the learning experience of students in a leadership course. We saw how multiple emotions motivate students to show up, pay attention, participate, engage, and feel agentic in expressing their thoughts and opinions with their peers and instructors. To gain a clearer and more descriptive understanding of student emotions, we recommend future studies measure student emotions multiple times throughout the learning experience and utilize validated and reliable instruments like the modified Differential Emotions Scale (mDES) (Fredrickson et al., 2003). Finally, this study did not seek to connect thought-action repertoires to pedagogical strategies in a leadership education classroom. Future work that assesses pedagogical or other course-related phenomena (e.g., interactions with peers, faculty, the curriculum, etc.) and the more long-term durable resources it helps build will offer a more nuanced understanding of the role positive emotions play in learning leadership. However, this study opens the door for future work that acknowledge the power and importance of positive emotions in the leadership learning experience.

References

Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology*, *2*, 300–319. https://doi.org/10.1037/1089-2680.2.3.300

Fredrickson, B. L. (2013). Positive emotions broaden and build. In *Advances in Experimental Social Psychology* (Vol. 47, pp. 1-53). Academic Press. https://doi.org/10.1016/B978-0-12-407236-7.00001-2

Fredrickson, B. L., Tugade, M. M., Waugh, C. E., & Larkin, G. R. (2003). What good are positive emotions in crisis? A prospective study of resilience and emotions following the terrorist attacks on the United States on September 11th, 2001. Journal of Personalist and Social Psychology, emotions(5), 904-917.

Guthrie, K. L., & Jenkins, D. M. (2018). *The role of leadership educators: Transforming learning.* Information Age Publishing.

Jenkins, D. M. (2020). What the best leadership educators do: A sequential explanatory mixed methods study of instructional and assessment strategy use in leadership education. *Journal of Leadership Education, 19*(4), 37–55. https://doi.org/10.12806/V19/ I4/R4

Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' self-regulated learning and achievement: A program of qualitative and quantitative research. *Educational psychologist*, *37*(2), 91-105. https://doi.org/10.1207/S15326985EP3702_4

Rowe, A. D., Fitness, J., & Wood, L. N. (2015). University student and lecturer perceptions of positive emotions in learning. *International Journal of Qualitative Studies in Education*, *28*(1), 1-20. https://doi.org/10.1080/09518398.2013.847506

Saldaña, J. (2009). *The coding manual for qualitative researchers.* Sage Publications.

Schmidt, S. J. (2020). Exploring the influence of course elements and emotional connection to content on students' approaches to learning in an introductory food science and human nutrition course. *Journal of Food Science Education, 19*(2), 59–73. https://doi.org/10.1111/1541-4329.12180

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research techniques*. Sage.

Vail, P. L. (1994). *Emotion: The on/off switch for learning.* Modern Learning Press.

Wolfe, P. (2006), The role of meaning and emotion in learning. *New Directions for Adult and Continuing Education, 2006*(110): 35-41. https://doi.org/10.1002/ace.217

Exploring the Types of Career Advancement Support Florida Early Career Extension Agents Receive from their Mentors

Matt Benge
126B Bryant Hall
PO Box 112060
Gainesville, FL 32610
352-294-1996
mattbenge@ufl.edu

Karlibeth Leitheiser
408 Rolfs Hall
PO Box 110540
Gainesville, FL 32611
kleitheiser@ufl.edu

Exploring the Types of Career Advancement Support Florida Early Career Extension Agents Receive from their Mentors

Introduction and Theoretical Framework

Extension agents deliver research-based educational programs and consultations based on identified needs throughout the state of Florida (Seevers et al., 1997). Early career extension agents often experience a variety of challenges during their first year on the job (Benge & Beattie, 2021), whereby making the onboarding and training process crucial in determining current and future success of newly hired employees (Martin, 2011). Mentorship is a key component of onboarding of Florida extension agents. Newly hired extension agents are paired with a mentor to guide them through the first phase in their career. Mentorship can take many forms and there is little evidence or data exploring the types of support newly hired extension agents are receiving from their mentor.

A mentor can be defined as a seasoned, influential member of an organization who supports new members through advice on organizational values, norms, and accepted behaviors (Mincemoyer & Thomson, 1998). A mentoring relationship requires intentional investment from the mentor and set expectations from both parties (Shellhouse et al., 2021). The traditional functions of mentorship include career development, psychosocial support, and role modeling. Career development functions include sponsorship, exposure-and-visibility, coaching, protection, and challenging assignments. Psychosocial functions include role modeling, acceptance-and-confirmation, counseling, and friendship (Kram, 1983). Role modeling can be perceived as its own function of mentorship, separate from psychosocial support (Scandura & Ragins, 1993). Role modeling refers to the action of modeling behaviors that proteges wish to replicate. Mentors form connections with their protégé through effective counseling, nurturing creativity, corrective action, fostering growth and development, sharing past experiences, and friendship (Balu, 2017). Successful mentoring relationships promote a healthy, professional environment that develops trust, defines roles and responsibilities, establishes goals, and problem-solving skills (Byington, 2010).

Purpose and Research Question

This study is part of a larger study exploring the onboarding experiences of Florida early career Extension professionals. The research question guiding this study was, what type of career advancement support are Florida early career extension professionals receiving from their mentors? This study aligned with priority three of the 2016-2020 National Research Agenda - Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century (Roberts et al., 2016).

Methods

The target population for my study were Florida extension agents who had been on the job for six months ($N = 51$). The UF/IFAS Extension Business Service Office provided me with a list of new agents every month, and at the agents' six-month mark on the job I emailed them asking if they would participate in an interview. I used a phenomenological qualitative design (Moustakas,

1994) utilizing one-on-one interviews via Zoom. I created a semi-structured interview guide consisting of five questions such as (1) do you have a mentor?, (2) how often do you talk to your mentor?, and (3) can you describe what type of guidance your mentor has given you on how to advance in your career? I obtained approval from the University of Florida Institutional Review Board prior to conducting our study. Out of the 51 new agents in the target population, 24 new agents agreed and completed an interview. I conducted interviews over a twelve-month span to capture new agent experiences at their six-month of hire, with the interviews ranging from 19 to 31 minutes in length. I audio recorded and transcribed interviews verbatim, and organized, coded, and analyzed the data using the phenomenological reduction method by Stevick-Colaizzi-Keen as modified by Moustakas (1994). I used five strategies to maintain credibility of study, as Eisner (1991) stated that establishing credibility within qualitative research "allows us to feel confident about our observations, interpretations, and conclusions" (p. 110). These strategies included investigator triangulation, peer debriefing, member checking, thick and rich descriptions, and clarifying researcher bias.

Findings

The new extension agent hires shared that their mentors were providing career advancement support on the following fourteen topics: (a) advisory boards, (b) contacts list/management, (c) conducting joint programming, (d) connecting to Specialists, (e) evaluation (methods and management, (f) marketing, (g) natural disaster preparedness, (h) objectives/goals, (i) Programmatic/content specific information, (j) annual reporting, (k) scholarship opportunities, (l) supervising program assistants, (m) training and development, and (n) volunteerism management and training. One of the participants, a 4-H agent that serves a rural county, explained how their mentor helped guide them through a challenging volunteer situation:

> At the beginning of the 4-H year I had recruited three new club volunteers. We are a very small county, and three new volunteers is wonderful. Well, I had to [release] 2 of my 3 volunteers already. So, that was a big to do, and I really didn't know how to handle the situation. So being able to talk to her about the situation and then looking at the options and how it should be handled, that was definitely a really big help to me. I definitely needed her help during that time because I would not have known what to do

Conclusions, Implication, and Recommendations

Findings from the interviews indicated early career agents receive a variety of career development support (Kram, 1983) from their mentors, where similar results were reported by previous literature (Harder et al., 2021). Mentees are looking to their mentors for guidance on professional and programmatic tasks during the first phase of their career, and our results can be used to help both mentors and mentees facilitate discussion during one-on-one mentorship meetings. Administrators and professional development specialists can also use these results to enhance Extension onboarding processes, curriculum development, and resource guides for mentorship programs. Future research could address the gaps of mentor support in other mentorship areas to ensure mentors are providing adequate support across all functions. A similar study could address the mentor functions of Extension state specialists as their mentoring needs might differ from those of county-based Extension professionals.

References

Balu, L. (2017). Facilitating protégé career development through skills of mentors. *Journal of Education and Practice*, *8*(4), 39–44. https://iiste.org/Journals/index.php/JEP/article/view/35446

Benge, M., & Beattie, P. (2021). Challenges of early career extension agents in Florida. *Advancements in Agricultural Development*, *2*(1), 42–55. https://doi.org/10.37433/aad.v2i1.87

Eisner, E. W. (1991). *The enlightened eye. Qualitative inquiry and the enhancement of educational practice*. Macmillan.

Harder, A., Narine, L. K., Benge, M., Denny, M., & Farner, K. (2021). Exploring early career Extension agents' perceptions of their mentors, best liked coworkers, and organizational commitment. *Journal of Human Sciences and Extension*, *9*(2), 80-95. https://www.jhseonline.com/article/view/1162/909

Kram, K. E. (1983). Phases of the mentor relationship. *The Academy of Management Journal*, *26*(4), 608–625. https://doi.org/10.2307/255910

Martin, M. J. (2011). *Influence of human resource practices on employee intention to quit* [Doctoral dissertation, Virginia Polytechnic Institute and State University]. https://vtechworks.lib.vt.edu/bitstream/handle/10919/28424/Martin_MJ_D_2011.pdf?sequence=1

Mincemoyer, C. C., & Thomson, J. S. (1998). Establishing effective mentoring relationships for individual and organizational success. *Journal of Extension*, *36*(2) Article 2FEA2. https://archives.joe.org/joe/1998april/a2.php

Moustakas, C. (1994). *Phenomenological research methods*. Sage.

Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). *American Association for Agricultural Education national research agenda: 2016-2020*. Gainesville, FL: Department of Agricultural Education and Communication.

Scandura, T.A., & Ragins, B.R., (1993). The effects of sex and gender role orientation on mentorship in male-dominated occupations. *Journal of Vocational Behavior*, *43*(3), 251-265. https://doi.org/10.1006/jvbe.1993.1046

Seevers, B., Graham, D., Gamon, J., & Conklin, N. (1997). *Education through Cooperative Extension*. Delmar Publications.

Shellhouse, J.A., Suarez, C.E., Benge, M., & Bunch, J.C. (2021). Mentoring mentality: Understanding the mentorship experiences of national FFA officers. *Journal of Agricultural Education*, *62*(1), 29-46. http://doi.org/10.5032/jae.2021.01029

Food As a Commodity: Network Analysis and The Des Moines Community

Morgan Bradley
Agriculture Education Program Manager
Appalachian Sustainable Development
280 Boone Trail Rd, Duffield, VA 24244
mbradley@asdevelop.org

Samuel Ikendi
Academic Coordinator for Climate Smart Agriculture
Division of Agriculture and Natural Resources
University of California – Merced
427 Sustainability Research and Engineering Building
5200 N. Lake Road, Merced, CA 95343
sikendi@ucanr.edu

Jane Rongerude
Associate Professor
Department of Community and Regional Planning
Graduate Program in Sustainable Agriculture
College of Design
Iowa State University
146 Design Building
715 Bissell, Ames, IA 50011
jrong@iastate.edu

Mônica Haddad
Professor
Department of Community and Regional Planning
Graduate Program in Sustainable Agriculture
Director of the GIS Certificate
Equity Advisor in the College of Design
Iowa State University
583 Design Building, 715 Bissell Road, Ames, IA 50011
haddad@iastate.edu

Food As a Commodity: Network Analysis and The Des Moines Metropolitan Community

Introduction/Need for the Study

Many people in the United States lack access to healthy food, especially people of color, those in urban areas, households with children, and low-income households (Alkon & Agyeman, 2011). This research delved into the meaning of food to best address issues in the food system – defined as "the aggregate of food-related activities and the environments … within which these activities occur" (Pinstrup-Andersen & Watson, 2011, p. 4). The food system is therefore intimately tied to broad social systems. This study sought to answer the question "***what does food mean?***" at the network and community development organization levels to better understand how to integrate food into the food system planning, implement improvements, and provide food for all.

Conceptual Framework

A network analysis was used to explain the food system of Des Moines, Iowa, its community, and the relationships among food organizations. Network analyses document the "connections between and among organizations, individuals, collectives, and social structures to understand the phenomena under study" (Broad, 2016, p. 28). The analyses expose the connections among people or organizations and the flow of information, power, and influence among them. When organizations and/or people are connected, they are more likely to choose the same option or path (Granovetter, 1973). Network analyses reveal strong ties, weak ties, people, and institutions that are central in networks and can help identify areas of the relationships that can be improved or built upon (Borgatti et al., 2009). These relationships tell a story in themselves; they explain which organizations have similar goals or strategies; who or what is most established in the region; and how food justice efforts may be bolstered through development of relationships.

In network analysis, centrality is another important element that refers to the prominence of a node in the network (Borgatti et al., 2009). More central organizations have a greater potential to influence the system at large because they are important connections for many organizations. This analysis is important, for instance, an organization with many strong ties to other organizations could be utilized in a leadership position due to its influence in the network – a crucial tool that helps in strategic food justice implementation. Network analyses not only identify where organizations can improve collaboration but also where barriers to action exist (Rongerude & Christianson, 2014) so they may be addressed. Food justice initiatives may increase the efficacy of their work by making connections between everyday life and broader social, economic, and ecological issues (Levkoe, 2014). Connections among organizations are important in alternative food movements because of a lack of funding and other resources.

Methodology

A total of 44 individuals were surveyed from 33 Des Moines food organizations involved in food security measures in this network analysis. Food organizations include grocery stores, county, and state health and wellness departments; Des Moines parks and recreation; non-profits; churches involved in food charities; food banks and pantries; soup kitchens; restaurants that donate food or time; and notable community members involved in food. These organizations or companies were included in the survey because they play an important role in the food system. Though grocery stores do not often directly assist with food access, they often have relationships with organizations that perform "food rescue" and donations (de Hooge et al., 2017). Similarly, governmental agencies are important players in food access, food safety, and efforts to increase the well-being of citizens. Schools are vital organizations included in this survey, for instance, the Des Moines school system provides free breakfast for all students. To analyze the responses to the survey and create a network diagram, we used the program – Gephi 0.9.2, an open-source software, to create visual graphics of networks (Bastian et al., 2009). We grouped organizations by their primary role, assigning specific colors to each group. The organizations were grouped as: food-oriented non-profits; food pantries (which fall under food-oriented non-profits); refugee-oriented non-profits; other non-profits government entities; schools; and vendors. Organizations are "nodes" while their connections are "ties" in this network analysis.

Results

The analysis of the Des Moines (DSM) area food system reveals strong and weak ties between organizations within the food system. The thickness of the connecting lines between organizations are indicative of the strength, or type of the tie or connection. The size of the node that represents each organization is proportional to its centrality in the region. Analysis revealed that the DSM Area Religious Council (DMARC), Eat Greater DSM (EGDM), and three refugee-oriented non-profits (Ethnic Minorities of Burma Advocacy and Resource Center (EMBARC), Refugee Alliance of Iowa (RACI), and Global Greens are the most central agencies with the strongest ties in this network. The City of DSM, Bidwell Riverside Center (a food pantry), the Polk County Health Department, and DSM Public Schools are secondarily central in the network. These results indicate that these organizations have the most influence over the food assistance landscape of Des Moines.

Similarly, while connections exist among organizations, there are just a few main "hubs" that connect the entirety of food access organizations in DSM. When asked about the most important partners organizations work with, nearly every respondent reported that DMARC, the Food Bank of Iowa, and EGDM were the most vital partnerships to their organization. This points to the success of EGDM, a food council, and also the importance of food banks in the region. Many of the central organizations are focused on the production of food: the City of DSM and Global Greens maintain garden space for residents and refugees; EGDM is a food system council focused on the production of food; others are focused on refugee services, such as EMBARC and RACI. The network illustrates that the food system of central Iowa is focused on the production of food as well as refugee services. DMARC and Global Greens' centrality are important. It means the faith-based aid organizations are some of the most important in food access.

Conclusion

Network analysis shows the connections and their strength among food organizations in DSM. By including food-oriented non-profits, food pantries, schools, government agencies, refugee-oriented non-profits, and vendors, it shows the flow of information and the hubs of power and influence in the area. It also illuminates the focal points of the DSM area food system: refugees, production, and the status quo of pantries, where most central organizations are focused on food production for the communities.

Implications

This network analysis points to a need to develop deeper connections among organizations involved in food access in the DSM region. Greater collaboration and network development can result in better services, resources, and knowledge sharing. Understanding the network of food organizations in the DSM area food system is imperative to increasing food justice and equity, but there are still gaps in the knowledge. To address these gaps, place-based organizations need to be analyzed as well as the lived experiences of people within the community.

References

Alkon, A. H., & Agyeman, J. (Eds.). (2011). *Cultivating food justice: Race, class, and sustainability*. Cambridge, MA: The MIT Press.

Bastian, M., Heymann, S., & Jacomy, M. (2009, May 17–20). Gephi: An open source software for exploring and manipulating networks. *In Proceedings of the International Association for the Advancement of Artificial Intelligence Conference on Weblogs and Social Media, 3*(1), 361–362. San Jose, CA, United States. https://doi.org/10.1609/icwsm.v3i1.13937

Borgatti, S. P., Mehra, A., Brass, D. J., & Labianca, G. (2009). Network analysis in the social sciences. *Science, 323*(5916), 892–895. https://doi.org/10.1126/science.1165821

Broad, G. M. (2016). *More than just food: Food justice and community change*. Oakland, CA: University of California Press.

de Hooge, I. E., Oostindjer, M., Aschemann-Witzel, J., Normann, A., Loose, S. M., & Almli, V. L. (2017). This apple is too ugly for me! Consumer preferences for suboptimal food products in the supermarket and at home. *Food Quality and Preference, 56*, 80–92. https://doi.org/10.1016/j.foodqual.2016.09.012

Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology, 78*(6), 1360–1380. https://www.jstor.org/stable/2776392

Levkoe, C. Z. (2014). The food movement in Canada: A social movement network perspective. *The Journal of Peasant Studies*, *41*(3), 385–403. https://doi.org/10.1080/03066150.2014.910766

Pinstrup-Andersen, P., & Watson II, D. D. (2011). *Food policy for developing countries: The role of government in global, national, and local food systems*. Cornell University Press.

Rongerude, J., & Christianson, E. (2014). Network analysis of affordable housing organizations in Polk County. *Resilient Neighborhoods Technical Reports and White Papers. 6.* https://core.ac.uk/download/pdf/38900419.pdf

Food as Lived Experience: A Photovoice with High School Youth

Morgan Bradley
Agriculture Education Program Manager
Appalachian Sustainable Development
280 Boone Trail Rd, Duffield, VA 24244
mbradley@asdevelop.org

Samuel Ikendi
Academic Coordinator for Climate Smart Agriculture
Division of Agriculture and Natural Resources
University of California – Merced
427 Sustainability Research and Engineering Building
5200 N. Lake Road, Merced, CA 95343
sikendi@ucanr.edu

Jane Rongerude
Associate Professor
Department of Community and Regional Planning
Graduate Program in Sustainable Agriculture
College of Design
Iowa State University
146 Design Building
715 Bissell, Ames, IA 50011
jrong@iastate.edu

Mônica Haddad
Professor
Department of Community and Regional Planning
Graduate Program in Sustainable Agriculture
Director of the GIS Certificate
Iowa State University
583 Design Building, 715 Bissell Road, Ames, IA 50011
haddad@iastate.edu

Food as Lived Experience: A Photovoice with High School Youth

Introduction/Need for the Study

Understanding the lived experiences of individuals is a vital component of a complete food justice perspective (Bradley, 2019; Broad, 2016). Lived experiences reveal ***what*** is happening to people without which we cannot fully identify solutions to issues in the food system (Fischler, 1988). In this study, students were asked to provide their perspectives on food through art which culminated in a community gallery show. Youth provide a unique perspective because of their lack of economic responsibility and somewhat limited awareness of food issues. They provide a uniquely insurgent potential for intervention. This inquiry explored the lived experiences of youth related to food through their photography and conversations.

The Photovoice

The phenomenological perspective, much aligned with the photovoice methodology, is the description and interpretation of human experience (Seamon, 2013). It recognizes that the world is shaped and interpreted by humans, finding that meaning comes from human experience. The world is meaningful and that meaning comes from the amalgamation of meanings people ascribe to the world through their experiences. Meaning can be altered by social networks, personal experiences, and the context of the world surrounding us (Seamon, 2013). This view is useful in understanding individual perspectives on food, as it is deeply engrained and integrated into daily life. Photovoice allows participants to use art and their narratives to explain their lived experiences. Understanding these lived experience grounded this research in real-life events and allowed investigators to understand how and where radical food movements occur on a personal level in the community. Speaking with the youth provides a unique perspective which gives information on institutions such as schools, families, community programs, and social dynamics.

Methodology

This photovoice involved three conversations: a focus group with all participants; a one-on-one or two-on-one interview participants; and a final meeting with all students. Each participant gave permission to use their names in the publications but only first names are used here. Joyce and Patience are sophomores; Joyce arrived in the U.S. at three months old from Cote d'Ivoire and Patience arrived at three years old from the same country. T'sheten came from Southeast Asian when she was three years old. Ikra from Somalia had spent years in Kenya before immigrating to Iowa. Zach and Mary, juniors, are the only white participants in the study. We had conversations in a conference room at Creative Visions – a place-based, black owned community-centered nonprofit. Holding conversations in a place that provides food assistance likely brought food security to the forefront of the participants' minds. I met with the participants prior to this conversation at their school. I arrived early with snack foods, both healthy and unhealthy, and ordered a pizza. The students arrived in pairs or alone. Once everyone was settled around the conference table and the recording devices were in place, we started our conversation. After going over the consent forms, we jumped into a discussion about food. Rather than starting with a generic ice breaker, I brought a large poster board and asked everyone to – while getting food and snacks – write or draw on the poster board something that explains what food means to them. We took turns responding and asking follow-up questions of the participants when they explained their answers. Participants immediately identified most of the major themes I had researched pertaining to food studies. In the second round, I met with participants alone or in pairs. Because I brought food items to each meeting, we had a conversation about what they ate. Joyce added to the poster during our interview. The next day, I met with Joyce and Patience again, this time with their photos of food. A third conversation was scheduled to come back together to discuss the project and reflect on what they learned and how they felt about the work. I met with participants enough to gain their narratives and an understanding of their lived experiences with food. Finally, the culmination of the photovoice project was an ***art show*** held at [organization] to empower participants and incite action with people from other organizations.

Results

Three themes emerged that we categorized as food means “body/health”, “care”, and “identity”. ***Food means body,*** **y**ou are what you eat is one statement that was iterated during our first meeting. On the poster, participants wrote energy, sustenance, energy and health, pointing to their knowledge of the importance of food in physical and even mental performance. One participant said, “people eat too much McDonald’s”, implying there are too may unhealthy foods in the region. Most participants reported regularly eating at home with their families and discussed the importance of health and knowing what one puts into their body. Mary’s mention of carb-loading for swimming pertains to health; food is necessary to maintain energy levels, but with consuming the correct amount. ***Food means care,*** *s*tudying food and the relationship it has to the home and family unit can uncover issues in power, societal expectations, and structures. Zach talked about his mother in his first photo. He talked about how children who play outside often come in briefly, ask their mother to make some food, then rush back out to climb more trees. He specifically mentioned ***mother, not father*** in this statement. Likewise, Ikra, T’sheten, Patience, and Mary all mentioned their mothers when discussing family dinners. They implied their mothers are the ones responsible for making food for the family. Ikra, Patience, and Joyce all talked about having responsibilities of cooking, too; “sometimes, mom tells me like, “you’re cooking tomorrow”” Joyce reported; T’sheten replied, “I cook for my sister.” It is clear these students have responsibilities when it comes to food that relate to family dynamics**. *Food means identity:*** identity and culture were the most talked about themes. It was not surprising with such a diverse group of youth. I asked Joyce and Patience about where they buy their groceries. While their mothers do shop at C Fresh (a local international grocery store), Wal-Mart, … but they also African stores. They were not aware of their names, but said, “There are a lot of African stores but they’re very… closed off. It won’t really look like a store unless you go inside.” T’sheten spoke of Asian food stores but also of how foods bring different culture together. “I think [food] also brings people together, like, from different cultures. You’re not forgetting your culture.”

Conclusion

This photovoice project revealed the importance of food in daily life for youth and for community members. The themes – health, care, and identity – were revealed to be important to the participants. Participants mentioned health in a dogmatic manner; these youth have been told about the importance of paying attention to health of food. The conversations and attention were much more dynamic and energetic when they focused on care and identity. This group of participants included four immigrants, so the tie to identity was strong among them.

Implications

Understanding the lived experiences related to food is vital to food justice initiatives. If interventions are not reflected in the everyday lived experiences of the target population, they will not succeed. Youth have the unique perspective of immersion in family and friend culture while remaining free of economic responsibility for food. The themes these participants came up with indicate what is important in their food system. The perspectives of these youth fill a gap that must be addressed in food justice initiatives informed by storytelling and lived experiences.

References

Fischler, C. (1988). Food, self and identity. *Social Science Information, 27*(2), 275–292. https://doi.org/10.1177/053901888027002005

Seamon, D. (2013). Lived bodies, place, and phenomenology: Implications for human rights and environmental justice. *Journal of Human Rights and the Environment, 4*(2), 143–166. https://doi.org/10.4337/jhre.2013.02.02

Broad, G. M. (2016). *More than just food: Food justice and community change*. University of California Press.

Bradley, M. (2019). *What does food mean? A multi-scale investigation into Des Moines, Iowa* [Masters' Thesis, Iowa State University). Graduate Theses and Dissertations. https://dr.lib.iastate.edu/handle/20.500.12876/31592

Growing Ag Teachers: What is Our Yield?

Amy R. Smith
Associate Professor and Program Leader
University of Minnesota
146 Ruttan Hall
St. Paul, MN 55108
(612) 624-6590
arsmith@umn.edu

Daniel Foster
Associate Professor
The Pennsylvania State University
212 Ferguson Building
University Park, PA 16802
(814) 863-0192
foster@psu.edu

Rebecca Lawver
Department Head & Professor
Applied Sciences, Technology and Education
Utah State University
1498 N 800 E | ASTE 101C
UMC 2300
Logan, UT 84321
(435) 797-1254
rebecca.lawver@usu.edu

Michael Spiess
Professor Emeritus
California State University, Chico
College of Agriculture
Chico, CA 95929-0310
(530) 521-6866
mspiess@csuchico.edu

Growing Ag Teachers: What is Our Yield?

Introduction

Like colleagues in production agriculture who grow crops, in agricultural teacher education programs, we strive to "grow" agriculture teachers. Just like any production agriculturalist, it is critical that we take a moment to reflect and analyze our yield as a measure of productivity. Numerous studies on behalf of the profession (Lawver, et al., 2018, etc) regarding the supply of school-based agricultural education (SBAE) teachers have documented a shortage. One strategy to address this shortfall is to simply increase the number of program completers who take jobs in SBAE. Boe et al. (1999) described yield in teacher education as "The yield percentage for degree graduates from teacher preparation programs in one school year who entered teaching employment during the following school year". Historically, yields for agricultural teachers have fluctuated, with times in the mid 1980s reaching levels below 50% (Kantrovich, 2010). Lawver et al. (2018) reported the average yield for 2014-2016 as 72%. While the national yield has been published regularly (Smith et al., 2022, Foster et al., 2020, Foster et al., 2019), each state has varying requirements for program completers which can make it challenging to increase yield. The goal of this study was to quantify the yield of program completers/new agricultural teachers by state using National Supply and Demand data collected from 2017 to 2021.

Conceptual Framework

The conceptual framework for the National Supply and Demand (NSD) study (adapted from Lyndsey et al., 2009) identifies factors contributing to SBAE teacher supply and demand. Five factors on the supply side of the model include: (1) SBAE teachers retained from previous year; (2) newly certified SBAE teachers from university-based teacher preparation programs; (3) SBAE teachers from alternative certification programs; (4) SBAE teachers in-migration: certified educators moving in from other states; and (5) SBAE reserve pool: educators who are willing and able to teach, but not currently employed.

Methods

This study is a review of newly licensed SBAE program completers' (PCs) employment as reported by agricultural teacher education programs. The objectives that guided this study were: 1) describe SBAE program completer placement trends from 2017-2021 and 2) compare regional SBAE yield to vacant positions as reported in the NSD Study. The study extracted five years of data (2017-2021) from the NSD study, as approved by the Institutional Review Board at [University]. Data presented highlights supply data collected from institutions offering agricultural education teacher licensure. These institutions were listed within the NSD study frame, as key contacts at universities with agricultural teacher education programs. Given the nature of the NSD study, the supply instrument was developed from previous iterations with additions and revisions based on literature and feedback from a panel of experts to ensure validity. Reliability was found appropriate for a descriptive study. Data was collected using Qualtrics, in accordance with Dillman's (2014) guiding principles.

Results and Findings

On average, 85 institutions with agricultural teacher education programs responded annually during the study period, representing 43 states and Puerto Rico. It should be noted that not all states have agricultural teacher education programs. Nationally, an average of 75% of program completers (PCs) accepted positions in school-based agricultural education upon completion of licensure requirements. During this time, the yearly combined average number of PCs produced was 814, with 201 not accepting positions in SBAE upon completion. During the same time, state staff reported an average of 68 vacant positions remained on an annual basis. No significant national trend in yield was observed over the study period with the annual yield range from 74% to 77% (Table 1). A wide range was found within states over the 5-year period. The minimum yield was 27%, with a maximum of 93%. Seven states reported yields exceeding 85%. Eight states reported yields below 60%. The average of all yields, or mean yield, was 72%. As one might expect, variation of yield by year occurs within states over the study period, especially states with smaller programs.

Table 1

National Annual Yield of Program Completers Entering SBAE

Year	Vacant	Institutions	Program Completers	Employment SBAE	Yield
2017	76	88	730	554	76%
2018	69	87	873	654	75%
2019	59	89	851	658	77%
2020	51	82	855	634	74%
2021	82	78	763	567	74%
Total	337	424	4072	3067	75%

Regional yield of program completers is reported in Table 2. Since states have varying requirements for licensure and teacher preparation programs differ, direct comparison between states should not be made. However, in states where there are multiple institutions preparing SBAE teachers (21 states in 2021), comparison between institutions might be instructive.

Table 2

AAAE Regional Yield of Program Completer from 2017-2021

AAAE Region	Reports	Program Completers	Employment SBAE	Yield
North Central	168	1383	1055	76%
Southern	189	2007	1435	71%
Western	67	682	577	85%
Total	424	4072	3067	75%

Conclusions/Recommendations for the Profession

Students that complete an agricultural teacher education program have already demonstrated some commitment to joining the profession. However, what can be done to encourage more to enter SBAE? Anecdotally, program completers may pursue other opportunities due to lack of positions where they need to live or better offers outside the teaching profession. However, given the pervasive shortage we face in SBAE, more information is needed. Given the diversity of state approaches, each state should examine their programs to determine if there are opportunities to increase yield of program completers into teaching in SBAE. Further exploration of the reasons for not teaching might lead to insight on what or how to entice program completers into teaching. PCs that choose not to teach also represent a pool of potential teachers to recruit in the future. Strategies geared at tapping this pool might help increase the teacher supply. Bos et al. (1999) found that 27% of 1993 vocational education graduates delayed entry in the workforce by a year.

References

Boe, E. E., Cook, L., Paulsen, C., Barkanic, G., & Leow, C. (1999) *Productivity of Teacher Preparation Programs: Surplus or Shortage in Quantity and Quality of Degree Graduates*. Philadelphia Center for Research and Evaluation in Social Policy. Data Analysis Report No. 1999-DAR2. Retrieved from: https://eric.ed.gov/?q=Productivity+of+Teacher+Preparation+Programs&id=ED434107

Dillman, D. A., Smyth, J. D., Christian, L. M., & Dillman, D. A. (2014). *Internet, mail, and mixed mode surveys: The tailored design method*. Hoboken, N.J: Wiley & Sons

Foster, D. D., Lawver, R. G., & Smith, A. R. (2021). *National Agricultural Education Supply and Demand Study, 2020 Executive Summary.* Retrieved from: http://aaaeonline.org/Resources/Documents/NSD2020Summary.pdf

Foster, D. D., Lawver, R. G., & Smith, A. R. (2020). *National Agricultural Education Supply and Demand Study, 2019 Executive Summary.* Retrieved from: http://aaaeonline.org/Resources/Documents/NSD2019Summary.pdf

Kantrovich, A. J. (2010). *The 36th volume of a national study of the supply and demand for teachers of agricultural education, 2006-2009.* West Olive, MI: Michigan State University, American Association for Agricultural Education.

Lawver, R. G., Foster, D. D., & Smith, A. R. (2018). *Status of the U.S. Supply and Demand for Teachers of Agricultural Education, 2014 - 2016*. Retrieved from: http://aaaeonline.org/Teacher-Supply- and-Demand

Lindsay, J. J., Wan, Y., & Gossin-Wilson, W. (2009). *Methodologies used by Midwest Region states for studying teacher supply and demand (Issues & Answers Report, REL 2008–No. 080)*. Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Midwest. Retrieved from http://www.eric.ed.gov/?id=ED506631

Smith, A. R., Foster, D. D., & Lawver, R. G. (2022). *National Agricultural Education Supply and Demand Study, 2021 Executive Summary.* Retrieved from: http://aaaeonline.org/Resources/Documents/NSD2021Summary.pdf

Identifying Conflict Styles of Agriculture Students at an HSI

Steven Boot Chumbley

Associate Professor

Texas A&M University-Kingsville

steven.chumbley@tamuk.edu

Eugenio Conklin

Graduate Student

Texas A&M University-Kingsville

Eugenio.conklin@tamuk.edu

Identifying Conflict Styles of Agriculture Students at an HSI

Introduction

Everyone has to deal with conflict from time to time. Conflict is a natural outcome in any setting in which people interact with each other (Chandolia & Anastasiou, 2020). While the word “conflict” may have a negative connotation, it can often lead to positive outcomes when handled well, such as an exchange of ideas. Unfortunately, conflict can also result in negative outcomes when not handled well, such as poor communication and a difference in values and views (Chandolia & Anastasiou, 2020). In order to work towards positive outcomes of conflict, it is important to first understand how you personally handle conflict as well as the ways others may handle conflict. In this study, the researcher will be looking to identify the styles of conflict present in the agriculture students at Texas A&M University-Kingsville, a regional Hispanic Serving Institution (HSI).

Conceptual Framework

A theoretical framework for understanding differences in conflict resolution styles is grounded in the development of the Intercultural Conflict Style Inventory (Hammer, 2005). Towards this a practical, four-quadrant intercultural conflict resolution style model is proposed based on high/low levels of directness and high/low levels of emotional expressiveness: (1) discussion style (direct & emotionally restrained), (2) engagement style (direct & emotionally expressive), (3) accommodation style (indirect & emotionally restrained) and (4) dynamic style (indirect and emotionally expressive).

Methodology

This descriptive study sought to determine the different conflict styles of students enrolled within the Texas A&M University-Kingsville. The researcher used the Intercultural Conflict Style (ICS) created by Mitchell R. Hammer to determine the students’ conflict styles. The ICS Inventory was completed in the Summer and Fall of 2022 by students of three classes: AGRI 4350 (Collective Leadership), AGSC 5361 (Facilities for Agriculture Science), and AGSC 1451 (Introduction to Agriculture Systems). There was a total of 66 students participating in this study.

Within the ICS, there are two parts, a survey and graph, along with an interpretive guide that was given to each participant. Scores were measures on two scales; Direct/Indirect (D/I) score and an Emotionally Expressive/Emotionally Restrained (E/R) score. Using these scores, the researcher can put a participant into one of four conflict styles, the Discussion style (Direct and Emotionally Restrained), the Engagement style (Direct and Emotionally Expressive), the Accommodation style (Indirect and Emotionally Restrained), and the Dynamic style (Indirect and Emotionally Expressive).

Dr. Hammer used a panel of experts to create the content of the inventory by evaluating their meaning using a focus on their direct/indirect or emotional expressive/ restrained communication. The instrument was also assessed by one graduate student, two faculty in agricultural science, and one faculty within the Spanish language arts department. In regard to validity the ICS can be generalized based on biological sex, education and time spent within communities of other cultures. The original ICS had a coefficient alpha of .73 for the direct/

indirect scale and a .85 for the emotional expressive/ emotional restraint scale. For this study an overall alpha coefficient of .79 was found.

Findings

All four conflict styles were found among the participants. 4.5% of participants were in the Dynamic style, 7.6% were in the Engagement style, 22.7% in the Accommodation style, and a majority (65.2%) were found within the in the Discussion style on the ICS. the Direct and Indirect (D/I), as well as the Emotionally Expressive and Emotional Restraint (E/R) scales of the instrument. The D/I, and E/R scores were then graphed in order to determine the participants conflict style. The overall mean score among participants for D/I was (M = 35.73, SD = 7.70) while the mean score for E/R was (M = 20.95, SD = 8.43).

Conclusions & Recommendations

While the study found participants in all four styles of conflict, almost 88% of students participating were found in either the Discussion style or the Accommodation style. . These findings are slightly different then the findings of Alagozlu in (2017), which found American college students to most likely be categorized within the Engagement style. Both of these styles are characterized by Emotional Restraint as opposed to Emotional Expression, meaning that these students are likely use limited nonverbal communication and present themselves in a calm manner during conflict. Students in the Discussion style, however, are going to be more direct as it relates to dealing with conflict. They are more likely to explain exactly what they want or need to the other party. The Accommodation style is characterized by a more indirect approach, meaning people in this category are more likely to use analogies or metaphors during conflict and focus more on maintaining a relationship that fighting the root of the conflict.

When looking at Hammer's Interpretive guide (2003) he states that North American cultural patterns are primarily found within the Discussion style of conflict resolution. He also states that cultural patterns of Latin America can primarily be found within the Accommodation style. The North American cultural patterns mixed with Latin American cultural patterns found in South Texas could be one reason why we see that a majority of participants from this study can most likely be categorized within the Discussion style, and the second highest percentage of students categorized within the Accommodation style.

Some recommendations for research would include replicating this study at similar Hispanic Serving Institutions (HSI). This would help to further validate the results of this study with students from similar demographic backgrounds. A larger sample size would also be recommended if further research or replication were to be performed. The larger sample size would allow for better representation across the board for each demographic.

The researchers recommend incorporating training and use of the ICS in other courses. This will create an environment in which students can understand each other and the ways each person communicates in times of conflict. It is recommended that educators have those "tough" conversations about cultural differences with the individuals in their classroom. Allowing individuals to group share about cultural differences in a safe environment will add to the understandings that each individual has with each other. The ICS is just one way that both educators and students can immerse themselves in conflict resolution styles that may be different from their own.

References

Alagozlu, N. (2017). Cross cultural conflict resolution styles: Data revisited. *International Online Journal of Education and Teaching*, 4(3), 199-211.

Chandolia E, Anastasiou S. (2020). Leadership and Conflict Management Style Are Associated with the Effectiveness of School Conflict Management in the Region of Epirus, NW Greece. *European Journal of Investigation in Heath, Psychology and Education,* 10(1):455-468. https://doi.org/10.3390/ejihpe10010034.

Hammer, M. R. (2003). Intercultural Conflict Style Inventory: ICS Interpretive Guide. ICS Inventory LLC.

Hammer, M.R. (2005). The Intercultural Conflict Style Inventory: A conceptual framework and measure of intercultural conflict approaches. *International Journal of Intercultural Relations*, 29, 675-695 https://doi.org/10.1016/j.ijintrel.2005.08.010.

Loode, S. (2011) Navigating the uncharted waters of cross-cultural conflict resolution education. *Conflict Resolution Quarterly*, 29, 65-84. Doi:10.1002/crq.21037.

Martin, J., Nakayama, T., van Oudtshoorn, G. V. R., & Schutte, P. (2013). *EBOOK: Experiencing Intercultural Communication: An Introduction*. McGraw Hill.

Identifying Laboratory Instruction and Teaching Concerns of Illinois Agriculture Teachers

Faith M. Still[1], Kemaly S. Parr[2], Steven M. Still[3]

[1] Faith Still – 466 US Route 51, Du Quoin, IL 62832 - 614-639-2961 – fmstill@gmail.com

[2] Kemaly Parr – College of Education and Human Services, Murray State University, 3231 Alexander Hall, Murray, KY, 42071 – 270-809-2854 – kparr@murraystate.edu

[3] Steven Still – School of Agricultural Sciences, Southern Illinois University, 1205 Lincoln Drive, Carbondale, IL, 62901 – 618-536-7733 – steven.still@siu.edu

Identifying Laboratory Instruction and Teaching Concerns of Illinois Agriculture Teachers

Introduction

The 1980's and beyond ushered in an era of educational research and reform that focused on preparing teachers, teacher recruitment and retention, and providing quality professional development (Borman & Dowling, 2008). As education changes so do the needs and challenges of teachers. Early literature identifies three concern stages: pre-service concerns, early teaching concerns, and late teaching concerns (Fuller, 1969). Fuller's work shows that as teachers gain experience, their concerns change. Past research indicates teachers are affected by challenges outside of the classroom as well. Fessler and Christensen (1992) explain that the characteristics of teachers are influenced by the organizational environment as well as the personal environment. Current concerns of teachers must be identified to improve current professional development and teacher education practices. The results of this study will provide a better understanding of the concerns of agriculture teachers in the state of Illinois and allow stakeholders to evaluate current professional development offerings and teacher education programs.

Theoretical framework

The theoretical framework for this study is based on the ideas of Fessler and Christensen (1992) and their Teacher Career Cycle. Previous studies, including the works of Fuller (1969) identified stages in teaching with significant characteristics, laid the foundation of the Teacher Career Cycle. The teacher career cycle is influenced by two environmental conditions: personal environment and organizational environment.

The Fessler and Christensen Model expands on the influences the teacher's personal environment has on the experiences of the teacher. The authors consider items like family, crises, and life stages; they address their impact on the teacher. When supportive, the organizational and personal environment will likely be a source of encouragement for the teacher.

Methodology

The study focused on three objectives: (a) identify the main concerns of Illinois agriculture teachers; (b) identify the main concerns of Illinois agriculture teachers when teaching laboratory instruction; and (c) identify the level of concerns among Illinois agriculture teachers based on years of experience. This research study collected data via the internet survey instrument SurveyMonkey. The target population consisted of current agricultural educators of all ages and experience levels in Illinois (N=432). The link for the survey was distributed initially by email to all 2019-2020 Illinois agriculture teachers. The instrument had three main sections. In the first general demographic data was gathered. The second section of the survey asked two open-ended questions. Question one was: "When you think about teaching, about what are you most concerned?" The second open-ended question was: "When you think about teaching laboratory classes, about what are you most concerned?" In the third section, the Likert-type scale questions from Stair, Warner, and Moore (2012) were used. The scale contained 20 common areas of concern for agriculture teachers which have been identified in previous literature.

The quantitative data was analyzed using descriptive statistics of mean, standard deviation, frequencies, and percentages in Microsoft Excel. The qualitative data from the open response questions used open coding to categorize the concerns expressed by the teachers (Merriam & Tisdell, 2016).

Results

Objective One

Student motivation was the most mentioned concern among the teachers with a total of 29 responses. Concerns relating to remote learning/COVID-19 and parent concerns were mentioned 11 times. Other major concerns include Maintaining a 3-circle program, student achievement, work/life balance, and curriculum.

Objective Two

Student safety was the number one concern of teachers when teaching in a laboratory setting, with 54 mentions. A lack of resources and/or funding was expressed by 39 teachers. 26 teachers were concerned they did not know enough about the content or the equipment to teach the content effectively. Other concerns included student behavior and discipline, student engagement and achievement, and the time to plan and prepare land, horticultural, and mechanics labs.

Objective Three

In Stair et al. (2012), only concerns above a mean of 4 were considered areas of concern. Since none of the means in this study were above the 4.00 threshold, researchers focused on concerns with a mean score of 3.5 or higher. Early career teachers had only one concern above a 3.5/5; Motivating Students (3.55). Middle career teachers identified 4 concerns rating greater than 3.5/5. They were: Recruiting and Retaining Students (3.86), Time Management (3.67), Balancing Personal and Professional Responsibilities (3.59), and Motivating Students (3.58). Late career teachers had one category of concern, which was Balancing Personal and Professional Responsibilities (3.53).

Conclusions

Among the teachers, motivating students was their most mentioned concern. One teacher said, “I'm concerned about finding ways to interest my students. I worry that many of my students are preoccupied with so many things outside of school, and even outside of their own lives (obsessing over internet celebrities and trends, etc.), that they have limited capacity for caring about learning. They truly believe that school has no purpose because they can ‘Just Google it’ for all of life's answers.” Previous research on school-based agriculture education teachers indicated that professional development on the topic of student motivation was needed (Smalley et al., 2019).

“My biggest concern is not knowing a lot about mechanics and taking on a mechanics class. I want to feel confident in the shop but somehow I feel that universities are lacking in helping teach in this area.” This sentiment has been identified among the needs of beginning agriculture teachers in other literature (Figland et al., 2019; Sorensen et al., 2014).

Recommendations

Since teachers have different needs at different career stages, stakeholder groups should consider tailoring professional development to different groups of teachers to eliminate one-size fits all in-services. The professional development and university course curriculum in the areas of ag mechanics and safety, remote learning, motivating students, external funding, recruitment, and retention of students, balancing personal and professional life, and time management, should continue to be implemented.

It is recommended that teacher education programs evaluate the current curriculum as it applies to agricultural mechanics and safety to meet the needs of pre-service teachers.

References

Borman, G. D. & Dowling, N. M. (2008). Teacher attrition and retention: A meta-analytic and
1. narrative review of research. *Review of Educational Research, 78*(3), 367-409. https://doi.org/10.3102/0034654308321455

Fessler, R. & Christensen, J. C. (1992). *The teacher career cycle: Understanding and guiding the PD of teachers*. Boston, MA: Allyn and Bacon

Figland, W., Blackburn, J., Stair, K., & Smith, E. (2019). What do they need? Determining differences in the professional development needs of Louisiana agriculture teachers by years of teaching experience. *Journal of Agricultural Education, 60*(2), 173-189. https://doi.org/10.5032/jae.2019.02173

Fuller, F. F. (1969). Concerns of teachers: A developmental conceptualization. *American Educational Research Journal, 6*(2), 207-226. https://doi.org/10.2307/1161894

Merriam, S. B. & Tisdell, E. J. (2016). *Qualitative Research: A Guide to Design and Implementation (4th ed.)*. San Francisco, CA: Jossey Bass.

Sorensen, T. J., Lambert, M. D., & McKim, A. J. (2014). Examining Oregon agriculture teachers' professional development needs by career phase. *Journal of Agricultural Education, 55*(5), 140-154. https://doi.org/10.5032/jae.2014.05140

Stair, K. S., Warner, W. J., & Moore, G. E. (2012). Identifying concerns of preservice and inservice teachers in agricultural education. *Journal of Agricultural Education 53*(2) 153-164. https://doi.org/10.5032/jae.2012.02153

Influence of Social Events on Academic Learning of Global Service-Learning Alumni

Samuel Ikendi, Ph.D.
Academic Coordinator for Climate Smart Agriculture
University of California
Division of Agriculture and Natural Resources
University of California - Merced
427 SRE Building
5200 N. Lake Road, Merced, CA 95343
sikendi@ucanr.edu

Michael S. Retallick, Ph.D.
Professor and Chair
Department of Agricultural Education and Studies
Iowa State University
513 Farm House Lane
206 Curtiss Hall, Ames, IA 50011
msr@iastate.edu

Gail R. Nonnecke, Ph.D.
University Professor
Morrill Professor
Department of Horticulture
Global Professor in Global Resource Systems
Associate Director for Education Programs
Center for Sustainable Rural Livelihoods
Iowa State University
105 Horticulture Hall, Ames, IA 50011
2206 Osborn Dr, Ames, IA 50011
nonnecke@iastate.edu

Influence of Social Events on Academic Learning of Global Service-Learning Alumni

Introduction/Need for the Study

Globalization has driven higher education institutions to internationalize their service-learning to enhance students' learning (Bringle & Hatcher, 2011). The Uganda service-learning program of this study was founded on school gardens as a learning approach that could fulfill students, curricula objectives (Ikendi, 2022; Ikendi et al., 2023a; 2023b; Nonnecke et al., 2015). Students from both Iowa State University (ISU) and Makerere University (MAK) participate every summer working with elementary school students in Kamuli district, Uganda to establish school gardens and also participate in several social events. Students participate in tours and travel to appreciate and learn from the long history of Uganda as the "Pearl of Africa"; they visit National parks, the Equator, and cultural sites which fulfill their tourist adventures, a common aspiration among study abroad students (Jarvis & Peel, 2008; Nawijn et al., 2010). Students also participate in co-curricular activities where they play several indoor games including Bananagrams, scrabble and chess; outdoor games like basketball, soccer, and biking; and music and dance to relax their minds from gardening. Also, students participate in social parties to celebrate their achievements like the singing of Anthems during American independence, cooking and sharing traditional foods, creative performances which involve composing songs relating to their garden activities, and painting team murals for identity. Whereas social events promote socialization (Ikendi et al., 2022a; 2022b; 2023c), this study sought to assess their influence on students' academic learning.

Conceptual/Theoretical Framework

School gardening, an experiential form of learning was conceptualized by Dewey, a 20th-century U.S. progressivist whose mission was educating the whole child (Dewey, 1918). Dewey termed experiential learning as an educational philosophy called a ***theory of experience*** (Dewey, 1938). He positioned his argument on the fact that traditional education had little need for theory since the practice was already determined by tradition. The new experiential approach to education, to Dewey, needed a sound theory of experience to guide its conduct. The experiential learning concept has over time been advanced through research by Kolb, which formed the theoretical base of this study. According to Kolb (2015), experiential learning highlights the fundamental role that experience plays in the learning process, "the process whereby knowledge is created through the transformation of experience" (p. 49). Experiential learning embraces involvement in specific experiences, reflecting on them, intellectualizing those experiences, and actively participating in experimenting with those experiences. Learners learn from their experience in the hands-on activities resulting in mastery of concepts through assimilation and accommodation processes; learning outcomes represent the historical records gained from the learning activities.

Methodology

This study was part of a larger census that involved 291; 166 (MAK) and 125 (ISU) alumni who completed a summer program named "Creating a school garden: Service-learning in Uganda" between 2006-2019. The IRB at ISU granted this study as "Exempt" under IRB #21-263-01. We reached the alumni through Qualtrics using emails provided by the Program Director. The main survey instrument with 23 questions was designed based on the guideline of Dillman et al. (2014) Tailored Design Method. However, the paper focused on two questions i) alumni's university and ii) the social events question which comprised a five-point Likert scale. The Likert question sought to determine how influential each social event was on alumni academic learning during service-learning. The scale was composed of "1=Not at all Influential" through "5=Extremely Influential." The main instrument was reviewed by a panel of eight professors and five graduate students based on a "panel of expert guidelines" to establish the content, construct, and face validity. All items were modified as needed and retained. Five communications were involved including an advance notice, an invitation letter with a survey link, and three reminders. We settled with 274 alumni after 17 email delivery failures during the advance notice. We facilitated MAK alumni who were in Uganda with a $10 internet fee sent to their mobile money accounts. Consent was embedded in the first question where participants who chose to take part, clicked "Yes". Data collection closed after 30 days on March 10th, 2022, with an overall 258 (94.2%) responses. The Cronbach's alpha was .792 showing a strong consistency.

Findings

The Mean (M=3.77; SD=.940) for 03 social events was established with 205 (81.3%) complete responses for all alumni. By event, the majority; 77 of 227 (33.9%) within tours and travels; and 68 of 226 (30.1%) within social parties reported that their participation was extremely influential to their academic learning. Also, the majority 79 of 240 (32.9%) within co-curricular reported it was very influential to their learning. We determined if there existed any differences between MAK and ISU alumni who reported that their participation in a social event influenced their academic learning. An independent sample t-test was performed, and Levene's Test for Equality of variances showed no violation. The combined complete responses for tours and travels were (MAK=126, ISU=101) and results indicated that MAK alumni reported higher influence on their academic learning (M=3.93, SD=1.174) than ISU alumni (M=3.60, SD=1.123), $t(225)$=2.110, p=.637. Similarly, for social parties (MAK=134, ISU=92), results indicated that MAK alumni reported higher influence on their academic learning (M=3.80, SD=1.175) than ISU alumni (M=3.57, SD=1.700 $t(224)$=1.469, p=.662. With co-curricular, (MAK=140, ISU=100) and results indicated that MAK alumni reported higher influence on their academic learning (M=3.70, SD=1.123) than ISU alumni (M=3.56, SD=1.140 $t(238)$=.946, p=.604. However, all these differences were not significant. Overall, the means for MAK alumni were higher for all three social events and were within the scale of 3.0–4.0. The scale of 3.0 in this study represents a "somewhat influential" and 4.0 represents "very influential" with the statement on each event.

Conclusions

Alumni learned several lessons from the social events. In tours and travels, students appreciated Uganda's beauty as the "Pearl of …" because of her flora and fauna; and learn from the adventures to fulfill their tourist adventures. The co-curricular activities like sports and games provided opportunities for relaxation, deeper engagement, and the development of intimate relationships with peers, pupils, instructors, and staff. Also, closer contact among students in the co-curricular lead to a better understanding of peers' cultural distinctiveness which improves the authenticity of inter-member contact relations and promotes intercultural development (Ikendi et al., 2022a; 2022b; 2023c). Social parties like celebrating independence which involves students singing the U.S. Star-Spangled Banner; cooking and sharing traditional foods increase their knowledge of cultural foods; and also painting murals promote social identity and belonging.

Implications

Social events depict students' social life through adventures and leisure during service-learning. These activities control fatigue after routine fieldwork, provide opportunities for students to learn about peers' unique talents and cultural distinctiveness beyond field activities, and learn about and from nature and the environment through tours. These activities similarly promote self-discovery in academic research and talent development through working in closer contact with peers, instructors, and communities in these several social event activities in service-learning.

References

Bringle, R. G., & Hatcher, J. A. (2011). International service learning. In R. G. Bringle, J. A. Hatcher, & S. G. Jones. (Eds.), *International service-learning: Conceptual frameworks and research* (pp. 3-28). Stylus.

Dewey, J. (1918). *Vocational education in the light of the world war*. Vocational Education Association of the Middle West.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: the tailored design method*. John Wiley & Sons.

Ikendi, S. (2022). *Exploring changes in academics, skills, and intercultural competence development of global service-learning students* [Doctoral Dissertation, Iowa State University]. Graduate Theses and Dissertations. https://dr.lib.iastate.edu/handle/20.500.12876/JvNVO1Xv

Ikendi, S., Cooper, T., Retallick, M., & Nonnecke, G. (2022a October 6-8). Intercultural competence development through appreciation of differences among global service-learners. *Paper Proceedings of the 2022 North Central Region Agricultural Education Research Conference* (pp. 38-46), Columbia, MO.

Ikendi, S., Retallick, M., & Nonnecke, G. (2022b May 16-19). Measuring global service-learning alumni Facebook communication. *Poster Proceedings of the 2022 National American Association for Agricultural Education Conference*, Oklahoma City, OK.

Ikendi, S., Retallick, M., Nonnecke, G. (2023a, May/June). Implementing global service-learning through school garden. *Agriculture Education Magazine*.

Ikendi, S., Retallick, M., & Nonnecke, G. (2023b, 26-29 April). Influence of school garden learning approach on the academic development of global service-learners. *Poster Proceedings of 2023 Association for International Agricultural and Extension Education* Guelph, Canada.

Ikendi, S., Retallick, M., & Nonnecke, G. (2023c, 15-18 May). It renewed my faith in humanity: Alumni's perception of global servicing-learning. *Poster Proceedings of 2023 National American Association for Agricultural Education Research Conference*, Raleigh, NC.

Jarvis, J., & Peel, V. (2008). Study backpackers: Australia's short-stay international student travelers. In K. Hannam, & I. Ateljevic. (Eds.), *Backpacker tourism: Concepts and profiles* (pp. 157-173). Channel View Publications.

Kolb, D. A. (2015). *Experiential learning: Experience as a source of learning and development*. Prentice-Hall.

Nawijn, J., Marchand, M. A., Veenhoven, R., & Vingerhoets, A. J. (2010). Vacationers happier, but most not happier after a holiday. *Applied Research in Quality of Life*, *5*(1), 35-47. https://doi.org/10.1007/s11482-009-9091-9

Nonnecke, G., McMillan, D. E., Kugonza, D., & Masinde, D. (2015). Leaving the doors open to new beneficiaries. In L. M. Butler & D. E. McMillan. (Eds). *Tapping philanthropy for development* (pp 165-189). Kumarian.

Institutional Representation at AAAE Conferences

Christopher M. Estepp
University of Arkansas
1120 W. Maple
Fayetteville, AR 72701
479-575-2037
estepp@uark.edu

Sarah F. James
University of Arkansas
1120 W. Maple
Fayetteville, AR 72701
479-575-2035
sfjames@uark.edu

Lauren L. Cline
Oklahoma State University
444 Agricultural Hall
Stillwater, OK 74078
405-744-8138
lauren.l.cline@okstate.edu

Will Doss
University of Arkansas
1120 W. Maple
Fayetteville, AR 72701
479-575-2035
wd009@uark.edu

Donald M. Johnson
University of Arkansas
1120 W. Maple
Fayetteville, AR 72701
479-575-2035
dmjohnso@uark.edu

Institutional Representation at AAAE Conferences

Diversity, equity, and inclusion (DEI) have become important topics in agricultural education (Estepp et al., 2022). In the context of DEI, diversity represents the different types of identities present in a group or organization (Abernethy et al., 2020). While much of the DEI conversation in our profession has centered around race/ethnicity, culture, and gender identity, little has focused on the diversity of higher education institutions involved in the American Association for Agricultural Education (AAAE). Estepp at al. (2022) identified a need for AAAE to increase diversity by broadening scholarly opportunities for institutions that may not identify research as their top priority. To identify the barriers for institutional representation at AAAE research conferences, the current state of institutional representation must be determined. Guiding this study was the conceptual framework provided by the 2017-2020 AAAE strategic plan goal one, to “build a more inclusive culture within the society” (AAAE, 2017, p. 1).

The purpose of this study was to describe the diversity of institutions represented at regional and national AAAE research conferences. The study was guided by the following objectives: (a) determine the representation of universities on research manuscripts at regional and national AAAE conferences; and (b) determine the representation of various groups on research manuscripts at regional and national AAAE conferences.

Methods

For this descriptive study, we examined all national and regional AAAE research paper proceedings from 2012-2022. Proceedings were retrieved from the AAAE website; however, the 2014 and 2015 Southern Region paper proceedings were not available online. We attempted to retrieve them from the corresponding research chairs listed online, but the documents were unattainable. All manuscripts (N = 1,458) were reviewed, and a count was made of each university or entity’s representation on each paper. If a single university or entity had multiple authors on a manuscript, the university or entity was only counted as being represented once. If multiple universities or entities were represented on a manuscript, each university or entity was counted once. For objective one, frequencies were calculated for each university represented at the national and each regional conference. To meet objective two, categories were created based on authors’ affiliations, which consisted of: 1862 Land-Grants, Non-Land-Grants, 1890 Land-Grants, community colleges, K-12 education, FFA, industry/NGOs, federal/state governments, extension/experiment stations, and international institutions. Frequencies were calculated for representation of each group at the national and each regional conference.

Results

The results for objective one showed that out of 651 research papers in the proceedings for the National AAAE Research Conference, the following universities were most represented: Oklahoma State University (f = 85), Texas Tech University (f = 81), University of Florida (f = 79), Louisiana State University (f = 46), and Iowa State University (f = 45). Among all papers (n = 246) in the North-Central Region proceedings, the universities with the most representation were: Iowa State University (f = 44), The Ohio State University (f = 37), University of Missouri (f = 33), Pennsylvania State University (f = 28), Kansas State University (f = 21) and Purdue University (f = 20). Out of the 301 papers in the Southern Region proceedings, the following universities had the most representation: University of Florida (f = 77), Oklahoma State University (f = 49), Louisiana State University (f = 36), University of Georgia (f = 32), and Texas A&M University (f = 26). Lastly, the Western Region proceedings had 260 papers, and the most represented universities were: Texas Tech University ($f = 71$), Oklahoma State University ($f = 44$), Oregon State University ($f = 28$), Texas A&M University ($f = 26$), and University of Idaho ($f = 26$).

Objective two was to determine the representation of various groups at AAAE conferences. Results revealed that 1862 Land-Grant institutions had the most representation across all conferences ($f = 1{,}683$). Non-Land-Grant institutions were represented on 340 papers across all conferences, while 1890 Land-Grants were represented on 22 papers. Among all conferences, the following groups were also represented: community colleges ($f = 10$), K-12 education ($f = 76$), FFA ($f = 9$), Industry/NGO ($f = 10$), government ($f = 8$), extension/experiment stations ($f = 11$), and international institutions ($f = 5$). Table 1 provides a breakdown of various groups' representation across each region and at the national conference.

Table 1

Frequency of Various Groups' Representation at National and Regional AAAE Conferences

	Frequency			
Group	North-Central	Southern	Western	National
1862 Land-Grant	319	352	237	775
Non-Land-Grant	24	39	114	163
1890 Land-Grant	2	8	0	12
Community College	1	2	2	5
K-12	11	11	13	41
FFA	0	5	1	3
Industry/NGO	1	0	7	2
Government	1	1	1	5
Extension/Experiment Stations	3	3	1	4
International Institutions	3	0	1	1

Conclusions/Implications/Recommendations

Results of objective one indicated a small group of universities compromised a large portion of manuscripts presented at AAAE conferences. At the national level, five universities were represented on just over half of conference papers, while a small group of universities were represented on between 66% to 75% of regional conference papers, with two universities in the top five for two regions. Results of objective two suggested most (77.4%) AAAE conference papers were from 1862 Land-Grants; non-Land-Grants were represented on 15.6% of conference papers and 1890 Land-Grants were represented on only 1% of papers. Combined, all other groups were represented on almost 6% of AAAE conference papers. No 1994 Land-Grant institutions were represented at any AAAE conferences. Diversity of institutions involved in AAAE conferences is lacking. Intentional efforts from the AAAE Leadership Team and members should be made to recruit more diverse institutions with related programs to participate. Additionally, AAAE conference paper submission requirements and procedures should be analyzed to identify any systemic barriers that may impact the inclusion of diverse institutions at our conferences.

References

AAAE. (2017). *American Association for Agricultural Education 2017-2020 strategic plan.* http://aaaeonline.org/resources/Documents/National/AAAE2017- 2020StrategicPlan.pdf

Abernethy, E. F., Arismendi, I., Boegehold, A. G., Colon-Gaud, C., Cover, M. R., Larson, E. I., Moody, E. K., Penaluna, B. E., Shogren, A. J., Webster, A. J., & Woller-Skar, M. M. (2020). Diverse, equitable, and inclusive scientific societies: Progress and opportunities in the Society of Freshwater Science. *Freshwater Science, 39*(3), 363-376. https://doi.org/10.1086/709129

Estepp, C. M., Cline, L. L., & Rodriguez, M. T. (2022). Members' perceptions regarding diversity and inclusion within the American Association for Agricultural Education. *Journal of Agricultural Education, 63*(2), 186-202. https://doi.org/10.5032/jae.2022.02182

Interns' & Supervisors' Perception of Professional Growth Through Internship Programs

Joshue Lewis Mite

Graduate Student

Texas Tech University

(806) 451-7563

joshuele@ttu.edu

Erica Irlbeck, Ed. D.

Professor

Texas Tech University

(806) 281-8606

erica.irlbeck@ttu.edu

Interns' & Supervisors' Perception of Professional Growth Through Internship Programs

Introduction

Students are concerned about finding job opportunities after four years of academic preparation. According to Andrews and Higson (2008), college curriculum improves students' performance in their job experience and allows them to use the skills acquired inside the classroom and apply them to real-life situations. For that reason, internships are considered experiential learning tools that help students' professional development in their career life (Leary & Sherlock, 2020). Companies and organizations look for an efficient workforce with technical knowledge and professional skills that demonstrate their ability to solve problems at work. According to a survey of employers, half the participants established internship programs are resources universities must develop in the curriculum (Hart Research Associates, 2008). However, research about internship perceptions in the agricultural communications industry is minimal, as is information about professional skills developed through these programs. The objectives for this study were to (1) describe students' perceptions of their professional growth through their internship; (2) explore which communication skills need improvement; and (3) identify differences between supervisors' and students' perceptions of professional skills.

Theoretical Framework

The theoretical base selected for this investigation was Social Cognitive Career Theory (SCCT) which seeks students' behavior related to their career development (Friesenborg, 2002). This theory strongly influences students' development when they are beginning their professional careers. However, SCCT identifies three dimensions: self-efficacy, outcome expectations, and goals, which together can impact students' behavior and perception of their professional growth (Burga et al., 2020). Therefore, internships are cooperative efforts between students and organizations where students can learn and work toward skills essential for their career success (Blenner et al., 2021).

Methodology

A descriptive, comparative, quantitative analysis was used to study interns' and their supervisors to measure their perceptions of professional growth through an online survey questionnaire using Qualtrics. The questionnaire was distributed at the end of their internship program in the Summer 2022 and Fall 2022 semesters. A series of 5-point Likert-type scale questions were used to measure two broad categories: professional and communications skills. The questionnaire has been distributed to supervisors of the Texas Tech University agricultural communications interns for several years. Summer 2022 was the first semester the same questions were distributed to students to measure their perceived growth. The questionnaire consisted of basic demographic information and five-point Likert-type scale questions about professional growth (16-item) and communication skills (15-items).

A Qualtrics survey link was distributed via email to students and supervisors at the end of their internship program. Then, the information collected was exported on an Excel spreadsheet and analyzed using descriptive and comparative statistics. The five point-scale was rated from 1 (No Growth at All) to 4 (Exponential Growth), ordering them according to the mean to accomplish objectives one and two. To achieve objective three, a Mann-Whitney test was used to identify differences between supervisors' and interns' perceptions of professional skills. An alpha level of $p < .05$ was established to determine which skills were statistically different.

Results

The findings showed a total of 37 students and 54 supervisors participated in the evaluation questionnaires. Objective one results showed that students perceived most professional skill levels in meeting deadlines ($M = 3.76$, $SD = .41$), the ability to follow directions ($M = 3.70$, $SD = .37$), and the willingness to assume responsibility ($M = 3.68$, $SD = .76$). While the least professional skills perceived were leadership ability ($M = 3.00$, $SD = 1.22$), ability to work in harmony with others ($M = 3.11$, $SD = .87$), and integrity ($M = 3.30$, $SD = .46$). On the other hand, findings for objective two demonstrated the most perceived growth in communications skills were editing ($M = 3.35$, $SD = 1.58$), graphic design ($M = 3.11$, $SD = 1.19$), and social media management ($M = 2.76$, $SD = 1.67$). However, the least perceived skills growth was magazine production ($M = 1.43$, $SD = 1.69$), trade show management ($M = 1.57$, $SD = 1.80$), and web design ($M = 1.73$, $SD = 1.66$). Finally, objective three results showed there is a statistical difference ($p < .05$) in the following perceived professional skills: tactfulness, acceptance of constructive criticism, dependability, maturity, receptive to supervision, integrity, work in harmony with others, and leadership ability where the supervisors perceived more development than students themselves.

Conclusions/Implications/Recommendations

Findings about professional growth (soft skills) demonstrated that students perceived more abilities related to organization and accomplishment of the tasks assigned during their internship program. According to Karunaratne and Perera (2019), most students agreed that internships allowed them to learn about industry culture and prioritize tasks. On the other hand, the skills least perceived were related to teamwork. According to Teng et al. (2022), internships after COVID-19 developed a gap in interpersonal skills because of distance work activities.

The skills with more improvement, as perceived by students were related to what today's agricultural communications industry needs, especially in editing. According to Patacsil and Tablatin (2017), the order of perceived hard skills depends on what most companies are focused on when hiring professionals, and the Texas Tech curriculum matrix has be reinforced with by research with the industry so students are prepared for current job opportunities.

More than half of professional skills were statistically different, where supervisors perceived the interns to have greater professional skills than students themselves. According to Urquía-Grande and Perez Estebanez (2020), supervisors evaluate their interns well because they find that interns fulfilled the company's expectations, and students also undervalue their professional skills applied in companies.

Further research should be done in other agricultural communications programs, and it could be assessed cross-sectional professional growth through evaluations before and after internship experience. The researchers should plan to collect similar data for a longitudinal study each semester. Also, these results can be replied by other colleges to determine what skills should be improved in their curriculum to develop a better career work experience for students.

References

Andrews, J., & Higson, H. (2008). Graduate employability,‘soft skills’ versus ‘hard’business knowledge: A European study. Higher education in Europe, 33(4), 411-422.

Blenner, S. R., Roth, S. E., Manukyan, R., Escutia-Calderon, Y., Chan-Golston, A. M., Owusu, E., & Prelip, M. L. (2021). Community partnerships and experiential learning: Investing in the next generation of a diverse, qualified public health workforce. Pedagogy in Health Promotion, 7(1_suppl), 51S-62S.

Burga, R., Leblanc, J., & Rezania, D. (2020). Exploring student perceptions of their readiness for project work: utilizing social cognitive career theory. Project management journal, 51(2), 154-164.

Friesenborg, L. (2002). The effect of internships on career decision, as explained by social cognitive career theory, identity theory and attribution theory (Doctoral dissertation).

Hart Research Associates (2008). How Should Colleges Assess And Improve Student Learning?.

Karunaratne, K., & Perera, N. (2019). Students’ perception on the effectiveness of industrial internship programme. Education Quarterly Reviews, 2(4).

Leary, M. P., & Sherlock, L. A. (2020). Service-Learning or internship: A mixed-methods evaluation of experiential learning pedagogies. Education Research International, 2020.

Patacsil, F. F., & Tablatin, C. L. S. (2017). Exploring the importance of soft and hard skills as perceived by IT internship students and industry: A gap analysis. Journal of Technology and Science education, 7(3), 347-368.

Teng, C. W. C., Lim, R. B. T., Chow, D. W. S., Narayanasamy, S., Liow, C. H., & Lee, J. J. M. (2022). Internships before and during COVID-19: experiences and perceptions of undergraduate interns and supervisors. Higher Education, Skills and Work-Based Learning, 12(3), 459-474.

Urquía-Grande, E., & Perez Estebanez, R. (2020). Bridging the gaps between higher education and the business world: internships in a faculty of economics and business. Education+ Training, 63(3), 490-509.

It Renewed My Faith in Humanity: Alumni's Perception of Global Servicing-Learning

Samuel Ikendi, Ph.D.
Academic Coordinator for Climate Smart Agriculture
University of California
Division of Agriculture and Natural Resources
University of California - Merced
427 SRE Building
5200 N. Lake Road, Merced, CA 95343
sikendi@ucanr.edu

Michael S. Retallick, Ph.D.
Professor and Chair
Department of Agricultural Education and Studies
Iowa State University
513 Farm House Lane
206 Curtiss Hall, Ames, IA 50011
msr@iastate.edu

Gail R. Nonnecke, Ph.D.
University Professor
Morrill Professor
Department of Horticulture
Global Professor in Global Resource Systems
Associate Director for Education Programs
Center for Sustainable Rural Livelihoods
Iowa State University
105 Horticulture Hall, Ames, IA 50011
2206 Osborn Dr, Ames, IA 50011
nonnecke@iastate.edu

It Renewed My Faith in Humanity: Alumni's Perception of Global Servicing-Learning

Introduction/Need for the Study

Multicultural programs like global service-learning promote diversity in learning through many students' field experiences, critically reflecting on those experiences (Cipolle, 2010). O'Grady (2000) adds that such programs provide for the participation of a diversity of students which prepares them to work in multicultural settings. Studies (e.g., Ikendi et al., 2022a; Jay, 2008) have encouraged such professionals to be role models in handling diversity-related issues in learning environments through activities like dialogue and reflections. Collaborative learning among diverse learners constitutes efforts where needs are met productively through dialogical sharing of thoughts which reduces bias among learners. However, the ability of service-learning to reduce bias in learning rests on how it effectively implements the intergroup contact theory in its program planning (Conner & Erickson, 2017). This study sought to determine global service-learning alumni's perception of their intercultural development as measured by self-perceived awareness of structural inequality (ASI). We defined ASI construct as a system of privilege created by institutions within an economy where students get immersed during service-learning.

Theoretical Framework

The intergroup contact theory (Allport, 1954) grounded this study which provides three factors that suggest the development of intergroup relations including the individual status of members, the nature of interactions, and the support of authorities. Allport puts it that, unless all members of the groups are of equal status, the likelihood of stereotyping of group members in the minority groups will persevere which reinforces negative perceptions among members. Equal status can be achieved by allowing members to equally participate in all activities and equal resource allocation to facilitate the activities of all members for a common goal. The nature of interaction focuses on the intrinsic and extrinsic value of the frequency and authenticity of intergroup interactions. Competition breeds intergroup conflicts which leads to devaluing and outright hostility among members. Allport advocated for greater and more genuine conversations among group members who are different from themselves. Support of authorities focuses on rules, regulations, and the local working environment which all influence the success of intergroup interactions. In service-learning, the type of institution, thoroughness of critical reflections, and the support of supervisors influence one's perceptions of peers (Ikendi et al., 2022a). The biases held by individuals over peers "may be reduced by equal status contact between majority and minority groups in the pursuit of common goals, [that is] sanctioned by institutional support" (Allport, 1954, p. 281). These three factors reinforce each other for successful interactions.

Methodology

This study was part of a larger census that involved 291; 166 (Makerere University [MAK]) and 125 (Iowa State University [ISU]) alumni who completed a summer program named Creating a school garden: Service-learning in Uganda between 2006-2019. IRB at ISU approved our study #21-263-01. We used Qualtrics to reach the alumni using emails provided by the Program Director. The main survey instrument had 23 questions designed based on the guideline of Dillman et al. (2014) Tailored Design Method. We focused on two questions for this paper i) alumni's university and ii) the ASI question which comprised a six-point Likert scale with 19 Likert items. These items sought the degree of dis/agreement among alumni who reported that their knowledge, awareness, and attitudes about intercultural issues changed due to participation in service-learning. The scale was composed of "1=Strongly Disagree" through "6=Strongly Agree." The main instrument was reviewed by a panel of 7 professors and 5 graduate students based on the authors' panel of expert guidelines to assess content, construct, and face validity. We modified all items as needed and retained them. We sent an advance notice to 291 alumni, but 17 emails were returned, and we settled with 274 to whom we sent an invitation letter with a survey link and three reminders. MAK alumni in Uganda received a $10 internet fee sent to their mobile money accounts. Consent was in the first question where participants who chose to participate, clicked "Yes". Data collection closed in 30 days on March 10th, 2022, with an overall response of 258 (94.2%). The Cronbach's alpha was .922 – strong consistency.

Findings

Descriptively, the Mean (M=4.88; SD=.696) for 19 Likert items was established with 231 (91.7%) complete responses for all alumni. We determined if there existed any differences between MAK and ISU alumni who reported that their knowledge, awareness, and attitudes about intercultural issues changed as measured by ASI. An independent sample t-test was performed, the Levene's Test for Equality of variances showed no violation, p=0.188. The combined complete responses were (MAK=129, ISU=102) and results indicated that ISU alumni had higher changes in their ASI (M=4.93, SD=.762) than MAK alumni (M=4.84, SD=.639 t(229)=-.945, p=.188, but these differences were not significant. Overall, the means for ISU alumni were high for most of the ASI Likert items, and eight of the 19 items were within the scale of 5.0–6.0. The scale of 5.0 in this study represents an "agree" with the statement on the ASI construct. Statistically, only four ASI items revealed differences among the MAK and ISU alumni, of which one of the four showed that ISU alumni had higher mean differences than MAK alumni. For instance, ISU alumni reported that they developed more complex ways of analyzing problems faced by students in under-resourced communities (M=5.17, SD=.879) than MAK alumni (M=4.69, SD=1.215 t(248)=-3.483, p=.001, d=.45. On one hand, MAK alumni reported that they developed a commitment to helping people in communities through charity (M=5.19, SD=.992) than ISU alumni (M=4.43, SD=1.209 t(247)=5.466, p=.005, d=.66.

Conclusions

Alumni developed higher changes in their knowledge, awareness, and attitudes toward intercultural issues as measured by the self-perceived ASI. They developed an understanding that social inequality in opportunities in the educational sector limits development. Alumni's development of more complex ways of analyzing problems faced by communities and students in under-resourced communities drove them into different ventures over time to contribute to solutions. For instance, through inventions like a pedal-operated grain cleaner which has been adopted by the program in schools and communities (Ikendi et al., 2023). Alumni have gone further to initiate fundraising campaigns and also contributed to the program campaigns that are revitalizing community livelihoods (Ikendi et al., 2022b; Ikendi & Retallick, 2023a; 2023b). These sentiments echo the findings of Paige et al. (2009) that participating students in study abroad programs have a likelihood of participating in charitable work.

Implications

Alumni developed the skills, knowledge, and awareness of how to challenge social injustices through critical analysis and civic actions. Multicultural service-learning is such an important pedagogical approach where learners learn and promote social justice through advocacy, commitment to solving community social problems, and philanthropy. Students require proper pre-departure orientations (Ikendi et al., 2022c; Ikendi, 2023) to tame the perceptions of bias and also help to break the tendency of holding white saviorism in their charities which promotes reciprocal learning between learners and the communities and good intergroup relations.

References

Allport, G. W. (1954). *The nature of prejudice*. Addison-Wesley.

Cipolle, S.B. (2010). *Service-learning and social justice: Engaging students in social change*. Rowman & Littlefield Publishers.

Conner, J., & Erickson, J. (2017). When does service-learning work? Contact theory and service-learning courses in higher education. *Michigan Journal of Community Service Learning*, *23*(2), 53-65. https://doi.org/10.3998/mjcsloa.3239521.0023.204

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: the tailored design method*. John Wiley & Sons.

Ikendi, S. (2023 15-18 May). An inquiry into preflections on students' participation in global service-learning. *Research Paper Proceedings of the 2023 National American Association for Agricultural Education Conference*. Raleigh, NC.

Ikendi, S., & Retallick, M. (2023a, 15-18 May). Improving managerial and leadership effectiveness in multistakeholder organizations. *Research Paper Proceedings of the 2023 National American Association for Agricultural Education Conference*. Raleigh, NC.

Ikendi, S., & Retallick, M. (2023b, 26-29 April). Exported through the theory of change: An inquiry into the compatibility of the U.S. land grant philosophy in Uganda (Paper). *Association of International Agricultural and Extension Conference*. Guelph, Canada.

Ikendi, S., Cooper, T., Retallick, M., & Nonnecke, G. (2022a October 6-8). Intercultural competence development through appreciation of differences among global service-learners. *Research Paper Proceedings of the 2022 North Central Region Agricultural Education Research Conference* (pp. 38-46). Columbia, MO.

Ikendi, S., Retallick, M., & Nonnecke, G. (2022b May 16-19). Measuring global service-learning alumni Facebook communication. *Research Poster Proceedings of the 2022 National American Association for Agricultural Education Conference*. Oklahoma City, OK.

Ikendi, S., Retallick, M., & Nonnecke, G. (2022c October 6-8). Pre-departure orientations: The architectural founding of learning in global service-learning (Poster). *North Central Region Agricultural Education Research Conference* (pp. 55-61), Columbia, MO.

Ikendi, S., Retallick, M., & Nonnecke, G. (2023, 26-29 April). Deepening research and academic learning through bi-national team projects in global service-learning (Poster). *Association of International Agricultural and Extension Conference*. Guelph, Canada.

Jay, G. (2008). Service learning, multiculturalism, and the pedagogies of difference. *Pedagogy 8*(2), 255-281. https://www.muse.jhu.edu/article/238618

Nonnecke, G., McMillan, D. E., Kugonza, D., & Masinde, D. (2015). Leaving the doors open to new beneficiaries. (pp 165-189). Kumarian.

Paige, R. M., Fry, G. W., Stallman, E. M., Josic, J., & Jon, J-E. (2009). Study abroad for global engagement: The long-term impact of mobility experiences. *Intercultural Education, 20*(1-2), 29-44. https://doi.org/10.1080/14675980903370847

Likert Versus Cronbach's Psychometric Thresholds: Reducing Error and Maximizing Agricultural Education's Scholarship Impacts

Robert Strong
Texas A&M University

James R. Lindner
Auburn University

Bruce Herbert
Texas A&M University

Nicole Ray
Fresno State University

Clare Hancock
Auburn University

Karissa Palmer
Texas A&M University

Primary author:
Robert Strong
Texas A&M University
2116 TAMU
College Station, TX. 77843
979-845-1139
robert.strongjr@ag.tamu.edu

Introduction/Need for Research

Instrumentation is a critical function in measuring social and behavioral science impacts on stakeholders, teachers, and change agents (Thüm et al., 2014). Inquiries on instrument quality offer researchers' evidence of the best instrumentation tool to use (Dillman et al., 2014). Internal validity and reliability have long been considered social sciences' quality gatekeepers (Kodheli, et al., 2021). Field (2013) indicated internal validity is as simple as the instrument measures what it is designed to measure. Reliability is the internal consistency of the instrument results when utilized with a similar population (Cronbach, 1951). Warmbrod (2014) recommended that agricultural education researchers document the empirical evidence proving an instrument is valid and reliable. *Priority 2* of our *National Research Agenda* suggested examining research practices to advance agricultural teaching processes (Lindner et al., 2016).

Conceptual or theoretical Framework

The theory of planned behavior (Ajzen, 1991) framed this study by utilizing the constructs; subjective norms, attitudes, perceived behavioral control, and resulting behavior. Subjective norms are beliefs individuals will endorse and accomplish a specific behavior. Attitudes are developed paradigms of thinking that result in one's behavior. Perceived behavioral control is the discernment of the complexity of carrying out a preferred behavior (Ajzen, 1991). The purpose was to investigate data collection instrument development and reporting subjective norms and resulting behavior in agricultural education literature over the last five years. Research objectives were: 1) determine the number of instrumentation articles reporting construct reliability, and 2) determine the numerical range of items used to measure constructs.

Methodology

Wright et al. (2007) posited a systematic review uses a comprehensive search based on explicit protocols to review existing literature with a synthesis of data focusing on key questions. Systematic reviews are five steps; identify the critical question, formulate search parameters, systematically search databases, analyze data, and data summary interpretation (Lee et al., 2021). Using the five steps, authors systematically reviewed all articles from *Advancements in Agricultural Development* (*AAD*), *Journal of Agricultural Education* (*JAE*), *Journal of Extension* (*JOE*), and *The Journal of Agricultural Education and Extension* (*TJAEE*) from 2018 to 2022. The authors reviewed eight hundred ninety-six (N = 896) articles from the four publications.

Results/findings

JAE reported forty-seven (N = 47) articles in 2022 and seventeen (n = 17, 36.17%) reported data collection reliability coefficients. Of the seventeen articles, the numerical range of statements or questions utilized to measure constructs extended from 1 to 10. *JAE* reported in 2021 (N = 73) published articles and thirty-two (n = 32, 43.83%) utilized data collection reliability coefficients. Of those thirty-two, the numerical range of statements or questions was 1 to 19. In 2020, *JAE* reported eighty-three (N = 83) articles published and forty-one (n = 41, 49.39%) that tested reliability coefficients. Statements numerically ranged from 1 to 32. Thirty-two was the extreme outliner. In 2019, (N = 70) articles were published and (n = 36, 51.43%) implemented collection instruments. Statements ranged from 1 to 12. *JAE* reported (N = 80) articles and (n = 44, 55%) articles used data collection instruments in 2018. The range of statements was from 1 to 20.

JOE published thirty-four (*N* = 34) articles in 2022 and five (*n* = 5, 14.70%) reported testing reliability coefficients. The range of statements or questions was 1 to 10. *JOE* had eighty- two (*N* = 82) articles published in 2021 and six (*n* = 6, 7.31%) reported data collection reliability coefficients. One to twelve was the range of statements or questions. In 2020, *JOE* reported sixty-eight (*N* = 68) articles and nine (*n* = 9, 13.23%) had data reliability coefficients. The numerical range of statements or questions utilized to measure constructs ranged from 1 to 7. *JOE* published (*N* = 77) articles in 2019 and (*n* = 13, 68.88%) indicated the use of data collection instruments. Statements ranged from 1 to 12. In 2018, *JOE* reported (*N* = 78) articles and (*n* = 15, 21.43%) testing reliability coefficients. The range of statements was from 1 to 12.

TJAEE had (*N* = 22) articles published in 2022 and three (*n* = 3, 13.63%) articles had construct reliability coefficients. Statements ranged from 1 to 36. Thirty-six was an outlier given the small number of instrumentation studies in 2022. In 2021, thirty-three (*N* = 33) articles were published and seven (*n* = 7, 21.21%) reported construct reliability coefficients. The numerical range of statements was 1 to 10. There were twenty-five (*N* = 25) articles and three (*n* = 3; 12%) articles that tested construct reliability coefficients in 2020. Statements or questions ranged from 1 to 7. *TJAEE* reported (*N* = 25) articles published in 2019 and (*n* = 9, 36%) indicated the use of data collection instruments and statements ranged from 1 to 8. In 2018, (*N* = 25) articles were published and (*n* = 11, 44%) utilized data collection instruments. Statements ranged from 1 to 10.

AAD began in 2020, and therefore, articles from 2018 and 2019. *AAD* had (*N* = 14) articles published in 2022 and seven (*n* = 7, 50%) articles reported data collection reliability coefficients. The numerical range of statements ranged from 1 to 7. Twenty-seven (*N* = 27) articles were published in 2021 and twelve (*n* = 12, 44.44%) utilized data collection reliability coefficients. The range of statements was from 1 to 7. Twenty- three articles (*N* = 23) were published in 2020 and eight (*n* = 8, 34.78%) reported reliability coefficients. Statements ranged from 1 to 5.

Conclusions

Fewer items produced lower construct reliability coefficients and thus, produced higher levels of error (Likert, 1932). Much of our published scholarship has not utilized instruments to collect data over the last five years; when they have, smaller numbers of items measured constructs.

Implications/recommendations/impact on profession

Likert's (1932) convention in his quintessential work on measuring social variables suggested that for measurements to be reliable an alpha of .9 should be achieved. While Cronbach's (1951) convention postulates that construct reliability of .7 be achieved. Besides, what difference does .2 make anyway? With a threshold of .7, a potential variance of up to 30% exists; subsequently with a threshold of .9, a potential variance of only up to 10% exists (Field, 2013; Saris & Gallhofer, 2007). A difference of 20% variance can be a substantial difference in the power of analysis and interpretation of effect size. As a profession we should seek the highest level of reliability as possible, when possible. When developing an instrument, researchers should include a maximum number of statements and questions and eliminate those that do not contribute to reliability and add additional questions when acceptable levels of reliability are not achieved.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*, 297–334. https://doi.org/10.1007/BF02310555

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: the tailored design method* (4th ed.). John Wiley & Sons.

Field, A. P. (2013). *Discovering statistics using IBM SPSS Statistics* (4th ed.). SAGE Publications.

Lee, C.-L., Strong, R., & Dooley, K. E. (2021). Analyzing precision agriculture adoption across the globe: A systematic review of scholarship from 1999–2020. *Sustainability, 13*(18), 10295. https://doi.org/10.1080/1389224X.2020.1844767

Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology, 140*, 1–55.

Lindner, J. R., Rodriguez, M. T., Strong, R., Jones, D., & Layfield, D. (2016). Research priority area 2: New technologies, practices, and products adoption decisions. In Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). *American Association for Agricultural Education national research agenda: 2016-2020*. Gainesville, FL: Department of Agricultural Education and Communication.

Kodheli, O., et al. (2021). Satellite communications in the new space era: A survey and future challenges. *IEEE Communications Surveys & Tutorials*, *23*(1), 70–109. https://doi.org/10.1109/COMST.2020.3028247

Saris, W. E., & Gallhofer, I. (2007). Estimation of the effects of measurement characteristics on the quality of survey questions. *Survey Research Methods*, *1*(1), 29–43. https://doi.org/10.18148/srm/2007.v1i1.49

Thüm, T., Apel, S., Kästner, C., Schaefer, I., & Saake, G. (2014). A classification and survey of analysis strategies for software product lines. *ACM Computing Surveys*, *47*(1), 1–45. https://doi.org/10.1145/2580950

Warmbrod, J. R. (2014). Reporting and interpreting scores derived from Likert-type scales. *Journal of Agricultural Education*, *55*(5), 30–47. https://doi.org/10.5032/jae.2014.05030

Wright, R. W., Brand, R., Dunn, W., & Spindler, K. (2007). How to write a systematic review. *Clinical Orthopedics and Related Research*, *455*, 23–29. https://doi.org/10.1097/BLO.0b013e31802c9098

Metal Fabrication Equipment Adequacy and Competence to Teach of Kansas Agricultural Educators

Jacob Rutledge
400 W. 4th Street
Chapman, KS 67431
785-922-6561
jrutledge@usd473.net

Dr. Gaea Hock
315 Umberger
Manhattan, KS 66506
785-532-1166
ghock@ksu.edu

Dr. Jonathan Ulmer
308 Umberger
Manhattan, KS 66506
785-532-1250
julmer@ksu.edu

Dr. Jason Ellis
301C Umberger
Manhattan, KS 66506
785-532-5804
jdellis@ksu.edu

Metal Fabrication Equipment Adequacy and Competence to Teach of Kansas Agricultural Educators

Introduction/ Literature Review/ Theoretical Framework

"Agricultural mechanics instruction is in a constant state of dynamic change" (Shultz et al., 2014, p. 48). No matter the agricultural mechanics content being taught, there are some sort of equipment or tools necessary for students to learn adequately. Metal fabrication, including welding, has a multitude of equipment pieces necessary for student learning of which vary from program to program. Quality equipment allows student learning opportunities to flourish and excel beyond the high school agricultural mechanics laboratory. As McCubbins et al. (2016) state, "adequate tools and equipment are vital in preparing students to fill an expanding, 21st century workforce" (p. 223).

Agricultural educators need to be competent about equipment to successfully teach students metal fabrication competencies (Sultan & Shafi, 2014). There is concern regarding the competence level of agricultural educators to effectively use and safely maintain the multitude of equipment present in an agricultural mechanics laboratory (Chumbley et al., 2018).

It is critical to consider self-efficacy (Bandura, 1997) when evaluating the equipment present in an ag mechanics laboratory and the competence of the ag educator. Self-efficacy can be defined as, "a personal belief in one's capability to organize and execute courses of action required to attain designated types of performances" (Artino, 2012, p. 76). Ag educators must have self-efficacy to create competence, which allows them to teach their students agricultural mechanic competencies.

Purpose and Objectives

The purpose of this study was to investigate the metal fabrication equipment needs of Kansas high school agricultural mechanic teachers. The following research objectives guided this study: 1.) Determine what metal fabrication equipment is present; 2.) Describe the adequacy of metal fabrication equipment present; 3.) Describe Kansas agricultural educators' competence to utilize metal fabrication equipment to teach their students agricultural mechanics competencies.

Methods

A Qualtrics survey consisting of four sections was disseminated to Kansas agriculture teachers during the summer of 2021 ($N = 275$). Three reminder emails were sent in weekly intervals to assure survey completion. The survey remained open for three weeks. The survey sections explored mechanics program information, equipment present in agricultural mechanic labs, adequacy of equipment, and competence to teach with the equipment. The survey was modified from one used by McCubbins et al. (2017) which reported acceptable reliability coefficients. Content validity was reviewed by a team of two university professors as well as a KSU Ph.D. student with experience and expertise in agricultural education and ag mechanics. Additional survey questions were added to the survey through the process to address newer agricultural mechanic competencies and equipment. Surveys were completed by 73 Kansas agricultural educators (26.5% response rate). Data was analyzed using SPSS.

Results

The population of this study was relatively young with over sixty-seven percent (*n* = 51) reporting 10 years or less, followed by 11-20 years of teaching experience (*n*= 11, 14.47%), and 21 years or more (*n* = 14, 18.42%). Agricultural mechanics competencies were taught to 2,623 students by 72 teachers during the 2020-2021 school year. The mean was 36.43 students per teacher, with a range of 0 to 175.

Research objective one sought to identify the metal fabrication equipment present in Kansas agricultural mechanic laboratories. ARC welders (M = 6.71) and MIG welders (5.31) were the highest quantity metal fabrication equipment per program. The next most common pieces of equipment were cutting torch (M = 2.33), chop saws (M=1.49), multi-process welders (M=1.47), drill presses (M=1.25), hand-held plasma cutters (M=1.21), and TIG welders (M=1.12). Band saws (M=0.68), iron workers (M=0.62), and plasma tables (M=0.51) all averaged less than one piece per program.

Research objective two sought to examine the reported adequacy of the metal fabrication equipment present. Teachers reported the two pieces of equipment most adequate in their laboratories ("very strong" or "strong") were chop saws (54.69%) and arc welders (46.88%). The pieces of equipment least adequate ("not at all" or "somewhat") were plasma table (60.34%) and TIG welder (59.02%). Research objective three examined the teachers' competence to utilize the equipment in their laboratories. The two pieces of equipment teachers were most competent (rated "strong" or "very strong") to use were also chop saws (91.42%) and arc welders (87.14%). TIG welders (55.71%) and plasma tables (37.14%) were the two items teachers were least competent to use (rated "not at all" or "somewhat").

Conclusions, Implications, & Recommendations

Self-efficacy is a process. Pekmezi et al. (2009) stated, "Past performance is considered the most powerful method of developing self-efficacy" (p. 3). Adequate equipment increases the competence of agricultural educators which in turn creates more meaningful learning opportunities for students to learn agricultural mechanic competencies.

When looking at the perceived *adequacy* of metal fabrication equipment, ag educators showed several trends in their responses. Not one piece of equipment had "very strong" as the highest rated adequacy. MIG welders, arc welders, chop saws, cutting torches, and hand-held plasma cutters were all rated as "strong" adequacy. TIG welders, iron workers, band saws, plasma tables, and multi-process welders were all rated "not at all adequate" most often. Six pieces of equipment were rated "strong" and "very strong" *competence* the most frequent (MIG welders, arc welders, drill presses, chop saws, cutting torches, and hand-held plasma cutters). The highest frequency for TIG welders and plasma tables were "not at all" and "somewhat."

It is recommended to focus on the least adequate equipment in agricultural mechanic laboratories with increased funding and training by universities and industry. Future research should investigate industry needs to best design and support future professional development and training. Additionally, research to identify how teacher preparation programs are addressing skill development in metal fabrication can help identify gaps in knowledge and self-efficacy to teach this content.

References

Artino, A. R. (2012). Academic self-efficacy: From educational theory to instructional practice. *Articles from Perspectives on Medical Education, 1*(2), 76-85. https://dx.doi.org/10.1007%2Fs40037-012-0012-5

Bandura, A. (1997). *Self-efficacy: The exercise of control.* Freeman.

Chumbley, S., Hainline, M., & Haynes, J. (2018). Agricultural mechanics lab safety practices in south Texas. *Journal of Agricultural Education, 59*(3), 309-323. https://doi.org/10.5032/jae.2018.03309

McCubbins, O., Anderson, R., Paulsen, T, & Wells, T. (2016). Teacher-perceived adequacy of tools and equipment available to teach agricultural mechanics. *Journal of Agricultural Education, 57*(3), 223-236. Doi: 10.5032/jae.2016.03223

McCubbins, O., Wells, T., Anderson, R., & Paulsen, T. (2017). Examining the relationship between the perceived adequacy of tools and equipment and perceived competency to teach agricultural mechanics. *Journal of Agricultural Education, 58*(2), 268-283. https://doi.org/10.5032/jae.2017.02268

Pekmezi, D., Jennings, E., & Marcus, B. H. (2009). Evaluating and enhancing self-efficacy for physical activity. *ACSMs Health & Fitness Journal, 13*(2), 16-21. doi: 10.1249/fit.0b013e3181996571

Shultz, M., Anderson, R., Shultz, A., & Paulsen, T. (2014). Importance and capability of teaching agricultural mechanics as perceived by secondary agricultural educators. *Journal of Agricultural Education, 55(*2), 48-65. doi: 10.5032/jae.2014.02048

Sultan, S. & Shafi, M. (2014). Impact of perceived teachers' competence on students' performance: Evidence for mediating/moderating role of class environment. *I-Manager's Journal on Educational Psychology, 8*(1), 10-18. https://doi.org/10.26634/jpsy.8.1.2764

Mind Mapping the Curricular Planning Process for Florida School Based Agricultural Education Teachers

Jason Dossett
310 Rolfs Hall
Gainesville, FL 32611
(865) 771-6868
j.dossett@ufl.edu

Sadie Hundemer
Bryant 117A
1772 Stadium Road
PO Box 112060
Gainesville, FL 32611
352-273-2574
shundemer@ufl.edu

R.G. Tre Easterly, III
307C Rolfs Hall
PO Box 110540
Gainesville, FL 32611
352-273-4052
tre.easterly@ufl.edu

J. C. Bunch
307A Rolfs Hall
Gainesville, FL 32611
352-294-2226
bunchj@ufl.edu

Introduction/need for research

The process of planning instruction is an important skill for teachers to have. Teaching utilizes a unique mixture of using a teacher's own knowledge and resources available to plan instruction. Teachers then use the knowledge and resources to guide students toward educational goals to transform the classroom and students into a more desired state. (Brown, 2009). Pedagogical design capacity (PDC) explains the relationship between instructional resources, teacher resources, and subsequent instruction in the classroom (Brown, 2009, Knight-Bardsley & McNeil, 2016). Teachers use different resources depending on knowledge, skill, and commitments (Brown & Edelson, 2003). The more we understand how teachers plan for instruction, the better insight we can provide support for the planning process.

While all teachers must consider curriculum, standards, objectives, and benchmarks, school-based agriculture education (SBAE) teachers must also account for FFA schedules, local agriculture industry needs, and land labs (Phipps et al. 2008). PDC is an important consideration for SBAE teachers and those creating resources. Standardized resources do not exist across the state or nation, and the goals and roles of each agriculture education program and teacher are different (Torres, et al. 2007).

Conceptual Framework

This research utilizes pedagogical design capacity (PDC) as a conceptual framework, which explains a teacher's ability to use resources to craft instruction for the classroom (Brown, 2009). PDC examines how teachers mobilize the tools they have around them (curricular resources) and their personal knowledge and beliefs (teacher resources). Curricular resources include items like physical items and procedures, while teacher resources include subject matter knowledge and beliefs. Classroom instruction is the planned learning events that come because of the confluence of these resources.

Methodology

This study utilized mental modeling techniques to examine how a convenient sample of Florida SBAE teachers planned instruction. Mental modeling techniques determine how people cognitively structure information presented. These methods are not used to hold predictive power but rather explore how a set group think about a concept. An effective mental model will define the mental space, use an "imagine if" scenario, focus on items related to the context, and use follow-up questions (Kearney, 2015). Florida SBAE teachers who attended chapter officer leadership training were invited to participate in the mental modeling. In total, 50 SBAE teachers participated. Teachers were given a prompt that read:

> Imagine another agriculture teacher asked you to explain your process for planning instruction for any course you teach. They are interested in how you develop key learning experiences for students including assignments/projects/teaching methods/materials. They are also interested in how you document your plan for instruction. Think about the specific things you would talk about and the words you would use as you share your process with them.

Teachers were given 38 cards relating to planning for instruction and were asked to sort and categorize the cards based on how they would answer the prompt. Once all cards were received,

the data was analyzed by the Anthropac software (Borgatti, 1992) to develop composite maps of the mental models of the group based on hierarchical clustering analysis (Kearney, 2015).
The results were processed using the Conceptual Content Cognitive Mapping (3CM) (Kearney, 2015). The arrangement of the cards presents a visual representation of participants' thoughts relating to planning instruction. Mental modeling is a versatile technique that supports high-level and detailed communication decisions. The richness of the data means that small sample sizes (<10) can provide a large amount of data (Kearney, 2015). The map produced indicates how closely related participants perceive the various items in the activity.

Results/findings

Six categories of concepts were found including curriculum guides, methods, resources, student prior experience, evidence of learning, and considerations and context. In the resource category, we found curricular resources, teaching resources, teaching tools, and textbook. Because these three items were so closely related, it seems as though teachers may consider every item used in their classroom as curricular resources and teaching tools.

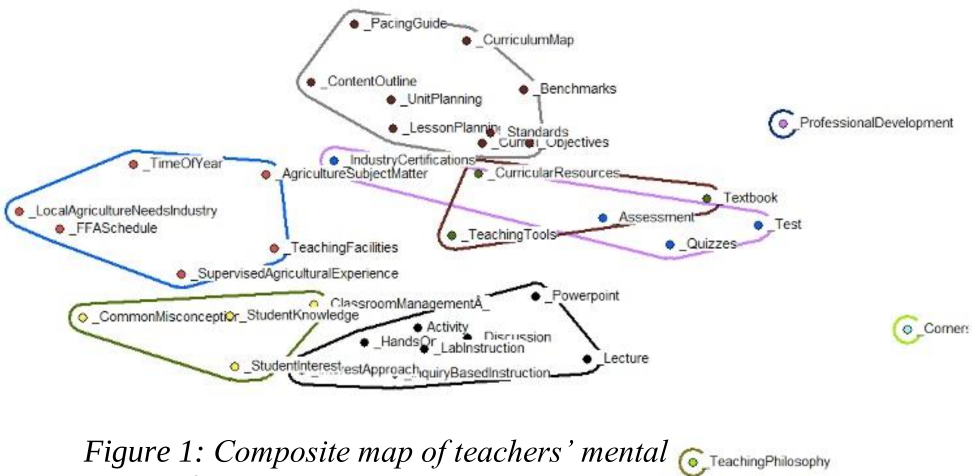


Figure 1: Composite map of teachers' mental model of planning instruction.

The category of considerations and context is specific to SBAE teachers and the items found in it are also an important part of the planning process. SBAE teachers must consider the context of time of the year and FFA schedule during the planning process.
A notable theme was found in the items not included in categories. These items were professional development, cornerstone tasks, and teaching philosophy. While teachers may use these items to plan instruction, the software did not include them in the categories listed.

Conclusions/Implications/recommendations/ impact on profession

Findings from this study are confined to the participants of the study. While the results cannot be generalized to all SBAE teachers, this research does serve as groundwork for future research for those who look to improve and provide support for the teacher planning process.
Planning instruction
Teachers plan instruction based on their own instructional goals. This data shows what teachers think about in relation to other aspects of planning. Teachers interact with curricular resources and teacher resources. This data paints a picture of how the interactions take place and how those items are related. Curricular designers should use this data to determine specific designs and how those impact a teachers' PDC.

References

Ball, A. L., Knobloch, N. A., & Hoop, S. (2007). The instructional planning experiences of beginning teachers. *Journal of Agricultural Education*, *48*(2), 56-65.

Borgatti, S. (1992). *Anthropac* (4.0) [Computer software]. Analytic Technologies. http://www.analytictech.com/anthropac/anthropac.htm

Brown, M. (2009). The teacher-tool relationship. In J. T. Remillard, B. A. Herbel-Eisenmann, & G. M. Lloyd (Eds.), *Mathematics teachers at work: Connecting curriculum materials and classroom instruction* (pp. 17–36). Routledge.

Brown, M. & Edelson, D.C. (2003). *Teaching as design: Can we better understand the ways in which teachers use materials so that we can better design materials to support their changes in practice?* The Center for Leaning Technologies in Urban Schools.

Kearney, A. R. (2015). 3CM: A tool for knowing "where they're at". In R. Kaplan, & A. Basu (Eds.), *Fostering reasonableness: Supportive environments for bringing out our best* (pp. 273–294). Michigan Publishing.

Knight-Bardsley, A. & McNeill, K. (2016). Teachers' pedagogical design capacity or scientific argumentation. *Science Education*, *100*(4), 645–672. https://doi.org/10.1002/sce.21222

Phipps, L. J., Osborne, E. W., Dyer, J. E., & Ball, A. (2008). *Handbook on agricultural education in public schools*. Thompson Delmar Learning.

Torres, R. M., Ulmer, J. D., & Aschenbrener, M. S. (2008). Workload distribution among agriculture teachers. *Journal of Agricultural Education*, *49*(2), 75-87. *10.5032/jae.2008.02075*

Modeling Determinants of Residential Water Conservation Behaviors to Inform Agricultural Education Programs

Kristin E. Gibson
University of Georgia
Kristin.gibson@uga.edu

Allison R. Byrd
University of Georgia
afortner@uga.edu

Alexa J. Lamm
University of Georgia
alamm@uga.edu

Kevan W. Lamm
University of Georgia
kl@uga.edu

Jessica Holt
University of Georgia
jaholt@uga.edu

Modeling Determinants of Residential Water Conservation Behaviors to Inform Agricultural Education Programs

Introduction

Water scarcity is one of the biggest threats to humankind and it is only expected to worsen due to climate change and population growth (Si et al., 2022). The severity of water scarcity is overlooked by many United States consumers as water is often provided for a low cost (Warner et al., 2018). Residential households have the ability to reduce water demands, but determinants of water saving behavior need to be examined to encourage voluntary residential reduction (Koop et al., 2019). Investigating the factors which may mitigate excessive residential water consumption is relevant to the 2016-2020 American Association for Agricultural Education National Research Agenda. Specifically, priority area seven of the research agenda calls for addressing complex problems in natural resource management, especially those related to water.

Theoretical Framework

The Theory of Planned Behavior (TPB; Ajzen, 1991) is frequently used to examine why individuals perform volitional conservation behaviors (e.g., Ho et al., 2014; Howell et al., 2014), including water conservation (e.g., Chaudhary et al., 2017; Si et al., 2022; Warner & Diaz, 2021). TPB is extended in water literature to include additional predictors, often increasing the variance explained by the theoretical model (e.g., Chaudhary et al., 2017; Si et al., 2022; Warner & Diaz, 2021). Motivations for behavioral actions, often grouped as either intrinsic and/or extrinsic motivation (Deci & Ryan, 1980; Stern, 2018), may help further explain residential water conservation behavior because it is unlikely an individual will perform a behavior without motivation (e.g., Li & Wen, 2019). Intrinsic motivation is defined as performing an action for the inherent satisfaction of the activity itself, whereas extrinsic motivation is defined as performing an activity for an external reward to avoid a punishment (Deci & Ryan, 1980; Stern, 2018). Therefore, the purpose of this study was to determine whether intrinsic motivation and/or extrinsic motivation predicted residential water conservation behavior beyond the TPB.

Methods

Data were collected in September 2022 from residents of Florida, Georgia, and Alabama using an online questionnaire ($N = 907$). Non-probability, opt-in sampling methods were used to recruit respondents (Baker et al., 2013). The University of Georgia Institutional Review Board (IRB #00005553) approved the research design.

A researcher-developed TPB instrument was constructed based on recommendations within the literature (Ajzen, 1991). Attitude (A) toward residential water conservation was measured using seven items on a five-point, semantic differential scale ($\alpha = 0.89$). Subjective norms (SN) and Perceived Behavioral Control (PBC) toward water conservation were each measured using five items on a five-point, Likert-type scale ranging from 1 = strongly disagree to 5 = strongly agree ($\alpha = 0.87$, $\alpha = 0.88$, respectively). Self-reported residential conservation intention was measured using five items on a five-point, Likert-type scale from 1 = very unlikely to 5 = very likely ($\alpha = 0.81$). Self-reported residential conservation behavior was measured using three items on a five-point Likert-type scale from 1 = very unlikely to 5 = very likely ($\alpha = 0.79$). Intrinsic motivation (IM) towards water conservation was measured using five items on a 5-point Likert-type scale from 1 = strongly disagree to 5 = strongly agree ($\alpha = 0.90$). Extrinsic motivation (EM) towards water conservation was measured using three items on a five-point Likert-type scale from 1 = strongly disagree to 5 = strongly agree ($\alpha = .88$).

The proposed model included direct paths from A, SN, and PBC on intention and intention on behavior. IM and EM were treated as mediating variables between intention and behavior. The Sobel test for mediation indicated mediation was present with IM but not with EM; therefore, IM remained a mediator in the model between intention and behavior but EM was only examined as a direct effect on behavior. A structural model was analyzed in R using the Lavaan package to examine the effects of the variables on behavior. Structural model fit indices were deemed acceptable (CFI = .91; TLI = .90; RMSEA = .06; Hooper et al., 2008).

Results

In the model, A (standardized = 0.35, $p < .001$) and SN (standardized = 0.30, $p < .001$) both had a significant direct effect on intention. PCB (standardized = 0.03, $p = .48$) did not have a significant direct effect on intention. The variables explained 31.2% of variance in intention. Intention (standardized = 0.21, $p < .001$) had a significant direct effect on behavior. EM had a significant direct effect on behavior (standardized = -0.47, $p < .001$). Mediation was present in the model. Intention had a significant indirect effect on behavior mediated by IM (standardized = -0.05, $p < .01$). The direct effect of intention on behavior (standardized = 0.20, $p < .001$) increased slightly when IM was present (standardized = 0.21, $p < .001$). IM (standardized = -0.13, $p < .001$) had a significant direct effect on behavior. In total, the TPB model with the inclusion of IM and EM explained 30.7% of variance in behavior.

Conclusions and Recommendations

The results were both expected and unexpected based on existing literature. For example, TPB had direct effects on intention as anticipated; however, these effects were limited to A and SN. The unanticipated results included non-significant effects of PBC on intention, as well as negative effects for both IM and EM on behavior. These observations contradicted previous studies related to environmental intentions (Li & Wen, 2019). It is possible respondents were not motivated to conserve water because residential water has always been available at a low cost; therefore, no rewards or punishments have been considered by the public in relation to water consumption. A potential interpretation of the negative effect of motivation on behavior may be related to the Intention-Action gap (Vermeir & Verbeke, 2006) where individuals desire a behavior, in this case motivation. However, their actions, in this case self-reported behavior, do not manifest.

The results of the present study are novel as they empirically indicate water conservation behaviors may be more effectively influenced through A and SN than through individual, self-directed, motivation. Based on these findings, a recommendation is for agricultural educators to focus water conservation programming on attitudes and subjective norms. Additionally, agricultural educators should work with leaders in communities to initiate conversations around residential water use to create a social norm surrounding water conservation behaviors. For example, programming for homeowners association leadership may help establish norms for other members within a community.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes,* 50(2), 179-211. https://doi.org/10.1016/0749-5978(91)90020-T

Baker, R., Brick, J. M., Bates, N. A., Battaglia, M., Couper, M. P., Dever, J. A., Gile, K. J., & Tourangeau, R. (2013). Summary report of the AAPOR task force on non-probability sampling. *Journal of Survey Statistics and Methodology, 1*(2), 90-136. https://doi.org/10.1093/jssam/smt008

Chaudhary, A. K., Warner, L., Lamm, A., Israel, G., Rumble, J., & Cantrell, R. (2017). Using the theory of planned behavior to encourage water conservation among extension clients. *Journal of Agricultural Education, 58*(3), 185-202. https://doi.org/10.5032/jae.2017.03185

Deci, E. L., & Ryan, R. M. (1980). The empirical exploration of intrinsic motivational processes. *Advances in Experimental Social Psychology, 13*, 39-80. https://doi.org/10.1016/S0065-2601(08)60130-6

Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods, 6*(1), 53-60. http://eprints.nuim.ie/6596

Ho, S. S., Liao, Y., & Rosenthal, S. (2015). Applying the theory of planned behavior and media dependency theory: Predictors of public pro-environmental behavioral intentions in Singapore. *Environmental Communication, 9*(1), 77-99. https://doi.org/10.1080/17524032.2014.932819

Howell, A. P., Shaw, B. R., & Alvarez, G. (2015). Bait shop owners as opinion leaders: A test of the theory of planned behavior to predict pro-environmental outreach behaviors and intentions. *Environment and Behavior, 47*(10), 1107-1126. https://doi.org/10.1177/0013916514539684

Koop, S. H. A., Van Dorssen, A. J., & Brouwer, S. (2019). Enhancing domestic water conservation behaviour: A review of empirical studies on influencing tactics. *Journal of Environmental Management, 247*, 867-876. https://doi.org/10.1016/j.jenvman.2019.06.126

Si, H., Duan, X., Zhang, W., Su, Y., & Wu, G. (2022). Are you a water saver? discovering people's water-saving intention by extending the theory of planned behavior. *Journal of Environmental Management, 311*, 114848. https://doi.org/10.1016/j.jenvman.2022.114848

Stern, M. J. (2018). *Social science theory for environmental sustainability*. Oxford University Press. https://doi.org/10.1093/oso/9780198793182.001.0001

Vermeir, I., & Verbeke, W. (2006). Sustainable food consumption: Exploring the consumer "attitude–behavioral intention" gap. *Journal of Agricultural and Environmental Ethics, 19*(2), 169-194. https://doi.org/10.1007/s10806-005-5485-3

Warner, L. A., & Diaz, J. M. (2021). Amplifying the theory of planned behavior with connectedness to water to inform impactful water conservation program planning and evaluation. *The Journal of Agricultural Education and Extension, 27*(2), 229-253. https://doi.org/10.1080/1389224X.2020.1844771

Warner, L., Diaz, J., & Kumar Chaudhary, A. (2018). Informing urban landscape water conservation extension programs using behavioral research. *Journal of Agricultural Education, 59*(2), 32-48. https://doi.org/10.5032/jae.2018.02032

Novice agriculture teacher content knowledge among traditional and alternatively certified teachers: A longitudinal comparison

Dr. John Tummons, University of Missouri
Logan Fullerton, University of Missouri

127 Gentry Hall
University of Missouri
Columbia, MO 65211
573-882-9599

tummonsj@missouri.edu
llf8g4@mail.missouri.edu

Introduction/Need for research

Agriculture teacher demand is at an all-time high due to program growth, expansion, retirements, and new program openings. In 2018, there were over 1,000 agricultural education positions left unfilled (Deimler et al., 2019). Alternatively certified teachers are becoming more common with chronic teacher shortages, with 1 in 3 new agriculture teachers entering the profession as uncertified or not completing a traditional certification program (Roberts & Dyer, 2004; Smith et al., 2022). How do the needs of new agriculture teachers prepared in certification programs differ from those who did not receive the same preparation? The purpose of this study was to compare the skill readiness level of Missouri beginning agriculture teachers who were traditionally certified to those without traditional certification.

This inquiry was guided by the following research objectives:

1. Describe the beginning agriculture teacher skill readiness in agriculture content, SAE and FFA knowledge, instruction and curriculum knowledge, program planning and management for first year traditional and alternatively certified teachers.
2. Compare the content knowledge of beginning agriculture teachers who remained in the profession for their second year to those who were not retained.
3. Compare 2021 novice cohort readiness with 2004 cohort readiness.

Conceptual or theoretical framework

This study was guided by Barrick and Garton's (2010) conceptual model of teacher preparation. Strong content knowledge is an essential component of teaching (Bransford et al, 2000, Schulman, 1987), and both alternatively and traditionally certified teachers historically complete foundational coursework in agricultural content area(s). According to Barrick and Garton (2010), agriculture teacher preparation includes content knowledge, pedagogical content knowledge, and skills and professional knowledge and skills. This inquiry attempts to illuminate how formal training in pedagogical and professional knowledge and skills are expressed in the confidence in various aspects of the tasks required of a beginning agriculture teacher.

Methodology

This was a descriptive quantitative study utilizing survey research methods. The target population for this research was first year agriculture teachers. The accessible population was first year agriculture teachers currently employed in Missouri. Researchers replicated Roberts & Dyer's (2004) study on inservice needs of traditional and alternatively certified teachers, utilizing the same instrument and scale to generate descriptive data for longitudinal comparison in agriculture content, FFA and SAE, instruction and curriculum, and program management and planning. This instrument was developed through previously constructed instruments by Garton and Chung (1996) and Washburn et al. (2001). After receiving IRB approval, researchers contacted all first-year agriculture teachers in the state directory via email with a link to a google form containing a survey where teacher identified their preparation level to perform or teach selected agricultural education skills and topics. Prior to distribution, the survey was reviewed by a panel of experts for face and content validity and for readability. Roberts and Dyer estimated reliability of each construct at or above $\alpha = 0.88$. Like the Roberts and Dyer study, researchers collapsed responses of one and two into "*high need*" and reported frequencies. Initial surveys were distributed in December. Non respondents were emailed twice in December and once in January. A total of 22 usable responses were obtained with a response rate of 45%. Findings should not be inferred beyond the respondents.

Results/findings

Table 1- Mean (standard deviation) for novice agriculture teacher skill readiness in various constructs.

	2021 novice teachers		2004 novice teachers	
	Traditional (*n = 16*)	Alternative (*n* = 6)	Traditional (*n* =70)	Alternative (*n* = 72)
Instruction and curriculum	3.49 (1.18)		3.15 (0.86)	
	3.58 (1.06)	3.24 (1.20)	3.15 (0.86)	2.98 (0.87)
Technical agriculture	3.05 (1.26)		3.11 (0.64)	
	3.13 (1.22)	2.75 (1.27)	3.11 (0.64)	3.09 (0.86)
Program planning and management	2.83 (1.24)		3.18 (0.94)	
	2.82 (1.18)	2.83 (1.37)	3.18 (0.94)	3.10 (1.02)
FFA and SAE	2.81 (1.22)		3.06 (0.85)	
	2.88 (1.23)	2.63 (1.21)	3.06 (0.85)	3.06 (0.92)

Note: Items scaled as *1=not prepared, need much assistance, 5=fully prepared*

Table 2- Mean (standard deviation) agriculture teacher skill readiness of first year agriculture teachers retained compared to leaving the profession

Constructs	Retained in profession *n* = 19	Leaving *n* = 3	Mean Difference
FFA and SAE content	2.99 (1.18)	1.61 (1.22)	1.38
Instruction and curriculum	3.65 (1.08)	2.32 (1.18)	1.33
Program planning and management	2.96 (1.22)	2.00 (1.24)	0.96
Technical agriculture	3.17 (1.22)	2.32 (1.26)	0.85

Note: Items scaled as *1=not prepared, need much assistance, 5=fully prepared*

Conclusions

In areas of technical agriculture content, FFA and SAE, and Instruction and Curriculum, the 2021 traditionally certified teachers, on average, scored higher than the alternative certified teachers at a similar level of +0.33 for all scales. For alternatively certified teachers in this study, 50% of respondents reported they were not prepared to complete proficiency awards, Program of Activities, FFA Degrees. Fifty percent of traditional and alternative teachers reported they were not prepared to lead Adult programming. Compared to 2004 teachers, 2021 novice teachers felt more prepared in curriculum and instruction, but lower on all other constructs. Teachers retained for a second year reported higher skill levels across all four areas for both traditional and alternatively certified teachers. Mean content differences of more than one scale point were found between leavers and stayers was in FFA and SAE content and instruction and curriculum.

Implications/Recommendations/impact on the Profession

This study supports the importance of content knowledge as a key component of teacher success. Beginning teachers felt most prepared in instruction and curriculum development and technical content. This could reflect curricular trends to increase education coursework and reduce content classes. Alternatively certified teachers reported a lack of preparation in the FFA and SAE. The study also brings to light the variation within "alternative" certification. This study supports the breadth of skills needed by agriculture teachers and suggests great importance of perceived content knowledge in retention of beginning agriculture teachers. As programs identify, recruit, and prepare alternatively certified teachers, teacher leaders should focus on confidence in the content as a potential predictor of retention in the profession. We recommend beginning teacher programs identify and support teachers who identify low content knowledge.

References

Barrick, K.R. & Garton, B.L. (2010). Frameworks for teacher preparation. In Torres, R. M., Kitchel, T. J., & Ball, A. L. (Eds.). (2010). *Preparing and advancing teachers of agricultural education*. Curriculum Materials Service, the Ohio State University.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How people learn* (Vol. 11). National academy press.

Deimler, B., Jackman, W.J., Ball, M., Thompson, E., Fristoe, A., Hamilton, V., Ehn, A., & Knight, E. (2019). *2018 National Teach Ag Campaign Annual Report*. National Association of Agriculture Educators.

Garton, B. L., & Chung, N. (1996). The inservice needs of beginning teachers of agriculture as perceived by beginning teachers, teacher educators, and state supervisors. *Journal of Agricultural Education*, *37*, 52-58.

Roberts, T.G., & Dyer, J. E. (2004). Inservice needs of traditionally and alternatively certified agriculture teachers. *Journal of Agricultural Education, 45*(4), 57-70. https:/doi.org/10.5032/jae.2004.04057

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational researcher*, *15*(2), 4-14. https:/doi.org/10.2307/1175860

Smith, A. R., Foster, D. D., & Lawver, R. G. (2022). National Agricultural Education Supply and Demand Study, 2021 Executive Summary. Retrieved from: http://aaaeonline.org/Resources/Documents/NSD 2021Summary.pdf

Washburn, S. G., King, B. O., Garton, B. L., & Harbstreit, S. R. (2001). A comparison of the professional development needs of Kansas and Missouri teachers of agriculture. In *Proceedings of the 28th National Agricultural Education Research Conference* (Vol. 28, pp. 396-408).

Perceptions of Science Communication by Professional Communicators

John Clemmons
448 Agricultural Hall
405-744-6548
john.clemmons@okstate.edu

Quisto Settle
448 Agricultural Hall
405-744-6548
qsettle@okstate.edu

Introduction

Scientific progress by itself is not enough to move society forward. As an example, measles was basically eradicated in the United States only to make a comeback because of declining vaccination rates (Patel et al., 2019). As the number of news outlets and journalists continue a decades-long decline, there is a need for science communication from reputable sources (Brownell et al., 2013; Simis et al., 2016). One of the areas to be addressed is the lack of training and resources available to new researchers (Bankston & McDowell, 2018). With social media dropping barriers between scientists and the public, there is an opportunity for researchers to fill a communication vacuum with evidence-based information (Voytek, 2017). Historically, science communication has depended on the knowledge deficit model, which purports that giving people information will improve their decision-making, but that model assumes the general public processes information the same way scientists do, which is not the case (Simis et al., 2016). Evidence by itself is not enough without understanding factors affecting audiences' ability and willingness to use the information (Longnecker, 2016). That model is also limited by scientists' lack of communication training (Brownell et al., 2013; Simis et al., 2016). Of the trainings that do exist, many show concepts and models of communication, but there is a need to provide scientists with hands-on practice in communication (Besley & Tanner, 2011).

Conceptual Framework

The narrative paradigm offers an alternative to the knowledge deficit model. In contrast to the assumption that people are rational beings, the narrative paradigm assumes people gravitate toward good stories and make decisions based on their background and circumstances (West & Turner, 2018). Rationality still exists in the narrative paradigm, but that rationality shifts to the story through coherence (i.e., internal consistency of the story) and fidelity (i.e., trustworthiness of the story). The narrative paradigm's strength in science communication is bolstered by the need to understand audiences and their needs when communicating research findings (Baram-Tsabari & Lewenstein, 2017; Bray et al., 2012; Dudo & Besley, 2016). The communication training the participants in this study engaged in was grounded in helping student scientists tell the story of their research.

Methods

Three two-hour science communication trainings were conducted in January of 2023 targeting student researchers at [university] in the [college of agriculture]. Communication professionals assisted the training so students could receive feedback from those actively engaging in science communication in their day-to-day work. Seven semi-structured interviews were conducted with communication professionals who participated in the sessions to get their perspectives on science communication and the trainings. The interviews were recorded to ensure accuracy. The interviews were then analyzed for common themes between participants.

Results

There were four key themes from the interviews: *defining science communication, importance of science communication, serving the science community*, and *potential of science communication trainings*. For *defining science communication,* nearly every participant gave a conceptually similar definition to science communication. It was generally defined as the process of translating or simplifying recent scientific developments for the purpose of educating the general public. There was a common assumption of low scientific literacy among members of the public, which was used to justify translating research into digestible pieces of information like news articles and online videos. For *importance of science communication*, every participant made remarks about how important the science communication process was to healthy research institutions and a well-informed society. While they noted the public probably had a more limited perspective of what science communication was, they believed that well-practiced scientific communication could contribute to the development of society and its research institutions. For *serving the science community*, many of the communications professionals interviewed described their career experience and built skills as a motivator for their involvement in the science communication training. They wanted to serve new researchers by passing down the information and strategies they had gathered. For the final theme of *potential of science communication trainings*, all participants noted the potential of science communication trainings. The believed young researchers needed resources to develop communication skills as a part of today's scientific community. While the current training was limited in its scope to the college of agriculture, some noted the need for expansion to other colleges. Participants were split on the size of the trainings. Some noted a desire to increase the number of people in the training, while others noted that smaller group sizes may be more conducive to fostering organic conversations.

Conclusions

The participants stated a need for science communication, which is well documented in the literature (Brownell et al., 2013; Simis et al., 2016; Voytek, 2017). Underpinning that belief is their assumption that the public lacks scientific literature, which is also well documented (Besley & Tanner, 2011). In line with the narrative paradigm, the participants were making statements and recommendations based on the needs of the audience: simplifying information so it can be understood and delivering that information through a variety of channels (Baram-Tsabari & Lewenstein, 2017; Bray et al., 2012; Dudo & Besley, 2016; West & Turner, 2018). While science communication needs to improve (Bankston & McDowell, 2018; Besley & Tanner, 2011), a notable finding of this research is why communication professionals would engage in trainings that they do not personally benefit from. These participants were engaging in the training as a service to the student researchers but also with the expectation that improving science communication would provide tangible benefits to society and the research institutions.

Recommendations

As noted by many others, there is a need for increased and improved science communication training and resources, including assessment of those efforts (Bankston & McDowell, 2018; Baram-Tsabari & Lewenstein, 2017; Simis et al., 2016). For efforts that focus on hands-on experiences (Besley & Tanner, 2011), integrating communication professionals could prove beneficial, and this research helps the research community understand why those professionals would volunteer their time for trainings. As new trainings are developed and implemented, evaluation of those programs is needed to understand what tactics are most effective for delivering the trainings and for understanding the outcomes of those programs beyond short-term changes, especially given that participants are expecting societal changes as a result of improved science communication.

References

Bankston, A., & McDowell, G. S. (2018). Changing the culture of science communication training for junior scientists. *Journal of Microbiology & Biology Education, 19*(1). https://doi.org/10.1128/jmbe.v19i1.1413

Baram-Tsabari, & Lewenstein, B. V. (2017). Science communication training: what are we trying to teach? *International Journal of Science Education. Part B. Communication and Public Engagement, 7*(3), 285–300. https://doi.org/10.1080/21548455.2017.1303756

Besley, J. C., & Tanner, A. H. (2011). What science communication scholars think about training scientists to communicate. *Science Communication, 33*(2), 239–263. https://doi.org/10.1177/1075547010386972

Bray. (2011). Identifying the essential elements of effective science communication: What do the experts say? *International Journal of Science Education, 2*(1), 23–41. https://doi.org/10.1080/21548455.2011.611627

Brownell, S. E., Price, J. V., Steinman, L. (2015). Science communication to the general public: Why we need to teach undergraduate and graduate students this skill as part of their formal scientific training. *Journal of Undergraduate Neuroscience Education, 12*(1). E6-E10. https://www.ncbi.nlm.nih.gov/pmc/journals/1910/

Dudo, A., & Besley, J. C. (2016). Scientists' prioritization of communication objectives for public engagement. *PLOS ONE, 11*(2). https://doi.org/10.1371/journal.pone.0148867

Longnecker, N. (2016). An integrated model of science communication: More than providing evidence. *Journal of Science Communication, 15*(5), 1–13. https://doi.org/10.22323/2.15050401

Patel, M., Lee, A. D., Clemmons, N. S., Redd, S. B., Poser, S., Blog, D., Zucker, J. R., Leung, J., Link-Gelles, R., Pham, H., Arciuolo, R. J., Rausch-Phung, E., Bankamp, B., Rota, P. A., Weinbaum, C. M., Gastañaduy, P. A. (2019). National update on Measles cases and outbreaks – United States, January 1-October 1, 2019. *Morbidity and Mortality Weekly Report, 68*(40), 893-896. https://doi.org/10.15585/2Fmmwr.mm6840e2

Simis, M. J., Madden, H., Cacciatore, M. A., & Yeo, S. K. (2016). The lure of rationality: Why does the deficit model persist in science communication? *Public Understanding of Science, 25*(4), 400–414. https://doi.org/10.1177/0963662516629749

Voytek, B. (2017). Social media, open science, and data science are inextricably linked. *Neuron, 96*(6), 1219-1222. https://doi.org/10.1016/j.neuron.2017.11.015

West, R. L., & Turner, L. H. (2018). *Introducing communication theory: Analysis and application* (6th ed.). McGraw-Hill Education.

Post-Pandemic Extension Needs of Floridians

Amy Harder
1376 Storrs Rd., Unit 4134
Storrs, CT 06269-4134
860-486-6270
amy.harder@uconn.edu

Karlibeth Leitheiser
P.O. Box 110540
Gainesville, FL 32611-0540
352-562-2301
kleitheiser@ufl.edu

Matthew Gold
P.O. Box 110540
Gainesville, FL 32611-0540
352-392-0502
matthewgold@ufl.edu

Introduction

From 2020 to 2022, the U.S. experienced a global pandemic and its impacts on health, the economy, and socialization. Society has been profoundly impacted and the consequences on human values and behaviors are of interest to a variety of fields, including sustainable development (Echegary, 2021), tourism (Everingham & Chassagne, 2020), and business (Anker, 2021). As an organization whose mission is focused on addressing the needs of individuals, families, and communities, UF/IFAS Extension also has a vested interest in assessing whether the pandemic impacted Floridians' perceptions of what is important to them. Past efforts to identify Floridians' needs found they prioritized protecting water quality, protecting freshwater resources, protecting air quality, and ensuring safe food handling practices to prevent foodborne illnesses (UF/IFAS Program Development & Evaluation Center, 2020). Our study was conducted to determine if UF/IFAS Extension should continue to focus its programs on the same priorities or whether new priorities had emerged for Floridians following a tumultuous time. The results contribute to enhancing the efforts of Extension, specifically, and agricultural education broadly, to solve complex, interdisciplinary problems (Roberts et al., 2016).

Conceptual/Theoretical Framework

Needs can be identified based upon three levels (Altschuld & Kumar, 2010; Witkin & Altschuld, 1995). Level 1 needs refer to the receivers of a service and their needs. Level 2 needs include the service providers, such as employees or administrators. Level 3 needs encompass system resources, such as buildings, equipment, or programs. Each of the levels are interrelated, relying on one another to function (Witkin & Altschuld, 1995). However, Altschuld and Kumar (2010) asserted "the needs of Level 1 should always be prime in the needs assessment process" (p. 23).

Methodology

We followed a three-phase plan to assess Level 1 needs in this study (Altschuld & Kumar, 2010; Witkin & Altschuld, 1995). The pre-assessment phase focused on uncovering needs already identified within the target audience. Information gathered in this exploratory stage aided the researchers in setting boundaries for the study. In the assessment phase, data were collected from the target audience and analyzed for emergent topics and themes. The final phase, post-assessment, will use the results of the study to create change and find solutions.

We conducted a non-experimental study of Floridians in 2022 using an online survey hosted by Qualtrics and distributed through Twitter, Facebook, and websites run by UF/IFAS and UF/IFAS Extension. A longer version of our survey instrument was used previously in 2020 (Harder et al., 2021). We replicated the priority issues section of that survey in our study; demographic questions were also asked of respondents. Questions asked respondents to indicate how much effort they thought UF/IFAS Extension should apply to various issues using five response options (1 = *No effort*, 2 = *Low effort*, 3 = *Moderate effort*, 4 = *High effort*, 5 = *Very high effort*).

There were 425 responses received in May and June; 112 responses were discarded after applying criteria designed to flag fraudulent (e.g., speeders, straightlining, potential bot), non-resident, and partial responses, leaving 313 usable responses. The high scrub rate was similar to the 2020 needs assessment (Harder et al., 2021). Data were analyzed using descriptive statistics and thematic coding of responses to an open-ended question that asked participants to describe the most pressing issue for UF/IFAS Extension issue to address.

Findings

The following issues were reported as needing *high effort* or *very high effort* by more than 70% of participants: protecting water quality (89.7%); protecting freshwater resources (88.2%); protecting natural habitats and ecosystems (88.2%); protecting the coastal environment (83.1%); controlling invasive plants (82.8%); strengthening the local food system (82.1%); controlling invasive pests (81.1%); protecting the marine environment (77.6%); composting, reducing, and recycling consumer goods (73.5%); reducing saltwater intrusion (71.5%); assisting local government with land use decisions (71.2%); and protecting air quality (70.6%). In comparison, several issues were reported as needing *no effort* or *low effort* by more than 50% of participants, including addressing illegal drug abuse (57.8%); addressing alcohol abuse (56.6%); addressing prescription drug abuse (56.2%); and strengthening couple and/or marital relationships (54.0%).

Participants expressed similar priorities in their open-ended responses. The statements were categorized into the following themes: environmental issues, agricultural processes, personnel in UF/IFAS, community engagement, population growth, education, and personal health and wellness. One participant wrote: "Water quality and sea level rise – these issues are critical to our state. We need to figure out how to protect our water and water supply, and how to protect our coastal areas from sea level rise." Another participant identified invasive species as a pressing issue: "Invasive plants and animals are destroying our natural resources/habitats." Few participants prioritized personal health and wellness compared to the frequency of responses corresponding to the other themes. One of those participants stated it was a priority for Extension to teach "homeowners healthy eating habits to reduce illness."

Conclusions

Despite the impacts of the pandemic, survey respondents continued to have stable views of the priorities for which they felt UF/IFAS Extension should apply the most effort. The use of a non-randomized sample means the views expressed may not be generalizable to all Floridians, but similarity was observed for the most agreed upon issues when compared with 2020 results. Protecting water quality repeated its performance as the leading priority for UF/IFAS Extension's efforts, consistent with the prior assessment of Floridians (UF/IFAS Program Development & Evaluation Center, 2020). Similarly, the issues for which respondents wanted UF/IFAS Extension to apply high or very high efforts tended to be thematically categorized as natural resources issues or safe and healthy food systems as they were in the 2020 assessment.

Implications/Recommendations/Impact on Profession

Altschuld and Kumar (2010) said "organizations, agencies, and business are there to resolve the needs of Level 1" (p. 23). Following a review of the data, the programmatic teams can create and provide content focused on the Level 1 priority needs. Further, agents can be supported in their efforts through additional in-service training opportunities facilitated by Extension state specialists. The findings of this study may lead to Extension addressing these issues more effectively. While our study focused on one state, the methods may be replicated by other states to provide a contemporary view of national needs following the COVID-19 pandemic.

References

Altschuld, J. W., & Kumar, D. D. (2010). *Needs assessment: An overview*. SAGE Publications, Inc.

Anker, T. B. (2021). At the boundary: Post-COVID agenda for business and management research in Europe and beyond. *European Management Journal, 39*(2), 171-178. https://doi.org/10.1016/j.emj.2021.01.003

Echegaray, F. (2021). What POST-COVID-19 lifestyles may look like? Identifying scenarios and their implications for sustainability. *Sustainable Production and Consumption, 27*, 567-574. https://doi.org/10.1016./j.spc.2021.01.025

Everingham, P., & Chassagne, N. (2020). Post COVID-19 ecological and social reset: moving away from capitalist growth models towards tourism as Buen Vivir. *Tourism Geographies, 22*(3), 555-566. https://doi.org/10.1080/14616688.2020.1762119

Harder, A., Craig, D. D., Caillouet, O., Israel, G. D., & Benge, M. P. (2021, April). They said what?! A practical reflection on the use of paid Qualtrics panels for a large-scale community needs assessment [Abstract]. *Proceedings of the annual conference of the Association for International Agricultural and Extension Education*, 172-176.

Roberts, T. G., Harder, A., & Brashears, M. T. (2016). *American Association for Agricultural Education national research agenda: 2016-2020.* University of Florida Department of Agricultural Education.

UF/IFAS Program Development and Evaluation Center. (2020). *2020 Floridians' perceptions of issues for which UF/IFAS Extension should apply effort* [Infographic]. https://pdec.ifas.ufl.edu/program_reviews/2020Survey/PDEC_FL_Perceptions_Issues_Which_Ext_Apply_Effort_FS_2020.pdf

Witkin, B. R., & Altschuld, J. W. (1995). *Planning and conducting needs assessments: A practical guide*. Thousand Oaks, CA: Sage Publications.

Preparing Agricultural Education Majors for Racially Diverse Classrooms: Students' Experiences During a Service-Learning Project for Black Youth

Authors

Richie Roberts, Ph.D.
Louisiana State University
131 JC Miller Hall
Baton Rouge, LA, 70803
roberts3@lsu.edu

Jacob Englin
Louisiana State University
jengl13@lsu.edu

Benita Komunjeru
Louisiana State University
bkomun2@lsu.edu

Preparing Agricultural Education Majors for Racially Diverse Classrooms: Students' Experiences During a Service-Learning Project for Black Youth

Introduction and Review of Literature

Changes in demographics in U.S. public schools have created challenges for some teachers and school districts because they have struggled to reduce the achievement gap between racial minority students, especially Black students, and their White peers (Rojas-LeBouef & Slate, 2012). Maxwell (2014) argued that these achievement gaps could negatively influence the well-being of the U.S., not only in urban spaces but also in rural areas, by exacerbating the socioeconomic gap between White and minority populations. These trends have also begun to influence the preparation of school-based agricultural education (SBAE) teachers (Roberts et al., 2020). As a result, a need has emerged to prepare SBAE teachers with the dispositions, knowledge, and skills needed to teach students who represent different cultural and racial backgrounds than themselves (LaVergne et al., 2012). One approach that has been advanced to achieve such in teacher preparation has been service-learning (SL) (Roberts et al., 2020). SL has been defined as the merger of academic learning with profound service in which students use critical reflection to connect their learning to issues and problems in a local context (Bringle & Hatcher, 1995). A need emerged to understand whether SL could be used to prepare agricultural education majors for racially diverse classrooms.

Background and Purpose of the Study

This study investigated a SL project for the *Foundations of Agricultural and Extension Education* course at Louisiana State University in the Fall 2020 and 2021 academic semesters. Because the project happened during the COVID-19 global pandemic, it was delivered in a virtual format. We partnered with BigBuddy, an after-school mentoring program that seeks to improve Black youth's academic and professional development in Baton Rouge. Each agricultural education major mentored four Black youth, called a *mentoring pod*, through weekly virtual sessions about career awareness in which the students introduced the youth to various careers in the agricultural and allied sectors. This was accomplished through multiple pedagogical approaches, including formal lessons, readings, and small group discussions. Therefore, using a critical constructionism lens (Denzin & Lincoln, 2008), the purpose of this case study was to examine the experiences of agricultural education majors during a SL project for Black youth designed to help prepare them for teaching racially diverse student populations.

Methodology

We employed Stake's (1995) instrumental case study design to ground this study methodologically. In total, 32 (*2020 Fall Semester* = 20; *2021 Fall Semester* = 12) agricultural education majors participated in this study. The agricultural education majors were primarily White (f = 29; 90.1%) and female (f = 24; 75.0%), with 15 (46.9%) freshmen, 10 (31.2%) sophomores, and seven (21.8%) juniors. The data for this investigation consisted of 219 written reflections, 128 photographs with captions, and focus group interviews, i.e., two total, that occurred at the conclusion of the 2020 and 2021 academic semesters, which lasted for two hours. Throughout the investigation, we promoted qualitative quality by embedding Lincoln's and

Guba's (1985) standards – confirmability, credibility, dependability, and transferability – throughout each phase. In our data analysis, we used Saldaña's (2021) qualitative analytic approaches to analyze each data source systematically. For this investigation, we used the following first-cycle coding procedures: (a) in vivo, (b) emotion, and (c) values coding. As a result, 682 unique first-cycle codes emerged. To reduce the data, we used axial coding to group similar first-cycle codes into categories. Then, in the final phase of analysis, we used thematic analysis to reduce the categories further and emerge the investigation's themes.

Findings

The findings for this investigation emerged through three themes: (1) defying stereotypes, (2) recognition of power and privilege, and (3) the reinforcement of professional identity. In the first theme, defying stereotypes, the agricultural education majors expressed how their attitudes, beliefs, and perspectives began to evolve as a result of the SL project. For example, Participant #17 shared in a reflection: "I think Black students are often thought of as low achieving, and we often think they won't be able to keep up in classes." She continued: "However, in my SL project, I realize[d] how bright and remarkable some of these kids are." Meanwhile, Participant #3 shared: "In the media, [Black] people are depicted as criminals and violent. However, in my learning pod, I had some of the sweetest kids ever; it [the SL project] just helped me flip the script in my mind, I guess." When reflecting on their experiences, in the second theme, the agricultural education majors began to recognize how issues of power and privilege negatively affected Black youth. For example, Participant #1 explained, "because of the pandemic, we usually Zoomed [a virtual meeting platform] into the kids' houses. Some of their living situations were pretty eye-opening for me. I forget how lucky I have it." Correspondingly, Participant #14 revealed: "One of my kids apologized for missing the previous week because his cousin was shot. It just kind of made me stop for a few moments because I did not know how to respond. I just don't have any experience with dealing with that heavy of a situation." In the final theme, the agricultural education majors expressed how the SL project contributed to growth in their professional identity as a *teacher*. For example, Participant #1 explained, "I think I was really nervous about teaching before doing this [the SL project]. Now, I feel like I could make a difference in kids' lives that maybe come from a different background."

Conclusions, Discussion, Implications, and Recommendations

This investigation sought to describe the experiences of agricultural education majors during a SL project for Black youth that was designed to help prepare them for teaching racially diverse student populations. Using a critical constructionism lens (Denzin & Lincoln, 2008), three themes emerged from our analysis: (1) defying stereotypes, (2) recognition of power and privilege, and (3) the reinforcement of professional identity. As a result, we conclude that the SL project helped the agricultural education majors recognize how various societal forces have created unique obstacles for Black youth. In the future, we recommend that teacher educators create opportunities for students to interact with Black youth more intimately through immersive projects such as SL. We also recommend that teacher educators who use a similar approach consider providing resources for students who may struggle with understanding how such forces may limit opportunities for Black youth.

References

Bringle, R. G., & Hatcher, J. A. (1995). A service-learning curriculum for faculty. *Michigan Journal of Community Service Learning*, *2*(1), 112-122. http://hdl.handle.net/2027/spo.3239521.0002.111

Denzin, N. K. & Lincoln, Y. S. (2008). *The landscape of qualitative research: Theories and issues* (3rd ed.). Sage.

LaVergne, D., Jones, W. A., Larke Jr, A., & Elbert, C. D. (2012). Identifying strategies for diversity inclusive agricultural education programs. *NACTA Journal*, *56*(2), 47-54. https://www.jstor.org/stable/pdf/nactajournal.56.2.47.pdf

Lincoln, Y. S. & Guba, E. G. (1985). *Naturalistic Inquiry*. Sage Publications.

Maxwell, L. A. (2014). U.S. school enrollment hits majority-minority milestone. *The Education Digest*, *80*(4), 27-35. http://libertyeducationgroup.org/yahoo_site_admin/assets/docs/US_School_Enrollment_Hits_Majority-Minority_Milestone.132151343.pdf

Roberts, R., Warren English, C., & Alston, A. J. (2020). Fostering identity development in teacher preparation: Service-learning's role in empowering agricultural education majors to teach STEM concepts. *Journal of Agricultural Education, 61*(3), 214-232. https://doi.org/10.5032/jae.2020.0324

Rojas-LeBouef, A., & Slate, J. R. (2012). The achievement gap between White and non-White students. *International Journal of Educational Leadership Preparation*, *7*(1), 1-61. https://files.eric.ed.gov/fulltext/EJ971502.pdf

Saldaña, J. (2021). *The coding manual for qualitative researchers* (4th ed.). Sage.

Stake, R. E. (1995). *The art of case study research*. Sage.

Principals' Perceptions of and Perceived Barriers to Implementing Agricultural Literacy in Pennsylvania Grades K-8

Madisen Plunkert
The Pennsylvania State University
(717) 965-9480
mpp5192@psu.edu

Kevin Curry, Jr.
Assistant Professor
The Pennsylvania State University
(814) 863-7069
kxc554@psu.edu

Department of Agricultural Economics, Sociology, and Education
211 Ferguson Building
University Park, PA 16802

Principals’ Perceptions of and Perceived Barriers to Implementing Agricultural Literacy in Pennsylvania Grades K-8

Introduction and Theoretical Framework

Due to urban sprawl and the advancement of crop production, less of Pennsylvania’s population lives and works in rural areas than in the past. As people move away from agriculture, so do school systems. With fewer youth exposed to agriculture, our society is becoming detached from its food and fiber systems, exacerbating an employment gap in the agricultural workforce (Burrows et al., 2020; NAITC, n.d.b: Riedel, 2006). Implementing agricultural literacy into school classrooms involves “applying authentic, agricultural-based content as the context to teach core curriculum concepts in science, social studies, language arts, and nutrition” (NAITC, n.d.a). Because research has shown that children begin to make choices regarding their career paths before secondary school (Tai et al., 2006; Wyss et al., 2012), engaging elementary and middle school students in agricultural literacy could lead to an increase in students that are interested in agriculture as a career before they begin high school. In turn, an interest in the agricultural industry could prevent an impending employment shortage. Exposing all youth to agricultural literacy could cultivate a more agriculturally literate population that makes informed choices regarding food, fiber, agriculture, and natural resources (Kovar & Ball, 2013). The researchers conducted this study using the theoretical lens of Fishbein and Ajzen’s (1975) Theory of Reasoned Action, which proposes that a person’s behavior is consistent with their attitudes and behavioral intentions.

Methodology

The purpose of this study was to assess principals’ and vice principals’ perceptions of and barriers to implementing agricultural literacy in their public elementary and middle schools. This quantitative study employed survey methods using Qualtrics, contacting principals (N=113) in a seven-county area of central Pennsylvania. This area was selected as a precursor to an intended larger study that surveys a broader state population and presents the regional uniqueness of the central part of the state. The questionnaire contained three target areas: (1) principals’ perceptions of agriculture (Knobloch, 2008), (2) barriers to implementing agricultural literacy as perceived by principals (adapted from Hammack & Ivey, 2019), and (3) demographics, measured by items created by the researchers. These questions included a mix of five-point summative scales (Likert, 1932), a ranking question, multiple choice, and open-ended styles.

Results

24 of the 113 principals contacted completed the survey, yielding a 21% response rate. All respondents were white, and a majority (58%) were male with an average age of 45.96 years old (*SD* = 7.42). The average respondent has been in education for 20.06 years, was a teacher for 12.50 years, has been a principal for 6.35 years, and has been at their current school for 6.89 years. To aid in answering the first research question, means and standard deviations were calculated to analyze principals’ perceptions (Knobloch, 2008) that were measured on a five-point summative scale (Likert, 1932) where 1 = strongly agree, 2 = agree, 3 = neutral, 4 = disagree, and 5 = strongly disagree. Principals had a contemporary view of agriculture (*M* = 1.65, *SD* = 0.66), believed that agriculture would fit in current academic subjects (*M* = 1.47, *SD* = 0.48), valued the educational benefits of implementing agriculture in the curriculum (*M* = 2.28,

SD = 0.63), and had a positive attitude of agricultural careers and the industry *(M* = 1.65, *SD* = 0.51). To answer the second research question, the researchers identified principals' perceived barriers to implementing agricultural literacy. This data is expressed in Table 1.

Table 1

Principal's Perceived Barriers to Implementing Agricultural Literacy

Item	*n*	*M*	*SD*
Increased accountability through standardized testing	24	4.17	0.96
Lack of time for teachers to learn about agricultural literacy	24	4.08	0.97
Lack of funding	24	4.04	0.91
Lack of training	24	3.96	0.86
Lack of teacher knowledge	24	3.63	0.88
Lack of flexibility in curriculum	24	3.54	1.02
Lack of teacher interest	24	3.25	0.90
Lack if administrative support	24	2.58	1.21

Note. Scale: 1 = Not Strong At All; 5 = Very Strong

Conclusions & Recommendations for Future Research

The findings regarding principals' perceptions were consistent with Knobloch's (2008) study and the following conclusions can be drawn: principals hold positive perceptions of agriculture, and principals believe that agriculture can be implemented in their schools. Additionally, principals' top perceived barriers to implementing agricultural literacy are increased accountability through standardized testing, lack of time for teachers to learn about agricultural literacy, and lack of funding, respectively. These results imply that principals would be likely to make decisions to support the implementation of agricultural literacy in their schools (Fishbein & Ajzen, 1975). To address principals' top perceived barrier, state staff could work to include agriculture in Pennsylvania standardized testing, which would add priority to teaching agriculture. The Pennsylvania Friends of Agriculture Foundation provides teachers with access to agricultural literacy curriculum and teacher training. Principals' second and third strongest perceived barriers suggest that schools are unaware of this organization. To address these barriers, state staff could create links between this organization and schools to catalyze communication for collaboration. For future research, the researchers recommend expanding this study to additional counties in the state and conducting qualitative research with survey respondents. This study lacks specificity regarding why principals perceive certain barriers as barriers. Qualitative data would help the researchers expand on the implications that perceived barriers have on implementing agricultural literacy.

References

Burrows, M., Sorensen, T., & Spielmaker, D. (2020). Assessing the Acceptance of Incorporating Agriculture into Elementary School Curriculum. *Journal of Agricultural Education*, *61*(2), 358-370.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: an introduction to theory and research.* Reading: Addison-Wesley.

Hammack, R., & Ivey, T. (2019). Elementary teachers' perceptions of K-5 engineering education and perceived barriers to implementation. *Journal of Engineering Education, 108*(4), 503-522.

Knobloch, N. A. (2008). Factors of teacher beliefs related to integrating agriculture into elementary school classrooms. *Agriculture and Human Values*, 25(4), 529-539.

Kovar, K. A., & Ball, A. L. (2013). Two decades of agricultural literacy research: A synthesis of the literature. *Journal of Agricultural Education*, 54(1), 167-178.

Likert, R. (1932). A technique for the measurement of attitudes. *Archives of psychology*.

National Agriculture in the Classroom. (n.d.a). *About National Agriculture in the Classroom.* National Agriculture in the Classroom. Retrieved December 11, 2022, from https://agclassroom.org/get/about/

National Agriculture in the Classroom. (n.d.b). *History of Agriculture in the Classroom*. National Agriculture in the classroom. Retrieved December 11, 2022, from https://agclassroom.org/get/about/

Riedel, J. S. (2006). Effects of an introductory agricultural education course on agricultural literacy and perceptions of agriculture in urban students.

Tai, R. H., Qi Liu, C., Maltese, A. V., & Fan, X. (2006). Planning early for careers in science. *Science, 312*(5777), 1143-1144.

Wyss, V. L., Heulskamp, D., & Siebert, C. J. (2012). Increasing middle school student interest in STEM careers with videos of scientists. *International journal of environmental and science education*, 7(4), 501-522.

Professional Development Needs of SBAE Teachers Regarding Suicide and Suicide Interventions

Kristin Stair
Louisiana State University
135 J. C. Miller Hall,
Baton Rouge, LA 70803
(225) 578-6128

Chris Haynes
Tarleton State University
1333 W. Washington
Stephenville, TX 76402
254-968-0595

Rebekah Epps
University of Kentucky
304 Garrigus Building, Lexington, KY 40546
rebekah.epps@uky.edu
(859) 257-3275

Jason Davis
University of Mount Olive
634 Henderson St. Mount Olive, NC 28365
rdavis@umo.edu
(919) 299-4556

Eric Rubenstein
University of Georgia
405 College Station Rd, GA 30602
erubenstein@uga.edu
(706) 542-3191

Carla Jagger
University of Florida
307B Rolfs Hall, Gainesville, FL 32611
carlajagger@ufl.edu
(352) 294-1992

O.P. McCubbins
Mississippi State University
P.O. Box 9745, Mississippi State, MS 39762
op.mccubbins@msstate.edu
(662) 325-2950

Don Johnson,
University of Arkansas
1120 West Maple, Fayetteville, AR 72701
dmjohnso@uark.edu
(479) 575-2035

Chaney Mosley
Middle Tennessee State University
MTSU Box 05, Murfreesboro, TN 37132
Chaney.Mosley@mtsu.edu
(615) 898-8037

Christopher Clemons
Auburn University
5060 Haley Center Auburn, AL 36849-5218
cac0132@auburn.edu
(334) 844-4434

Dale Layfield
Clemson University
246 McAdams Hall, Clemson, SC 29634.
dlayfie@clemson.edu
(864) 656-5676

Edly Santiago
University of Puerto Rico
Call Box 9000, Mayagüez PR 00680-9000
edly.santiago@upr.edu
(787) 832-4040 Ext. 3855

Jon Ramsey
Oklahoma State University
466 Agricultural Hall, Stillwater, OK 74078
jon.ramsey@okstate.edu
(405) 744-4260

Andy Seibel
VAAE Executive Director
115 Hutcheson Hall, Blacksburg, VA 24061
gseibel@vt.edu
(540) 231-3823

Introduction

According to the Centers for Disease Control (CDC, 2020), a death by suicide occurred every 11 minutes in 2020. Rural America has been plagued by an increase in suicides for many years; the rate of death by suicide for those located in rural communities across America is consistently higher than in metropolitan areas (Ivey-Stephenson, et al, 2017), and 1.5 times higher than the national average (CDC, 2022). Due to this problem, there is a distinct need for suicide prevention programs to support rural communities. Before effective suicide prevention programs can be developed however, there is a need for clear and distinct understanding of what suicide prevention programs have been utilized in the past, and what type of prevention programs are needed. This study, as part of a larger investigation, sought to determine the professional development needs of agricultural educators in regard to suicide and suicide prevention in the Southern United States and two United States Territories.

Theoretical Framework

This study was informed by the Interpersonal Theory of Suicidal Behavior (Van Orden et al., 2010). The theory explains that suicide risk consists of three main factors: (a) thwarted belongingness; (b) perceived burdensomeness; and (c) capability for suicide. When all three are present, an increase in lethal suicide attempts can occur as compared to the desire for suicide. Desire for suicide is present when the simultaneous presence of the two factors–thwarted belonging and perceived burdensomeness, is present.

Methodology

Instruments were developed to better understand the professional development needs of agricultural teachers in relation to suicide. Content validity was achieved using a panel of experts in agricultural education (N = 14). Further, cognitive interviews were conducted with five SBAE teachers to achieve face validity and improve instrument design as well as content validity and reliability (Knafl et al., 2007). This study identified the professional development needs of teachers through three open-ended questions included within the larger instrument. Participants were asked to describe concerns they have when identifying individuals who may be suicidal, their concerns related to working directly with individuals who may be suicidal, and the most essential areas of training for working with individuals who may be suicidal. The survey was distributed to 13 southern states (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia) as well as the U.S. Virgin Islands and Puerto Rico. Participants were contacted through state agriculture aeacher association email lists; three follow-up reminder messages sent at one-week intervals. Data were analyzed through multiple cycle coding methods to identify commonalities.

Results

Using the National Association of Agricultural Educators' (n.d.) 2021 state-level agricultural education supply and demand profiles, the researchers estimate the total population of SBAE teachers from states and territories involved in this study to be 6,961. Of the total number of attempted respondents (*N* = 1,155), 21% (*n* = 247) were not included in the study due to suicidal ideation. Additionally, 95 did not consent to participation. Of the 813 submitted responses, 20 were removed from analysis due to incompletion. Therefore, the usable response rate was 11% (*n* = 793).

Of the participants, two identified as gender non-confirming, one identified as a transgender woman, 355 identified as male, and 438 identified as female. The majority of participants (*n* = 699) identified as white. The average age reported was 39 with one to five years of teaching experience. Of the teachers in this study who had not previously participated in suicide-related professional development (*N* = 384), 76% (*n* = 293) were willing to attend. Face to face training only was the most preferred single delivery format(*n* = 94; 32%), followed by virtual only (*n* = 77; 26%) and hybrid only (*n* = 25; 9%); many were open to any delivery format (*n* = 54; 18%), with the rest amenable to ,more than one, but not all delivery formats (*n* = 43; 15%)..

When asked to describe concerns when identifying individuals who may be suicidal (N = 220), 49 (22%) were concerned about not seeing the warning signs or warning signs being hidden from them, whereas 36 (16%) expressed concern that they might not recognize the signs if they saw them. Teachers were least concerned about anger or hostility from confrontation (*n* = 4; 2%) or that there might be significant differences between identifying students and adults who might be suicidal (*n* = 3; 1%). When asked about concerns related to working directly with individuals who may be suicidal (N = 248), the majority of teachers (*n* = 72; 29%) expressed concerns related to not knowing what steps to take or how to get individuals help. Teachers were least concerned about concerns related to the difficulty of the conversation (*n* = 4; 2%), dealing with the impact to other students (*n* = 2; <1%), and personal care or safety (*n* = 2; <1%). When asked to identify the most essential areas of training (N = 242), teachers were most concerned about learning the warning signs and identification of individuals who might be suicidal (*n* = 78; 32%) and how to start conversations without triggering students (*n* = 50; 20%).

Conclusions

Teachers in this study desire professional development training related to understanding the warning signs of suicide and how to help students who might be suicidal. While most prefer in-person training, there was willingness to participate in a variety of training formats. While teachers expressed an interest in a variety of training topics related to suicide, they were most concerned about identifying students who might be at risk for suicide and how to start the conversation with students about suicide. Like many others in society, teachers in this study were concerned that starting a conversation about suicide might trigger a student to consider suicide. It is important that trainings be conducted to help teachers understand that having these conversations will not harm students or cause them to consider suicide (Knafl, et. al, 2007).

Implications

Professional development training is desired by teachers in the southern states. In particular, trainings should be conducted that help teachers identify warning signs for students in their classrooms that might be suicidal and how to begin that conversation with individuals about which they might have concerns. It is also important to stress during trainings that bringing up conversations about suicide will not increase the chances of suicidal behaviors which may help teachers be more willing to begin conversations with students about their mental health. It is recommended that states explore how training could be conducted in their area, including through partnerships with others in regional training formats.

References

Centers for disease control and prevention (2022). Rural Health Policy Brief: Preventing Suicide in Rural America. Publication No. CS290906-A https://www.cdc.gov/ruralhealth/suicide/pdf/18_290906-A_Turner_Policy-Brief_Suicide-002_508.pdf

Dazzi, T., Gribble, R., Wessely, S., & Fear, N. T. (2014). Does asking about suicide and related behaviours induce suicidal ideation? What is the evidence?. *Psychological medicine*, *44*(16), 3361–3363. https://doi.org/10.1017/S0033291714001299

Ivey-Stephenson AZ, Crosby AE, Jack SPD, Haileyesus T, Kresnow-Sedacca MJ. Suicide Trends Among and Within Urbanization Levels by Sex, Race/Ethnicity, Age Group, and Mechanism of Death - United States, 2001-2015. MMWR Surveill Summ. 2017 Oct 6;66(18):1-16. doi: 10.15585/mmwr.ss6618a1. PMID: 28981481; PMCID: PMC5829833.

Knafl, K., Deatrick, J., Gallo, A., Holcombe, G., Bakitas, M., Dixon, J., & Grey, M. (2007). The Analysis and Interpretation of Cognitive Interviews for Instrument Development. *Research in Nursing & Health*, *30*(2), 224–234. https://doi-org.ezproxy.mtsu.edu/10.1002/nur.20195

National Association of Agricultural Educators. (n.d.) 2021 State-level Agricultural Education supply and demand profiles. National Alliance on Mental Illness. (n.d.). *Mental health conditions*. https://www.nami.org/Learn-More/Mental-Health-Conditions

Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S. R., Selby, E. A., & Joiner, T.E. (2010). The interpersonal theory of suicide. *Psychological Review, 117*(2), 575–600. https://doi.org/10.1037/a0018697

Random Forest Algorithms for County-level Supplemental Nutrition Assistance Program (SNAP) Classifications

Jaehyun Ahn
Texas A&M University
Agriculture and Life Sciences Building
College Station, TX 77843
(979) 985-1658
jaehyun.ahn@ag.tamu.edu

Matt Baker
Texas A&M University
Agriculture and Life Sciences Building
College Station, TX 77843
(979) 845-6944
mathew.baker@ag.tamu.edu

Jean Parrella
Texas A&M University
Agriculture and Life Sciences Building
College Station, TX 77843
(979) 845-2954
jean.parrella@ag.tamu.edu

Dawn Burton
Prairie View A&M University
761 Carden-Waller Cooperative Extension Building
Prairie View, TX 77446
(713) 797-7032
deburton@pvamu.edu

Rafael Quijada Landaverde
Texas A&M University
Agriculture and Life Sciences Building
College Station, TX 77843
(979) 458-7993
rafael.q@ag.tamu.edu

Random Forest Algorithms for County-level Supplemental Nutrition Assistance Program (SNAP) Classifications

Introduction/Need for Research

Since 1933, the Food Stamp Program has steadfastly supported American farmers/food suppliers and families/food consumers. The Program started amid The Great Depression for legislators to support federal government-level purchases of farm commodities and distribute those commodities to communities in need. In 2008, the name of the Program changed to the Supplemental Nutrition Assistance Program (SNAP), and its focus shifted to helping qualified consumers purchase fresh, nutritional foods (Snap to Health, n.d.). As of 2022, over 47 million U.S. consumers participated in SNAP. However, SNAP research in the discipline is limited, although the American Association of Agricultural Education Research Agenda underscores this (Food & Nutrition Service, 2023; Roberts et al., 2016). Considering agricultural educators and Extension professionals' essential roles in supporting an affordable, nutritious food supply and demand, research on SNAP is paramount. Understanding the needs of participants is essential for Program performance and evaluation (Pinard et al., 2017). We sought to classify counties receiving SNAP benefits based on variables that best-predicted participation.

Conceptual Framework

Identifying SNAP benefit inclusion and exclusion criteria is important as more households receive SNAP benefits. Annual data from the U.S. Department of Agriculture's (USDA's) Food Nutrition Service provides the most detailed demographic and geographic features regarding county-level SNAP participation (Newman & Scherpf, 2013). The purpose of the USDA collecting this data was to

1. Understand local needs affecting food insecurity to inform tailored SNAP implementation;
2. Help Extension professionals, policymakers, and administrators allocate resources effectively; and
3. Evaluate/classify counties with SNAP benefits if the Program meets its goals.

Methodology

The Data Planet (2023) is SAGE Publication's web-based data repository containing over 65 billion data points, 550 databases, 90 data providers, and 16 subjects (e.g., Agriculture and Food). We accessed the repository and collected 86 SNAP-related, county-level quantitative variables predicting SNAP participation. The variables represented data from 3,143 U.S. counties between 2015 and 2017. For instance, we gathered information on the Food Environment (e.g., cluster of access to stores, food assistance, health activity, food price), SNAP Benefits Recipients (in percent), and socioeconomic characteristics originating from the Economic Research Service (2021), the Food and Nutrition Service (2023), and the United States Census Bureau (2022). We analyzed the data using TIBCO Statistica® (v. 13.0.5) for random forest classification.

Random forest is a decision tree-based machine learning (ML) method for classification, and its use enabled us to determine the correct classification of counties and predictor importance. Today, agriculture is one of the areas where ML is often applied (Pugliese et al., 2021). The random forest algorithm takes original data and creates many decision trees randomly in training. The test/trained data (i.e., data from the dataset that helps ML confirm the learned patterns) show the results from the combined decision trees that are less correlated. It is called an ensemble learning method in boosting-bagging-stacking that reduces bias and variance. All the predictors have ranked concerning the target variable (Ahn et al., 2022).

Findings

We bifurcated the target variable (i.e., 3,143 counties) according to the median of 2017 SNAP recipients (in percent). One-hundred counties (Alamance, NC to Yancey, NC, in alphabetical order) were in the 13.29% median. About 1,530 counties had fewer residents benefitting from SNAP than the median and 1,511 counties had more than the median. Twenty-three counties had the least residents benefitting from SNAP (5.67%; Albany, WY to Weston, WY), whereas 33 countries had the most residents benefitting from SNAP (22.06%; Bernalillo, NM to Valencia, NM). To simplify classification, counties in the median and with less than the median were treated as 0, and counties with more than the median were treated as 1.

The random forest algorithms built 160 trees, with some misclassifications: 29 observed less but predicted more and 28 were mismatches that observed more but predicted less, against 18,586 (both less) and 22,523 (both more) correct classes/cases. Standard errors of both training and test data were minuscule—less than 0.1%. Our primary interest was predictor importance in classification standards. The top four predictors were use of the National School Lunch Program (NSLP), adult obesity rate, soda sales tax (retail stores), and SNAP benefits (USD per capita). Albeit significant, SNAP benefits (USD per capita) ranked lower than the aforementioned predictors. Ironically, use of the NSLP was proportionate between SNAP-benefitted counties and adult obesity rate (Soda sales tax comes next).

The algorithms also identified the least essential predictors, which were persistent child poverty, population loss, and persistent poverty. The lower each of these predictors was, the more counties there were with fewer SNAP recipients.

Conclusions/Implications

The U.S. is not free from food insecurity. Although the national SNAP participation rate changes constantly based on economic prosperity and recession, about 12% of U.S. families stand food insecure (Economic Research Service, 2022) because they lack the adequate nutrition required to live healthy, productive lives. The predictors we identified characterize counties home to more SNAP beneficiaries. The most important predictor was the NSLP, which provides low-cost or free, nutritious lunches to public and nonprofit school students. Newman and Scherpf (2013) similarly identified NSLP participation as an essential predictor of SNAP participation (Newman & Scherpf, 2013). Our findings reaffirm previous findings characterizing SNAP participants and provide a greater understanding of local/county needs that can help inform tailored resource allocation and program implementation. As agricultural educators and Extension professionals, we should continuously re-evaluate county-level SNAP classifications to determine how to educate best and serve food-insecure households and communities.

Reference

Ahn, J., Briers, G., Baker, M., Price, E., Sohoulande Djebou, D. C., Strong, R., Piña, M., & Kibriya, S. (2022). Food security and agricultural challenges in West-African rural communities: A machine learning analysis. *International Journal of Food Properties*, *25*(1), 827-844. https://doi.org/10.1080/10942912.2022.2066124

Economic Research Service. (2021, January 8). *Food environment atlas: Access and proximity to grocery store American Indian or Alaska Native, low access to store, 2015*. [Data set]. Data Planet™ Statistical Datasets: A SAGE Publishing Resource from United States Department of Agriculture. https://doi.org/10.6068/DP1863709995593

Economic Research Service. (2022, October). *Food security and nutrition assistance*. U.S. Department of Agriculture. https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/food-security-and-nutrition-assistance/

Food and Nutrition Service. (2023, January). *Food National level annual summary: Participation and costs, 1969-2022*. U.S. Department of Agriculture. https://www.fns.usda.gov/pd/supplemental-nutrition-assistance-program-snap

Newman, C., & Scherpf, E. (2013). *Supplemental Nutrition Assistance Program (SNAP) access at the state and county levels: Evidence from Texas SNAP administrative records and the American Community Survey*. U.S. Department of Agriculture, Economic Research Service. https://ageconsearch.umn.edu/record/262218

Pinard, C. A., Bertmann, F. M., Byker Shanks, C., Schober, D. J., Smith, T. M., Carpenter, L. C., & Yaroch, A. L. (2017). What factors influence SNAP participation? Literature reflecting enrollment in food assistance programs from a social and behavioral science perspective. *Journal of Hunger & Environmental Nutrition*, *12*(2), 151-168. https://doi.org/10.1080/19320248.2016.1146194

Pugliese, R., Regondi, S., & Marini, R. (2021). Machine learning-based approach: Global trends, research directions, and regulatory standpoints. *Data Science and Management*, *4*, 19-29. https://doi.org/10.1016/j.dsm.2021.12.002

Roberts, T. G., Harder, A., & Brashears, M. T. (2016). *American Association for Agricultural Education national research agenda: 2016-2020*. Department of Agricultural Education and Communication, University of Florida. http://aaaeonline.org/resources/Documents/AAAE_National_Research_Agenda_2016-2020.pdf

Snap to Health. (n.d.). *The history of SNAP*. https://www.snaptohealth.org/snap/the-history-of-snap

The Data Planet. (2023, January). *Data Planet statistical datasets: About Data Planet statistical datasets*. SAGE Publications. https://data-planet.libguides.com/c.php?g=398594&p=2710212

United States Census Bureau. *(2022, October 10). Supplemental Nutrition Assistance Program (SNAP) - annual: Snap benefits recipients - percentage of population, 1989 - 2019*. [Data set]. Data Planet™ Statistical Datasets: A SAGE Publishing Resource. https://doi.org/10.6068/DP18636F4422387

Student Perceptions of Influence Emerging from Agricultural Influencer Instagram Posts

Hannah Culak[1], David Doerfert[1], Shelby Shank[2], Jason Headrick[1], Laura Fischer[1]

[1]Agricultural Education and Communications, Texas Tech University

[2]Texas Farm Bureau

Author Note

Hannah Culak, Graduate Research Assistant, hannah.culak@ttu.edu

David Doerfert, Professor, david.doerfert@ttu.edu

Shelby Shank, Field Editor, Texas Farm Bureau, sshank@txfb.org

Jason Headrick, Assistant Professor of Leadership & Community Development, jason.headrick@ttu.edu

Laura Fischer, Assistant Professor, laura.fischer@ttu.edu

Correspondence regarding this abstract should be addressed to David Doerfert, Texas Tech University, Box 42131-Lubbock, TX 79409-2131, Telephone: (806) 834 – 4477.

Student Perceptions of Influence Emerging from Agricultural Influencer Instagram Posts

Introduction

Influence is the force a person employs to enact a change in a target individual by altering their opinion, attitude, or behavior toward a certain product, idea, or concept (Hall & Barret, 2007). Individuals who use social media as a channel for influence or advocacy have been coined as influencers (Carpenter & Bonin, 2020). Influence is directly related to how much trust is formed between influencers and their followers (Shank, 2022). There is a cultural shift happening in which social media has overtaken television as the main source of information, as surveyed of 18- to 24-year-olds (Wakefield, 2016; Buster et al., 2021) with 71% of this age group using Instagram (Pew Research Center, 2021). University students often use social media to quickly secure the information they desire (Wang, et al., 2011). Previous research found social media followers are more likely to trust and share content where argument quality is more prevalent than emotion (Weismueller, et al., 2022). Within current social media platforms, Instagram establishes connections between influencers and their followers (Blight et al., 2017) formed through the process of users uploading photos or videos to share with other users (Ting et al., 2015). In agriculture, there is minimal research of influencers, and it is assumed that agricultural influence is like general social media influence (Powell, 2022; Shank, 2022). As social media platforms like Instagram are widely used among university students, influence is a necessary topic of research for agricultural influencers to utilize when advocating for agriculture.

Theoretical Framework

Today's society cannot be imagined without the presence of social communication media (Mehrad & Yousefi, 2018). The way people receive information is greatly influenced by social media; so much so that there is a co-dependency between the media platforms and the media consumers (Roese, 2018). The theoretical framework that guided this study was the Media-Systems Dependency Theory conceptualized by Ball-Rokech and DeFleur (1976) which explains the overall relationship between media and the people, and how media affects audience behavior. Kim and Yung (2016) confirmed that individuals who are more dependent on a social networking service (SNS) are more likely to engage in interactive activities on SNS (e.g., posting, commenting, and sharing) related to the topics of politics, shopping, and sports. The results also indicated that SNS dependency influences individual's offline behaviors including interpersonal storytelling with others offline about the topics to which they were exposed and pay attention to on an SNS creating implications for agricultural literacy efforts.

Methodology

The purpose of this study was to identify student perceptions of influence through agricultural Instagram posts after receiving instruction about advocacy. This study was a one-group, pretest-posttest quantitative design (Campbell & Stanley, 1963) that used two Qualtrics questionnaires to collect data from college-age students with six weeks (12 units) of advocacy-related instruction between the data collections. Three research objectives guided this study:

1. Determine how student's perceptions of influence in agriculture-related Instagram post changed after receiving instruction about advocacy.
2. Determine what characteristics of the post they used to make that determination.
3. Determine if a student's background affect their level of perceived influence.

Study participants were recruited from an undergraduate agricultural advocacy course at Texas Tech University. Participation was voluntary with 67% of the students completing the two questionnaires. Participants rank-ordered Instagram post screen captures of 16 agricultural advocates in 10 states located identified through snowball sampling. Following their ranking, students were asked to describe the factors that led to their top and bottom post rankings. Students also responded to demographic questions. Data analysis included the use of descriptive statistics being calculated. For the open-ended questions, thematic analysis techniques were used.

Findings

Objective 1: Nearly 57 percent (56.25%) of the Instagram posts changed in their ranking following the advocacy instruction. The greatest changes in rankings were a four- and five- placing decline and a three-placing increase.

Objective 2: Three themes emerged from the findings of this study reflecting how students perceive influence through agricultural Instagram posts and what characteristics they used to make that determination: (a) relatability to post; (b) captions with facts; (c) use of comprehensible pictures. Regarding relatability to a post, a survey participant said:

> *"Influencer F influenced me the most because they highlighted a topic that is relatable and significant to me and addressed a conversation that needs more attention in the agriculture community. By quoting an LGBTQ+ member, it was impactful to learn that there are LGBTQ+ people and allies with similar experiences as me in the agriculture community."*

Several survey participants reiterated the same explanation about how captions with facts increase a post's influence. One survey participant stated:

> *"Influencer P showed the most feelings towards the subject while staying factual in their words."*

With reference to the use of pictures in an Instagram post, a survey participant said:

> *"I picked this one to be my top choice because this one used a picture that was easy to look at and know what was going on. The picture and the copy told the same story."*

Objective 3: Findings suggest an agricultural background does affect the level of perceived influence. Survey participants indicated people without an agricultural background are more likely to perceive a greater influence from an Instagram post than people with an agricultural background with differences in geographic location (rural or urban area) and 4-H and FFA involvement found.

Conclusions

Instruction in advocacy related topics may have impacted perceptions of influence in agriculture-related Instagram posts. Student perceptions of influence through agricultural Instagram influencer posts are analogous based on the identified themes. A greater perceived influence is increased when influencer posts are relatable, when the captions state facts, and when pictures are comprehensible. Perceptions of influence may be greater for individuals who do not have an agricultural background, whereas those who do have an agricultural background may not have an increased level of perceived influence.

Implications/Recommendations

The results illustrate the potential of instruction changing perceptions of content gained via Instagram social media posts. The results also indicated that both content and imagery are considered by college-age students when determining the quality of an Instagram post. Related to Kim and Yung's 2016 study, this could impact how a user of Instagram may share agriculture content with others as well as the development of agriculture-related social media posts.

References

Ball-Rokeach, S. J., & DeFleur, M. L. (1976). A dependency model of mass-media effects. *Communication Research, 3*(1), 3-21. https://doi.org/10.1177/009365027600300101

Blight, M. G., Ruppel, E. K., & Schoenbauer, K. V. (2017). Sense of community on Twitter and Instagram: Exploring the roles of motives and parasocial relationships. *Cyberpsychology, Behavior, and Social Networking, 20*(5), 314-319. https://doi.org/10.1089/cyber.2016.0505

Buster, R., Wachira, E., & Yeatts, P. (2021). Examining relationship between social media and cross-cultural world mindedness among college students: A cross-sectional study. *Journal of Social Sciences and Humanities, 7*(2), 94-99. http://www.aiscience.org/journal/paperInfo/jssh?paperId=5283

Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Ravenio Books.

Carpenter, C. W., & Bonin, M., II. (2020). To win friends and influence people: Regulation and enforcement of influencer marketing after ten years of the endorsement guides. *Vanderbilt Journal of Entertainment & Technology Law*, *23*(2), 253. https://scholarship.law.vanderbilt.edu/jetlaw

Hall, A., & Barrett, L. (2007, March). *Influence: The essence of leadership*. https://extensionpublications.unl.edu/assets/html/g1695/build/g1695.htm

Kim, Y. C., & Jung, J. Y. (2016). SNS dependency and interpersonal storytelling: An extension of media system dependency theory. *New Media & Society*, *19*(9), 1458–1475. https://doi.org/10.1177/1461444816636611

Mehrad, J., & Yousefi, Z. (2018). Introducing the theory of "media system dependency" with emphasis on its potential application in theoretical framework of researches in the field of information science and knowledge. *International Journal of Information Science and Management (IJISM), 16*(1). https://ijism.ricest.ac.ir/article_698263.html

Pew Research Center (2021). *Social media fact sheet*. https://www.pewresearch.org/internet/fact-sheet/social-media/

Powell, E. (2022). *A mixed methods study of checkoff programs and their utilization of influencers on Instagram* [Master's Thesis, (University)]. https://hdl.handle.net/2346/89286

Roese, V. (2018). You won't believe how co-dependent they are. *From Media Hype to Twitter Storm*, 313–332. https://doi.org/10.2307/j.ctt21215m0.19

Shank, S. E. (2022). *A phenomenological investigation of trust and transparency among agricultural influencers on Instagram* [Master's Thesis, (University)].

Ting, H., de Run, E. C., & Liew, S. L. (2016). Intention to use Instagram by generation cohorts: The perspective of developing markets. *Global Business & Management Research, 8*(1). http://www.gbmrjournal.com/pdf/vol. 8 no. 1/V8N1-4.pdf

Wang, Q., Chen, W., & Liang, Y. C. (2011). The effects of social media on college students. *Johnson & Wales University ScholarsArchive@JWU*. http://scholarsarchive.jwu.edu/mba_student/5

Weismueller, J., Harrigan, P., Coussement, K., & Tessitore, T. (2022). What makes people share political content on social media? The role of emotion, authority, and ideology. *Computers in Human Behavior*, *129*, 107150. https://doi.org/10.1016/j.chb.2021.107150

Wakefield, J. (2016). Social media 'outstrips TV' as news source for young people. *BBC News*, 15, 2016. https://www.bbc.com/news/uk-36528256

Students' Perceived Importance of the Three-Component Model in Pennsylvania SBAE Programs

Jessica Myschisin
The Pennsylvania State University
724-859-9954
jrm7133@psu.edu

Kevin Wylie Curry, Jr.
Assistant Professor
The Pennsylvania State University
814-863-7069
kxc554@psu.edu

Department of Agricultural Economics, Sociology, and Education
211 Ferguson Building
University Park, PA 16802

Students' Perceived Importance of the Three-Component Model in Pennsylvania SBAE Programs

Introduction and Theoretical Framework

School-based agricultural education (SBAE) is comprised of three intra-curricular components: classroom and laboratory instruction, Supervised Agricultural Experiences (SAEs), and FFA (Phipps & Osborne, 1988; Dailey et al., 2001). When these three components of SBAE are integrated together, they can provide "a context for learning necessary content and life skills to prepare students for adulthood, regardless of their ideal career area" (Dailey et al., 2001). Previous research has focused on the interconnectedness and importance of the three-component model of agricultural education and has identified barriers to student involvement in agriculture classes, SAEs, and FFA. However, a gap in the literature exists to understand how students' level of SBAE involvement impacts their perceptions of classroom and laboratory instruction, SAEs, and FFA. The theory of student involvement served as a foundation for this study (Astin, 1984). Researchers used Astin's (1984) theory of student involvement to better understand how students' varying levels of SBAE program involvement impact their perceived importance for each component of the three-component model of agricultural education.

Methodology

The purpose of this descriptive study was to explore students' perceived importance of the three-component model in Pennsylvania high school-based agricultural education programs. This research aligns with AAAE Research Priority 4: Meaningful, Engaged Learning in All Environments, Question 3: "How can delivery of educational programs in agriculture continually evolve to meet the needs and interests of students?" (Roberts et al., 2016). The following research objectives guided this study, 1) describe the sample population in this study by level of SBAE involvement and 2) determine if differences exist between students' perceived level of importance of classroom/laboratory instruction, SAE, and FFA across levels of SBAE program involvement. A paper-pencil questionnaire was designed by the researchers to address the research objectives. The questionnaire consisted of two sections. The first section included Likert-type questions to gauge students' perceived importance of each component of the three-component model of agricultural education. The second section ascertained student demographics. A convenience sample was utilized with three schools representing rural, suburban, and urban programs in Pennsylvania to ensure representation from diverse populations. Students (n = 53) were categorized by their agriculture teachers based on their level of SBAE program involvement (Highly Involved or Limited Involvement) prior to participating in the study. Quantitative data was analyzed using SPSS®.

Results

A total of 53 students completed the questionnaire. 28 students were categorized as "Highly Involved" in a SBAE program, and 25 students were categorized as having "Limited Involvement" in a SBAE program. Both the students categorized as "Highly Involved" (n = 28) and the students categorized as having "Limited Involvement" in a SBAE program (n = 25) had taken an average of four agriculture classes. However, students categorized as "Highly Involved" in a SBAE program, on average, competed in a greater number of CDEs (M = 4, SD = 3), held a greater number of FFA Leadership positions (M = 2, SD = 1), and invested more hours into SAEs (M = 212.1, SD = 220.7) than students categorized as having "Limited Involvement" in a SBAE program. Students' perceptions of the three-component model of agricultural education, based on level of program involvement, are displayed in Table 1. Students categorized as having "Limited Involvement" in a SBAE program reported significantly lower perceived importance of the FFA (t = 5.22, p = .00, d = 1.43) and SAE (t = 2.09, p = .04, d = .59) components of the three-circle model. No differences were observed in the importance of classroom instruction.

Table 1

Students' Perceived Level of Importance of the Three-component Model of SBAE

SBAE Model Component	Level of SBAE Involvement	*n*	*M*	*SD*	*t*	*p*	*d*
FFA	Highly Involved	28	2.82	.39	5.22	.00*	1.43
	Limited Involvement	22	2.05	.65			
SAE	Highly Involved	28	2.43	.63	2.09	.04*	.59
	Limited Involvement	22	2.05	.65			
Classroom	Highly Involved	28	2.79	.42	.86	.39	
	Limited Involvement	25	2.68	.48			

Note. Scale of Not at all Important (1) to Extremely Important (3)

Conclusions and Recommendations

Students in this sample who were categorized by their agriculture teacher as having "Limited Involvement" in a SBAE program had a lower perceived importance for the FFA and SAE components compared to students categorized as "Highly Involved" in a SBAE program. However, students categorized as "Highly Involved" and students categorized as having "Limited Involvement" both ranked classroom instruction as important. Results indicated that students' level of SBAE program involvement did not impact their perceptions pertaining to the importance of classroom instruction. These results did not align with Astin's (1984) theory of student involvement, as students with varying levels of SBAE involvement had similar positive experiences regarding learning and development within the classroom instruction component. Although the SBAE profession promotes the value of each component of the three-component model of agricultural education (National FFA Organization, 2023), we found that students enrolled in SBAE programs did not equally find value in each of the three components. Why did students in this sample, on average, perceive classroom instruction as important, however, have different perceptions pertaining to the importance of the FFA and SAE components, depending on their level of SBAE involvement? What factors impact students' participation in and perceptions of the FFA and SAE components? According to Martin and Kitchel (2014), the lack of diverse role models in FFA could create a barrier to student participation in the organization. Further, student motivation and student focus are two factors that impact student participation in SAEs (Barrick et al., 1991; Bird et al., 2013; Dyer & Osborne, 1995; Retallick, 2010; Roberts & Harlin, 2007; Rubenstein & Thoron, 2019; Wilson & Moore, 2007). A greater understanding of students' perceptions can help agricultural educators improve student involvement and engagement in the classroom instruction, FFA, and SAE components and further provide opportunities for leadership development, personal growth, and career success (National FFA Organization, 2023). Future qualitative research should be conducted to better understand why some students in this sample perceived the FFA and SAE components as less important than classroom instruction.

References

Astin, A. W. (1984). Student involvement: A developmental theory for higher education. *Journal of College Student Personnel*, *25*(4), 297-308.

Barrick, R. K., Hughes, M., & Baker, M. (1991). Perceptions regarding supervised experience programs: Past research and future direction. *Journal of Agricultural Education*, *32*(4), 31-36. doi:10.5032/jae.1991.04031

Bird, W. A., Martin, M. J., & Simonsen, J. C. (2013). Student motivation for involvement in supervised agricultural experiences: An historical perspective. *Journal of Agricultural Education*, *54*(1), 31-46. DOI: 10.5032/jae.2013.01031

Dailey, A. L., Conroy, C. A., & Shelley-Tolbert, C. A. (2001). Using agricultural education as the context to teach life skills. *Journal of Agricultural Education, 42*(1), 11-20. https://doi:10.5032/jae.2001.01011

Dyer, J. E. & Osborne, E. W. (1995). Participation in supervised agricultural experience programs: A synthesis of research. *Journal of Agricultural Education*, *36*(1), 6-14. doi:10.5032/jae.1995.01006

Martin, M. J. & Kitchel, T. (2014). Barriers to participation in the national FFA organization according to urban agriculture students. *Journal of Agricultural Education*, *55*(1), 120-133. doi: 10.5032/jae.2014.01120

National FFA Organization. (2023). *Agricultural education*. https://www.ffa.org/agricultural-education/

Phipps, L. J. & Osborne, E. W. (1988). *Handbook on agricultural education in public schools* (5th ed.). Danville, IL: Interstate.

Retallick, M. S. (2010). Implementation of supervised agricultural experience programs: the agriculture teachers' perspective. *Journal of Agricultural Education*, *51*(4), 59-70. doi:10.5031/jae.2010.04059

Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). *American Association for Agricultural Education national research agenda: 2016-2020*. Gainesville, FL: Department of Agricultural Education and Communication.

Roberts, T. G. & Harlin, J. F. (2007). The project method in agricultural education: Then and now. *Journal of Agricultural Education*, *48*(3), 46-56. doi:10.5032/jae.2007.03046

Rubenstein, E. D. & Thoron, A. C. (2019). Motivational factors that influenced learner participation in supervised agricultural experience programs. *Journal of Southern Agricultural Education Research*, *69*(1), 33-49.

Wilson, E. B. & Moore, G. E. (2007). Exploring the paradox of supervised agricultural experience programs in agriculture education. *Journal of Agricultural Education*, *48*(4), 82-92. doi:10.5032/jae.2007.04082

Talking about Diddly Squat: A Content Analysis of Tweets about Clarkson's Farm

Dr. Kellie Claflin
Assistant Professor
The Ohio State University
claflin.11@osu.edu
200 Agricultural Administration
Columbus, OH 43210
614-688-0610

Dr. Gaea Hock
Associate Professor
Kansas State University
ghock@ksu.edu
315 Umberger Hall
Manhattan, KS 66506
785-532-1166

Dr. Nellie Hill
Assistant Professor
Kansas State University
nlhill@ksu.edu
307 Umberger Hall
Manhattan, KS 66506
785-532-1140

Dr. Annie Specht
Associate Professor
The Ohio State University
specht.21@osu.edu
200 Agricultural Administration
Columbus, OH 43210
614-292-1626

Talking about Diddly Squat: A Content Analysis of Tweets about Clarkson's Farm

Introduction

The documentary series, *Clarkson's Farm*, premiered on Amazon Prime in June 2021. The series highlighted the exploits of Jeremy Clarkson, a television presenter, in the first year of taking over managing his 1,000 acre *Diddly Squat Farm* in the United Kingdom (Whitehead, 2021). The eight episodes highlighted agriculture as Clarkson learned about farming through trial and error and his small team of advisers (Whitehead, 2021). After its debut, *Clarkson's Farm* received positive feedback for the realistic representation of agricultural life. However, agriculture and rural life are not always depicted realistically or positively, with television shows often reinforcing stereotypes (Craig, 2019; Fountaine & Bulmer, 2022; Lundy et al., 2007; Specht & Beam, 2015). Given that television shows influence the perception of agriculture and rural life (Fountaine & Bulmer, 2022; Lundy et al., 2007), we sought to understand the Twitter discourse focusing on *Clarkson's Farm*.

Theoretical Framework

This study was grounded in the theory of narrative persuasion. As audiences consume media, such as television and literature, they are influenced by the narratives depicted, which include the setting, structure, and implied or explicit messages (Braddock & Dillard, 2016). These narratives influence audience beliefs, attitudes, and behaviors. Additionally, using social media has provided opportunities for audiences to connect with narratives through social television or live tweeting. This phenomenon creates a public experience as individuals watch a show and they share their thoughts and feelings via social media (Lin et al., 2016). The effects of social television on those participating include neurological engagement through emotion, memory, and attention (Nielsen, 2015). Social television viewing is also connected to higher levels of incidental learning, especially among younger viewers (Nee & Dozier, 2017).

Methods

A quantitative content analysis was completed to answer the research question, what are Twitter users commenting about the television show *Clarkson's Farm* in the first six months after it aired on Amazon Prime? A systematic thematic analysis was utilized through inductive coding to identify categories to guide the content analysis. Twitter was selected due to the relation to social television and audiences sharing their thoughts about the series as they watch. Researchers used the social media monitoring tool, Meltwater, to collect tweets related to *Clarkson's Farm* between June 10, 2021-November 20, 2021, from the day the show debuted to six months after. The search query included show-related terms of "Clarkson, Diddly Squat, farm, Kaleb, sheep, tractor." There were 19,521 collected tweets, with 2,228 of those tweets originating in the United States and therefore selected for analysis in this study due to the researchers' location and background.

The selected tweets were downloaded into a Microsoft Excel spreadsheet, and a random sample of 378 tweets was selected for analysis. Three members of the research team developed a code book to categorize tweets by coding the same tweets in a 10% sample to understand the data (Elo & Kyngäs, 2008). The research team developed four categories: entertainment value, education about or appreciation towards agriculture and rural life, conflict value, and logistics of the show. Intercoder reliability was determined based on the initial randomized 10% sample of tweets (n = 38) which was not used for the main analysis (Riffe et al., 2019). Intercoder reliability was measured using Fleiss' kappa between the three coders. The kappa value of .644

denotes a "good" strength of agreement (Altman, 1999). The three coders then split the sample evenly and coded using the established codebook. Six tweets were removed from the sample due to lack of relevance in the study for a final sample of 374 tweets.

Results

Frequencies were analyzed for each category of tweet using SPSS. The frequency of content themes in tweets about *Clarkson's Farm* (*N* = 374) is displayed in Table 1.

Table 1
Frequency of content themes in tweets about Clarkson's Farm (N = 374)

Codes	Frequencies	Percent
Entertainment value	170	45.5
Education about or appreciation towards agriculture and rural life	90	24.1
Logistics of the show	79	21.2
Conflict value	35	9.4

The majority of the tweets focused on *entertainment value* (*n* = 170, 45.5%). The tweets in this category related to the enjoyment and humor of the show. Approximately a quarter of tweets (*n* = 90, 24.1%) referred to *education about or appreciation towards rural life*. These tweets highlighted the information they learned about agriculture or positivity towards the representation of rural life. *Show logistics* (*n* = 79, 21.1%), representing approximately 20% of the tweets, included viewers curious about the second season of the show or mentioned the farm store or filming locations. The least frequent category was *conflict value* (*n* = 35, 9.4%) or tweets indicating negative comments towards Clarkson and the farm store.

Conclusions

The results of this study indicate a positive attitude towards *Clarkson's Farm* and how agriculture and rural life are displayed in the first sixth months after it debuted, with the majority of tweets falling into the categories of *entertainment value* or *education about or appreciation towards agriculture and rural life*. As the average consumer continues to be less cognizant of how food is produced, entertainment programs like *Clarkson's Farm* provide awareness of agricultural practices in a realistic manner, which is not common in television programming (Lundy et al., 2007; Specht & Beam, 2015). Using social viewing (i.e., live-tweeting) on such programs can increase awareness of essential issues and the amount of learning (Nee & Dozier, 2017). Researchers should continue to explore the influence of *Clarkson's Farm* and other agriculturally-focused television shows to study audience reactions and what they learn from the shows (Winter et al., 2018). For example, focus groups with *Clarkson's Farm* viewers could provide a deeper knowledge of what they learned or appreciated about agriculture and rural life.

References

Altman, D. G. (1999). Practical statistics for medical research. Chapman & Hall/CRC Press.

Braddock, K. & Dillard, J. P. (2016). Meta-analytic evidence for the persuasive effect of narratives on beliefs, attitudes, intentions, and behaviors. Communication Monographs 83(4): 446–467.

Craig, G. (2019). Sustainable everyday life and celebrity environmental advocacy in Hugh's War on Waste. Environmental Communication, 13(16), 775–789. https://doi.org/10.1080/17524032.2018.1459770

Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. Journal of Advanced Nursing, 62(1), 107-115. https://doi.org/10.1111/j.1365-2648.2007.04569.x

Fountaine, S., & Bulmer, S. (2022). Telling stories about farming: Mediated authenticity and New Zealand's Country Calendar. Television & New Media, 23(1), 81–99. https://doi.org/10.1177/1527476420966756

Lin, J., Sung, Y., & Chen, K. J. (2016). Social television: Examining the antecedents and consequences of connected TV viewing. Computers in Human Behavior, 58. https://doi:10.1016/j.chb.2015.12.025

Lundy, L., Ruth, A., & Park, T. (2007). Entertainment and agriculture: An examination of the impact of entertainment media on perceptions of agriculture. Journal of Applied Communications, 91(1). https://doi.org/10.4148/1051-0834.1257

Nee, R. C., & Dozier, D. M. (2017). Second screen effects: Linking multiscreen media use to television engagement and incidental learning. Convergence: The International Journal of Research into New Media Technologies, 23(2). https://doi.org/10.1177/1354856515592510

Nielsen. (2015, March 9). Social TV: A bellwether for TV audience engagement. Retrieved from http://www.nielsen.com/us/en/insights/news/2015/social-tv-a-bellwether-for-tv-audienceengagement.html

Specht, A. R., & Beam, B. W. (2015). Prince farming takes a wife: Exploring the use of agricultural imagery and stereotypes on ABC's The Bachelor. Journal of Applied Communications, 99(4). https://doi.org/10.4148/1051-0834.1055

Whitehead, G. (2021). Clarkson's Farm. Expectation Entertainment; Amazon Prime.

Winter, S., Krämer, N. C., Benninghoff, B., & Gallus, C. (2018). Shared entertainment, shared opinions: The influence of social TV comments on the evaluation of talent shows. Journal of Broadcasting & Electronic Media, 62(1), 21-37. https://doi.org/10.1080/08838151.2017.1402903

Tasks Associated with Teaching School-Based Agricultural Education

Ryan W. Best
Dr. J. Shane Robinson
Dr. Robert Terry, Jr.
Dr. M. Craig Edwards
Dr. Ki L. Cole

Oklahoma State University
459 Agricultural Hall
Stillwater, OK 74078
(254) 459-9221
ryan.best@okstate.edu

Introduction/Need for Study

School-based agricultural education (SBAE) teachers experience heavy workloads (Torres et al., 2008), challenges (Boone & Boone, 2009), and needs (DiBenedetto et al., 2018; Traini et al., 2021). Moreover, the expectations required of SBAE teachers are ever changing (Eck et al., 2019), which can cause strain (Traini et al., 2021) and lead to stress and burnout (Croom, 2003).

Research indicates that *general* tasks associated with teaching SBAE, such as excessive paperwork, working overtime, meeting deadlines, and insufficient personal time, can be sources of stress for teachers (Torres et al., 2009). However, determining the *specific* tasks required of SBAE teachers is a difficult undertaking. Although the tasks of teaching SBAE can be inferred from the above-mentioned professional needs, challenges, and characteristics, limited literature exists detailing the specific tasks SBAE teachers are expected to perform. Therefore, this study sought to identify the specific tasks expected of SBAE teachers within the classroom and laboratory, FFA, SAE, as well as *other* professional responsibilities associated with teaching.

Theoretical Framework

The topics of interest for this study are the tasks SBAE teachers are expected to complete, either intrinsically or extrinsically. Gardner (1985) defined tasks as “a body of work requiring mental and/or physical activity” (p. 346). Tasks are central to a multitude of motivational theories (de Brabrander & Martens, 2014; Gardner, 1985; Schunk et al., 2014) such as the Expectancy Value Theory (EVT). EVT hinges on two main variables, expectancies and values as they relate to an individual’s beliefs about their ability to carry out a task and the value they place on that task (Schunk et al., 2014). Wigfield & Eccles (2000) posited “individuals’ choice, persistence and performance can be explained by their beliefs about how well they will do on the activity and the extent to which they value the activity” (p. 68).

Methodology

A modified, three-round Delphi method was used to meet the objectives of the study. The panelists consisted of doctoral students in agricultural education with at least three years of SBAE teaching experience. An email was sent to department heads at the 22 universities that offer a doctoral program in agricultural education requesting the names and email addresses of agricultural education doctoral students enrolled in their programs. Thirteen (59%) responded and provided 40 potential Delphi panelists who met the criteria. Of those, 23 (58%) responded to Round 1, 22 (55%) responded to Round 2, and 20 (50%) responded to Round 3. Because 13 are needed to establish a reliability coefficient of .90 (Dalkey et al., 1972), the study can be assumed reliable. Prior to its submission to panelists, the instrument was assessed for face and content validity by members of the Agricultural Education department at Oklahoma State University, and slight modifications were made.

The initial email was sent to panelists describing the study and directing them to a Qualtrics link to the Round 1 instrument on September 29, 2022. The instrument included the following four open-ended questions: 1) What tasks are associated with the roles and responsibilities of an SBAE teacher regarding classroom and laboratory instruction in a typical year?; 2) What tasks are associated with the roles and responsibilities of an SBAE teacher regarding FFA advisement in a typical year?; 3) What tasks are associated with the roles and responsibilities of an SBAE teacher regarding supervised agricultural experiences (SAEs) in a typical year?; and 4) What other tasks are associated with the roles and responsibilities of an SBAE teacher in a typical year (aside from classroom/laboratory instruction, FFA, and SAE)? For each round of the study, a reminder email was sent to potential panelists approximately one week following the initial email for the round per Dillman's et al. (2014) tailored design method. Responses to the open-ended questions in Round 1 were analyzed using the constant comparison method (Creswell & Guetterman, 2019). Duplicated responses were grouped into a single task descriptive of the responses, and the resulting unduplicated tasks were arranged into themes.

In Round 2, panelists were asked to rate the tasks on a four-point agreement scale. An 80% level of agreement was chosen *a priori* to determine consensus of agreement. Items achieving the threshold were included in the final list of tasks of SBAE teachers. However, items achieving 51.00% to 79.99% level of agreement were included in Round 3 through an additional Qualtrics link where panelists were asked whether the task should be included as an expectation for SBAE teachers (1 = *No*, 2 = *Yes*) and why. Tasks achieving 80% level of agreement were considered to have reached consensus and were included in the final list of tasks of SBAE teachers.

Results/Findings

Initial results for Round 1 yielded 865 original tasks and 54 themes across the four areas. After analysis, 348 unduplicated tasks were identified. Classroom and laboratory instruction produced 84 tasks across 14 themes, FFA produced 99 tasks across 13 themes, SAE produced 80 tasks across 12 themes, and other professional responsibilities produced 85 tasks across 15 themes.

The final list of tasks associated with teaching SBAE included 238 items achieving consensus in 48 themes across the four question areas (216 tasks reached the consensus of agreement threshold in Round 2, and an additional 22 tasks achieved consensus of agreement in Round 3). In total, 74 tasks populated classroom and laboratory instruction, 80 tasks populated FFA, 45 tasks populated SAE, and 39 tasks populated *other professional responsibilities*. In all, 110 tasks and six themes failed to reach consensus of agreement and were dropped from the study.

Conclusions, Implications, and Recommendations

It can be concluded that the tasks expected of SBAE teachers are plentiful and widely varied and demonstrate the breadth and depth of the responsibilities of SBAE teachers as they relate to each of the three components of the three-circle model as well as other professional responsibilities as designated by the local school district. It is apparent based on these findings that teachers are expected to complete an overwhelming number of tasks related to their role as SBAE instructors.

Although this study uncovered the expectancies related to tasks, additional research should assess the value teachers have for completing them (Schunk et al., 2014; Wigfield & Eccles, 2000). Currently, the tasks expected of SBAE teachers are vast and demanding (Torres et al., 2008). Consequently, as workload increases, it can be reasonably inferred that pressures on SBAE teachers to manage these tasks could potentially lead to stress and burnout and might be the cause for teachers leaving the profession altogether. Additional research should conduct a factor analysis of these findings to make the tasks more manageable for SBAE teachers.

References

Boone, H. N., & Boone, D. A. (2009). An assessment of problems faced by high school agricultural education teachers. *Journal of Agricultural Education, 50*(1), 21–32. https://doi.org/10.5032/jae.2009.01021

Creswell, J. W., & Guetterman, T. C. (2019). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (6th ed.). Pearson Education Inc.

Croom, D. B. (2003). Teacher burnout in agricultural education. *Journal of Agricultural Education, 44*(2), 1–13. https://doi.org/10.5032/jae.2003.02001

de Brabrander, C., & Martens, R. (2014). Towards a unified theory of task-specific motivation. *Educational Research Review, 11*. https://doi.org/10.1016/j.edurev.2013.11.001

Dalkey, N. C., Rourke, D. L., Lewis, R., & Snyder, D. (1972). *Studies in the quality of life*. Lexington Books.

DiBenedetto, C. A., Willis, V. C., & Barrick, R. K. (2018). Needs assessments for school-based agricultural education teachers: A review of literature. *Journal of Agricultural Education, 59*(4), 52–71. https://doi.org/10.5032/jae.2018.04052

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th ed.). Wiley.

Eck, C. J., Robinson, J. S, Ramsey, J. W., & Cole, K. L. (2019). Identifying the characteristics of an effective agricultural education teacher: A national study. *Journal of Agricultural Education, 60*(4), 1–18. https://doi.org/10.5032/jae.2019.04001

Gardner, H. (1985). A cognitive mediation theory of task goals and human performance. *Motivation and Emotion, 9*(4), 345–367. https://doi.org/10.1007/BF00992205

Schunk, D. H., Meece, J. L., & Pintrich, P. R. (2014). *Motivation in education: Theory, research, and applications* (4th ed.). Pearson Education, Inc.

Torres, R. M., Lawver, R. G., & Lambert, M. D. (2009). Job related stress among secondary agricultural education teachers: A comparison study. *Journal of Agricultural Education, 50*(3), 100–111. https://doi.org/10.5032/jae.2009.03100

Torres, R. M., Ulmer, J. D., & Aschenbrener, M. S. (2008). Workload distribution among agriculture teachers. *Journal of Agricultural Education, 49*(2), 75–87. https://doi.org/10.5032/jae.2008.02075

Traini, H. Q., Haddad, B., Stewart, J., & Velez, J. J. (2021). Adjusting, appeasing, and rearranging: How agriculture teachers reconcile the demands of the profession. *Journal of Agricultural Education, 62*(2), 167–184. https://doi.org/10.5032/jae.2021.02167

Wigfield, A., & Eccles, J. S. (2000). Expectancy–value theory of achievement motivation. *Contemporary Educational Psychology, 25*, 68-81. https://doi.10.1006/ceps.1999.1015

Teaching Soft Skills in Agricultural Education: Best Practices

Bryce Groves
Department of Agricultural Leadership, Education and Communications
Texas A&M University
2116 TAMU
College Station, TX 77843-2116
817-709-5942
Bryce.Groves@tamu.edu
Theresa Murphrey, Ph.D.
Theresa.Murphrey@ag.tamu.edu

Teaching Soft Skills in Agricultural Education: Best Practices

Introduction

Priority area three of the National Research Agenda for the American Association for Agricultural Education states, "Agricultural education must determine the most effective means for incorporating and assessing soft skills development (National Research Council, 2009) in both formal and nonformal settings" (Stripling & Ricketts, 2016, pp. 30-31). According to the National FFA Organization, The Agricultural Education Mission states "Agricultural education prepares students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber and natural resources systems" (Agricultural Education, 2019).

There are many classroom settings for Agricultural Education aside from the typical classroom such as mechanics shops, greenhouses, livestock barns and laboratories. "Enhanced understanding of learning and teaching environments could result in the development of present-day best practices and research-based pedagogies and technologies that not only meet the goal of agricultural education but also society's greatest challenges" (Edgar et al., 2016, p. 39). Teaching soft skills in Agricultural Education demonstrates commitment to the Agricultural Education Mission and Priority area three of the National Research Agenda for the American Association for Agricultural Education.

Theoretical Framework

The theoretical framework of this study was based on constructivism, a learning theory that explains how knowledge is constructed by people. In the educational context, Paiget (1967) describes the philosophical meanings of constructivism, Vygtosky (1978) outlined social constructivism, and von Glaserfeld (1995) advocated for radical constructivism (Jones & Brader-Araje, 2002). The purpose of this study was to identify the best practices for teaching soft skills. Therefore, Vygotsky's Social Constructivism has the greatest impact on educational practices and instructional design making it the best option for a theoretical framework for this study (Jones & Brader-Araje, 2002).

Methods

The study aims to describe "the common meaning for several individuals of their lived experiences of a concept of a phenomenon" (Creswell & Poth, 2018, p.75). A purposeful sampling technique was used (Merriam & Tisdell, 2016). The sample consisted of experienced Agricultural Educators teaching for more than 3 years. An email was sent to agricultural educators to gauge interest in participating in the qualitative study. Educators who agreed to become participants were sent an email with an attachment to schedule a ZOOM call at the participant's convenience. Semi-structured interviews were conducted with seven participants. Participants were known to the researcher or identified using advisor contact lists on area association websites. As a measure of credibility, programs were chosen at random. The participants represented an inclusive spectrum of experience and student demographics. Those interviewed consisted of two males and five females. Participant data was coded to protect their identity. Interview questions were developed after reviewing the literature and determining the purpose of the study. The interviews were conducted by the lead researcher. During the interviews, the participants were asked ten questions following the institutional review board-approved protocol, using follow-up questions as needed to gain more understanding of what the participants were trying to explain. The constant comparative method was used to search the data for constant or popular themes throughout the interview process (Glazer, 1965). To interpret the raw data, the approach of social constructivism was applied. Agriculture Education is associated with education disciplines such as Career and Technology, and Science, Technology, Engineering and Mathematics. Recognizing these educators' experience and academic versatility, we listened carefully to what each educator shared, and considered their comments to determine their perceptions of soft skills and their teaching practices for soft skills. Triangulation was performed on the findings by reviewing interview and observation notes, reflexive journal, and historical documents provided by the educators.

Findings

The perceptions of Agricultural Educators on soft skills that emerged from the data were: Soft skills are a combination of critical thinking, leadership, and communication skills. The majority of participants believed that soft skills are a learned skill and most students display how soft skills are taught and practiced in their home environments. This combined with social and peer pressure is the biggest oppressor and obstacle for students when teachers are teaching soft skills. It was frequently mentioned in interviews that students struggle to "find their voice", whether that's confidence or ability to communicate. One last perception that Agricultural Educators had is that students have more opportunities to develop soft skills by participating in programming and activities sponsored by their areas.

Conclusions, Recommendations, and Implications

Application of Humanist Psychologist Abraham Maslow's four stages of learning describes a student's process in learning soft skills. In the first stage, learners are unconsciously incompetent. Learners at this stage are confident and believe in their skills and abilities, unaware there are more skills they could develop (Crosbie 2005). In stage two they are introduced to new skills, becoming consciously incompetent. The third stage places learners in another uncomfortable place of learning. Learners are so focused on practicing and using their new skills efficiently that they are not coming naturally (Crosbie 2005). The fourth stage of Maslow's stages of learning is Unconsciously competent. Here the skills are mastered and become second nature. Crosbie (2005) describes being in this stage of learning like how we drive cars home from work. We have mastered that route that the car seems to drive itself. Until we move to a new house and are forced to learn a new route. This takes us back to the first step in the stages of learning (Crosbie 2005).

To help combat some of the frustrations in the four stages of learning, one must create an effective training program that incorporates active involvement and Kinesthetic learning. (Crosbie 2005). Agricultural Education uses active involvement in the way it asks its learners to work in groups, physically move, and practice skills in competition. To have an effective training program the following elements must be present to ensure behavioral change: expert facilitation; contextual awareness; formal support; informal support; opportunities to use the new skills; self-study and self-analysis; stress; and celebration (Crosbie, 2015).

It is unknown if Agricultural Education teacher preparation programs are preparing future teachers to emphasize soft skills. To follow the Agricultural mission statement of "preparing students for successful careers and a lifetime of informed choices", it is imperative that soft skill practices be taught in teacher preparation programs.

References

Agricultural Education. National FFA Organization. (2019, January 14). https://www.ffa.org/agricultural-education/#:~:text=The%20Agricultural%20Education%20Mission,fiber%20and%20natural%20resources%20systems.

Anthony, S., & Garner, B. (2016). Teaching soft skills to business students. *Business and Professional Communication Quarterly*, *79*(3), 360–370. https://doi.org/10.1177/2329490616642247

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry & research design: Choosing among five approaches.* SAGE.

Crosbie, R. (2005). Learning the soft skills of leadership. *Industrial and Commercial Training*, *37*(1), 45–51. https://doi.org/10.1108/00197850510576484

Deepa, S., & Seth, M. (2013). Do Soft Skills Matter? - Implications for Educators Based on Recruiters' Perspective. *The IUP Journal of Soft Skills*, *vii*(1), 7–20. Retrieved February 22, 2022, from https://www.proquest.com/docview/1434861330?pq-origsite=gscholar&fromopenview=true.

Edgar, D. W., Retallick, M., & Jones, D. (2016). *American Association for Agricultural Education national research agenda: 2016-2020.* Gainesville, FL: Department of Agricultural Education and Communication.

Jones, M. G., & Brader-Araje, L. (2002). The Impact of Constructivism on Education: Language, Discourse, and Meaning. *American Communication Journal*, *5*(3).

Merriam, S. B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation*. Jossey-Bass.

Roberts, T. G., Harder, A., & Brashears, M. T. (2020). *American Association for Agricultural Education national research agenda: 2016-2020.* Gainesville, FL: Department of Agricultural Education and Communication.

Stripling, C. T. & Ricketts, J. C. (2016). *American Association for Agricultural Education national research agenda: 2016-2020.* Gainesville, FL: Department of Agricultural Education and Communication.

The Rural Health and Safety Education Program: Exploring Rural Communities' Needs for Behavioral Health Programming

Aaron Golson, M.B.A (*aaron.golson@uga.edu)*
Dr. Virginia Brown (*virginia.brown@uga.edu*)
Dr. Dianne Bales (*dbales@uga.edu*)
Dr. Marie Bowie (*mbowie@uga.edu*)
Dr. Anna Scheyett (*amscheye@uga.edu*)
University of Georgia
Department of Agricultural Leadership, Education and Communication
2023 National American Association for Agricultural Education Conference

Introduction

The United States has a high prevalence of systemic mental health and substance abuse challenges within rural communities; impacting residents' quality of behavioral health due to limited resources (Lundeen et al., 2018). Such disparities in rural communities contribute to the constant rise in U.S. adult and youth behavioral health divergence (MacNab & Francis, 2015). Thus, Cooperative Extension has increased its role in creating programming to assist in behavioral health awareness for its rural clients. Extension has acknowledged developing programs in these rural communities could be considered difficult compared to the urban communities due to a lack of readily available services (Benke et al., 2013). However, Extension has a long-standing relationship as a stakeholder in many rural communities and could be seen as an asset to leverage assistance to provide appropriate behavioral health programs. Extensions' mission is to improve community members' overall quality of life by integrating scientific interdisciplinary approaches to solving issues within a community-based context (Braun et al., 2014; Linnell et al., 2021). Furthermore, developing and enhancing community public health initiatives for individuals and families is a foundation for behavioral health promotion, a familiar strategy used by Extension to increase behavioral health practices within communities (Barnes et al., 2020; Morgan & Fitzgerald, 2014; Walsh et al., 2018). Therefore, Extension professionals must fully understand the effectiveness of their programs by properly identifying the behavioral health needs within these rural communities.

The purpose of this qualitative study was to explore rural communities' perceptions of the essential knowledge necessary for successful behavioral health programs in their perspective county. The following two research questions guided the study: What are rural community members' perceptions of the Cooperative Extension mission; What are rural community members' perceptions of behavioral health programs in rural areas? The Rural Health and Safety Education Program (RSHE) will serve as a catalyst for increasing behavioral health awareness programming for rural community members throughout the counties in the state of [State] participating in this project.

Theoretical Framework

The theoretical framework for this study is based on Roger's diffusion of innovations theory focusing on rural community members' perceptions of behavioral health services being implemented in their county. Roger's diffusion of innovations focuses on the relative advantage; compatibility, complexity, trialability, and observability of an innovation (Rogers, 2003). These five characteristics provide context for Extension professionals to identify the rural community needs to address when developing programs (Taylor & Miller, 2016). This study focused on each of the five characteristics of Roger's diffusion of innovation to best support the rural community members.

Methodology

The participants in this qualitative study were from six rural counties in Georgia. Each participant from the rural communities volunteered for this study. These rural community members were selected due to their high level of community engagement. Participants included social workers, counselors, teachers, extension personnel, first responders, providers, pastors, community leaders, and social service organizations who were invited to an 80-120-minute focus group. Each of the participants was recruited through purposive sampling. Extension personnel acted as recruitment liaisons to the focus group participants. The focus group script was developed to capture the participants' internal and external perceptions of Extension. A consent form was distributed via email to the participants prior to engaging in the focus groups (Dillman et al., 2014). The focus groups were conducted by a committee of three Extension professionals consisting of a content specialist, a program coordinator, and an evaluation specialist. The focus groups were held in the four districts including six counties throughout Georgia. In addition, each focus group was recorded and transcribed through a third-party service. A codebook was created by two doctoral students with expertise in qualitative research. The current study used thematic analysis to identify key themes related to the phenomenon of interest. Data were analyzed through Atlas Ti through an abductive coding method using both *a priori*, or theory-driven, and emergent, or data-driven codes (DeCuir-Gunby et al., 2011).

Results/Findings

There was a total of 60 rural community members who participated in the six focus groups. The focus groups highlighted four emerging themes: 1) Extension is trusted and has many strengths; 2) Extension Behavioral Health Hubs (EBHHs) as a multifunctional system, 3) Barriers with Extension offices as EBHHs, 4) Required resources for EBHHs. The participants showed interest in learning about the role of Extension would serve as a hub for behavioral health resources. Also, participants indicated wanting to be involved with the strategic plan for where the hub should be located in their community. For example, participants stated: "I think one benefit that Extension has is that they've already got a foot in the door in the school system and with a lot of communities, so they've already got that partnership." Another participant expressed, "Do y'all have a way of making Extension services more visible because I have never heard of the Extension office having anything to do with helping with, or even wanting to help with, drug problems in the community?". These statements show the potential strengths and challenges of implementing EBHHs within rural communities.

Conclusion/Recommendations

Overall, the participants were familiar with Extension, but not with their ability to be seen as a behavioral health resource in rural communities. The social structure within the participants' community would require behavioral changes in their perception of Extension to conceptualize a new behavior toward the organization (Rogers, 2003; Warner et al., 2019). Extension professionals must continue building relationships to instill trust amongst rural communities to be able to create EBHHs throughout Georgia. The US rural population should token community leaders to collaborate with Extension to assist in developing innovative recruitment strategies for residents to participate in Extension programs. As the demand for mental health and substance abuse resources increases, Extension should promote each division's (4-H, ANR, FACS) programs through the rural school systems and community events. Thus, ensuring these community members with a safe inclusive space to seek behavioral health resources. Further research should examine Extension professionals' capacity to build out new programs in addition to their current responsibilities within the profession.

References

Barnes, M. D., Hanson, C. L., Novilla, L. B., Magnusson, B. M., Crandall, A. C., & Bradford, G. (2020). Family-centered health promotion: Perspectives for engaging families and achieving better health outcomes. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*, *57*, 004695802092353. https://doi.org/10.1177/0046958020923537

Benke, C., Bailey, S., Martz, J., Paul, L., Lynch, W., & Eldridge, G. (2013). Developing a parent-centered obesity prevention program for 4-H families: Implications for extension family programming. *Journal of Extension*, *51*(3). https://tigerprints.clemson.edu/joe/vol51/iss3/26/

Braun, B., Bruns, K., Cronk, L., Fox, L. K., Koukel, S., LeMenestrel, S., Lord, L. M., Reeves, C., Rennekamp, R., Rice, C., Rodgers, M., Samuel, J., Vail, A., & Warren, T. (2014). *Cooperative Extension's national framework for health and wellness*. http://www.aplu.org/members/commissions/food-environment-and-renewableresources/CFERR_Library/national-framework-for-health-and-wellness/file

DeCuir-Gunby, J. T., P. L. Marshall, and A. W. McCulloch. (2011). Developing and using a codebook for the analysis of interview data: An example from a professional development research project. Field Methods 23 (2): 136–155. https://doi.org/10.1177/1525822X10388468

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). Internet, phone, mail, and mixed-mode surveys: The tailored design method (4th ed.). Wiley

Linnell, J. D., Case, P., & Kraemer, L. (2021). Extension's role in changing the context of health. *Journal of Extension*, *58*(6), Article 8. https://tigerprints.clemson.edu/joe/vol58/iss6/8

Lundeen, E. A., Park, S., Pan, L., O'Toole, T., Matthews, K., Blanck, H. M. (2018). Obesity prevalence among adults living in metropolitan and nonmetropolitan counties — United States, 2016. *Morbidity and Mortality Weekly Report*, *67*(23), 653-658. https://doi.org/10.15585/mmwr.mm6723a1

MacNab, L., & Francis, S. (2015). Sequential online wellness programming is an effective strategy to promote behavior change. *Journal of Extension*, *53*(2). https://tigerprints.clemson.edu/joe/vol53/iss2/4/

Morgan, K. T., & Fitzgerald, N. (2014). Thinking collectively: Using a food systems approach to improve public health. *Journal of Extension*, *52*(3), Article 25. https://tigerprints.clemson.edu/joe/vol52/iss3/25

Rogers, E. M. (2003). Diffusion of innovations (3rd ed.). New York: Simon and Schuster.

Taylor, C., & Miller, G. (2016). Examining eXtension: Diffusion, disruption, and adoption among Iowa State University extension and outreach professionals. *The Journal of Extension*, *54*(5), Article 14. https://tigerprints.clemson.edu/joe/vol54/iss5/14

Warner, L., Silvert, C., & Benge, M. (2019). Using adoption and perceived characteristics of fertilizer innovations to identify extension educational needs of Florida's residential audiences. *Journal of Agricultural Education*. https://doi.org/10.5032/jae.2019.03155

Trends in Research on American Consumers' Motivations for Purchasing Eco-friendly Products

Daniel Ayisi Nyarko

Fally Masambuka-Kanchewa, Ph.D.

Sidney Schnor

Iowa State University

513 FarmHouse Lane,

Ames,

Iowa, 50010

Telephone: 515-2948943

Emails: dnayisi@iastate.edu, fallymk@iastate.edu and sidney@iastate.edu

Introduction

In recent years, American consumers' approaches and attitudes toward food have changed drastically. Consumers have become more selective regarding their choices and are curious to know how their food and other agricultural products are produced (Wang et al., 2020). In addition, consumers are curious to know the company's history and their social and sustainability consciousness (Wang et al., 2020). Consumers are attached to brands that reflect their personal identity and values and look for foods and products that are produced under a particular environmental condition, such as eco-friendly (Carbone & Zoellner, 2012). Eco-friendly purchasing behavior has been gaining popularity among Americans in recent years. Many consumers have started demanding quality foods and products that are produced under environmentally friendly conditions (Lin & Chang, 2012). Consequently, food-producing firms implement marketing strategies to persuade consumers by using terms like green products and eco-friendly on food labels. (Lin & Chang, 2012).

Product labels are used for communicating information about products to prospective consumers. The labels, among others, contain nutritional, health, and general information about the products; this information assists consumers in making informed agricultural product purchasing decisions (Azman & Sahak, 2014). However, many Americans find it difficult to make meaning from food labels (Guthrie et al., 2015). As consumers' perceptions and behavior toward agricultural products keep changing, it is prompting researchers' interest in knowing the main force behind this drive. However, not much is known about American consumers' perceptions and purchase behaviors of different agricultural products. Such understanding will assist in addressing any misconceptions about agricultural product labels and assist consumers to make informed decisions.

Theoretical Framework

This study was guided by social identity theory. Social identity theory postulates that an individual's association to a group provides them with a source of pride as such people make conscious efforts to achieve and maintain positive distinctiveness for the groups (Mcleod, 2019). Social identity theory was proposed by Tajfel in 1979 (Trepte & Loy, 2017). He defined social identity as the sense of whom an individual thinks they are, based on their group memberships (Trepte & Loy, 2017). People identify things about themselves by knowing the categories they belong to; they also define acceptable behaviors based on group norms (Trepte & Loy, 2017). Social identification is the group identity tag that one carries after they have categorized themselves (Mcleod, 2019).

Past studies have applied social identity to study identities that are cultivated and fostered in youth (Carter, 2014) and in alcoholism and substance addiction correction. Social identity theory is useful in consumer behavior studies because it gives the basis to understand attitudes, beliefs, emotions, and behaviors people portray towards brands. Therefore, its application is important for understanding consumers' eco-friendly purchase perceptions and behaviors. We believe that synthesizing past research findings will help to identify areas that need more studies.

Purpose

The study sought to explore the status of research conducted in the U.S on consumers' perceptions of food labeling and eco-friendly products. Specifically, the study sought to address the following objectives.

- Establish the trends in research on American consumer perceptions of eco-friendly products.
- Identify the sources of motivation for purchasing eco-friendly products.

Methods

In this study, a systematic literature review was employed. Using Google Scholar, five terms (Motivation, Product Labeling,' 'Eco Labeling,' 'Greenwashing,' and 'Agriculture Product Labeling) were used to search for articles written between 2012 to 2022. This period (2012-202) was chosen because 2012 was reported as the year where there was a decline in purchase of eco-friendly products among consumers (Neff, 2012). The initial search yielded Google 407,800 articles. The next criterion for filtering search results was by title relevance which reduced the number to 115. Only articles whose titles reflected motivations alongside any of four terms were included for further review. After reading the abstracts for relevance, 24 articles were selected for further review. However, only three articles that covered research conducted in the U.S incorporated in the qualitative content analysis. Notes were taken on each source that was read. The findings from each study were systematically analyzed and summarized based on the objectives of the study.

Results

The common themes that emerged from the content analysis on consumers' perception of eco-friendliness were products with good taste, high prices, and sustaining the environment. Consumers perceive eco-friendly products to have good taste, high quality, pricy and sustain the environment (Magdaleno et al., 2021; Purohit, 2012; Hadjimichael & Hegland, 2016). Product satisfaction and positioning, labeling, price, advertisement, loyalty, consumer experience, and promotion of environmental effectiveness were identified as factors influencing consumers' motivations for buying eco-friendly products (Magdaleno et al., 2021; Purohit, 2012).

Conclusions

Based on the systematic literature review, it is concluded that American consumers regard eco-friendly products as high value and are willing to pay a premium for them. Their identity and belief influence their decision to purchase eco-friendly products. Their belief in contributing to sustainability and the influence of their social groups motivate them to purchase eco-friendly products. Many of them depend on food labels for their purchasing decisions.

Implications/recommendations/impact on profession

The results indicated that there is limited research in the U.S on consumer perception and motivations for purchasing eco-friendly products. Considering the growing popularity of these products it is recommended that future study focuses on this area especially considering that most Americans are disconnected from agriculture. The research should investigate consumers ability to decipher authentic agriculture food labels, as there are increased reports about fraud when labelling agricultural products (National Archives, 2023).

Reference

Azman, N., & Sahak, S. Z. (2014). Nutritional label and consumer buying decision: a preliminary review. *Procedia-Social and Behavioral Sciences*, *130*, 490-498. https://doi.org/10.1016/j.sbspro.2014.04.057

Carbone, E. T., & Zoellner, J. M. (2012). Nutrition and health literacy: a systematic review to inform nutrition research and practice. *Journal of the Academy of Nutrition and Dietetics, 112*(2), 254-265.

Guthrie, J., Mancino, L., & Lin, C. T. J. (2015). Nudging consumers toward better food choices: Policy approaches to changing food consumption behaviors. *Psychology & Marketing*, *32*(5), 501-511. https://doi.org/10.1002/mar.20795

Hadjimichael, M., & Hegland, T. J. (2016). Really sustainable? Inherent risks of eco-labeling in fisheries. *Fisheries Research*, 174, 129–135. https://doi.org/10.1016/j.fishres.2015.09.012

Lin, Y. C., & Chang, C. C. A. (2012). Double standard: The role of environmental consciousness in green product usage. *Journal of Marketing*, *76*(5), 125-134. https://doi.org/10.1509/jm.11.0264.doi: 10.1108/IJCCSM-11-2016-0168

Magdaleno, L., Rolling, T., Waits Galia, S., & Ayala, G. X. (2021). Evaluation of a front-of-pack food labeling intervention on a college campus. *Journal of American College Health*, 1–9. https://doi.org/10.1080/07448481.2021.1970563

McLeod, S. A. (2019, October 24). Social identity theory. *Simply Psychology*. www.simplypsychology.org/social-identity-theory.html

National Archives, (January 2023). National Organic Program (NOP); Strengthening Organic Enforcement. *Federal Register: The Daily Journal of the United States Government.* https://www.federalregister.gov/documents/2023/01/19/2023-00702/national-organic-program-nop-strengthening-organic-enforcement

Neff, J. (September, 2012). "As More Marketers Go Green, Fewer Consumers Willing to Pay for It." http://adage.com/ article/news/marketers-green-fewer-consumers-pay/237377/.

Purohit, H. C. (2012). Product positioning and consumer attitude towards eco-friendly labeling and advertisement: An analytical study. *Journal of Management Research, 12(3)*, 153-162.

Trepte, S., & Loy, L. S. (2017). Social identity theory and self-categorization theory. *The international encyclopedia of media effects*, 1-13. https://doi.org/10.1002/9781118783764.wbieme0088

Wang, J., Pham, T. L., & Dang, V. T. (2020). Environmental consciousness and organic food purchase intention: a moderated mediation model of perceived food quality and price sensitivity. *International journal of environmental research and public health*, *17*(3), 850. https://doi.org/10.3390/ijerph17030850

Undefined: In Search for a Definition of Blended Learning in SBAE

D. Brett Milliken
Virginia Tech
175 Campus Drive
Blacksburg, VA 24061
540.231.1003
bmilliken@vt.edu

Haley Q. Traini
Oregon State University
130 Strand Hall
Corvallis, OR 97331
541-737-2661
haley.traini@oregonstate.edu

Undefined: In Search for a Definition of Blended Learning in SBAE

Introduction and Conceptual Framework

Many K-12 teachers and teacher educators found themselves unprepared, lacking both the skills and resources to facilitate learning in remote settings during COVID-19 emergency school closures (Cahapay, 2020; Short et al., 2021). Likewise, school-based agricultural education (SBAE) programs were not immune to the impacts of the pandemic (McKim & Sorensen, 2020). Educators throughout the profession implemented new strategies and methods to deliver instruction using a variety of technologies. Students today are considered digital natives, never knowing life without many forms of technology and with instant access to vast amounts of information via the internet, computers, and smartphones (An & Reigeluth, 2011; Roberts et al., 2016). Educational technologies and online communications are ever-present in the lives of today's students, and as a result, many stakeholders are demanding an education that reflects the 21st century (Roberts et al., 2016). As we move beyond the pandemic, we should consider the strategies and technologies we used and explore alternative pedagogical models to enhance learning opportunities for our students. Blended learning may very well be able to meet the needs of the 21st-century student and teacher, but before blended learning in SBAE can be effectively evaluated and implemented, identifying a commonly agreed-upon definition may be required.

Blended learning has historically been ill-defined and there is no commonly agreed-upon definition among scholars and practitioners (Dziuban et al., 2018; Norberg et al., 2011; Oliver & Trigwell, 2005). Horn and Staker (2015) proposed a definition of blended learning and argued that three distinct components must be present in a blended learning environment: 1) a formal education program that facilitates student learning, at least in part, through online learning, and provides an element of student control over time, place, path, and/or pace; 2) student learning happens, at least in part, in a supervised brick-and-mortar location away from home; and 3) learning experiences for each student are purposely coordinated between the brick-and-mortar and online modalities. Unlike other definitions of blended learning, Horn and Staker (2015) incorporated the idea that students must have some control over when, where, what, and how they learn.

Purpose

The purpose of this qualitative study was to explore how SBAE teachers defined blended learning, which aligns with the American Association of Agricultural Education's Research Priority 4, Question 1: "How do digital technologies impact learning in face-to-face and online learning environments?" (Roberts et al., 2016, p. 39).

Methods

This study was part of a larger study that explored SABE teachers' beliefs and practices in blended classrooms. For this study, we employed a phenomenological approach, seeking to explore, describe, and analyze the meaning of a shared experience or phenomenon by several individuals (Creswell & Poth, 2018; Marshall & Rossman, 2016). Using the Horn and Staker (2015) conceptualizations of blended learning as a lens, we explored how five SBAE educators who self-identified as blended teachers defined blended learning. Each participant engaged in an hour-long, semi-structured interview during which they were asked to define blended learning in their own words and based on their experience. Data were transcribed and initial coding, as described by Saldaña (2009), was used to break down participant responses as a way to closely examine individual definitions and compare them for differences and similarities.

Findings

We discovered that each definition of blended learning given by participants was unique to the individual. One participant, Jill, drew on the definition of a flipped classroom to define blended learning saying, "to me, blended learning is when core knowledge is on the kids". Kathy provided a definition that was focused on technology integration as a way to provide experiences saying blended learning is "students utilizing technology as a tool to learn and experience things that we can't necessarily provide here in our program". Similarly, Nancy defined blended learning as "using a computer platform to offer the opportunity for kids to engage in content, and then be able to utilize that content…where they're building something with the knowledge that they've learned". Although Nancy's definition does mention technology integration as a component of blended learning, Nancy acknowledges that students are not passive participants in a blended environment and that there is an expectation that they engage in constructive learning processes. Julianne defined blended learning as "focusing on the hands-on labs and projects of our class, as this is a big part of agriculture, but also integrating technology", viewing SBAE and blended learning as potentially in conflict with one another. Of the participants, Jeremy was the only one whose definition of blended learning explicitly aligned with the core pieces of the Horn and Staker (2015) definition. He said blended learning is when "students are in class, some of the time and online some of the time". Upon reviewing these definitions, no participant accounted for student control over when, where, what, and how they learn, key components of the Horn and Staker (2015) conceptualization of blended learning. The definitions provided by the participants indicate an inconsistency in how these SBAE teachers defined blended learning. This aligns with what others have identified (Dziuban et al., 2018; Norberg et al., 2011; Oliver & Trigwell, 2005), and may demonstrate a lack of understanding of blended learning among the SBAE profession. This inconsistency and lack of agreement could potentially impact how SBAE teachers implement blended learning in their classrooms.

Conclusions, Implications, and Recommendations

Blended learning provides opportunities for teachers to personalize learning by incorporating student choice, accounting for student interests, and increasing application and connectivity to the communities in which students live. However, before these opportunities can be realized, it becomes important to have a shared understanding and definition of blended learning in the SBAE profession. Creating an SBAE-specific definition for blended learning allows the profession to account for the specific needs of SBAE teachers, students, and programs. Discovering what our teachers do and do not understand about blended learning will better help teacher educators provide adequate instruction to fill in the gaps. We can begin this process by seeking to understand how SBAE teachers define blended learning, what has influenced their definition, and then provide relevant blended learning training to preservice and in-service teachers built on a common framework. Additionally, teacher educators can evaluate and refine how technology integration and blended learning are being discussed within their programs so that future SBAE teachers have the skills and knowledge necessary to implement true blended learning in their future classrooms.

References

An, Y. J., & Reigeluth, C. (2011). Creating technology-enhanced, learner-centered classrooms: K–12 teachers' beliefs, perceptions, barriers, and support needs. *Journal of Digital Learning in Teacher Education*, *28*(2), 54-62. https://doi.org/10.1080/21532974.2011.10784681

Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches*. Sage.

Dziuban, C., Graham, C. R., Moskal, P. D., Norberg, A., & Sicilia, N. (2018). Blended learning: the new normal and emerging technologies. *International Journal of Educational Technology in Higher Education*, *15*(1), 1-16. https://doi.org/10.1186/s41239-017-0087-5

Horn, M. B., & Staker, H. (2017). *Blended: Using disruptive innovation to improve schools*. John Wiley & Sons.

Marshall, C., & Rossman, G. B. (2014). *Designing qualitative research*. Sage.

Norberg, A., Dziuban, C. D., & Moskal, P. D. (2011). A time-based blended learning model. *On the Horizon*. *19*(3), 207-216. https://doi.org/10.1108/10748121111163913

Oliver, M., & Trigwell, K. (2005). Can 'blended learning' be redeemed?. *E-learning and Digital Media*, *2*(1), 17-26. https://doi.org/10.2304/elea.2005.2.1.17

Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). *American Association for Agricultural Education National Research Agenda: 2016-2020*. Department of Agricultural Education and Communication. https://doi.org//10.5032/jae.2009.03069

Saldaña, J. (2009). *The coding manual for qualitative researchers*. Sage.

Use of Experiential Learning to Support Climate Change Adoption

Andrew Waaswa
North Carolina State University
NCSU Campus Box 7607
Raleigh, NC 27695
awaaswa@ncsu.edu
(919) 515-6077

Abasiama-Arit Aniche
North Carolina State University
NCSU Campus Box 7607
Raleigh, NC 27695
aaaniche@ncsu.edu

Joy Morgan
North Carolina State University
NCSU Campus Box 7607
Raleigh, NC 27695
jemorga2@ncsu.edu

Introduction/Need for Research

Educators and Extension agents are tasked with developing research and instruction related to relevant and pertinent agricultural topics. Climate change has been at the forefront and the division on this topic presents a challenging task for those needing to find solutions. Climate-smart agriculture (CSA) as a strategy for climate change (CC) adaptation comprises management techniques or technological advancements that sustainably boost productivity, enhance resilience, reduce greenhouse gas emissions, and more effectively meet food security and development goals (Waaswa et al., 2022). Climate variability, characterized by low precipitation, flooding, high temperatures, prolonged sunshine, and delayed rainfall, has threatened agricultural productivity, leading to food insecurity. Several CSA strategies for increasing agricultural production have been developed to address these challenges. Specifically, institutional support and the use of experiential learning have been found to impact the adoption of CSA significantly (Okello et al., 2018).

Conceptual Framework

This study was based on adopting the CSA concept as a climate-smart agriculture adaptation strategy among farming communities. The concept of CSA is based on its triple-win impact of increasing production, improving resilience, and lowering emissions by integrating various goals and managing trade-offs (Newell & Taylor, 2018). This concept first used by Food and Agricultural Organization (FAO) in 2009 (Mann et al., 2009) was followed by the Wageningen statement, which identified scientific priorities to accelerate CSA. Since then, several foster the widespread use of CSA concept including the African Agricultural Ministers' call to action and Conference of Parties (COP) 17 in Durban, South Africa. During this meeting, parties asked the United Nations Framework Convention on Climate Change (UNFCCC) Subsidiary Body for Scientific and Technological Advice (SBSTA) to explore the possibility of a formal work program on CSA (Newell & Taylor, 2018). In 2013, the FAO launched the Economics and Policy Innovations for Climate-Smart Agriculture (EPIC) program, which inspired the launch of the Global Alliance for CSA (GACSA) at the UN climate summit in New York the same year. In Africa, Kenya launched the National Climate Change Action Plan (NCCAP 2013–2017) in 2013 after successfully launching the National Climate Change Response Strategy (NCCRS) in 2010 (Ambrosino et al., 2020), followed by the CSA Strategy (KCSAS) in 2017. Utilizing an integrated agriculture, development, environment, food security, and climate change strategy, KCSAS guides changes to agricultural systemsby highlighting it as an "excellent opportunity for transformation by uniting agriculture, development, and climate change under a common agenda" (GoK, 2017). Kenya is vulnerable to CC and has implemented several interventions, such as the Climate and Water Smart Agriculture Centre (CaWSA-C) under Community Action Research Project (CARP+), to foster the adoption of CSAPs.

Methodology

The CSAPs commonly introduced to farmers include rainwater harvesting and storage, irrigation, mulching, minimal tillage, improved crop varieties, terracing, drainage management, intercropping, agroforestry, synthetic fertilizers, composting, furrow/ridge planting, crop rotation, apical rooted cuttings, and mini-tubers. Several of these projects allow farmers to learn about CSA as a climate change adaptation strategy through experiential learning at field days and the utilization of progressive farmer's farms to teach other farmers to boost the likelihood of CSA adoption. Those without transportation were shuttled from their villages to the various sites at the university due to the difficulty of finding potato minitubers and apical rooted cuttings (newly introduced technologies in Kenya) only in the field laboratories of the university. This allowed the farmers to learn by seeing and believing in these CSA practices' potential. Based on the CSAPs offered to Kenyan farmers, this study sought to test a hypothesis that adopting CSA is a significant strategy for climate change adaptation. A cross-sectional survey was used to collect data from smallholder potato growers in Kenya. A sample of 120 farmers was drawn from the 15,359 smallholder farmers actively engaged in potato production in Gilgil Sub-County using a 95 percent confidence level. Gilgil Sub-County was chosen for this study precisely because of its vulnerability to the effects of CC. Potato producers were selected for this study because CC is reducing the production of the potato crop, Kenya's second most important staple food crop, after corn (Bolt et al., 2019). Data was collected using a structured researcher-administered questionnaire. SPSS version 28 was used to analyze the data. The percentages and frequencies for the CSA adoption rates and potentials of different CSAPs were computed using descriptive analysis. A binary logistic regression model was used to test the hypothesis.

Results/Findings

The use of synthetic fertilizer was the most adopted CSAPs by 95% of the potato farmers, rainwater harvesting and storage (83.3%), irrigation (31.7%), mulching (64.2%), minimal tillage (72.5%), improved crop varieties (59.2%), terracing (75%), drainage management (70.8%), intercropping (89.2%), agroforestry (85%), composting (75.8%), furrow/ ridge planting (74.2%), crop rotation (83.3%), apical rooted cuttings (7.5%), and the mini-tubers were the least adopted CSAPs by 1.7%. However, an average of 64.56% of potato farmers adopted the CSAPs. Of the 64.56% of potato farmers who adopted the CSAPs, 94.2% reported that CSA helped them adapt to CC by improving soil fertility, increasing yields (94.2%), increasing incomes (95%), reducing soil erosion (88.3%), ensuring production all year round (56.7%), increasing livelihood diversification (84.2%), reducing labor requirements (92.5%), reducing input expenses (87.5%), reducing pests and disease infestation (86.7%), increasing product quality (89.2%), and watering animals (79.2%). Regarding the magnitude of the adaptation potentials, 12.4% of the farmers reported a low impact of CSAPs, 65.9% reported a moderate impact, and 21.8% reported a high impact. At a 5% significance level, hypothesis test findings from a binary regression analysis revealed that CSA is a significant CC adaptation strategy (Wald $\chi2 = 49.417$, df = 1, $p < 0.001$). Further, findings show that implementing CSA increases the farmers' chances to adapt to climate change by 19 times more than non-adopters. Unlike ensuring production all year round, all the CSA potentials investigated in this study significantly contributed to farmers' adaptation to CC.

Conclusion and Implications

Based on the findings, CSA is a significant climate change adaptation strategy especially if taught with the use of experiential learning. Farmers improved soil fertility; increased yields, incomes, and product quality; minimized soil erosion, labor needs, input expenses; pests and disease infestation; diversified their livelihood; and provided water for animals as a result. Educational programs should make CSAPs as a climate change adaptation strategy an integral component; this will establish a sustainable link between research and innovation and the farmers. Therefore, CSA training should be planned with an experiential learning approach, and linkages between research intuitions and farmers should be established and bolstered. Additionally, connecting progressive farmers with the rest of the farming community would greatly influence other farmers to accept CSAPs widely.

References

Ambrosino, C., Hufton, B., Nyawade, B. O., Osimbo, H., & Owiti, P. (2020). Integrating Climate Adaptation, Poverty Reduction, and Environmental Conservation in Kwale County, Kenya. In W. Leal Filho, N. Ogugu, L. Adelake, D. Ayal, & I. da Silva (Eds.), *African Handbook of Climate Change Adaptation* (pp. 1–18). Springer International Publishing. https://doi.org/10.1007/978-3-030-42091-8_118-1

Bolt, J., Demissie, T., Duku, C., Groot, A., & Recha, J. (2019, August 20). *Potato Kenya: Climate change risks and opportunities*. https://cgspace.cgiar.org/handle/10568/103233

GoK. (2017). *Kenya Climate Smart Agriculture Strategy—2017-2026*. UNDP Climate Change Adaptation.

Mann, W., Lipper, L., Tennigkeit, T., McCarthy, N., Branca, G., & Paustian, K. (2009). *Food security and agricultural mitigation in developing countries: Options for capturing synergies*. FAO.

Newell, P., & Taylor, O. (2018). Contested landscapes: The global political economy of climate-smart agriculture. *The Journal of Peasant Studies*, *45*(1), 108–129. https://doi.org/10.1080/03066150.2017.1324426

Okello, D., Mayega, R. W., Muhumuza, C., Amuge, P. O., Kakamagi, E., Amollo, M., Amuka, I., Kayiwa, R., & Bazeyo, W. (2018). *Gender and innovation for climate-smart agriculture. Assessment of gender-responsiveness of RAN's agricultural-focused innovations* [CCAFS Working Paper no. 260]. https://cgspace.cgiar.org/handle/10568/100324

Waaswa, A., Oywaya Nkurumwa, A., Mwangi Kibe, A., & Ngeno Kipkemoi, J. (2022). Climate-Smart agriculture and potato production in Kenya: Review of the determinants of practice. *Climate and Development*, *14*(1), 75–90. https://doi.org/10.1080/17565529.2021.1885336

Using Students' Chosen Gender Pronouns in School-Based Agricultural Education: Preservice Teachers' Perceived Knowledge and Preparedness – Phase II

Tyler J. Price
Doctoral Student
Department of Agricultural Education, Communications and Leadership
Coordinator of LGBTQ+ Affairs
240 Student Union, Stillwater, OK 74078
Oklahoma State University
405-714-8289
tyler.price10@okstate.edu

M. Craig Edwards
Professor, Agricultural Education
464 Agricultural Hall Stillwater, OK 74078
Department of Agricultural Communications and Leadership
Oklahoma State University
405-744-8141
craig.edwards@okstate.edu

Using Students' Chosen Gender Pronouns in School-Based Agricultural Education: Preservice Teachers' Perceived Knowledge and Preparedness – Phase II

Introduction/Conceptual Framework

Many U.S. teachers are unprepared to instruct and mentor lesbian, gay, bisexual, transgender, questioning (LGBTQ+), and non-gender conforming youth (Clark, 2010). The use of gender-neutral language is one way to assist transgender and gender diverse youth feel included and supported (Cross & Hiller, 2021; Matsuno, 2019) in school and other spaces in their lives. "Efficient and Effective Agricultural Education Programs" was identified as an area of importance by the American Association for Agricultural Education in its National Research Agenda (Roberts et al., 2016, p. 42). However, literature on school-based agricultural education (SBAE) is limited regarding gender inclusive language (Murray et al., 2020). With scant research in this area, the question stands – How prepared are preservice SBAE teachers to address situations involving gender pronouns in their programs? This poster, therefore, will report on the Phase II results of a longitudinal, descriptive investigation. Our overall goal was to assess preservice students' knowledge and preparedness as they matriculate through their teacher preparation program at Oklahoma State University (OSU). The purpose of this portion of the study was to describe the changes in attitudes since our baseline observation regarding knowledge and preparedness of preservice SBAE teachers regarding gender pronouns. Two research objectives guided our inquiry: (1) determine the knowledge of preservice SBAE teachers regarding gender pronouns, and (2) determine the preparedness of preservice SBAE teachers to understand and properly use gender pronouns at the end of their first three-credit hour course on teaching methods.

A three-part framework guided this study: (1) gender pronouns knowledge and preparedness, (2) proper use of gender pronouns, and (3) perceived benefits of proper use are realized. Bandura's social cognitive theory posits that a person will be more willing to adopt an action or object if they perceive benefits exist (Vasta, 1989). Making preservice teachers aware of the benefits to their students when they feel comfortable in a learning space supports the need for gender pronouns curriculum in teacher preparation. During the teacher preparation program, they engage in campus events and some course activities on issues regarding the inclusivity of members of the LGBTQ+ community. These experiences likely play a role in building their knowledge of gender pronouns and prepare them for situations that involve using such as student teachers and as in-service professionals but to what extent or impact is not well-understood.

Methods

The population for the initial observation included 45 preservice SBAE teachers enrolled in *AGED3103/5203: Foundation and Philosophy of Teaching Agricultural Education* at OSU in Fall 2021. The second observation included 29 of the same preservice teachers enrolled in *AGED4103/5333: Methods and Skills of Teaching and Management in Agricultural Education* in Fall 2022. All students were asked to participate at each observation. At the second observation or Phase II of our study, the students completed a Qualtrics questionnaire with six Likert-type items assessing views on their knowledge and preparedness regarding gender pronouns using a seven-point agreement scale: 1 = *Strongly disagree* to 7 = *Strongly agree*. The second observation also included an open-ended question that asked the participants to describe their attitudes regarding the use of gender pronouns in SBAE as well as any experiences they had that may have influenced their views about the importance of teachers' preparedness to properly use such in SBAE. We computed the means (*M*) and standard deviations (*SD*) as well as the mean differences (*MD*) between observations for the Likert-type items.

Results

About one-half (26) of the students participated in the first observation. Most students (23) also responded in the second observation. These respondents *agreed* that it was important for SBAE teachers to be knowledgeable and prepared to properly use gender pronouns with a slight increase from the first observation (M = 5.48, SD = 1.06, MD = 0.21). Students also agreed that their understanding of the meaning of gender pronouns had improved between the observations (M = 5.52, SD = 1.35, MD = 0.40). Even though students' perceived importance and understanding increased, the other items all saw mean score decreases from the first observation. For instance, students perceived that they were less prepared by their teacher preparation program to understand and properly use gender pronouns (M = 3.61, SD = 1.58, MD = -0.20). They also *agreed* that teachers using gender pronouns aligned with their students' choices was less important after having completed the methods course (M = 5.48, SD = 1.56, MD = -0.29). When asked to share their thoughts on SBAE teachers' use of gender pronouns through an open-ended response item, the students mostly indicated that it was important. One participant stated: "It's important to respect a students' needs on how they want to be addressed." However, others stated not being well-enough informed to properly use students' chosen gender pronouns. One participant said: "I think this is something that's definitely important and will be very prevalent in the years to come. However, I'm not sure I feel prepared to handle this type of situation if it arises." When asked what experiences impacted their understanding of gender pronouns, about two-thirds of the 23 participants said they had not had any related experiences. Those with experiences impacting their understanding expressed their lab instructor, as associated with the recently completed course, was passionate about inclusivity. A participant stated: "In [instructor's name] lab we had great conversations about his experiences with gender pronouns in the classroom . . . other than that we did not talk about gender pronouns in the classroom throughout our time here at OSU." While other students also expressed it was important and that they needed more training, another said: "You are what you are."

Conclusions, Implications, and Recommendations

The participants continued to *agree* with the importance of understanding how to properly use gender pronouns in SBAE. However, they still saw themselves as somewhat unprepared regarding their future practice, a finding supported by Clark (2010). We recommend that efforts continue at OSU to prepare aspiring SBAE teachers to understand and use students' chosen pronouns (Cross & Hiller, 2021; Murray et al., 2020). An instructional unit is likely needed to provide appropriate content on gender pronouns and making gender diverse students feel welcomed and included. Participants' comments implied the need for discussion and guidance on situations specific to SBAE that may arise due to students' gender identities such as overnight rooming assignments during travel as well as appropriate official dress standards for student with a chosen gender identity other than their assigned sex. These preservice teachers will be surveyed after their student teaching internship to identify whether they experienced situations that better prepared them to use students' chosen gender pronouns in SBAE. Similar studies should be conducted with in-service teachers of SBAE.

References

Clark, C. T. (2010). Preparing LGBTQ-allies and combating homophobia in a U.S. teacher education program. *Teaching and Teacher Education*, *26*(3). 704-713. https://doi.org/10.1016/j.tate.2009.10.006

Cross, E., & Hillier, A. (2021). Respecting pronouns in the classroom. *The Educator's Handbook*. https://www.gse.upenn.edu/news/educators-playbook/erin-cross-pronouns-gender-identity

Matsuno, E. (2019). Breaking the binary in psychology: How to empower and support trans and non-binary graduate students in psychology. *Division 44 Newsletter*. http://www.apadivisions.org/division-44/publications/newsletters/division/2019/04/support-nonbinary

Murray, K. A., Trexler, C. J., & Cannon, C. E. B. (2020). Queering agricultural education research: Challenges and strategies for advancing inclusion. *Journal of Agricultural Education, 61*(4), 296-316. https://doi.org/10.5032/jae.2020.04296

Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). *American Association for Agricultural Education national research agenda: 2016-2020.* Gainesville, FL: Department of Agricultural Education and Communication. https://aaaeonline.org/resources/Documents/AAAE_National_Research_Agenda_2016-2020.pdf

Vasta, R. (Ed.). (1989). Social cognitive theory. *Annals of Child Development. Six Theories of Child Development, 6*, 1-85. JAI Press. https://www.uky.edu/~eushe2/Bandura/Bandura1989ACD.pdf

What are Students' Perceptions Regarding Using a Flipped Classroom to Deliver Agricultural Mechanics Course Instruction?

Jay Solomonson, Ph.D.
Illinois State University
140 Ropp Agriculture Building
Normal, IL 61790
jksolom@ilstu.edu

Trent Wells, Ph.D.
Southern Arkansas University
Department of Agriculture
Agriculture (AGR) 208
Magnolia, AR 71753
ktwells@saumag.edu

What are Students' Perceptions Regarding Using a Flipped Classroom to Deliver Agricultural Mechanics Course Instruction?

Introduction and Theoretical Framework

As student engagement factors tend to change with each successive generation of students, so must instructors' approaches to teaching and learning (Edgar et al., 2016). The increasing emphasis on student-centered, active learning in American classrooms dictates that instructors be open to attempting new approaches to reaching and teaching their students (McCubbins et al., 2018). One such approach that has proliferated across the American university landscape in recent years is the flipped classroom (O'Flaherty & Phillips, 2015). Student-centered in nature, flipped classrooms provide students with the flexibility to peruse course content online at their convenience before actively engaging in deeper, meaningful applications during course meetings (McCubbins et al., 2018). As instruction in agricultural courses is often centered on preparing students to solve complex, thought-provoking problems (Parr & Edwards, 2004; Phipps et al., 2008), the applications that can be used within flipped classrooms often align well with instructors' goals for student learning.

The active nature of the flipped classroom often lends itself well to agricultural courses (McCubbins et al., 2018). In the context of an agricultural teacher education course taught using a flipped classroom, Connor et al. (2014) found that "a flipped classroom approach seems to have promise as a model for delivering a teaching methods course" (p. 65) and opined that "other instructors of similar courses attempt a flipped classroom approach to test the model in other contexts" (p. 65). While Connor et al. (2014) studied using a flipped classroom in agricultural teacher education and McCubbins et al. (2018) researched its use in an agricultural capstone course, the application of the flipped classroom in the context of university-level agricultural mechanics courses has received limited scholarly attention. Figland et al. (2020) recently helped to address this gap in the literature, finding that students who experienced a flipped classroom in an introductory-level agricultural mechanics course viewed the experience in a favorable light. Thus, this led to our guiding research question: Would students in a similar course at another institution perceive their experience comparably?

We used Murillo-Zamorano et al.'s (2019) Flipped Classroom in Higher Education model to theoretically underpin our study. Their model indicated that flipped classroom instruction can directly and positively affect students' knowledge, skills, and engagement, which in turn directly and positively affects a student's satisfaction with the course. We used influences from their model to guide the design and discussion components of our study.

Purpose and Objectives

The purpose of our study was to determine students' perceptions of their engagement and learning in a flipped introductory-level agricultural mechanics course at Illinois State University (ISU). Our specific objectives were to: (1) determine student-perceived levels of engagement in a flipped classroom design and (2) examine student-perceived levels of learning when enrolled in a flipped classroom design course. Our study aligned with the AAAE National Research Agenda Research Priority 4: Meaningful, Engaged Learning in All Environments (Edgar et al., 2016).

Methods

This descriptive study was designed to determine student perceptions of engagement and learning in the flipped Introduction to Agricultural Engineering Technology course at ISU. After receiving IRB approval, we used a valid and reliable instrument employed within a prior study (i.e., Russell et al., 2016) to collect data from students who completed the course during the 2021 and 2022 calendar years. Data were electronically collected each semester during their final laboratory session. Our instrument consisted of three parts. Part one asked five questions related to their previous experience in a flipped classroom and their perceived levels of enjoyment, workload, and overall learning in our course. Part two consisted of six Likert-type questions regarding their academic preparedness, levels of engagement, and overall satisfaction of the course. Part three consisted of six demographic questions. We received 61 usable responses, yielding a 70.9% response rate. We used SPSS© version 26.0 software to analyze our data. To address our two research objectives, we used descriptive statistics to assess both student levels of engagement and their perceived levels of learning while enrolled in a course that uses the flipped classroom design.

Results

Approximately two-thirds (n = 41; 67.2%) of participants indicated having some previous experience with a flipped classroom in a post-secondary setting prior to taking our course. When asked about the amount of work in our flipped course, 75.4% (n = 46) of participants said the workload was similar to a traditional classroom while 19.7% (n = 12) said the workload was less. Students self-reported spending an average of 3.54 hours per week outside of our weekly sessions preparing for course activities. Eighty-two percent (n = 50) of participants said they were better engaged in our flipped classroom design while overall engagement had a mean score of 5.98 on a seven-point, Likert-type scale. Fifty-two participants (85.2%) also indicated their level of enjoyment in the course increased due to the flipped classroom design.

When examining perceived levels of learning, 42.6% (n = 26) of participants indicated their level of overall learning increased in the flipped classroom while 45.9% (n = 28) said it was similar to a traditional course. Overall, 90.2% (n = 55) of participants said they were satisfied with the online component of the course and 96.7% (n = 59) of participants indicated they were satisfied with the in-person component of the course.

Conclusions, Implications, and Recommendations

Similar to those of Figland et al. (2020), our findings indicate that using a flipped classroom design to deliver an introductory-level agricultural mechanics course is a worthy endeavor that can positively impact students' course experience. Every semester we are finding similar results suggesting that students at ISU prefer this teaching strategy over a traditional lecture style. Hence, the lead author plans to continue teaching the Introduction to Agricultural Engineering Technology course via a flipped classroom design for the foreseeable future. We recommend that instructors of introductory-level agricultural mechanics courses at other universities consider using a flipped classroom design. We also recommend that other agricultural teacher educators consider replicating our study to further explore this topic.

References

Connor, N. W., Rubenstein, E. D., DiBenedetto, C. A., Stripling, C. T., Roberts, T. G., & Stedman, N. L. P. (2014). Examining student perceptions of flipping an agricultural teaching methods course. *Journal of Agricultural Education, 55*(5), 65-77. doi:10.5032/jae.2014.05065

Edgar, D. W., Retallick, M. S., & Jones, D. (2016). Research priority 4: Meaningful, engaged learning in all environments. In T. G. Roberts, A. Harder, & M. T. Brashears. (Eds.), *American Association for Agricultural Education national research agenda: 2016-2020.* Gainesville, FL: Department of Agricultural Education and Communication.

Figland, W. L., Blackburn, J. J., & Roberts, R. (2020). Undergraduate students' perceptions of Team-Based Learning during an introductory agricultural mechanics course: A mixed methods study. *Journal of Agricultural Education, 61*(1), 262-276. https://doi.org/10.5032/jae.2020.01262

Murillo-Zamorano, L. R., Lopez-Sanchez, J. A., & Godoy-Caballero, A. L. (2019). How the flipped classroom affects knowledge, skills, and engagement in higher education: Effects on students' satisfaction. *Computers & Education, 141*, 1-18. https://doi.org/10.1016/j.compedu.2019.103608

McCubbins, O., Paulsen, T. H., & Anderson, R. G. (2018). Examining student perceptions of their experience in a TBL formatted capstone course. *Journal of Agricultural Education, 59*(1), 135-152. doi:10.5032/jae.2018.01135

O'Flaherty, J., & Phillips, C. (2015). The use of flipped classrooms in higher education: A scoping review. *The Internet and Higher Education, 25*, 85-95. Retrieved from https://www.sciencedirect.com/science/article/abs/pii/S1096751615000056

Parr, B., & Edwards, M. C. (2004). Inquiry-based instruction in secondary agricultural education: Problem solving—An old friend revisited. *Journal of Agricultural Education, 45*(4), 106-117. doi:10.5032/jae.2004.04106

Phipps, L. J., Osborne, E. W., Dyer, J. E., & Ball, A. (2008). *Handbook on agricultural education in public schools* (6th ed.). Thomson Delmar Learning.

Russell, J., Van Horne, S., Ward, A. S., Bettis III, E. A., Sipola, M., Colombo, M., & Rocheford, M. K. (2016). Large lecture transformation: Adopting evidence-based practices to increase student engagement and performance in an introductory science course, *Journal of Geoscience Education, 64*(1), 37-51. doi:10.5408/15-084.1

What Do They Value? Predicting U.S. Consumer Attitudes Toward Gene-Editing

Jean A. Parrella
265B Agriculture and Life Sciences Bldg.
600 John Kimbrough Blvd.
College Station, TX 77803
(530) 219-5642
jean.parrella@ag.tamu.edu

Holli R. Leggette
262 Agriculture and Life Sciences Bldg.
600 John Kimbrough Blvd.
College Station, TX 77803
(979) 458-3039
holli.leggette@ag.tamu.edu

Peng Lu
238 Agriculture and Life Sciences Bldg.
600 John Kimbrough Blvd.
College Station, TX 77803
(979) 845-2953
peng.lu@ag.tamu.edu

Gary Wingenbach
261 Agriculture and Life Sciences Bldg.
600 John Kimbrough Blvd.
College Station, TX 77803
(979) 862-1507
gary.wingenbach@ag.tamu.edu

Matt Baker
250 Agriculture and Life Sciences Bldg.
600 John Kimbrough Blvd.
College Station, TX 77803
(979) 845-6944
mathew.baker@ag.tamu.edu

Rafael Landaverde
224 Agriculture and Life Sciences Bldg.
600 John Kimbrough Blvd.
College Station, TX 77803
(979) 458-7993
rafael.q@ag.tamu.edu

Nate Jackson
265B Agriculture and Life Sciences Bldg.
600 John Kimbrough Blvd.
College Station, TX 77803
(512) 201-7424
niki123@tamu.edu

Introduction

Gene-editing can responsibly contribute to agricultural productivity, food security, and environmental sustainability (Kuzma, 2018). For the technology to strengthen food and agricultural systems in this capacity, consumers' acceptance of gene-editing should be considered in the early stages of technology development before gene-edited foods reach retail (Frewer et al., 2011). That way, agriculturalists and food manufacturers can predict profitable developments and implement science communication strategies designed to improve consumers' likelihood of purchasing such products. At this point, we know little about how consumers will respond to gene-edited foods (Yang & Hobbs, 2020). Because gene-edited foods may reach retail within five to 10 years, now is the time to determine which psychological factors most influence consumers' decision-making processes about gene-edited foods. Such research responds to the AAAE Research Agenda's call to develop effective methods of communicating and informing public opinion about agriculture (Roberts et al., 2016).

Theoretical Framework

Homer and Kahle's (1988) value-attitude-behavior model guided the study. The model posits that values indirectly influence behavior through the mediating role of attitude; therefore, values directly influence attitudes. We sought to determine which values predicted consumers' attitude toward the use of gene-editing in food production by answering the research question: What effect do perceived benefit, perceived risk, subjective social norm, institutional trust, preference for naturalness, environmental concern, and food technology neophobia have on participants' attitudes toward using gene-editing in food production?

Methods

The study was conducted as part of an undergraduate research methods course at Texas A&M University, although students were not involved in the survey instrument development process. The research team, including the lead instructor of the research methods course, developed the survey instrument using existing literature. The instrument, that was also used in a larger nationwide study, included a three-item scale measuring attitude toward the use of gene-editing in food production (Chen et al., 2013); a three-item scale measuring perceived benefit of gene-editing (Ferrari et al., 2021); a three-item scale measuring subjective social norm (Thyroff, 2011); a three-item scale measuring perceived risk of gene-editing (Pixley et al., 2022); a six-item scale measuring institutional trust (e.g., agriculture, food industry, science/research; Roosen et al., 2015); a four-item scale measuring food technology neophobia (Cox & Evans, 2008); a three-item scale measuring preference for naturalness (Bearth et al., 2014); and a four-item scale measuring environmental concern (Dunlap et al., 2000). Items in each scale were measured using 5-point, 6-point, or 7-point Likert-type response scales, and all scales were internally consistent with Cronbach's alpha coefficients ranging from .80 to .97. To collect data, students in the course posted the survey link to their social media accounts twice in two weeks and received N = 177 usable responses. We analyzed the data using a simultaneous multiple linear regression analysis with attitude as the dependent variable.

Results

Most respondents identified as white (*n* = 160; 90.40%), females (*n* = 141; 79.66%), between the ages of 18 and 44 (*n* = 109; 61.58%), who lived in Texas (*n* = 148; 83.62%). The regression model accounted for 84.02% of the variance in participants' attitudes toward the use gene-editing in food production (see Table 1). Accounting for the number of predictors, the adjusted percentage of variance explained is 83.36%. The F-test shows that the model explained a statistically significant amount of variation in the dependent variable ($F(7, 169) = 126.98$, $p < .001$). Holding all other variables constant, each additional point in perceived benefit is associated with a statistically significant average increase in attitude of .363 ($t(169) = 5.67$, $p < .001$); each additional point in subjective social norm is associated with a statistically significant average increase in attitude of .262 ($t(169) = 5.68$, $p < .001$); and each additional point in institutional trust is associated with a statistically significant average increase in attitude of .196 ($t(169) = 2.83$, $p = .005$). Moreover, each additional point in perceived risk is associated with a statistically significant average decrease in attitude of .185 ($t(169) = -2.80$, $p < .006$), and each additional point in food technology neophobia is associated with a statistically significant average decrease in attitude of .103 ($t(169) = -2.06$, $p = .041$). Preference for naturalness did not significantly affect attitude, nor did environmental concern.

Table 1

Results from the Regression Model with Attitude as the Dependent Variable

Predictors	Attitude Toward Gene-Editing (α = .97)			
	B (S.E.)	*t*	*p*	*β*
Intercept	2.019 (.521)	3.87	< .001	--
Perceived benefit (α = .93)	.363 (.064)	5.67	< .001	.335
Subjective social norm (α = .91)	.262 (.046)	5.68	< .001	.298
Perceived risk (α = .83)	-.185 (.067)	-2.80	.006	-.143
Institutional trust (α = .86)	.196 (.069)	2.83	.005	.124
Food technology neophobia (α = .87)	-.103 (.050)	-2.06	.041	-.104
Preference for naturalness (α = .81)	-.096 (.059)	-1.64	.104	-.062
Environmental concern (α = .80)	.011 (.044)	.25	.802	.008

Note. R = 84.02%; R^2 = 83.36%.

Conclusions

Perceived benefit of gene-editing had the strongest positive effect on consumers' attitude, followed by subjective social norm, while perceived risk had the strongest negative effect on attitude, followed by food technology neophobia. To increase perceived benefit, food manufacturers should consider including voluntary labels on gene-edited food packaging that include information about the technology's benefits. To improve subjective social norm, visual communications about gene-editing should depict social environments. An effective strategy may be to use consumers as information sources so that consumers see others like them supporting gene-edited foods. In the future, scholars should control for socio-demographic characteristics when conducting similar regression analyses. They should also measure behavioral intention toward gene-edited foods and conduct mediation analyses to determine how attitude mediates the relationships between consumers' values and behavioral intention (Homer & Kahle, 1988).

References

Bearth, A., Cousin, M-E., & Siegrist, M. (2014). The consumers' perception of artificial food additives: Influences on acceptance, risk and benefit perceptions. *Food Quality and Preference*, *38*, 14–23. https://doi.org/10.1016/j.foodqual.2014.05.008

Chen, M-F., Lin, Y-P., & Cheng, T-J. (2013). Public attitudes toward nanotechnology applications in Taiwan. *Technovation*, *33*(2–3), 88–96. https://doi.org/10.1016/j.technovation.2012.11.008

Cox, D. N., & Evans, G. (2008). Construction and validation of a psychometric scale to measure consumers' fears of novel food technologies: The food technology neophobia scale. *Food Quality and Preference*, *19*(8), 704–710. https://doi.org/10.1016/j.foodqual.2008.04.005

Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). Measuring endorsement of the new ecological paradigm: A revised NEP scale. *Journal of Social Issues*, *56*(3), 425–442. https://doi.org/10.1111/0022-4537.00176

Ferrari, L., Baum, C. M., Banterle, A., & De Steur, H. (2021). Attitude and labelling preferences toward gene-edited food: a consumer study amongst millennials and Generation Z. *British Food Journal*, *3*, 1268–1286. https://doi.org/10.1108/BFJ-09-2020-0820

Frewer, L. J., Bergmann, K., Brennan, N., Lion, R., Meertens, R., Rowe, G., Siegrist, M., & Vereijken, C. (2011). Consumer response to novel agri-food technologies: Implications for predicting consumer acceptance of emerging food technologies. *Trends in Food Science and Technology*, *22*, 442–456. https://doi.org/10.1016/j.tifs.2011.05.0

Homer, P. M., & Kahle, L. R. (1988). A structural equation test of the value-attitude-behavior hierarchy. *Journal of Personality and Social Psychology, 54*(4), 638–646. https://doi.org/10.1037/0022-3514.54.4.638

Kuzma, J. (2018). Regulating gene-edited crops. *Issues in Science and Technology*, *35*, 80–85. https://issues.org/wp-content/uploads/2018/10/Kuzma-Regulating-Gene-Edited-Crops-Fall-2018-ISSUES.pdf

Pixley, K. V., Falck-Zepeda, J. B., Paarlberg, R. L., Phillips, P. W. B., Slamet-Loedin, I. H., Dhugga, K. S., Campos, H., & Gutterson, N. (2022). Genome-edited crops for improved food security of smallholder farmers. *Nature Genetics*, *54*, 364–367. https://doi.org/10.1038/s41588-022-01046-7

Roberts, T. G., Harder, A., & Brashears, M. T. (2016). *American Association for Agricultural Education national research agenda: 2016-2020*. Department of Agricultural Education and Communication, University of Florida. https://aaaeonline.org/resources/Documents/AAAE_National_Research_Agenda_2016-2020.pdf

Roosen, J., Bieberstein, A., Blanchemanche, S., Goddard, E., Marette, S., & Vandermoere, F. (2015). Trust and willingness to pay for nanotechnology food. *Food Policy*, *52*, 75–83. https://doi.org/10.1016/j.foodpol.2014.12.004

Thyroff, A. E. (2011, March 31–April 2). *Thinking too small? Predicting intentions to consume nanofoods: A pilot study* [Paper presentation]. 20th Annual Robert Mittelstaedt Doctoral Symposium Proceedings (pp. 145–158). http://www.communicationcache.com/uploads/1/0/8/8/10887248/2011_symposium_proceedings.pdf#page=163

Yang, Y., & Hobbs, J. E. (2020). Supporters or opponents: Will cultural values shape consumer acceptance of gene-editing? *Journal of Food Products Marketing*, *26*(1), 17–37. https://doi.org/10.1080/10454446.2020.1715316

What is the Perceived Ability of Agriculture Teachers to Achieve Positive Work-Life Integration During the School Year?

Jay K. Solomonson, Ph.D.
Illinois State University
140 Ropp Agriculture Building
Normal, IL 61790
jksolom@ilstu.edu

Lucas D. Maxwell, Ph.D.
Illinois State University
147 Ropp Agriculture Building
Normal, IL 61790
ldmaxwe@ilstu.edu

Michael J. Barrowclough, Ph.D.
Illinois State University
137 Ropp Agriculture Building
Normal, IL 61790
mjbarr4@ilstu.edu

What is the Perceived Ability of Agriculture Teachers to Achieve Positive Work-Life Integration During the School Year?

Introduction/ Theoretical Framework

The concept of balance is not foreign to School Based Agricultural Education (SBAE). Countless students across the nation have been taught to balance feed rations, discussed pH balance during a hydroponics unit, or learned to read a balance in agriscience. Despite our familiarity with balance, one area the SBAE profession seems to struggle with is work-life balance, also referred to as work-life integration. Osborne (1992), while discussing SBAE, stated "the stress, heavy workload, and constant pressure to be better has resulted in a profession that literally devours its young" (p.3). Given the long-standing national shortage of SBAE teachers, over the last decade a great deal of attention has been paid to the topic of work-life integration (Clemons et al., 2021: Hopkins et al., 2020; Murray et al., 2011; Solomonson et al., 2022; Sorensen et al., 2016; Traini et al., 2019; Traini et al., 2020).

We framed our study around the documented relationship between one's work and non-work life, also known as spillover. Wilensky (1960) noted the relationship between work and leisure has been a topic of scholarly contemplation as far back as ancient Greece and Rome. Only since the industrial revolution has interaction between the two become a real concern. The "spillover leisure hypothesis" (p. 544) addresses the carryover of the mental strain of work to the home. Voydanoff (1980) noted that the relationship between work and family life is not simply a one-way street with family life often impacting work. Crouter (1984) posited the reciprocal spillover between work and life can be categorized into cognitive and behavioral areas. Using the concept of spillover as a guide, we developed our purpose and objectives.

Methodology

The purpose of our descriptive study was to investigate SBAE teachers' perceived ability to achieve positive work-life integration during the school year. Our specific objectives were: (1) Describe the hours spent on SBAE work activities outside of contract time, (2) Determine if differences existed in hours spent on specific SBAE work activities among various demographic groups, and (3) Explain the perceived ability of a SBAE teacher to achieve positive work-life integration. It should be noted this project was part of a larger study examining work-life integration of agriculture teachers in Illinois.

After receiving IRB approval, we sent out an electronic questionnaire to all 519 full-time agriculture teachers in Illinois. Contact information was obtained from the online Illinois agriculture teachers' directory. Our instrument consisted of three parts. Part one asked eight questions on hours spent on specific work activities outside of contract time. Part two asked three questions on their perceived ability to balance career and personal time. Part three asked our demographic questions. The questions were chosen from a valid and reliable instrument used within a prior study on work-life balance (Murray et al., 2011). Using Dillman et al.'s (2014) tailored-design method, we scheduled five points of contact over four-weeks to collect data. This approach yielded 165 usable responses and a 31.79% response rate. Data were analyzed using SPSS© version 26.0. Frequencies, percentages, means, standard deviations, and t-tests were used to analyze data.

Findings

Objective one sought to describe the hours agriculture teachers spend on work activities outside of contact time. During the school year, our participants self-reported working an average of 56.4 hours per week, and of those, 16.4 hours outside of their contract time. The specific work activities conducted outside of contract time can be found in Table 1.

Table 1

Average Number of Hours Per Week Agriculture Teachers Spend Outside of Contract Time on Work Activities (n = 165)

Variable	*M*	*SD*
FFA Activities	5.33	3.80
Classroom and Lab Preparation/ Lesson Planning	4.34	3.53
Operation and Maintenance of Facilities	2.04	2.12
Reports and Paperwork	1.82	2.42
SAE Activities	1.31	1.88
Meetings	1.26	1.85
Other	.26	1.24

Objective two was used to determine if differences existed in hours spent on work activities among various demographic groups, specifically sex, marital status, and children. We found no significant differences in total hours worked when examining sex. Males reported working an average of 16.59 hours per week (SD = 10.06) and females 16.19 hours per week (SD = 9.67). Further, no significant differences existed in the total hours worked between those with children living at home (M = 15.96, SD = 10.53) and those with no children (M = 16.89, SD = 8.82). However, we did discover two significant differences when examining marital status. Those married reported working 15.29 hours per week (SD = 9.31) outside of contract time, while those not married 19.13 hours per week (SD = 10.62), $t(163) = 2.28$, $p = .02$. Those not married also reported working significantly more (M = 5.63, SD = 4.48) on classroom/ laboratory preparation and lesson planning than those married (M = 3.83, SD = 2.96), $t(163) = 3.00$, $p = .00$.

Objective three attempted to explain the perceived ability of an agriculture teacher to achieve positive work-life integration. Over half our participants (f = 98; 59.4%) reported that they can usually achieve a positive work-life integration during the school year, but it was difficult at times. Forty-eight participants (29.1%) indicated it is always difficult to have a positive work-life integration, while four participants (2.4%) said it was completely impossible. Adversely, fifteen participants (9.1%) reported having no issues and they always felt they could achieve a positive work-life integration during the school year.

Conclusions, Implications, & Recommendations

Illinois SBAE teachers, regardless of sex, are devoting significant time beyond their contractual requirements to attend to all their work activities. The 56.4 hours per week being reported is consistent with existing literature suggesting SBAE teachers devote 55-57 hours per week to their jobs (Cooper & Nelson, 1981; Murray et al., 2011). Solomonson, et al. (2022) found Illinois SBAE teachers possessed high levels of occupational commitment suggesting these hours beyond contract time should not come as a surprise. More than half of the hours worked each week outside of contract time are devoted to FFA activities, and preparation and planning for instruction. While no differences were found between the sexes, unmarried teachers do work significantly more hours each week and devote more time to the area of classroom and laboratory preparation. Further study should examine the nature of the FFA activities that require so much beyond contract time. Research should also look at ways to aid teachers in planning and preparation for classroom and laboratory instruction.

References

Clemons, C., Hall, M., & Lindner, J. (2021). What is the real cost of professional success? A qualitative analysis of work and life balance in agriscience education. *Journal of Agricultural Education*, *62*(1), 95-113. http://doi.org/10.5032/jae.2021.01095

Cooper, E. L., & Nelson, C. L. (1981). Professionalism: Spouse and house. *The Agricultural Education Magazine*, *54*(1), 17–18.

Crouter, A. C. (1984). Spillover from family to work: the neglected side of the work–family interface. *Human Relations*, *37*(6), 425–440. doi:10.1177/001872678403700601

Dillman, D, A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th edition). John Wiley & Sons, Inc.

Hopkins, N., Sorensen, T., Burrows, M., & Lawver, R. (2020). Happy spouse, happy greenhouse: Perceptions of the SBAE teacher's spouse regarding agricultural education as a career. *Journal of Agricultural Education*, *61*(3), 194-213. https://doi.org/10.5032/jae.2020.03194

Murray, K., Flowers, J., Croom, B., & Wilson, B. (2011). The agricultural teacher's struggle for balance between career and family. *Journal of Agricultural Education, 52*(2), 107-117. https://doi.org/10.5032/jae.2011.02107

Osborne, E. (1992). A profession that eats its young. *The Agricultural Education Magazine*, *64*(12), p. 3–4.

Solomonson, J. K., Still, S. M., Maxwell, L. D., & Barrowclough, M. J. (2022). Exploring relationships between career retention factors and personal and professional characteristics of Illinois agriculture teachers. *Journal of Agricultural Education*, *63*(2), 119-130. https://doi.org/10.5032/jae.2022.02119

Sorensen, T. J., McKim, A. J., & Velez, J. J. (2016). Why agriculture teachers leave: A national examination of turnover intentions and work-family conflict. *Journal of Agricultural Education*, *57*(4), 186-201. https://doi.org/10.5032/jae.2016.04186

Traini, H. Q., Claflin, K., Stewart, J., & Velez, J. J. (2019). Success, balance, but never both: Exploring reified forms of success in school-based agricultural education. *Journal of Agricultural Education, 60*(4), 240-254. https://doi.org/10.5032/jae.2019.04240

Traini, H. Q., Yopp, A. M., & Roberts, R. (2020). The success trap: A case study of early career agricultural education teachers' conceptualizations of work-life balance. *Journal of Agricultural Education*, *61*(4), 175-188. http://doi.org/10.5032/jae.2020.04175

Voydanoff, P. (1980). Perceived Job Characteristics and Job Satisfaction among Men and Women. *Psychology of Women Quarterly*, *5*(2), 177–185.

Wilensky, H. L. (1960). Work, careers, and social integration. *International Social Science Journal*, *12*, 543–560.

What Types of Social Support Do Early Career School-Based Agricultural Education Teachers Find Most Beneficial?

Amy Leman
University of Illinois at Urbana-Champaign
bunselme@illinois.edu

Claire Smith
University of Illinois at Urbana-Champaign
claire4@illinois.edu

Jay Solomonson
Illinois State University
jksolom@ilstu.edu

Introduction/Need for Research

Across the United States, public schools face a continued and increasing shortage of qualified teachers, as not enough students are entering the teaching profession, and teachers are leaving the profession at alarming rates (Garcia & Weiss, 2020; Sutcher et al., 2019). This problem is particularly salient in agricultural education, where historically, the demand for school-based agricultural education (SBAE) teachers each year far exceeds the supply of new teacher candidates (Eck & Edwards, 2019; Smith et al., 2022). While training new teachers to fill the vacant positions is always a solution to the problem, it may prove more effective to focus on retaining existing teachers. Providing additional support to early career teachers (ECT), or those with less than five years in the profession, may increase their teaching sense of efficacy which in turn may lead to higher teacher retention (Korte & Simonsen, 2018). Moser & McKim (2020) found SBAE connection to other SBAE teachers was related to career commitment.

Conceptual Framework

House (1981) defines social support as a person's relationships with partners, friends, work colleagues, and work supervisors and links increased social support to decreased work stress and increased well-being (p. 7). Korte and Simonsen (2018) developed a conceptual framework describing the connection of social support to teacher sense of efficacy and career commitment, specifically for SBAE teachers. They list the various sources of potential social support for an SBAE teacher, including school-based (school administration, other teachers in their school, other SBAE teachers) and non-school-based (partner, friends, family). However, their framework does not specify or note the varying levels of importance the different types of support may provide for novice teachers, or how the support manifests in those relationships.

Purpose and Objectives

The purpose of our study was to examine the social support most beneficial to early career SBAE teachers. Our objectives were: (1) Identify specific areas of difficulty for ECTs, and (2) Determine the types of social support ECTs find most beneficial to address these areas of difficulty. Our study aligned with Research Priority 3: Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century of the AAAE National Research Agenda (Roberts et al., 2016).

Methodology

Our qualitative study utilized a basic interpretive approach guided by a realism epistemological perspective. A basic qualitative study was deemed appropriate as we determined how our participants interpreted and constructed meaning within their lived experiences (Merriam & Tisdell, 2016). After receiving IRB approval, we acquired a contact list from [STATE] state agricultural education staff and sent a recruitment email to all 126 agriculture teachers in their second to fifth year of teaching. Nineteen ECT's agreed to participate in our study. Consent documentation and demographic information were collected via Qualtrics. Each teacher participated in a semi-structured virtual interview using Zoom in the fall 2022 semester. The interviews were recorded and transcribed verbatim. All data were analyzed using an open-coding technique by each member of our research team. The codes were used to reveal concepts that developed into our final themes. The reliability and validity of the study were achieved through our methods based on the recommendations of Lincoln and Guba (1985).

Our sample included ten teachers with traditional teaching licenses and nine teachers with a provisional, alternate license gained from working at least in an agricultural industry prior to teaching. Six identified as male, and 13 as female. All identified as white or Caucasian. Five worked in a school with one SBAE teacher, and 14 worked in a multi-teacher program.

Findings

In order to address the first objective, what do ECTs identify as areas of their jobs that are most difficult, we identified four themes.

Theme 1: The school environment and classroom climate are instrumental in determining the difficulty of adjusting to teaching as a profession. Teachers in our sample discussed challenges in classroom management, especially in classes using a shop or lab setting. They also struggled to determine what issues could be handled on their own or what they needed to talk to their principal. ECTs discussed addressing the social-emotional needs of students and the changing needs of students since the COVID pandemic.

Theme 2: The responsibilities of administering an FFA program provide added challenges not addressed by traditional agricultural education teacher education programs. ECTs identified challenges in learning administrative aspects of FFA, including knowing and remembering event deadlines, understanding how Career Development Events run, entering information into online database systems, and preparing for FFA awards. Traditionally licensed teachers discussed the pull between learning the principles of educational-related theories and the need-to-know specific details to run an FFA chapter.

Theme 3: ECTs identified gaps between their knowledge and skills and job expectations. All teachers in our sample felt that they needed additional knowledge from what their backgrounds and education prepared them to teach. Those with traditional teaching licenses expressed the challenge of unfamiliar content, while those with alternative licenses expressed challenges with understanding educational pedagogy and teaching methods. Many expressed needing additional support for agricultural mechanics curriculum. Some teachers were also teaching middle school courses and did not feel prepared for this audience.

Theme 4: ECTs struggled to attain a work-life integration with the expected workload. Teachers talked about the struggle of teaching five, six or seven different class preps a day while finding time to teach new content to themselves before bringing the information to their students. As one teacher stated, “I can only teach myself so much.”

To address the second objective, what assistance do early career teachers find most important to their job success, we identified two themes.

Theme 1: ECTs prefer support from other SBAE teachers, state staff, and supportive administrators as well as people they know and have existing relationships. ECTs went to other SBAE teachers, state staff, and supportive administrators with their various work-related needs. They were most comfortable and went first to those teachers and staff they already knew. Support from people they did not know already was not as welcome or important.

Theme 2: ECT appreciation timely answers to various questions, as they occurred. Teachers went to the person with the timeliest response and answer to their question. They used email and text messages, the priority being the most efficient method to get a quick response.

Conclusions, Implications, & Recommendations

Early career teachers While our interview questions focused almost exclusively on emotional, appraisal, and informational support when interviewees were asked what other support is helpful, the need for additional money came up repeatedly. This fits under the category of instrumental support in the frameworks by House (1981) and Korte & Simonsen (2018) and confirms that the need for tangible items to support SBAE teachers is important, as well as other types of support.

References

Eck, C. J., & Edwards, M. C. (2019). Teacher shortage in school-based, agricultural education (SBAE): A historical review. *Journal of Agricultural Education, 60*(4). https://doi.org/10.5032/jae.2019.04223

Garcia, E., Weiss, E. (2020, December 15). *A policy agenda to address the teacher shortage in U.S. public schools*. Economic Policy Institute. https://www.epi.org/publication/a-policy-agenda-to-address-the-teacher-shortage-in-u-s-public-schools/

House, J. S. (1981). *Work, stress and social support.* Addison-Wesley Publishing Company.

Korte, D. S., & Simonsen, J. C. (2018). Influence of social support on teacher self-efficacy in novice agricultural education teachers. *Journal of Agricultural Education, 59*(3), 100-123. https://doi.org/10.5032/jae.2018.03100

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalist inquiry*. Sage Publishing.

Merriam, S B., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation*. Jossey-Bass Publishing.

Moser, E., & McKim, A. (2020). Teacher retention: A relational perspective. *Journal of Agricultural Education, 61*(2), 263-275. https://doi.org/10.5032/jae.2020.02263

Roberts, T. G., Harder, A., & Brashears, M. T. (Eds). (2016). *American Association for Agricultural Education National Research Agenda: 2016-2020*. Department of Agricultural Education and Communication.

Smith, A. R., Foster, D. D., & Lawver, R. G. (2022). *National agricultural education supply and demand study, 2021 executive summary*. http://aaaeonline.org/Resources/Documents/NSD 2021Summary.pdf

Sutcher, L., Darling-Hammon, L., & Carver-Thomas, D. (2019). Understanding teacher shortages: An analysis of teacher supply and demand in the United States. *Educational Policy Analysis Archives, 27*(35). https://doi.org/10.14507/epaa.27.3696

Who Are They? The Internal Factors Associated with the Science Communication Identities of Extension Professionals

Klae O'Brien
University of Idaho
875 Perimeter Drive MS 2040
Moscow, ID 83844-2040

Sarah A. Bush
University of Florida
P.O. Box 110540
Gainesville, FL 32611-0540
sab5271@ufl.edu

Carrie N. Baker
University of Florida
P.O. Box 110540
Gainesville, FL 32611-0540
baker.carrie@ufl.edu

Jean Parrella
Texas A&M University
600 John Kimbrough Blvd.
College Station, TX 77843
(530) 219-5642
jparrella@tamu.edu

Maggie Elliot
Washington Hops Commission
melliot@wahops.org

Kattlyn Wolf
University of Idaho
875 Perimeter Drive MS 2040
Moscow, ID 83844-2040
kwolf@uidaho.edu

Introduction/Conceptual Framework

The Cooperative Extension Service (CES) is a critical vehicle for sharing nonformal education and research from land-grant universities with people and communities (Seevers & Grahm, 2012). If CES is the vehicle, Extension professionals are the drivers of relationships and communication within communities to ensure that scientific information is communicated in ways that are relevant and meaningful to their audiences (Kurtzo et al., 2019). These individuals must rely on new media channels and social trends to determine how to broadcast their messages widely to all constituents. Understanding the audience and proactively framing information for them is important to increase buy-in (Jenkins et al., 2020). An individual who identifies as a science communicator is more likely to take action to increase the quality and personalization of their communication (Baram-Tsabari & Lewenstein, 2017). Longnecker's (2016) integrated model of science communication considers an individual's identity as a science communicator as vital, "a sense of identity affects engagement with information – whether we receive it, how we process it and what use we make of it" (p. 5). The major components of this model include identity, engagement, communication, facts, and social norms. For this study, we concentrated on exploring the eight factors related to identity: affect, awareness, understanding, skills, behavior, attitudes, beliefs, and values (Longnecker, 2016). Identity as a communicator can be an addition or expansion of one's current professional identity; the new identity as a communicator can help broaden their reaches in their discipline (Baram-Tsabari & Lewenstein, 2017). Therefore, our purpose was to explore how [University] extension professionals identify as science communicators based on the eight factors of identity from Longnecker's (2016) model.

Methods

Following a census survey of [University] CES professionals with advanced degrees (N = 131), we employed a stratified purposive sample based on district representation, rural and urban county type, and preferred communication type. We conducted 12 Zoom interviews with an adapted protcol from Parrella and Leggette's (2020), based on Longnecker's (2016) model. The questions to address each factor were as follows: understanding (three questions), affect (one question), values (two questions), awareness (one question), skills (three questions), behavior (two questions), attitudes (two questions), and beliefs (two questions).We transcribed interviews verbatim and deconstructed into meaning units (Yin, 2011). Two researchers used an iterative process to provide rigor and increase credibility of the coding and meaning making process (Creswell, 2014). We utilized a constant comparative method through open coding followed by axial coding for meaning making (Yin, 2011). The meaning making process resulted in five themes: continual development, technology, research dissemination, evaluation & motivation, and community relationships. This analysis process included stratifying the meaning units, previously coded, for each theme based on the factor the interview question was developed to explore.

Results

Interviewees frequently discussed continual development. In the understanding factor, individuals noted the importance of being a science communicator, but continuing to adapt. In the awareness factor, some shared their resources for reaching new people and developing skills. In the behavior factor, they expanded on new skills, platforms, and connections they could make to increase their communication skills. In the attitudes factor, individuals indicated they can become more reliable and better assets when they continue to grow and increase their skills.

Individuals discussed technology throughout many facets of the interview. In the understanding factor, they indicated being a science communicator was having the means to share information. In awareness, they shared how they can utilize technology as a resource, but it can also serve as a barrier. In the skills factor, respondents identified that different audiences are more receptive to different types of technology. Lastly, they discussed technology in the attitude factor as a means to increase their impact as science communicators.

In the interviews, they also mentioned research dissemination throughout. In the understanding factor, they discussed dissemination of information heavily as a science communicator's role. In the affect factor, they indicated providing access to useful and application information as a motivation for them. They identified values, such as being reliable and trustworthy They believed they play a key role in science communication. In the skills factor, individuals shared it is their job to provide information that can be easily understood and used to their constituents. In the attitudes factor, respondents noted they can make a significant impact by fulfilling their responsibility as a reliable source of the information. In the beliefs factor, individuals noted their key role in discussing scientific information with the public.

They discussed evaluation and motivation in multiple places during the interviews. In the understanding factor, individuals noted their passion for wanting to make an impact. Similarly, the affect factor included conversations about their motivation as science communicators to benefit their communities. This sentiment was also discussed during the values factor. The skills factor included discussion on how different audiences have different needs, and it is necessary to evaluate those and deliver meaningful content. In the attitudes factor, they indicated the opportunity to make positive impacts in their community and science fields. In the beliefs factor, they indicated communicating information to their communities is a valued part of their position.

They talked about community relationships under many factors. In the understanding factor, they discussed how their role is to enable the transfer of information through relationships. In the affect factor, they indicated their motivation to communicate based on relationships and the impact they can have. In the values factor, they said they had the responsibility to connect and maintain relationships to fulfill their job descriptions. In the attitudes factor, respondents discussed how they establish relationships by being trustworthy sources in order to fulfill their roles and impact their community. In the beliefs factor, they indicated that discussing information and research in their communities was important to them.

Conclusions and Recommendations

Each individual had their own understanding of what it meant to be a science communicator and how they fit into that realm (Longnecker, 2016). However, we uncovered each of Longnecker's (2016) internal identity factors were present in the five emergent themes of continual development, technology, research dissemination, evaluation & motivation, and community relationships. By understanding these shared themes, we can begin to unpack larger meaning on how to utilize Longnecker's (2016) model to help CES professionals better understand their identity as science communicators. These findings lend to the improvement on trainings for CES to increase their competencies as science communicators. Missing from this study is the viewpoint of the constituents. Additional research is needed to understand how constituents view their CES as science communicators and their ability to meet their needs.

References

Baram-Tsabari, A., & Lewenstein, B. V. (2017). Science communication training: What are we trying to teach?, *International Journal of Science Education, Part B, 7*(3), 285-300. https://doi.org/10.1080/21548455.2017.1303756

Creswell, J. W. (2014). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. Pearson Education Inc.

Jenkins, A. E., Grygorcyzk, A., & Boecker, A. (2020). Science communication: Synthesis of research findings and practical advice from experience communicators. *Journal of Extension*, *58*(4). https://archives.joe.org/joe/2020august/tt6.php

Kurtzo, F., Edgar, L. D., & Edgar, D. W. (2019). Exploring communication tendencies of program facilitators. *Journal of Applied Communications, 103*(1), 1-17. https://doi.org/10.4148/1051-0834.1415

Longnecker, N. (2016). An integrated model of science communication – More than providing evidence. *Journal of Science Communication*, *15*(5), 1-13. https://doi.org/10.22323/2.15050401

Parrella, J. & Leggette, H. (2020). A case of social identity: Assessing how scientists identify as science communicators. *Proceedings of the 2020 Western Region AAAE Research Conference, 39*, 80-85.

Seevers, B. & Graham, D. (2012). *Education through cooperative extension.* University of Arkansas.

Yin, R. K. (2011). *Qualitative research from start to finish.* The Guildford Press.