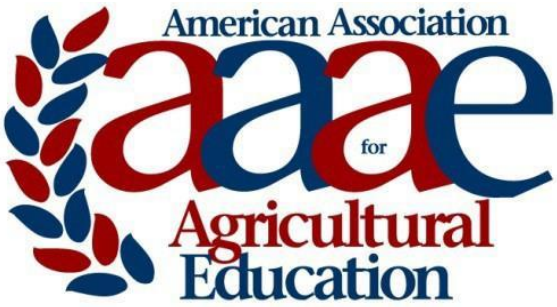
Research Conference Proceedings

North Central Region of the
American Association for
Agricultural Education



Research Conference and Session Coordination
Michigan State University, Research Host
North Dakota State University, Research Host-Elect

Conference Host
South Dakota State University
Brookings, South Dakota

September 27-29, 2023

Review Process for the North Central AAAE Research Conference

Michigan State and North Dakota State University faculty, as the 2023 NC-AAAE Conference Research Host and Host-Elect, and members of the NC-AAAE Research Committee offer sincere gratitude to the colleagues who served as members of the panel that evaluated this year's research submissions. A total of 45 research abstracts were submitted. Based on quality rankings and time allotted in the conference schedule, 30 abstracts were selected for research presentations at the 2023 NC-AAAE Conference.

Research Manuscript Reviewers for 2023 North Central AAAE Research Conference

Elizabeth Abraham, University of Minnesota

Emily Buck, The Ohio State University

Aaron Giorgi, West Virginia University

Rachel Hendrix, West Virginia University

Gaea Hock, Kansas State University

Michael Martin, Iowa State University

Aaron McKim, Michigan State University

Haley Rosson, West Virginia University

Scott Smalley, Iowa State University

Garrett Steed, University of Minnesota

Laura Rice, University of Minnesota

David Rosch, University of Illinois at Urbana-Champaign

Youth Learning and Engagement

"Trial and Error": A Case Study of Experiential Learning in a 4-H STEM Program
Christal Huber, University of Missouri
Rebecca Mott, University of Missouri

The Impact of Using Youth Participatory Action Research to Empower FFA Members
Amy M. Leman, University of Illinois at Urbana-Champaign
Aisha N. Griffith, University of Illinois at Chicago
Katrina A. Swinehart-Held, Central State University
Lauren A. Elrod, University of Illinois at Chicago

A Case Study of 4-H Teen Camp Counselor Roles, Responsibilities, and Experiences
Stephanie Femrite, University of Missouri
Rebecca Mott, University of Missouri

Social and Environmental Nexus

A Systematic Scoping Review of Stakeholder Analysis in Natural Resource Management
Anil Kumar Chaudhary, The Pennsylvania State University
Sharmistha Basak, The Pennsylvania State University
Parmveer Singh, The Pennsylvania State University

A Community-Based Survey to Explore the Potential Health Effects Due to Drinking Water Quality among Plain-Sect Communities
Anil Kumar Chaudhary, The Pennsylvania State University
Parmveer Singh, The Pennsylvania State University
Sharmistha Basak, The Pennsylvania State University
Farhan Sadique, The Pennsylvania State University

Understanding Motivators of and Barriers to Participation in Environmental Quality Incentives Program (EQIP): A Case of Pennsylvania
Elsie Assan, Purdue University
Anil Kumar Chaudhary, The Pennsylvania State University

Teacher Retention

Modeling Michigan School-Based Agricultural Education Teacher Shortage: A System Dynamics Approach
Tiffany A. Marzolino, Michigan State University
Aaron J. McKim, Michigan State University
Michael W. Everett, Michigan State University
Mark Forbush, Michigan State University

A Twenty-Year Comparison of Traditionally and Alternatively Licensed SBAE Teacher Retention in Kansas
KaCee James, Kansas State University
Brandie Disberger, Kansas State University
Gaea Hock, Kansas State University
Jonathan Ulmer, Kansas State University

To Those Concerned with Teacher Retention: A Collective Thought Experiment
Becky Haddad, University of Nebraska-Lincoln
Aaron J. McKim, Michigan State University
Haley Q. Traini, Oregon State University
Catlin M. Goodwin, Michigan State University

Enhancing Postsecondary Learning

Experiences from a Postsecondary Mentor Education Program
Aaron J. McKim, Michigan State University
Phillip Warsaw, Michigan State University
Douglas L. Bessette, Michigan State University

Job Crafting Among State FFA Officers by College Major
John D. Tummons, University of Missouri
Alexandra Gast, University of Missouri
Jennifer Russell, University of Missouri

Evaluating Collegiate Learning Outcomes without Student Surveys
Amy M. Leman, University of Illinois at Urbana-Champaign
Jennifer A. Smist, University of Illinois at Urbana-Champaign

Tools for Teachers

Describing 'Do, Reflect, Apply' as a Model for Reflective Writing
Dusti M. Ingles, Iowa State University
Michael S. Retallick, Iowa State University

Examining the Relationship Between School-Based Agricultural Education Teacher Social Media Use and Self-Confidence
Josie Manternach, The Ohio State University
Kellie Claflin, The Ohio State University

A Survey of Teacher Creativity in Michigan
Tiffany A. Marzolino, Michigan State University
Aaron J. McKim, Michigan State University

Teacher Stress and Balance

Impact of the COVID-19 Pandemic on School-Based Agricultural Education (SBAE) Teachers' Job Satisfaction and Work-Life Balance
Kelly Hoelting, Mission Valley High School
Gaea Hock, Kansas State University
Brandie Disberger, Kansas State University
Jonathan Ulmer, Kansas State University

Exploring West Virginia University Preservice Teachers' Stress and Coping Abilities: 2nd Year Findings
Aaron J. Giorgi, West Virginia University
Rachel E. Hendrix, West Virginia University

A Qualitative Analysis of Factors Impacting an Agriculture Teacher's Ability to Achieve Positive Work-Life Integration
Jay K. Solomonson, Illinois State University
Lucas D. Maxwell, Illinois State University
Kara Barling, Illinois State University
Liz Harris, Illinois State University

Research Presentation Session 3
Thursday, September 28, 2:45PM

Information Resources and Applications

Information Sources Used by Farmers in Developing Conservation Plans and Adoption of Best Management Practices (BMPs) in Pennsylvania: Implications for Program Design and Delivery
Elsie Assan, Purdue University
Rama Radhakrishna, Purdue University
Anil Kumar Chaudhary, The Pennsylvania State University

Examining the Use of Social Media Applications by West Virginia Agricultural Producers
Mikayla Hargis, West Virgina University
Haley Rosson, West Virgina University
Aaron Giorgi, West Virgina University

Describing Collaborations between SBAE and Extension Educators in West Virginia
Creed Ammons, West Virginia University
Aaron J. Giorgi, West Virginia University
Haley Rosson, West Virginia University

Expanding Agricultural Education

Gender Bias Experiences in School-Based Agricultural Education
Kaley Mumma, Iowa State University
Katherine Hartmann, Iowa State University
Michael J. Martin, Iowa State University

Agricultural Teacher views on Importance of Entrepreneurial Competencies for Student Career Success
John Tummons, University of Missouri,
Stephen C. Mukembo, University of Missouri,
Nathan Smith, Oklahoma State University
Jon Simonsen, University of Missouri,

Transforming Traditional School-Based Agricultural Education in an Urban Context
Michael J. Martin, Iowa State University
Kaley Mumma, Iowa State University
Blake van der Kamp, Iowa State University

Teacher Support

Triumphs and Tribulations: Student Teacher Needs-Supporting and -Frustrating Experiences Through Guided Reflective Journaling
Hannah C. Parker, The Ohio State University
Kellie Claflin, The Ohio State University
Amanda M. Bowling, The Ohio State University

Agricultural Educators' Perceptions of Supervisors' Instructional Feedback
Brooke L. Thiel, North Dakota State University
Justin V. Benna, North Dakota State University
Breanna Pastir, North Dakota State University
Nikki Fideldy-Doll, North Dakota State University

Help! A Qualitative Investigation of Social Support Early Career Agriculture Teachers Find Most Beneficial
Amy M. Leman, University of Illinois at Urbana-Champaign
Jay K. Solomonson, Illinois State University
Claire E. Smith, University of Illinois at Urbana-Champaign
Adrian Hernandez, University of Illinois at Urbana-Champaign

A Brief Primer for Critical Research in School-Based Agricultural Education
Katherine Hartmann, Iowa State University
Michael J. Martin, Iowa State University
Colby Gregg, University of Illinois at Urbana-Champaign

Retaining School-Based Agricultural Educators: A System Dynamics Approach
Tiffany A. Marzolino, Michigan State University
Aaron J. McKim, Michigan State University

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

"Trial and Error": A Case Study of Experiential Learning in a 4-H STEM Program

Christal Huber, University of Missouri
Dr. Rebecca Mott, University of Missouri

Introduction/Need for Research

4-H youth development programs began including science as a project area in the 1960s. Since then, research has found that 4-H STEM (science, technology, engineering, and mathematics) programs are successful in engaging youth through hands-on learning and providing excitement and enthusiasm around the program. (Mielke & Butler, 2013, Donaldson & Frank, 2018; Sage et al., 2018). Youth in 4-H programs are more likely to be enthusiastic about science and participate in science, engineering, and computer technology programs than their peers in other out-of-school programs (Mike & Butler, 2013, Learner & Learner, 2013).

Hands-on learning has also been found to be a crucial component of all forms of STEM education including formal and informal (Aschbacher et al., 2010, Burke & Iannini, 2021; Christensen & Knezek, 2017; Martin-Paez et al., 2018). While hands-on learning is often thought to be synonymous with experiential learning in STEM environments, it is not often explicitly mentioned in research (Martin-Paez et al., 2018). Even within 4-H programs, which have coined their own version of experiential learning, there is often a gap between practice and research (Bectel et al., 2013; Norman & Jordan, 2019). To address this gap this study sought to explore the role of experiential learning in a non-formal 4-H STEM learning environment.

Conceptual Framework

Experiential learning theory indicates that learning is a process that incorporates hands-on real-world experiences. By making learning active, the process of acquiring knowledge becomes more meaningful for learners. Kolb (1984), who coined the phrase experiential learning, claimed that learning consists of four phases: (a) concrete experience, (b) reflective observation, (c) abstract conceptualization, and (d) active experimentation. 4-H programs have adapted Kolb's model to reflect the experiential learning process through 4-H project work. When participating in a 4-H program youth (a) experience an activity, (b) share their results with others (c) process and reflect, (d) generalize to real world experiences, and (e) apply to different situations. (Norman & Jordan, 2019).

Purpose

The purpose of this study was to explore and describe how a non-formal STEM 4-H education program utilized experiential learning. The study was guided by the following research questions.

- How do youth participate in a non-formal STEM education program?
- What aspects of experiential learning occur in the non-formal STEM education program?

Methodology

This IRB-approved research is part of a larger research project exploring non-formal STEM programs education programs. This study used a qualitative single case study design, utilizing focus group interviews, individual interviews, document review, and observations. We used two-tiered sampling, first selecting the case and then the participants (Merriam & Tisdell, 2016). When selecting a case, the researcher must maximize what they can learn, keeping in mind the purpose is to not understand the whole picture but the particular case at hand (Stake, 1998).

We conducted approximately 60 hours of observations during weekly team practices and at a regional FIRST robotics competition. During the competition, we conducted a one-hour focus group to gain insight and explore members' involvement in the program. From these focus group interviews, we selected four participants who demonstrated extensive involvement to interview individually for 60-120 minutes in person and via Zoom. All interviews and observations were recorded on a digital device and transcribed for coding.

We followed Merriam's data analysis process to read, open code, and axial coding focus group and individual interviews as well as field observations (Merriam & Tisdell, 2016). This process was repeated with each set of data while referencing prior categories and creating new ones until categories were further condensed. The data was then triangulated with other interviews, observation field notes, and documents to check for commonalities (Merriam & Tisdell, 2016). Documents reviewed included FRC regional competition programs, FIRST online resource library documents, and documents created by the team such as an impact binder, manuals, team assignments and photos. Audit trails, reflective memos, and member checks were performed to promote dependability and trustworthiness.

Our research team members are faculty or staff at a land grant university who have experience with non-formal education programs. One researcher served as a 4-H youth specialist for several years specializing in STEM programing and currently provides support to researchers on planning non-formal STEM engagement programs. We served as both authors and researchers for this study, using a social constructivist paradigm to ensure the representation of youths' perspectives. Taking the view that knowledge is constructed through interaction with the world around us; it is not merely discovered. As we move through the world we construct meaning as we interact with the objects around us (Davis, 2009).

The Case

Tech Titans is a FIRST robotics competition (FRC) team and 4-H club in a Midwest town. This program is unique because it was created by subject matter experts who were interested in science outreach. FRC teams are comprised of youth ages 14-18 who design, fabricate, and program an industrial-sized robot to compete in a predetermined game for the season (FIRST, 2023). Teams are led by adult volunteers with expertise in engineering and mathematics. Each of the three adult volunteers on Tech Titans holds advanced degrees in engineering and/or biological sciences. They do not have children involved in the program, although two did in the past.

Tech Titans is considered an independent team, meaning they do not have an association with a school group. The team boasts that it utilizes student leadership, relying on two team

captains and six department leads two per department. Departments include (a) computer-aided design (CAD), (b) fabrication, and (c) programming. Demographic information for those interviewed can be found in Table 1.

Table 1

Study participants

Pseudonym	Team role	Years with team
Frank	Team captain	4 years
Sarah	Fabrication, marketing, and logistics lead	3 years
Elana	Student leadership member	4 years
Wayne	College student "mentor", prior captain	6 years

Findings

The following themes emerged from the data: (a) guiding peers through the learning process; (b) figuring it out for themselves; and (c) indirectly applying new skills.

Theme 1: Guiding peers through the learning process.

All participants explained that Tech Titans was a student-led team, meaning the students were the driving force of decision-making and team training. They also agreed that older, more experienced members taught younger members. Wayne, a college student who still returns to work alongside the high school members and sees himself as a mentor, explained,

> *It's like the seniors who have been on the team...they have the most experience, but they should be making sure that the juniors are getting hands-on experience as well so that they can then teach the juniors next year when they're seniors.*

Each member recalled experiences of training and reiterated the department leads' role in this process. Sarah commented that "the adults aren't usually involved in the training," indicating that the responsibility of teaching basic procedures was her responsibility as a department lead. While some such as Sarah took this role seriously Wayne recalled an experience as a lowerclassman in which he didn't have a similar experience. He commentated that his department lead "didn't teach us anything about CAD…he is just like, yeah, here's the software, here's how you open the software and then you can look up YouTube videos if you want to learn how to do it."

These training roles were not limited to department leads, and often more experienced members were often observed learning alongside younger students they were working with. Elana felt it was a responsibility as a senior member to instruct others commenting, "I just decided to help guide the underclassmen and actually getting my hands dirty and doing stuff." Underclassmen were also observed instructing others during a team meeting, three freshman students who built a swerve motor at the previous meeting were observed guiding their peers through the process. Each freshman paired themselves with another member to build a motor. During this process, they referenced the instructions, the previously built motor, and each other for validation that they were all proceeding correctly. When a less experienced student suggested a different method for assembling the motor, the process was modified to see if the suggestion proved to be a better solution.

Theme 2: Figuring it out for themselves.

In some instances, more experienced members had to figure out how to conduct procedures before guiding others through the learning process. Frank summarized this role as an expectation stating that "they try to give their department the tools to be able to design and build stuff whenever it comes to build season. They also try to learn more about stuff themselves." Wayne commented, "Sometimes I have to do it first to then know how to explain it." Sarah summarized how she prepared to train others:

> *I think a lot of it was trial and error… trying to think of ways I could incorporate this or incorporate new techniques, research, looking up how other teams train their students. And sometimes I would try something new, and it would fall flop completely. They would just look completely disinterested or they wouldn't retain anything from it. And then I would have to learn from that back panel, say, okay, what went wrong?*

While problem-solving often fell on the more experienced members, we also observed younger members figuring out how to build something. During one meeting three freshmen took it upon themselves to construct a swerve motor using only printed online instructions. While adult mentors were available for questions if needed, it was expressed by the members that mentors were only consulted when questions arose. In several instances, we did observe adult mentors overseeing the process from a distance and then stepping in when they noticed members truly struggling or a question was asked.

Members frequently expressed that they wanted to figure out the process on their own during interviews and observations. Once they were personally comfortable performing the task, they would then guide others through the process. When asked about mentor support Sarah expressed gratitude for the mentors stand back approach.

> *He [a mentor] gave us a space to grow both as engineers and as people while being there in the background to support us when we needed it the most. So we were never, he let us be on our own, but we were never alone when he was there because if we really needed him he would help us and it was nice to know that we could experiment and explore and try out our own things and take risks without, I mean he let us fail, but he didn't let us fail with $5,000 of materials.*

This sentiment was reiterated by various members of Tech Titans, with all members appreciating the problem-solving approach to the learning process. They all considered themselves adept problem solvers due to the program.

Theme 3: Indirectly applying new skills.

Members mentioned that they often indirectly applied lessons learned from the team to other experiences in their lives. Sarah felt that learning how to deal with imperfections on the team aided her in her college selection process. She stated she was "stressing so hard about picking a major, I'm like, well if I try something out for a year and I don't love it, I at least learn from something, and I can switch." Reflecting on his time as past team captain, Wayne recalled a time he used his past experiences in Tech Titans to convince the mentors to change the summer training program. He commented, "It was more just me explaining why we had trouble with those kits in the past…and that to me didn't seem like a way to train freshmen."

It is interesting to note that participants also felt they brought teaching skills with them gained through other youth development organizations to apply to the FIRST team and 4-H club. Frank contributed his ability to teach others to his prior experience in karate. He explained, “I've been trained on how to teach people. I've been trained on how to lead a large group of people, how to explain stuff like productively to people needing to learn.” Elana referenced Boy Scouts of America’s influence on her training process, commenting "Maybe that's where the scout leadership comes in. In Scouts, you have a teaching method. It's like educate, demonstrate, guide, and you teach how to do it then.”

Sarah also directly referred to her robotics experience in contributing to her education goals which she had recently changed. When asked about is change she commented “Well, so this has been, it was kind of a shock for me personally that I wanted to go into music education because I was so heavily involved in robotics education. But it's kind of the overlap of my two passions, teaching robotics and playing music.” She further elaborated that she wanted to work in the non-profit sector and attributed the out-of-school learning experience of Tech Titans as a large influence on this change of direction.

Conclusions, Discussion, and Recommendations

This case study research is limited by our inability to generalize to larger populations. However, these findings may be transferable to other non-formal STEM programs that offer students similar immersive experiences.

We found evidence of all components of the experiential learning model occurring in the FRC team and 4-H club. However, the way that these components appeared was different than what we are accustomed to seeing in more traditional 4-H project work. There was a rapid “back and forth” pattern occurring between concrete experiences and active experimentation. This process is consistent with the engineering design process, a loop of formulating, reformulating, and evaluation. Through this process, an engineer designs a product, tests it to the original design, and then evaluates or reflects on the original intention of the design to see if it is functional (Zheng, et al., 2020).

Members collaborated on their work and demonstrated their skills at robotics competitions. Reflection, a key component of experiential learning, was harder to find. Although there was no regular, intentional reflection built in, at times a more experienced member asked questions that promoted reflective conversation among team members. Interviews suggest that members are generalizing and applying *interpersonal skills* obtained through the FRC team and 4-H club to other areas of their lives. At this point, we are not certain to what extent they are applying their technical skills outside of the program.

While it is not unusual for non-formal education programs to claim they are “student-led,” this case is unique in that adult volunteers were almost invisible. Adult volunteers only appeared when they were sought out or when they saw members truly “stuck.” This behavior by adult volunteers may be helping with member persistence in problem-solving. Research purports that when adults take over during problem solving children become less persistent (Leonard et.al, 2021).

We recommend further research describing models and best practices that support student growth and development in the areas of science, technology, engineering, and mathematics. In

addition to focusing on how experiential learning can promote both technical and interpersonal skills, adult roles in youth organizations should be further explored.

References

Aschbacher, P. R., Li, E., & Roth, E. J. (2010). Is science me? High school students' identities, participation, and aspirations in science, engineering, and medicine. *Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching, 47(5),* 564-582. https://doi.org/10.1002/tea.20353

Bechtel, R., Ewing, J. C., Threeton, M., & Mincemoyer, C. (2013). Understanding the knowledge and use of experiential learning within Pennsylvania 4-H clubs. *The Journal of Extension*, *51*(5), 4. https://tigerprints.clemson.edu/joe/vol51/iss5/4/

Burke, L. E. C. A., & Navas Iannini, A. M. (2021). Science engagement as insight into the science identity work nurtured in community-based science clubs. *Journal of Research in Science Teaching, 58(9),* 1425-1454.DOI: 10.1002/tea.21714

Camilli, G., Hira, R. (2018). Introduction to special issue-STEM workforce: STEM education and the post-scientific society. *Journal of Science Education and Technology 28,* 1-8. https://doi.org/10.1007/s10956-018-9759-8

Christensen, R. & Knezek, G. (2017). Relationship of middle school student STEM interest to career intent. *Journal of Education in Science, Environment and Health, 3(1),* 1-13.

Committee on STEM Education (2018). *Chartering a course for success: America's strategy for STEM education.* National Science and Technology Council. https://www.energy.gov/sites/default/files/2019/05/f62/STEM-Education-Strategic-Plan-2018.pdf

Corbett, C., Hill, C. (2015). *Solving the STEM equation; The variable for women's success in engineering and computing.* American Association of University Women. https://www.aauw.org/app/uploads/2020/03/Solving-the-Equation-report-nsa.pdf

Davis, B. (2004). *Inventions of teaching: A genealogy*. Routledge

Donaldson, J.L., Franck, K.L. (2018). 4-H science: Building a 4-H career pathway initiative. University of Tennessee Institute of Agriculture. https://extension.tennessee.edu/publications/Documents/W668.pdf

For Inspiration and Recognition of Science Technology (FIRST). (2023) About FIRST. https://www.firstinspires.org/sites/default/files/uploads/resource_library/about-first-programs-FI079.pdf

Hill, C.T. (2019). STEM is not enough: Education for the post-scientific society. *Journal of*

Science Education and Technology, 28, 69-73. https://doi.org/10.1007/s10956-018-9745-

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development* (Vol. 1). Englewood Cliffs, NJ: Prentice-Hall.

Lerner, R. M., Lerner, J. V., et al. (2013). The positive development of youth: Comprehensive findings from the 4-H Study of Positive Youth Development.

Leonard, J.A., Martinez, D.N., Dashineau, S.C., Park, A.T. and Mackey, A.P. (2021), Children Persist Less When Adults Take Over. *Child Dev, 92:* 1325-1336. https://doi.org/10.1111/cdev.13492

Martín-Páez, T., Aguilera, D. Perales-Palacios, F. J., Vílchez-González, J.M. (2019). What are we talking about when we talk about STEM education? A review of literature. *Science Education, 103* 799-822. DOI: 10.1002/sce.21522

Merriam, S.B., Tisdell, E.J. (2016). *Qualitative research: A guide to implementation and design* (4th ed.). Jossey-Bass Publications.

Metcalf, H. (2010). *Stuck in the pipeline: A critical review of STEM workforce literature*. InterActions: UCLA Journal of Education and Information Studies, 6(2). https://escholarship.org/uc/item/6zf09176

Mielke, M., & Butler, A. (2013). *4-H science initiative: Youth engagement, attitudes, and knowledge study.* Policy Studies Associates. https://files.eric.ed.gov/fulltext/ED591155.pdf

Norman, M.N., Jordan, J.C. (2019). *Using an experiential model in 4-H.* https://edis.ifas.ufl.edu/publication/4H243

Stake, R.E. (1995) *The art of case study research*. Sage Publications.

White, A. J., Sero, R., Scanga, L. H., Cummins, M. M., Lile, J. R., Stott, N. K., & Leach, J. (2020). "The right tools at the right time": Improving volunteer education and support. Journal of Youth Development, 15(4), 110-144. DOI: https://doi.org/10.5195/jyd.2020.878

U.s Bureau of Labor Statistics (2022). *Employment in STEM occupations.* https://www.bls.gov/emp/tables/stem-employment.htm

Zheng, J., Xing, W., Zhu, G., Chen, G., Zhao, H., & Xie, C. (2020). Profiling self-regulation behaviors in STEM learning of engineering design. *Computers & Education, 143,* 103669. https://doi.org/10.1016/j.compedu.2019.103669

The Impact of Using Youth Participatory Action Research to Empower FFA Members

Amy M. Leman, University of Illinois at Urbana-Champaign
Aisha N. Griffith, University of Illinois at Chicago
Katrina A. Swinehart-Held, Central State University
Lauren A. Elrod, University of Illinois at Chicago

Introduction

While many career fields are stagnant or declining, agricultural science (ag-science) is expected to grow by 9% between 2020 and 2030 (U. S. Bureau of Labor Statistics, 2021). However, the projected field of agricultural-related science and engineering job openings is already more significant than the estimated number of college graduates to fill these positions (Fernandez et al., 2020). Of those students enrolled in four-year degree agricultural STEM programs, over 66% are white, non-Hispanic (Meeks et al., 2019). As with all science and engineering fields, individuals employed in ag-science fields are still predominantly white and male (National Science Board, 2018). At the same time, FFA participation has been linked to ag-science career interests and STEM-specific critical thinking and problem-solving (Phelps et al., 2012; Swafford, 2018; Talbert & Balschweid, 2006). While FFA has shown success in increasing the desire of high school students to pursue degrees and careers in ag-science fields (Mouser et al., 2019), creating opportunities that lead to developing college and career readiness (Copeland et al., 2020; Latham et al., 2014), FFA's chapters' member demographics, which are often less heterogeneous than their associated communities (Lawrence et al., 2013), suggest that the FFA may not promote an ag-science identity equally for all current and potential members. This work explores how employing Youth Participatory Action Research can enhance agricultural education within FFA.

Youth Participatory Action Research

Youth Participatory Action Research (YPAR) is a research methodology that engages youth who are not professional researchers in the formal research process at each level, and centers the decision-making power with the youth, as they investigate an issue that affects their lives and work towards learning more about the issue and developing ways to address the issue and make positive social change. YPAR can be an innovative tool within education in general (Anderson, 2020; Keddie, 2021; Ozer et al., 2010) and the STEM learning environment specifically (Jacquez et al., 2020). Youth as active partners in research is found in community-based participatory research practices used in public health (Branquinho et al., 2020), participatory action research practices (Shamrova & Cummings, 2017), and critical youth studies (Quijada Cerecer et al., 2013). FFA is well-suited for the use of YPAR because it straddles both the formal and informal agricultural education space.

YPAR is particularly powerful during the developmental period of early adolescence (ages 10-14) and especially during middle adolescence (ages 15-19) (Ballonoff Suleiman et al., 2021). It is an excellent fit with high school-aged youth’s developmental characteristics. Cognitive advances during adolescence create a greater understanding of abstract concepts like society, organizational systems, injustice, and fairness (Harrison, et al., 2019). Adolescence is a time when youth are engaging independently from their parents and other adults, and YPAR can draw upon their expertise to address areas of society and teen life less familiar to adults (Ozer, 2017). YPAR has been found to help youth manage bias, or while being aware of their own emotions

and personal experiences as their source of motivation, and also being open to data or reflection that differs from their personal experience (Kirshner et al., 2011).

The actions that youth generate and employ based on YPAR may be particularly meaningful for historically marginalized youth's sense of belonging because it has been argued that creating institutional structures in educational spaces for young people to make changes to inequitable systems is key to Black youth's sense of belonging in educational spaces (Gray et al., 2018). Thus, this may also be true for historically marginalized members of the FFA.

YPAR describes an engaged process in which youth are partners in research with adults. It relies upon adults to share power, facilitate conversations, and create a shared sense of identity as a team with the youth (Malorni et al., 2022). YPAR benefits are bi-directional, with adults reporting impactful changes to their knowledge, attitudes, and practice from their work with youth (Kennedy, 2018). However, many studies that consider themselves YPAR only involve youth as participants and not as partners (Jacquez et al., 2013).

Youth Participatory Action Research Conceptual Framework

Branquinho et al. (2020) developed a framework for YPAR work, including 8 steps. The first stage is *raising awareness* both among adults to the process of working in partnership with youth (both challenges and opportunities) and among youth to the process of YPAR and the research topic. The second stage, *capacitation,* involves empowering youth with the skills necessary to complete the project while building the skills of adults for working with youth as partners. The third stage, *design,* explains that youth should be involved in designing the research project from the beginning and aware of and involved with all aspects of the project throughout the stages. The fourth stage, *motivation,* reminds adults that young people need relationships with adults and other youth members where they feel trusted and comfortable sharing their voices. The next stage, *implementation,* describes the completion of the research activities by the youth. Next, the framework includes *evaluation* of the data collected, *dissemination* through presentations, and *replication* to other levels and other spaces.

Objectives

The objectives of our study are to:

1) Describe the impact of a YPAR participation on FFA members' perceived sense of belonging in the FFA;
2) Describe the impact of YPAR participation on FFA members' perceived skills and abilities; and
3) Describe the impact of YPAR research stage completion on creating action changes or changes to policies, events, and expectations within the local and state FFA organizations.

Methods

This research uses a case study design (Creswell & Creswell, 2018) to explore the impact of a YPAR project completed between two FFA chapters in a midwestern state over the course of the spring 2022 semester.

Participants
The two FFA chapters included one from a large metropolitan area representing a college preparatory high school with an agricultural-centered curriculum and one from a midsized community in which 39% of the students identify as a race or ethnicity other than white. Among FFA chapters, this second chapter is from one of the state's largest school districts with an agricultural education program and has one of the most diversely identifying chapter memberships.

While a total of eight FFA members (four from each chapter) participated over the course of the project, six members (three from each chapter) were primarily involved. All but one youth were seniors in their last year of high school; the remaining youth was a junior. Half of the youth identified as non-white and/or Hispanic.

YPAR Process
Each week, members from the two FFA chapters met on Zoom. The participants met at their schools and joined from the same room using the same computer camera and microphone. The researchers joined separately from various locations. During the first virtual meeting, we began *raising awareness* by first offering an academic article about diversity and inclusion within the FFA to the YPAR group to read and discuss (Martin & Kitchel, 2015). We then invited the authors of the article to join us via Zoom to answer questions from the youth. In addition, a former FFA national officer met with the YPAR group. To prepare for the guests, the YPAR members developed interview questions and practiced the research skill of interviewing.

Besides practicing interview techniques, the researchers helped *build capacity* in research skills by providing lessons on observation practices and focus group facilitation. This was done in tandem with the *design* of the research question and collection methods in order to provide skills based on the question and methods determined by the group. The members developed the research question:

> *To what extent do students feel like they have a "place" in FFA? And why do they feel this way?*

Their research design included visiting a total of 6 schools and holding focus groups with 1) students in agricultural education classes but not active in FFA and 2) students in agricultural education classes and active in FFA. The YPAR group developed the focus group protocol and practiced with students from their own schools. As a first step to *implementation,* they developed and led a presentation for the Illinois DEI Task Force to ask for funding to cover transportation to the schools for the focus groups.

Data Collection
All YPAR meetings were recorded using Zoom video and audio recording and transcription tools. The members of the research team all took field notes during the meetings as well. At the end of the semester, members of the research team interviewed six of the eight members of the YPAR group. Interviews took place virtually using Zoom. Interview questions were adapted from questions piloted with Illinois FFA officers by the researchers prior to the start of the YPAR project to further understand perceptions of FFA participation and the common verbiage used by FFA members to describe their experience. Part of the interview protocol included

asking participants to graph their sense of belonging in FFA at the local, state, and national level from their time joining FFA to their time joining YPAR to the current time. The graph was displayed on the computer screen, and participants had the option to use the Whiteboard tools to draw their own lines, or they instructed the interviewer to draw the lines for them. During the interview, participants were also given a list of ten different aspects of the YPAR experience that they ordered from the one that was most influential to the one that was least influential. Interviews were recorded and transcribed first using Zoom and then compared to the audio of the interview to correct the automatized transcription errors.

Data Analysis

The interview data was analyzed independently from the artifacts collected from the YPAR meetings and used in the *evaluation* step of the YPAR experience. Transcripts were uploaded to the Dedoose online qualitative analysis software. The qualitative computer software was used to store and organize the data, allowing all researchers searchable access to the codes and memos in the collaboration (Creswell & Creswell, 2018).

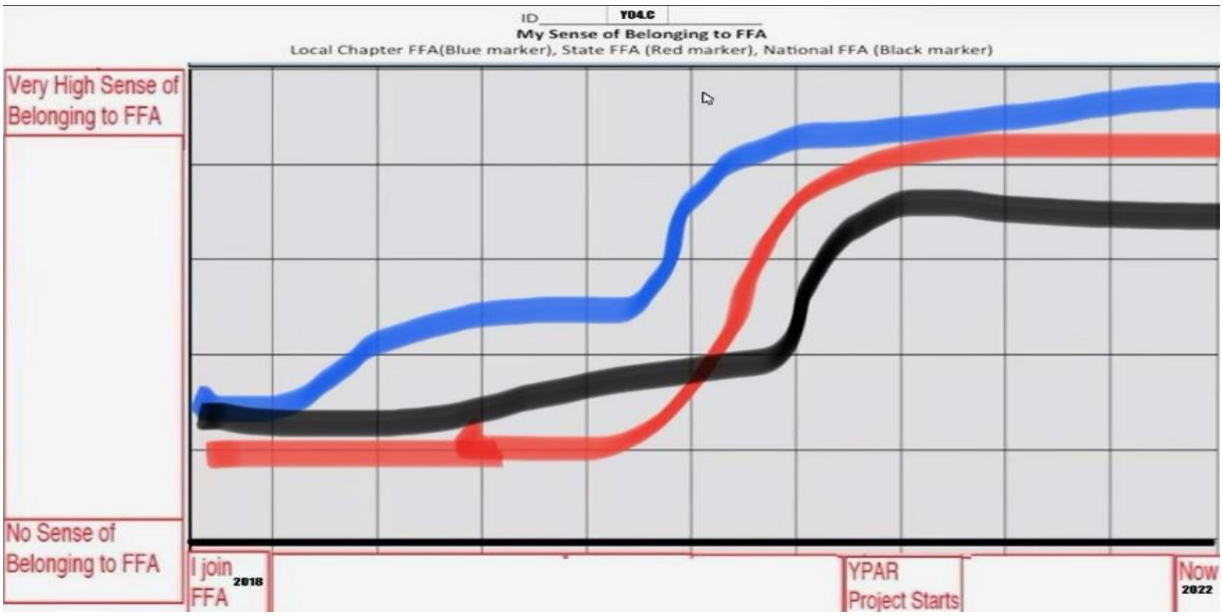
Findings

Sense of Belonging

Our first research objective was to determine if participating in YPAR impacted their sense of belonging in FFA. During interviews, participants used a graph to track their sense of belonging for local, state, and national FFA from when they joined FFA, through starting the YPAR project, to the time of the interview. The participants were asked to use blue to represent sense of belonging in their local chapter, red for state FFA and black for national FFA.

Figure 1.

Sample FFA Sense of Belonging Interview Graph



When asked about their sense of belonging when they joined FFA, all interviewees except one had a low sense of belonging for local, state, and national FFA. All three lines started at or near

the bottom of the graph. All interviewees saw their local sense of belonging rise to very high levels between the time they joined FFA and the time of the interview.

All participants reported their local sense of belonging as higher than their state and national levels of belonging throughout their FFA journey. Starting to participate in the YPAR project increased members' sense of belonging. At the YPAR project start, four of the six included an extra increase in sense of belonging. Both participants that did not have an increase were already at the high end of very high and did not have room to increase.

The start of the YPAR project coincided with an increase in state sense of belonging. All participants included at least a small increase at this point. In their interviews, participants discussed how much they liked working with people from another FFA chapter in their state and getting to know these individuals. One youth said she increased her state FFA sense of belonging because YPAR participants in the other chapter "told me that I belong in FFA, even though I might not have the same experiences as them or they might have more experiences than me… those interactions within YPAR definitely helped." (Participant Y03.C)

Participant Skills and Abilities

To assess the second objective, changes in skills and abilities, we looked for instances in the interviews in which participants talked about changes in their thoughts and actions. In the participants' descriptions, they reflected on understanding differences between individuals and finding a new frame from which to view the world.

> *We looked at the different parts of why people act the way they do and what systems, and different activities, that make people act the way they do…it was all just very interesting learning why people do what they do, how people do what they do and how that affects other people in their organization.* (Participant Y05.N)

In addition, participants discussed the responsibility given to their YPAR group while working with the university researchers and described an increased sense of agency from the experience.

> *It was really cool to be like, given the responsibility, like having someone trust and believe in us that we can participate in this research and change the way people look at things and maybe encourage people to make changes to improve other people's sense of belonging and sort of advocate for others.* (Participant Y02.N)

YPAR-related Action Changes

In assessing the third objective, this YPAR project completed the first part of the *Implementation* step by securing funding to collect focus group data. However, due to timing, no focus groups were completed. The project shifted, and participants created an activity room during the Illinois FFA convention that included interactive displays related to diversity and inclusion within FFA.

While the state convention experience was not directly linked to YPAR, the YPAR collaboration led to the two chapters creating the opportunity. Three interviewees mentioned the state convention room, and one specifically said that they thought the experience would not have happened without YPAR.

Conclusions and Recommendations

This YPAR project led participants on a journey to incorporate research strategies into their critical thinking and problem-solving approaches through (1) raising awareness of an issue and examining the issue from multiple perspectives, (2) increasing their capacity to apply research-based skills, (3) designing both a research protocol and an event to spread awareness of different FFA voices, (4) staying motivated while forming a team with members from a different chapter, and (5) implementing parts of their project.

Our project matches the research on YPAR projects in that we did not complete all the goals in the original timeline (Bettencourt, 2020; Keddie, 2021). However, the commitment of the participants, their motivation and connection to each other as a team, and their reports of this project's impact on their thinking and actions far exceeded our expectations. Our project demonstrates that involvement in research activities for high school students, even when not taken to completion, can lead to positive impacts. While we plan to continue the project, the original timeline coincided with the school year and continuing involves losing students who graduate and including new students.

Even with the challenges and incomplete objectives associated with this YPAR initiative, we believe that using YPAR to empower youth to use research and seek change in their communities is an important tool for youth organizations in general and FFA specifically. YPAR offered FFA members who felt like their voices were not always heard a forum to share their thoughts. National FFA has been working to address DEI topics within the agricultural education space; therefore, this project aligns well with initiatives and values within our discipline.

Our research also discovered that FFA members see FFA at the local, state and national levels as different concepts. YPAR between two chapters in the same state added to state FFA sense of belonging but not national sense of belonging. As FFA continues to address DEI issues, the benefits and consequences of this split sense of belonging could provide insight into how members see the organization and how the organization can adapt to members' needs.

References

Anderson, A. J. (2020). A qualitative systematic review of youth participatory action research implementation in U.S. high schools. *American Journal of Community Psychology, 65,* 242-257. https://doi.org/10.1002/ajcp.12389

Ballonoff Suleiman, A. B., Ballard, P. J., Hoyt, L. T., & Ozer, E. J. (2021). Applying a developmental lens to youth-led participatory action research: A critical examination and integration of existing evidence. *Youth & Society, 53*(1). 26–53. https://doi.org/10.1177/0044118X19837871

Branquinho, C., Tome, G., Grothausen, T., & Gaspar de Matos, M. (2020). Community-based youth participatory action research studies with a focus on youth health and well-being: A systematic review. *Journal of Community Psychology, 48,* 1301-1315. https://doi.org/10.1002/jcop.22320

Bettencourt, G. (2020). Embracing problems, processes and contact zones: Using youth participatory action research to challenge adultism. *Action Research, 18*(2), 153-170. https://doi.org/10.1177/1476750318789475

Copeland, B. A., Talbert, B. A., LaRose, S. E., & Russell, M. A. (2020). College and career ready? A snapshot of 12th grade national FFA members. *Journal of Agricultural Education, 61*(4), 90-108. https://doi.org/10.5032/jae.2020.04090

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches, 5th ed.* Sage Publishing.

Fernandez, J. M., Goecker, A. D., Smith, E., Moran, E. R., & Wilson, C. W. (2020). *Employment opportunities for college graduates in food, agriculture, renewable natural resources and the environment: United States 2020-2025.* National Institute of Food and Agriculture. https://www.purdue.edu/usda/employment/

Gray, D. L., Hope, E. C., & Matthews, J. S. (2018). Black and belonging at school: A case for interpersonal, instructional, and institutional opportunity structures. *Educational Psychologist, 53*(2). 97–113. https://doi.org/10.1080/00461520.2017.1421466

Harrison, L. M., Hurd, E., & Brinegar, K. M. (2019). Exploring the convergence of developmentalism and cultural responsiveness. In K. Brinegar, L. Harrison, & E. Hurd (Eds.) *Equity & cultural responsiveness in the middle grades* (pp. 3–22). Information Age Publishing.

Jacquez, F., Vaughn, L., Boards, A., Deters, A., Wells, J., & Maynard, K. (2020). Creating a culture of youth as co-researchers: The kickoff of a year-long STEM pipeline program. *Journal of STEM Outreach, 3*, 1-11. https://doi.org/10.15695/jstem/v3i1.02

Jacquez, F., Vaughn, L. M., & Wagner, E. (2013). Youth as partners, participants or passive recipients: A review of children and adolescents in community-based participatory research (CBPR). *American Journal of Community Psychology, 51*, 176-189. https://doi.org/10.1007/s10464-012-9533-7

Keddie, A. (2021). The difficulties of 'action' in youth participatory action research: Schoolifying YPAR in two elite settings. *Discourse: Studies in the Cultural Politics of Education, 42*(3), 381-393. https://doi.org/10.1080/01596306.2019.1696747

Kennedy, H. (2018). How adults change from facilitating youth participatory action research: Process and outcomes. *Children and Youth Services Review, 94*, 298–305. https://doi.org/10.1016/j.childyouth.2018.10.010

Kirshner, B., Pozzoboni, K., & Jones, H. (2011). Learning how to manage bias: A case study of youth participatory action research. *Applied Developmental Science, 15*(3), 140-155. https://doi.org/10.1080/10888691.2011.587720

Latham, L., Rayfield, J., & Moore, L. L. (2014). Influence of FFA activities on critical thinking skills in Texas three-star FFA chapters. *Journal of Agricultural Education, 55*(5), 126-139. https://doi.org/10.5032/jae.2014.05126

Lawrence, S., Rayfield, J., Moore, L. L., & Outley, C. (2013). An analysis of FFA chapter demographics as compared to schools and communities. *Journal of Agricultural Education, 54*(1), 207-219. https://doi.org/10.5032/jae.2013.01207

Malorni, A., Lea III, C. H., Richards-Schuster, K., & Spencer, M. S. (2011). Facilitating youth participatory action research (YPAR): A scoping review of relational practice in U.S. youth development and out-of-school time projects. *Children and Youth Services Review, 136*, Article 106399. https://doi.org/10.1016/j.childyouth.2022.106399

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

Meeks, A., Jalili, D., & Ziegler, P. (2019). *Making connections: Agriculture STEM programs in the FAEIS survey* [Conference presentation]. NACTA 2019, Twin Falls, ID, United States. https://faeis.cals.vt.edu/resources/presentations/nacta2019/NACTA2019-1.pdf

Mouser, D. M., Sheng, Z., & Thoron, A. C. (2019). Are agriculture students more career ready? A comparative analysis of Illinois juniors. *Journal of Agricultural Education, 60*(2), 15-27. https://doi.org/10.5032/jae.2019.02015

National Science Board. (2018). *Women and minorities in the S & E workforce.* Science & Engineering Indicators 2018. https://www.nsf.gov/statistics/2018/nsb20181/report/sections/science-and-engineering-labor-force/women-and-minorities-in-the-s-e-workforce

Ozer, E. J., Ritterman, M. L., & Wanis, M. G. (2010). Participatory action research (PAR) in middle school: Opportunities, constraints and key processes. *American Journal of Community Psychology, 46*, 152-166. https://doi.org/10.1007/s10464-010-9335-8

Ozer, E. (2017). Youth-led participatory action research: Overview and potential for enhancing adolescent development. *Child Development Perspectives, 11*(3), 173–177. https://doi.org/10.1111/cdep.12228

Phelps, K., Henry, A. L., & Bird, W. A. (2012). Factors influencing or discouraging secondary school students' FFA participation. *Journal of Agricultural Education, 53*(2), 70–86. https://doi.org/10.5032/jae.2012.02070

Quijada Cerecer, D. A., Cahill, C., & Bradley, M. (2013). Toward a critical youth policy praxis: Critical youth studies and participatory action research. *Theory into Practice, 52*(3), 216-223. https://doi.org/10.1080/00405841.2013.804316

Shamrova, D. P., & Cummings, C. E. (2017). Participatory action research (PAR) with children and youth: An integrative review of methodology and PAR outcomes for participants, organizations, and communities. *Children and Youth Services Review*, *81*, 400–412. https://doi.org/10.1016/j.childyouth.2017.08.022

Swafford, M. (2018) STEM education at the nexus of the 3-circle model. *Journal of Agricultural Education, 59*(1), 297-315. https://doi.org/10.5032/jae.2018.01297

Talbert, B. A., & Balschweid, M. A. (2006). Career aspirations of selected FFA members. *Journal of Agricultural Education, 47*(2), 67–80. https://doi.org/10.5032/jae.2006.02067

U. S. Bureau of Labor Statistics. (2021, September 8). *Occupational outlook handbook: Agricultural and food scientists.* https://www.bls.gov/ooh/life-physical-and-social-science/agricultural-and-food-scientists.htm

A Case Study of 4-H Teen Camp Counselor Roles, Responsibilities, and Experiences

Stephanie Femrite, University of Missouri
Rebecca Mott, University of Missouri

Introduction

4-H camp provides opportunities for teens to work alongside adult 4-H staff to ensure that younger 4-H members have a positive camp experience. Previous research suggests that teens who serve as camp counselors develop life skills such as communication, responsibility, independence, and teamwork (Garst & Bruce, 2003). Van Horn et al. (1998) purport that, in addition, camp helps build leadership skills and team building with a peer group. Their research also suggested that serving as a counselor challenges teens' thinking, calling to question previous viewpoints and scripts for dealing with similar situations (Van Horn et al., 1998).

However, there is a need to understand the processes occurring when teens serve as 4-H camp counselors. Previous research has yet to explore precisely what being a 4-H camp counselor entails or how counselors function within the camp system. This case study research explores the roles, responsibilities, and experiences of 14–18-year-old camp counselors in Missouri 4-H.

Conceptual Framework

Youth-adult partnerships (Y-AP) play a vital role in developing thriving youth. The concept of Y-AP refers to youth and adults working together to make decisions or act in their program, organization, or community (Akiva & Petrokubi, 2016). When youth are provided with the opportunity to be involved in decision-making, programs experience benefits in motivation and retention (Deschenses et al., 2010). Youth experience an increased sense of belonging, improved adult relationships (Zeldin, 2014), empowerment (Larson et al., 2005), leadership efficiency, and skills (Larson & Angus, 2011). Previous research suggests that promising program practices for carrying out Y-AP include building positive adult-youth relationships, engaging youth in first-hand learning, and gradually increasing responsibilities as youth age and gain experience (Akiva & Petrokubi, 2016).

Purpose and Objectives

This qualitative single case study research is part of a larger research project that explored the processes and structures that support the teen camp counselor experience through the Missouri camping program. For this manuscript, we focus on the following objectives:

1. Understand the teen 4-H camp counselor experience.
2. Describe how teen 4-H camp counselors and adult program leaders perceive counselor roles and responsibilities.
3. Describe youth-adult partnerships among adult program leaders and teen 4-H camp counselors.

Methods

As authors and researchers for this study, we adopted a social constructivist approach. This epistemology assumes knowledge and understanding can be gained through exploring multiple perspectives and lived experiences. The lead author had leadership roles as a 4-H youth and later pursued a career in youth development. She has been involved in developing and implementing camping programs. The second author also was involved in 4-H camps as a teen counselor and now teaches coursework to help prepare Extension professionals and agriculture teachers to work with youth.

With IRB approval from our home institution, we conducted a single qualitative case study to better understand the camp counselor experience in Missouri 4-H. A case study is an in-depth description and analysis of a bounded system (Merriam, 2016, p. 237). Merriam (1998) characterizes case study research as particularistic, descriptive, and heuristic.

Case Selection and Description

Overnight camping programs within Missouri 4-H serve campers 8-14 years old and utilize camp counselors between the ages of 14-18. Purposefully selected participants, in this case study include camp counselors and program directors from three different regions in the state. Each of the ten teenage counselor participants had served in this role for at least two years. Each of the three program directors (who are also 4-H staff) has over fifteen years of service to the organization and is active in the design and implementation of camp and the camp counselor role. These participants were selected because of their extensive involvement with 4-H camp. In Missouri, camping programs typically occur over three to four days and two or three nights in one of several state parks. Campers participate in various activities throughout camp, including crafts, nature, and campfire ceremonies. All camp counselors participate in at least one training course (4-8 hours) before their campers arrive.

.**Data Collection and Analysis**

Data collection techniques included individual interviews with ten teenage 4-H camp counselors and three adult camp program directors. All interviews were conducted via Zoom in a convenient setting for participants. Each interview lasted between 45 and 60 minutes and was recorded on a portable recording device. Additionally, the lead researcher analyzed camp documents, including camp schedules, camp counselor training agendas, and a counselor handbook to help triangulate interview data. Utilizing existing documents provides a deeper understanding of the bounded system without intruding upon or altering the setting (Merriam, 1998).

Case studies share the desire with qualitative research to “search for meaning and understanding” to provide a rich description through inductive investigation (Merriam, 2009, p. 39). The researchers followed Merriam’s data analysis process to edit for redundancies, fit pieces together, and organize data chronologically and topically. First, data was compressed and linked together in a meaningful way. Next, categories were constructed to capture recurring patterns in the data. Finally, these categories were coded to create robust themes (Merriam, 1998). A similar process was utilized for mining and analyzing camp documents.

Our research team triangulated data sources and provided detailed descriptions of the case to strengthen the rigor of this qualitative case study. Explaining our positionality and philosophical assumptions also strengthens the credibility of this research. (Merriam, 2002).

Findings

Four themes emerged from individual interviews and camp documents analysis: a), Managing behavior; b). Caring for campers; c). Inspiring the next generation; and d). Ensuring campers have fun.

Theme 1: Managing behavior

Counselors perceived that the program directors and other adult volunteers do the teaching, while the counselor's role is to help manage the campers. Eric, counselor, described his role, "…I'd almost say a babysitter…in a leader position" (ER interview, 1 227).

When program director Shannon was asked about counselor expectations, she stated:

> "We have not, in the past, placed a lot of expectation that the counselors will teach… I'll just say we've been selfish…We don't get to spend enough time with the kids in our jobs. And camp is one place where we've gotten to spend time with the kids" (SG interview, 1 430-433).

In some camps, program leaders meet with counselors at night during camp to debrief, reflect on the day's activities, and try to figure out how to address camper behavior challenges that arise. However, one counselor stated that they only interacted with adult program leaders when problems occurred.

Theme 2: Caring for campers

Interviews suggested that camp counselors serve as caregivers to the younger campers. Kelsey, counselor, emphasized ensuring camper safety as a primary responsibility. She explained: "We make sure they're safe…be in charge of the kids…we're there to ensure that they are safe and like they're doing what they're supposed to (KS interview, 1 259-262).

While the teens mentioned camper safety was an important aspect of care, adult 4-H camp program leaders seemed to expect a different level of care from the counselors. Ray, a program director, described counselors as "flight attendants." He stated, "They're supposed to figure out what [campers] need" (RJ interview 2, 70-71). Program director Shannon went as far as to describe counselor expectations as "They are moms or dads to those kids while they are here. (SG interview, 1 410).

Theme 3: Inspiring the next generation

Counselors perceive they are expected to inspire the next generation of camp counselors. Madison, counselor, shared, "You get to be a role model to so many kids…" (ML interview, 1

214). Jacob, counselor, shared, "I felt the responsibility and the opportunity to…make it fun and hopefully inspire them" (JM interview, l 110-111).

Similarly, program directors often used the word mentor when describing the role of counselors. Jackie, program director, explained, "…they will become mentors for those younger kids and many of them have told us that the reason that they became a camp counselor…was because of a counselor that they had…" (JA interview, 1 425-428).

Theme 4: Ensuring campers have fun

Counselors' understanding of their role included helping campers have fun as they moved throughout their day. Mia, counselor, described how she perceived her counselor role: "You're in charge of getting them to have fun and have a great experience" (MW interview, 1 319-320).

Adult camp directors did not specifically use the word "fun" when talking about counselor roles and responsibilities. Instead, they focused on the importance of counselors keeping campers engaged. Shannon, an adult program leader explained, "Their job as a counselor is to help those kids that are struggling or to praise those kids that are doing great things." (SG interview, 1 438-439).

However, examination of a 4-H camp counselor handbook helped to confirm that the teens' perceptions aligned with expectations about the counselor role. Duties listed were primarily focused on making sure campers had fun. Specific examples from the handbook were: "Be prepared for singing and games. Have an hour of canned games planned for rainy days." (Camp Handbook, p.7).

Significance and Limitations

Although many non-formal youth programs claim to function through Y-AP, little research explores *how* youth programs utilize Y-AP as developmental practice (Petrokubi, 2016). This case study research adds to the literature that helps describe how youth-adult partnerships function in non-formal educational settings.

Case studies are not meant to be generalized. By the nature of design to focus on a single phenomenon in a particular bounded system, the aim is to generate findings unique to this context that may be transferable to other settings. This study focuses on camping in one midwestern state and is not intended to be representative. Additionally, this study began during the COVID-19 pandemic. As a result, there was no opportunity for the researchers to conduct observations at the camps.

Conclusions/Implications/Recommendations

Though not a specific program model, Y-AP is a set of principles and practices to be interpreted by practitioners (Akiva & Petrokubi, 2016) as authentic decision making, youth voice mentoring, reciprocal activity, and community connection (Zeldin et al., 2014). Bronfenbrenner (1979) speaks to Y-AP as a role throughout an individual's lifespan as progressively more complex reciprocal interactions between two people with strong and enduring emotional relationships. Over time, the power will gradually shift toward the developing person and becomes a two-way relationship (Akiva & Petrokubi, 2016).

However, the findings from this study align with previous research suggesting that some adults struggle to find the balance between sharing power and being the ones held responsible for delivering quality programming (Akiva & Petrokubi, 2016).

There are many opportunities for teens to provide meaningful input into 4-H camp efforts. Many have the capacity within a Y-AP to set goals, plan, and implement various components of camp. Literature suggests that Y-AP supports the development of youth as well as benefit programs (Deschenses et al, 2010).

Practitioners should consider giving teens an opportunity to pursue a broader group goal, such as planning and implementing workshops or large group activities. While adults should be there in a supportive role to help teens understand how youth at different ages learn, many teens are ready and eager to help identify topics and develop content. Akiba and Petrokubi (2016) recommend teen counselor responsibilities start small and increase in size and scope as counselors develop experience and competency.

This study should be replicated in other states with overnight camping programs. With a better understanding of how Y-AP is currently occurring in 4-H camping programs, youth development professionals will be better equipped to plan and facilitate opportunities that can better meet the developmental needs of teen counselors while still providing a positive experience to campers.

References

Akiva, T. Cortina, K. S., & Smith, C. (2014). Involving youth in program decision-making; How common, and what might it do for youth? *Journal of Youth and Adolescence,* 43, 1844-1860.

Akiva, T. & Petrokubi, J. (2016). Growing with youth: A lifewide and lifelong perspective on youth-adult partnerships in youth programs. *Children and Youth Services Review, 69,* 248-258.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design.* Cambridge, MA: Harvard University Press.

Deschenes, S. N., Arbreton, A., Uttle, P. M. Herrera, c. Grossman, J, B. Weiss, H. B., S. Lee, D. (2010). *Engaging older youth: Program and city-level strategies to support sustained participation in out-of-school time.* Cambridge, MA: Harvard Family Research Project.

Garst, B.A., & Bruce, F.A. (2003). Identifying 4-H camping outcomes using a standardized evaluation process across multiple 4-H educational centers. *Journal of Extension, 41*(3).

Larson, R.W. & Angus, R.M. (2011). Adolescents' development of skills for agency in youth programs: Learning to think strategically. *Child Development, 82,* 277-294.

Larson, R.W., Walker, K., & Pearce, N. (2005). A comparison of youth-driven and adult-driven youth programs: Balancing inputs from youth and adults. *Journal of Community Psychology, 33*(1), 57-74.

Merriam, S. B., & Tisdell, E. J. (2016). Qualitative Research: A Guide to Design and Implementation (4th ed.). San Francisco, CA: Jossey Bass.

Merriam, S. B., & Merriam, S. B. (2009). *Qualitative research : a guide to design and implementation*. Jossey-Bass.

Merriam, S. & Associations. (2002). *Qualitative research in practice: Examples for discussion and analysis.* San Francisco, CA: Jossey-Bass.

Merriam, S. B., & Merriam, S. B. (1998). *Qualitative research and case study applications in education* (2nd ed.). Jossey-Bass Publishers.

Mitra, D.L. (2009). Collaborating with students: building youth-adult partnerships in schools. *American Journal of Education, 115*(3), 407-436, doi: 10.1086/597488.

Petrokubi, J., & Janssen, C. (2017). Creating inclusive and effective environments for young people: Exploring youth voice and youth-adult partnership. Portland, OR: Education Northwest, Institute for Youth Success.

SoLD Alliance. (2021, April 8). *How can we design learning settings so that all students thrive?* SoLD Alliance. Retrieved October 23, 2021, from https://www.soldalliance.org/post/how-can-we-design-learning-settings-so-that-all-students-thrive.

Stake, R. E. (1995). *The art of case study research*. Sage Publications.

Van Horn, B.E., Flanagan, C.A., & Thomson, J.S. (1998). The first fifty years of the 4-H program. *Journal of Extension, 36*(6).

Zeldin, S., Krauss, S.E., Collura, J., Lucchesi, M., & Sulaiman, A.H. (2014). Conceptualizing and measuring youth-adult partnerships in community programs: A cross national study. *American Journal of Community Psychology, 54*(3-4), 337-347, doi: 10.1007/s10464-014-9676-9.

A Systematic Scoping Review of Stakeholder Analysis in Natural Resource Management

Anil Kumar Chaudhary, The Pennsylvania State University
Sharmistha Basak, The Pennsylvania State University
Parmveer Singh, The Pennsylvania State University

Introduction

Natural resource management (NRM) is a complex, multifaceted process because of the involvement of multiple stakeholders with their competing needs and interests. Still, consistency in efforts and active participation of all the stakeholders is the key to any natural resource management effort (Reed et al., 2009). Active participation of the stakeholders not only improves the decision-making process but also empowers the local communities and enhances the possibility of conserving scarce resources (Heyd & Neef, 2006). To ensure stakeholders' active participation in the decision-making process, a systematic process is necessary to identify all relevant stakeholders to address the specific issue (e.g., water quality). According to literature (Grimble & Wellard, 1997; Mitchell et al., 1997; Ramirez, 1999; Reed et al., 2009; Schmeer, 1999), stakeholder analysis is a systematic process to identify stakeholders while considering the diverse perspectives of different stakeholders situated in an NRM system.

Several stakeholder analysis studies have been conducted to address the diverse aspects of natural resource management, but the reasoning behind the process of conducting stakeholder analysis is unclear in the literature (Reed et al., 2009). The suggested guidelines are rather broad and challenging to employ, considering specific contextual factors in a system (Jepsen & Eskerod, 2009). Additionally, an inclusive and practical approach to the process is still missing (Bondy & Charles, 2020; Wang & Aenis, 2019) that has the potential to include the marginalized and voiceless stakeholders who are usually underrepresented in environmental decision-making (Butler & Adamowski, 2015; Michel et al., 2018). There is a need to identify and include marginalized stakeholders because decision-makers are more likely to address powerful stakeholders who affect the decision or policy rather than vulnerable or marginalized stakeholders who are affected by the decision or policy (Johnson et al., 2004; Leventon et al., 2016; Roloff, 2008). Depending on the context of stakeholder analysis, specific stakeholders remain historically and contextually marginalized and are often excluded from management decisions (Daniels & Walker, 2001; Grimble & Wellard, 1997; Stringer et al., 2006). This study aims to fill these gaps in the existing literature with a systematic scoping review to provide a clearer process for conducting stakeholder analysis along with the engagement of marginalized stakeholders.

Theoretical/Conceptual Framework

With multiple challenges with top-down approaches to address NRM issues, more inclusive and democratic approaches to promoting the participation of diverse stakeholders. including stakeholder engagement, to manage natural resources are increasing (Eaton et al., 2021). Stakeholder engagement in the context of NRM is a process where diverse stakeholders actively engage through deliberation and dialogue while situated in internal and external contextual conditions to make decisions to promote social and environmental change (Eaton et al., 2021). With stakeholder analysis, including engagement of diverse stakeholders, we used

stakeholder engagement (Eaton Et al., 2021; Koontz & Thomas, 2006) as a conceptual framework to guide our study. Stakeholder analysis is described as a stepwise participatory approach of a) identifying all the individuals, groups, or organizations, b) analyzing their attributes, roles, interests, power, and conflicts of interest, and c) investigating their interrelationships for decision-making to understand and address the complexity of natural resource management (Brugha & Varvasovszky, 2000; Friedman & Miles, 2004; Grimble & Wellard, 1997; Mitchell et al., 1997; Ramirez, 1999; Reed et al., 2009; Schmeer, 1999). In a stakeholder analysis, stakeholders refer to the individuals, interested groups, or organizations with potential roles, interests, and power in decision-making, activities, or outcomes without whom the issue could not be resolved (Brugha & Varvasovszky, 2000; Grimble, 1998).

Research Questions

In this study, we conducted a systematic scoping literature review to understand the process of conducting stakeholder analysis in the context of NRM. The following research questions guided our review:

1. What were the goals and objectives of studies conducting a stakeholder analysis?
2. How were the stakeholders and stakeholder analysis defined?
3. What were the steps for conducting stakeholder analysis discussed in the literature?
    a. What were the different methods, attributes, or indicators used to identify the stakeholders, categorize them, and describe their relationships in the stakeholder analysis process?
4. How was the concept of power defined in the literature related to NRM? How were the marginalized stakeholders defined and identified?
5. What were the challenges mentioned in the literature while conducting a stakeholder analysis?
6. How were the results of stakeholder analysis used in addressing the mentioned issues?

Methodology

We used systematic scoping to conduct our analysis because it helps in synthesizing the evidence on a related topic when the literature is heterogeneous and research questions are broad (Franco-Trigo et al., 2020). We used Preferred Reporting Items for Systematic Reviews and Meta-Analyses Framework (PRISMA) guidelines for the identification of articles and reporting results of scoping reviews (Page et al., 2021).

Selection criteria

To answer the research questions, a preliminary review of the studies was conducted to decide the context of stakeholder analysis and potential natural resource management systems (e.g., coastal management, watershed management). The search string was developed, encompassing all possible contexts of natural resource management systems where stakeholder analysis is commonly used. The selection criteria for the articles included the following:

1. Web of Science and Scopus databases
2. Peer-reviewed articles
3. Published in English between 1990-2021
4. Empirical studies (i.e., with original data) excluding systematic reviews, conference proceedings, editorials, book reviews, books, abstracts, book chapters, and pre-prints

5. Articles with a detailed description of the methods used to conduct the stakeholder analysis

Applying these criteria, a total of 40 papers were retained. Figure 1 is a visual representation of the selection process.

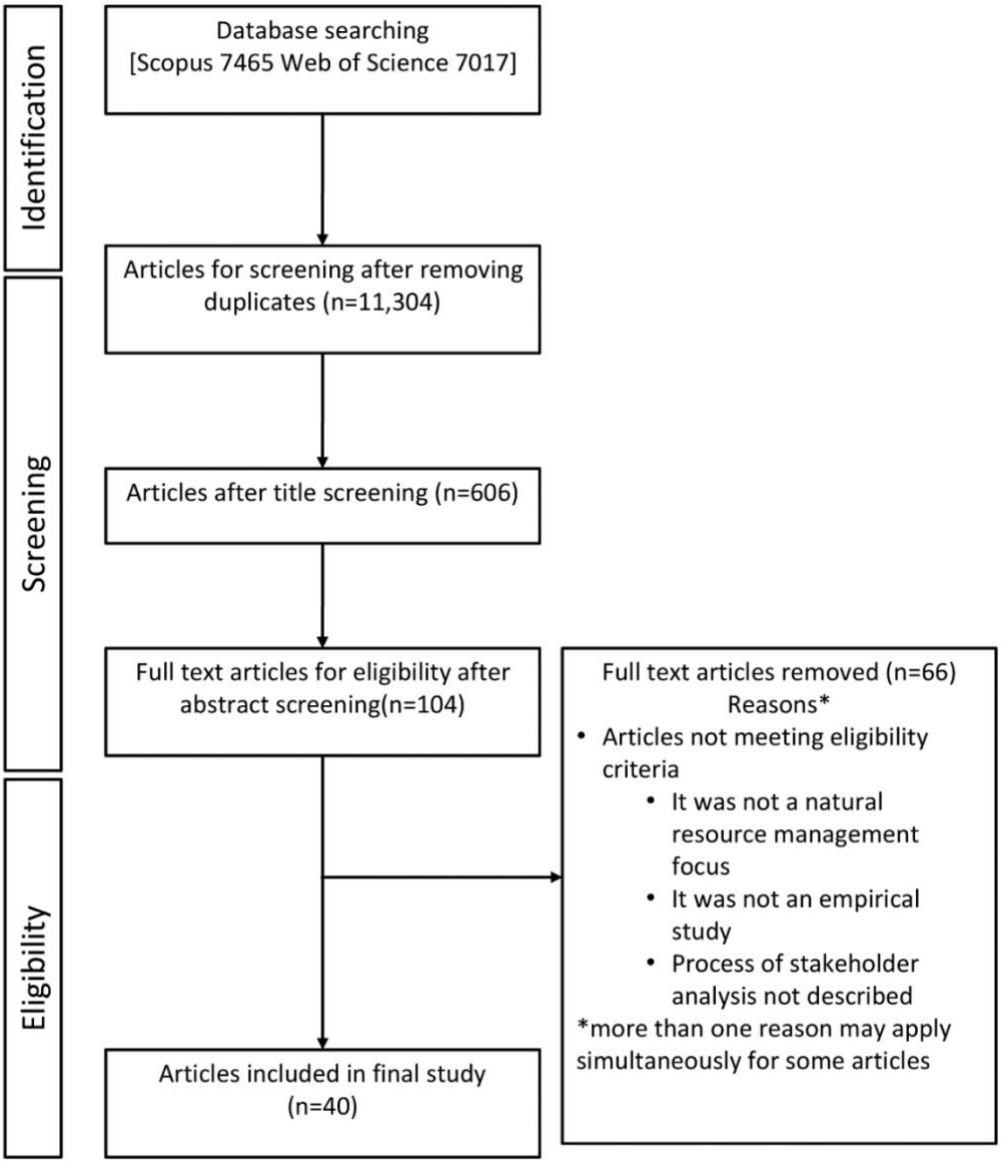
Instrumentation

RISA (Reporting Items for Stakeholder Analysis) tool (Franco-Trigo et al., 2020) was adapted for extracting data from the selected 40 papers. The tool was further adapted and used as a codebook to answer the research questions. The codebook was divided into two sections. The first section included information on the coder, article code, reference, and region where the study was conducted. The second section comprised questions to answer our research questions.

Data extraction and analysis

Using the codebook, both quantitative and qualitative data were extracted. Quantitative data was collected for information related to the journal of publication, country, and whether the study included steps related to a boundary, identification, categorization, and analysis of relationships of the stakeholders. We used descriptive statistics (e.g., frequencies) to analyze the extracted quantitative data. The qualitative method was applied to collect and analyze data related to goals and objectives, challenges faced during different stages of the stakeholder analysis, and specific actions taken after stakeholder analysis. We applied content analysis using a deductive approach to analyze the extracted qualitative data.

Figure 1
Selection and Exclusion Criteria for Reviewed Papers



Results

From the reviewed studies, we found that the majority of studies (85%, n = 34) were published between 2012 and 2021, whereas the remaining studies (15%, n = 6) were published between 2002 and 2011. These studies were conducted across various countries on different continents representing Europe (40%), Australia (3%), Asia (27%), Africa (10%), South America (5%), and North America (15%). These studies focused on a range of issues within NRM such as water resource management, marine management, wildlife conservation, and ecosystem services.

RQ 1 Goals and Objectives of Stakeholder Analysis: The study revealed that most of the studies (87.5%, n = 35) explicitly specified goals and objectives for conducting the stakeholder analysis. We found that the main goal was the active participation of stakeholders in environmental decision-making. The specific objectives targeted multiple outcomes such as understanding existing stakeholders, capacity building, information sharing, evaluating NRM options, examining stakeholders' values, roles, interests, influence, and viewpoints related to NRM, and understanding stakeholder analysis application in NRM.

RQ 2 Definition of Stakeholder Analysis and Stakeholders: We found that about one-third of papers (67.5%, n = 27) utilized the existing definitions of stakeholder analysis (Grimble & Wellard, 1997; Reed et al., 2009). Similarly, more than half (57.5%) of the papers provided a definition of stakeholder with definitions adopted from previous literature (Mitchell et al., 1997).

RQ 3 Steps in Conducting Stakeholder Analysis and Specific Details of Steps: We found four primary steps for conducting stakeholder analysis in the reviewed studies, including a) setting the boundary and understanding the context, b) identifying the stakeholders, c) categorizing the stakeholders, and d) analyzing the relationships among the stakeholders. Interestingly, all the studies (n = 40) included the stakeholder identification step using various methods such as interviews, surveys, workshops, and focus groups. Furthermore, the data on the stakeholder attributes such as interest, power, roles, and knowledge were collected in this step. In the next step, 82.5% of papers (n = 33) categorized the identified stakeholders using an attribute matrix (77.2%, n = 17). Lastly, 60% (n = 24) of the studies provided information on the relationships among the stakeholders. The most widely used method was surveys or social network analysis as indicated by 62.5% of studies (n = 15).

RQ 4 Power and Marginalized Stakeholders: We focused on four dimensions of power that included a) hierarchical power, referring to stakeholders' formal rank or authoritative power over the issue, b) knowledge power, where the stakeholders had skills, abilities, and rights over the issue, c) process power, where the stakeholders had control over resources needed by others and reduced dependencies on others for resources and d) assets power, where the stakeholders had some forms of physical assets such as money or land (Beritelli & Laesser, 2011). Our findings revealed that 40% (n = 16) of studies focused on process power, followed by hierarchical, assets, and knowledge power. With a specific focus on the definition and identification of marginalized stakeholders, to our surprise, only 15% of the studies expressed the need to include diverse stakeholders, including marginalized, in NRM, however, none of the studies operationalized or discussed potential strategies to identify them.

RQ 5 Challenges: About half of the papers (57.5%, n = 23) discussed challenges related to conducting stakeholder analysis. The challenges include but are not limited to inconsistent and conflicting stakeholders' attributes, inclusiveness of diverse stakeholders, limitations of research methods, and lack of resources for conducting the stakeholder analysis.

RQ 6 Application: Regarding the application of stakeholder analysis results, only 17.5% (n = 7) of studies discussed the potential application of stakeholder analysis including contributing to policy frameworks and decisions regarding NRM issues, setting priorities of related organizations, and enhancing the involvement of stakeholders.

Conclusions, Discussion, and Recommendations

Stakeholder analysis is a widely used approach across diverse disciplines and has gained traction in the NRM sector due to the increased demand for engagement of stakeholders in environmental decision-making (Eaton et al., 2023). The major purpose of the scoping review was to identify an easy-to-follow methodology for stakeholder identification, power dimensions, and recognizing marginalized stakeholders, thus, overcoming the shortcomings of the existing methods. Our analysis revealed that the majority of the studies relied on secondary data sources such as websites and snowball sampling to identify stakeholders in a system. However, there is a lack of comprehensive guidance and theoretical rationale to effectively identify marginal stakeholders. The lack of easy-to-follow methods and contextualization for conducting stakeholder analysis is a prominent limitation in scientific literature. Additionally, this paper is a reminder to conservation professionals regarding their engagement with stakeholders for delivering conservation education as they need to make conscious efforts to identify and engage marginalized stakeholders. Our study found mention from studies regarding the importance of marginalized stakeholder engagement, but no effort or process was described for their engagement. Therefore, in this paper, we aimed to provide a strategic procedure for the systematic identification of the stakeholders and offer guidelines to ensure the inclusion of diverse stakeholders, including marginalized, through our revised stakeholder analysis protocol related to sustainable agriculture. The research findings highlighted valuable methodological implications and offered recommendations for future researchers interested in stakeholder analysis in natural resource management and beyond. Finally, the conservation professionals (e.g., Extension educators, and agency professionals) who assist people in making informed decisions related to NRM (Warner et al., 2017) often have difficulty reaching diverse stakeholders and benefit from the findings of this study to systematically identify and include diverse stakeholders in NRM process.

References

Beritelli, P., & Laesser, C. (2011). Power dimensions and influence reputation in tourist destinations: Empirical evidence from a network of actors and stakeholders. *Tourism Management, 32*(6), 1299-1309.

Bondy, K., & Charles, A. (2020). Mitigating stakeholder marginalization with the relational self. *Journal of Business Ethics*, *165*, 67-82.

Brugha, R., & Varvasovszky, Z. (2000). Stakeholder analysis: a review. *Health Policy and Planning*, *15*(3), 239-246.

Butler, C., & Adamowski, J. (2015). Empowering marginalized communities in water resources management: Addressing inequitable practices in Participatory Model Building. *Journal of Environmental Management*, *153*, 153-162.

Daniels, S. E., & Walker, G. B. (2001). *Working through Environmental Conflict: The Collaborative Learning Approach.*

Eaton, W. M., Brasier, K. J., Burbach, M. E., Whitmer, W., Engle, E. W., Burnham, M., ... & Weigle, J. (2021). A conceptual framework for social, behavioral, and environmental change through stakeholder engagement in water resource management. *Society & Natural Resources, 34*(8), 1111-1132.

Franco-Trigo, L., Fernandez-Llimos, F., Martínez-Martínez, F., Benrimoj, S. I., & Sabater Hernández, D. (2020). Stakeholder analysis in health innovation planning processes: a systematic scoping review. *Health Policy*, *124*(10), 1083-1099.

Friedman, A., Miles, S., 2006. *Stakeholders: Theory and Practice*. Oxford University Press, Oxford.

Grimble, R. (1998) Stakeholder methodologies in natural resource management. *Socioeconomic Methodologies. Best Practice Guidelines*. Chatham, UK: Natural Resources Institute.

Grimble, R., & Wellard, K. (1997). Stakeholder methodologies in natural resource management a review of principles, contexts, experiences and opportunities. *Agricultural Systems*, *55*(2), 173-193.

Heyd, H., & Neef, A. (2006). Public participation in water management in northern Thai highlands. *Water Policy*, *8*(5), 395-413.

Jepsen, A. L., & Eskerod, P. (2009). Stakeholder analysis in projects: Challenges in using current guidelines in the real world. *International Journal of Project Management*, *27*(4), 335-343.

Johnson, C. Y., Bowker, J. M., & Cordell, H. K. (2004). Ethnic variation in environmental belief and behavior: An examination of the new ecological paradigm in a social psychological context. *Environment and Behavior*, *36*(2), 157-186.

Koontz, T. M., & Thomas, C. W. (2006). What do we know and need to know about the environmental outcomes of collaborative management? *Public Administration Review*, *66*, 111-121.

Leventon, J., Fleskens, L., Claringbould, H., Schwilch, G., & Hessel, R. (2016). An applied methodology for stakeholder identification in transdisciplinary research. *Sustainability Science*, *11*, 763-775.

Michel, V., Nazemi, N., & Eddy, T. (2018). Identifying vulnerable stakeholders from dependent relationships in California's water system. In *Proceedings of the International Annual Conference of the American Society for Engineering Management.* (pp. 1-10). American Society for Engineering Management (ASEM).

Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *Academy of Management Review*, *22*(4), 853-886.

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *International Journal of Surgery*, *88*, 105906.

Ramirez, R. (1999). Stakeholder analysis and conflict management. In *Cultivating Peace: Conflict and Collaboration in Natural Resource Management*. IDRC, Ottawa, ON, CA.

Reed, M. S., Graves, A., Dandy, N., Posthumus, H., Hubacek, K., Morris, J., ... & Stringer, L. C. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of Environmental Management*, *90*(5), 1933-1949.

Roloff, J. (2008). Learning from multi-stakeholder networks: Issue-focussed stakeholder management. *Journal of Business Ethics*, *82*, 233-250.

Schmeer, K. (1999). *Guidelines for Conducting a Stakeholder Analysis*. Bethesda, MA, USA: PHR, Abt Associates.

Stringer, L. C., Dougill, A. J., Fraser, E., Hubacek, K., Prell, C., & Reed, M. S. (2006).

Unpacking “participation” in the adaptive management of social–ecological systems: a critical review. *Ecology and Society*, *11*(2).
Wang, J., & Aenis, T. (2019). Stakeholder analysis in support of sustainable land management: Experiences from southwest China. *Journal of Environmental Management*, *243*, 1-11.
Warner, L. A., Kumar Chaudhary, A., Lamm, A. J., Rumble, J. N., & Momol, E. (2017). Using home irrigation users' perceptions to inform water conservation programs. *Journal of Agricultural Education*, *58*(3), 101-119. doi:10.5032/jae.2017.03101

A Community-Based Survey to Explore the Potential Health Effects Due to Drinking Water Quality among Plain-Sect Communities

Anil Kumar Chaudhary, The Pennsylvania State University
Parmveer Singh, The Pennsylvania State University
Sharmistha Basak, The Pennsylvania State University
Farhan Sadique, The Pennsylvania State University

Introduction

Lancaster County, Pennsylvania is home to large Amish and old-order Mennonite communities. Based on Anabaptist faith and traditional practices, these communities are called plain-sect communities altogether (Miller et al., 2019). The population density, social-cultural factors, and limited contact with the outside world differentiate plain-sect communities (Gonzalez et al., 2021). The primary drinking water source of these communities is groundwater, more specifically private wells. Lancaster County consists of approximately 38,000 private wells, which are not federally regulated (Meko, 2019). Plain-sect communities have a considerable impact on water quality due to traditional farm practices, poor livestock, manure, and land management practices, and limited participation in government-supported conservation programs (Hubler & Hupcey, 2002; Brock et al., 2018). Many factors such as educational level, geographic location, and community-based norms regarding the use of technology affect the plain-sect communities from availing of healthcare services (Miller et al., 2019).

Recent research has shown that some of the traditional practices used by plain-sect communities pose significant risks to environmental resources such as water. With agriculture is part of mainstream life and exposure to agricultural chemicals has been shown to cause many diseases (e.g., anemia, thyroid) in plain-sect community (Miller et al., 2019). Healthcare providers outside the community are only sought if they ensure respect towards the Anabaptist norms (Wright et al., 2016). Another study found that the older-order Amish farmers do not realize the agricultural water pollutants and a lack of evidence exists on Amish populations adopting conservation practices (Ulrich-Schad et al., 2017). Considering the lack of knowledge and skills and enhancing the uptake of sustainable practices related to maintaining the well water and the well-being of the community led to collaboration among interdisciplinary researchers on examining the water quality and its effect on human and animal health.

Conceptual/Theoretical Framework

This research has been guided by the community-based participatory approach. This approach has been considered relevant as this approach, "emphasizes the participation, influence, and control by non-academic researchers in the process of creating knowledge and change" (Israel et al., 1998). The approach holds significant social relevance and opportunities to apply the results of research to improve the livelihood of community members (Shalowitz et al., 2019). By actively involving community members in the research process, the approach benefits in developing long-term relationships with hard-to-reach communities (Leung et al., 2004). The community-based participatory research has three main features that include collaboration

between academic researchers and community members; creation of an opportunity/avenue for knowledge sharing (democratize knowledge) by validating multiple sources of knowledge; and promotion of the use of different methods for knowledge generation and dissemination, and has a main goal of social action to achieve social change and justice that improves the lives of community members (Strand et al., 2003).

Purpose and Objectives

The study aimed to explore the potential health effects among plain-sect communities in Lancaster County associated with deteriorated drinking water quality. The specific objectives that guided this study were to:

1. Understand the general status of water quality in the community;
2. Determine the changes in the water quality and sources of water contamination in the community;
3. Understand the status of the human and animal health concerns related to water quality in the community;
4. Identify the solutions to address the potential health effects among humans and animals caused by poor water quality; and
5. Identify educational needs related to water quality and health concerns in the community.

Methods

This exploratory study focused on plain-sect communities residing in the Caernarvon Township and its surrounding areas in Lancaster County. This study used a descriptive, cross-sectional survey design. We employed a combination of convenience and snowball sampling techniques to recruit participants and collect data because it is hard to get a list of plain-sect community members (a conservative and hard-to-reach population) to select a random sample (Kumar Chaudhary et al., 2017). The data were collected using a researcher-developed survey. The survey had nine sections, including the perception of water quality status, causes of change in water quality, effects of drinking poor quality water, management of water quality, and aspects related to water testing in the past. The survey also determined the association of changing weather to water quality, human and animal health, preference of educational sources, perception of effects, benefits, and actions related to water quality, and socio-economic characteristics of the community. To establish the validity of the survey, we invited the interdisciplinary project team, along with project collaborators, to provide feedback on various aspects, including language, question flow, question difficulty level, response categories, and question arrangement. The experts' feedback was considered, resulting in a revised survey. We used the revised version to conduct cognitive interviews with three community members to further enhance the content validity of the survey (Kumar Chaudhary & Israel, 2015). Based on the feedback from the community members, certain additions and deletions were made, which further contributed to strengthening the face and content validity. Prior to distributing the surveys, we obtained approval from the Institutional Review Board (IRB) of the Pennsylvania State University. We used the drop-off/pick-up technique (Junod & Jacquet, 2023) for the distribution of the surveys. Usually, this method of survey distribution has significantly higher response rates when compared to the Tailored Design Method (Dillman, Smyth, & Christian, 2014). Additionally, face-to-face contact and verbal communication with respondents allowed

researchers to establish a strong connection with the community members (Allred & Ross-Davis, 2011; Junod & Jacquet, 2023). Given the conventional nature of the targeted community, using this approach was particularly important to mitigate potential non-response issues that may have arisen otherwise.

The study involved water sample collection and survey distribution. An essential step in survey distribution within this community involved establishing face-to-face interactions with community members and providing them with detailed explanations of the study. The filled surveys were collected from the community members on the subsequent visits and water test reports were returned that fostered networking, and accountability of the research team. Given the predominant reliance on farming, finding time to complete the survey posed a challenge for the community members. Multiple visits were made to the community, accompanied by reminders and requests to community members to fill out the surveys. Based on discussions with community members, we learned that there are around 100 plain-sect farm families in the community. We tried to recruit all 100 families to be part of our study, but only 54 families agreed to participate in the study. Out of the 54 distributed surveys, we received 33 surveys returned from the community members, indicating a 61.10% response rate. We used descriptive statistics, including frequencies and percentages, to summarize and interpret the results.

Results

Objective 1. General status of the water quality

The findings indicate that 96.97 % (n = 32) of respondents use well water and only 3.03% (n =1) of respondents rely on bottled water. Similarly, for animals, 96.97% (n = 32) and 3.03% (n =1) of respondents rely on well water and spring water, respectively. About 57.58 % (n = 19) of the respondents perceive the overall quality of the water as good. In terms of change in the water quality, out of the 32 collected responses, 43.75% (n = 14) of the respondents perceived no change in the quality of water in the last ten years, however, 46.88% (n = 15) of the participants reported that they are aware of the changes in water in past ten years. Regarding the concerns related to water quality, 30.30% (n =10) of the participants reported that they were somewhat concerned about water quality.

Objective 2. Changes in water quality and sources of water contamination

In terms of changes in water quality, a considerable proportion (46.88%, n = 32) of the respondents believe that there has been no change in the quality of the water, whereas 3.13% (n =1) of the respondents believe that changes in the water quality are due to water hardiness, increased use of fertilizers/agrochemicals in farms, and manure application. Out of the 33 responses, a small percentage (6.06%, n = 2) of the respondents perceive nitrates and bacteria to be the major contributors to water pollution. However, out of the 32 respondents, a small proportion of respondents perceive lead, copper, barium, asbestos, chlorine, radon, and sulfate as sources of water quality pollution, whereas 18.75 % (n = 6) of the respondents perceive that pH level, total dissolved solids, manganese, and *E. Coli* bacteria are responsible for the water contamination. Additionally, 39.39 % (n = 13) of the respondents attribute water contamination to soil runoff from the agricultural fields, whilst 30.30 % (n = 10) also expressed concern about

the use of excess fertilizer on the farmlands, and herbicides or pesticides on the farm fields. Moreover, about 42.42% (n = 14) of respondents believe that runoff of animal manure from farm fields or barnyards has a considerable impact on water quality. Additionally, 36.36% (n= 12) of respondents said that stormwater runoff from parking lots or streets is affecting the water quality.

Objective 3.1. Human health status

Out of 32 responses, 15.63% (n =5) of the respondents reported vomiting. Furthermore, 3.23% (n = 1) of the respondents stated that they have experienced urine tract infection, epilepsy, and colon cancer. In addition to these conditions, a small proportion (6.45%, n =2) of the respondents reported eye infections, skin problems, and ear problems. Approximately, 19.35 % (n= 6) of the respondents mentioned nausea, abdominal cramps, and gastrointestinal infection. When asked whether the respondents knew anyone in the community who had experienced any health-related issues, out of 29 responses, 34.48% (n =10) reported cases of diarrhea and 31.03% (n =9) of the respondents reported birth effects and nausea. None of the community members mentioned the connection of drinking water quality with discussed diseases.

Objective 3.2. Animal health status

Regarding animal health concerns, data from the 29 responses revealed that 44.83 % (n =13) of the respondents expressed some incidences of infertility and foot rot issues, whereas 34.48% (n= 10) also reported spontaneous abortions, diarrhea, and dysentery. Apart from this, about one-third (31.03%, n =9) of the respondents mentioned urinary tract infection, a decrease in milk production, weak growth, and neurotoxicity among the animals in the community. Similar to human health, none of the community members mentioned any relationship between drinking water quality and animal health.

Objective 4.1. Strategies to improve the water quality.

To improve the local water quality, the findings from a five-point Likert scale matrix question listing major agricultural best management practices revealed that over 70% of respondents employed several best agricultural practices (e.g., manure management, crop residue and tillage management (mulch till, no-till, strip-till, direct seed), planting cover crops, and split application of N fertilizer).

Objective 4.2. Water testing behavior

In terms of water testing behavior, one-fourth of respondents (27.27%, n=9) reported getting their well water checked every third year, leading to installing a new treatment system (33.33%, n=11). Moreover, results of the water sample report (60.61%, n=20) showed that water was safe to drink, whilst about one-fourth of the respondents (27.27%, n=9) revealed that water was unsafe to drink, indicating failing for nitrates, bacteria, pH levels, manganese, and iron issues.

Objective 5. Educational needs

To improve the well water, and the well-being of both human and animal health, many respondents are interested in learning about human health concerns (27.27%, n= 9), livestock health concerns (21.21%, n= 7), and water sampling (15.15%, n =5).

Conclusion and recommendations

The study identified a wide gap in awareness and knowledge related to water quality, health-related issues, and agricultural and livestock practices. The study also verified the significance and application of a community-based participatory research framework to engage with hard-to-reach populations. The results emphasize the need for comprehensive educational programs among plain-sect communities promoting knowledge and awareness related to drinking water quality, animal and agricultural practices, and their impact on human and animal health. Additionally, regular research and educational efforts from agriculture education professionals, veterinary, health care, and conservation professionals are needed. The findings can serve as a baseline to strategically design and implement community-level initiatives for improving the livelihood of the plain-sect community members. By raising awareness and encouraging the adoption of best management practices within the community, we foresee significant betterment in the overall welfare of the community. Finally, this study showcases the significance of trust building, the use of the Pick-up/Drop-off method, and knowledge gaps among hard-to-reach populations like plain-sect communities, which can offer guidance to other education professionals working with these communities.

References

Allred, S. B., & Ross-Davis, A. (2011). The drop-off and pick-up method: An approach to reduce nonresponse bias in natural resource surveys. *Small-Scale Forestry, 10*(3), 305-318.

Brock, C., Ulrich-Schad, J. D., & Prokopy, L. (2018). Bridging the divide: Challenges and opportunities for public sector agricultural professionals working with Amish and Mennonite producers on conservation. *Environmental management, 61*, 756-771.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method*. John Wiley & Sons.

Gonzalez, M., Guin, A., Allen, K., Chilcote, A. G., Toriello, P. J., & Mead, E. P. (2020). Best practices for engaging communities of color in opioid prevention programs. *The Journal of Extension*, *58*(3), 3.

Hubler, C. L., & Hupcey, J. E. (2002). Incidence and nature of farm-related injuries among Pennsylvania Amish children: implications for education. *Journal of Emergency Nursing*, *28*(4), 284-288.

Junod, A. N., & Jacquet, J. B. (2022). Insights for the Drop-off/Pick-up Method to Improve Data Collection. *Society & Natural Resources*, 1-13. https://doi.org/10.1080/08941920.2022.2146821

Kumar Chaudhary, A., & Israel, G. D. (2015). The savvy survey #8: Pilot testing and pretesting questionnaires (AEC402/ PD072). Gainesville: UF/IFAS. http://edis.ifas.ufl.edu/pdffiles/PD/PD07200.pdf

Kumar Chaudhary, A., Warner, L. A., Lamm, A. J., Israel, G. D., Rumble, J. N., & Cantrell, R. A. (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

Meko, H. (2019, Sep 23). Lancaster County has around 38,000 private wells. The state regulates none of them. *LNP: Lancaster Online.* https://lancasteronline.com/news/politics/lancaster-county-has-around-38-000-private-wells-the-state-regulates-none-of-them-video/article_e223ae86-da4a-11e9-ae18-67945c1a834b.html

Miller, K., Yost, B., Abbott, C., Thompson Buckland, S., Dlugi, E., Adams, Z., ... & Cohen, M. A. (2019). Health needs assessment of five Pennsylvania Plain populations. *International Journal of Environmental Research and Public Health, 16*(13), 2378.

Shalowitz, M. U., Isacco, A., Barquin, N., Clark-Kauffman, E., Delger, P., Nelson, D., ... & Wagenaar, K. A. (2009). Community-based participatory research: a review of the literature with strategies for community engagement. *Journal of Developmental & Behavioral Pediatrics*, *30*(4), 350-361.

Leung, M. W., Yen, I. H., & Minkler, M. (2004). Community based participatory research: a promising approach for increasing epidemiology's relevance in the 21st century. *International journal of epidemiology*, *33*(3), 499-506.

Strand, K., Marullo, S., Cutforth, N., Stoecker, R., & Donohue, P. (2003). Principles of best practice for community-based research. *Michigan journal of community service learning*, *9*(3).

Wright, D. J., Martin, M. A., & Jones, M. (2017). Anabaptist community members' perceptions and preferences related to healthcare. *The Journal of Amish and Plain Anabaptist Studies*, *4*(2), 187–200. https://doi.org/10.18061/1811/79932

Ulrich-Schad, J. D., Brock, C., & Prokopy, L. S. (2017). A comparison of awareness, attitudes, and usage of water quality conservation practices between Amish and non-Amish farmers. *Society & Natural Resources*, *30*(12), 1476-1490.

Understanding Motivators of and Barriers to Participation in Environmental Quality Incentives Program (EQIP): A Case of Pennsylvania

Elsie Assan, Purdue University
Anil Kumar Chaudhary, The Pennsylvania State University

Introduction

Intensive agricultural production activities are responsible for significant environmental resource degradation, including loss of plant biodiversity, change in soil structure and composition, and poor water and air quality among others (Greiner, 2015; Reimer & Prokopy, 2014, Stuart & Gillon, 2013). Therefore, farmers have a crucial role to play in reducing the environmental impacts of their agricultural practices while enhancing the profitability and sustainability of their farm business (USDA NRCS, 2018). Farmers' voluntary participation in incentive-based conservation programs, such as the Environmental Quality Incentives Program (EQIP) and subsequent adoption of recommended best management practices (BMPs), can help address environmental problems in the Chesapeake Bay watershed and sustain farm productivity (Cocklin et al, 2007; Wright, 2006).

The Environmental Quality Incentives Program (EQIP) is the largest working land program in terms of the funding received and the acres impacted and it is administered by the USDA Natural Resources Conservation Service (NRCS) (Reimer & Prokopy, 2013; Stubbs, 2010). The program is designed to partly help farmers address environmental problems and promote sustainable agriculture production by providing financial and technical assistance for the installation of BMPs on working farmlands (Wright, 2006; Oliver, 2019). For instance, between 2009 and 2019 fiscal years, the USDA Natural Resources Conservation Service disbursed approximately $15 billion through program cost-share to support farmers' adoption of BMPs through EQIP participation across the U.S. (Liu, Wang & Zhang, 2022).

Despite this available support for conservation on working farmlands, the negative environmental impact of intensive agriculture persists with a heightened need for more BMPs installation on farmlands. However, little is known about what influences farmers in Pennsylvania to participate in the program and what barriers are there that hinder program participation. Given the crucial role of farmers' voluntary participation in achieving EQIP outcomes (McCann & Nunez, 2005) and the increasing stakeholder demand for efficient use of program funds by the USDA NRCS to achieve the most environmental resources conservation gains (US Government Accountability Office, 2017), it is important that research is conducted to address this gap. The findings of this study could inform agricultural stakeholders and policy makers about what factors influence farmers' decisions to participate in government-funded agri-environmental programs and the design of agri-environmental policies that caters to the heterogeneity in farmer needs. The findings could help identify program implementation strategies that can be used to more effectively engage farmers to adopt BMPs towards sustainable agriculture production and improved environmental performance of agriculture, e.g., improved water quality, through increased farmer participation in EQIP.

Theoretical Framework

We used the Theory of Planned Behavior (TPB) to guide our research study (Ajzen, 1991). Among conservation literature, the TPB is one of the widely used theories to explain farmers' conservation behavior (e.g., Armstrong, Ling, Stedman, & Kleiman, 2012; Chapman, Satterfield, & Chan, 2019; Reimer & Prokopy, 2014; Sweikert & Gigliotti, 2019). The theory posits that the behavior of an individual is predicted by intentions to perform the behavior. Behavioral intentions are predicted by subjective norms, attitudes toward behavior, and perceived behavioral control (Ajzen, 1991). We specifically focused on the attitude construct of the TPB, where attitude is formed by a combination of behavioral beliefs (i.e., a belief of a person regarding the outcome of behavior) and individual assessment of potential results from performing the behavior (Fishbein & Ajzen, 1975). Given that farmers' attitude towards EQIP could influence their willingness to participate in the program and their perceptions about the constraints to program participation, we used the attitude construct to guide the design of the interview guide used in conducting this study.

Purpose and Research Questions

The overall purpose of this study was to understand how farmers make decisions to participate in government-sponsored conservation programs, such as the EQIP. The specific research questions that guided the study were:

- How familiar are farmers with federal conservation programs administered by the USDA NRCS?
- What are the factors that motivate farmers to participate in EQIP?
- What are the barriers that prevent farmers from voluntarily participating in EQIP?

Methodology

This study used a case study research design to understand the diverse contextual factors that inform farmers' program participation decisions. Interview participants were purposively recruited to be grain and/or livestock farmers, with or without a history of participation in EQIP, and reside in the selected three counties of Pennsylvania. More than 50 farmers met eligibility criteria and were invited to voluntarily participate in the study. Twenty-five accepted the invitation and were interviewed for the study between Fall 2021 and Spring 2022.

Instrumentation and Data Collection

We used a researcher-developed semi-structured interview guide to collect data. We asked participants about their motivations for being farmers, their familiarity with conservation programs, and how they learned about the programs. Additionally, we asked participants about their EQIP participation status and how they made decisions to participate in the program. For EQIP non-participants, a second version of the interview guide was developed which asked all the questions above and a question about why they chose not to participate in the program. The interviews lasted an average of 20 minutes. The interviews were recorded and transcribed for analysis.

Data Analysis

We analyzed the interviews using NVivo Qualitative Analysis software. We coded the interviews using Case Study coding methods (Creswell & Poth, 2018). We developed initial codes using participants' words and descriptions based on existing literature and the theoretical framework and allowing new codes to emerge after reviewing three randomly selected transcripts. These initial codes formed the codebook for coding the remainder of the interviews and were reviewed by the second author. The second round of coding was conducted using "direct interpretation" coding methods to identify the most significant initial codes to establish patterns and similarities between the different themes identified (Creswell & Poth, 2018; Yin, 2014). After coding all the data sets, we compared the codes and themes to identify similar and different patterns of responses across the program participants and non-participants (Creswell & Poth, 2018). We established the trustworthiness of study findings using more than one coder, establishing inter-coder reliability, keeping audit trails, providing a thick description of data, and expert panel review of the interview protocol (Creswell & Poth, 2018).

Results

Participation status and EQIP familiarity

Fourteen of the interview participants either had an EQIP contract in the last decade (2010-2020), have a current contract with the program, or have had their EQIP application selected for funding and were in the process of finalizing the contract or have applied to the program and are awaiting a funding decision.

With regards to familiarity with federal conservation programs in general and EQIP specifically, slightly more than half of the EQIP participants expressed that they were very familiar with the different conservation programs. However, when asked to mention specific federal conservation programs they were familiar with, a few program participants were unable to mention programs because of the many acronyms associated with federal conservation programs. In contrast, less than half of EQIP non-participants were aware of the existence of federal conservation programs and could tell the names of some of these programs and the goals of these. We observed program participants and non-participants who were very familiar with the federal conservation programs had more interactions with conservation agencies as former contractors, staff, or participants of other programs.

Motivation for EQIP Participation

The EQIP participants gave numerous reasons for participating in the program. Of the 14 EQIP participants, 8 of them mentioned financial assistance through cost-share as the reason for participating in the program. These farmers indicated that the cost share provided them through the program enabled them to undertake conservation practices e.g., manure storage, which they would have had to put off due to financial constraints as explained by this farmer:

> "Obviously, a big key for farmers in this area is the financial part that EQIP contributes to a project. If you have a 70% or 90% cost share, and their cost shares are usually very attractive, projects that wouldn't get done are now being done and thereby cleaning up some trouble spots, or manure water quality issues that previously wouldn't have been touched." - [Farmer 2, Lebanon County].

All the EQIP participants indicated participation enhanced their ability to reduce environmental problems on their farms which in turn reduces their farms' contribution to

environmental resources degradation, particularly water quality, in their locality. For instance, a farmer opines that:

> "I'm working on a project now; I'm trying to cover some existing barnyards to get away from the rain runoff. I've got some manure stacking area that controls runoff and I think that was a good thing for everybody also. So, in my experience it's helpful for the environment and for myself." [Farmer 6, Lebanon County].

Many of the interview participants shared that their participation in the program enabled them to access conservation knowledge and technical assistance (TA) crucial to their farms' needs. They indicated TA enabled them to identify problems they did not know they had, identify the appropriate practices to address identified concerns, and access knowledgeable engineers to design the conservation practices suited for their conditions. This farmer articulates the value of technical assistance through EQIP participation as:

> "Yeah, just being able to see maybe problems that I didn't see. Something like one of those lane ways for my cows was rutting out, rainwater was making a mess of it, and they explained how to fix that, to get it to stop washing out. It's very detailed and thought out. So, they have their specs, they know what numbers to use and it's not like it's an opinion or anything."- [Farmer 1, Lebanon County]

Additionally, three of the program participants indicated that program participation enabled them to adopt farm management practices that align with environmental regulations governing farming practices. They indicated that since USDA NRCS was the agency mandated with developing solutions to address environmental degradation due to agriculture, they were confident that USDA NRCS recommended solutions that were good and accepted by environmental regulatory agencies.

> "Well, to me, a big part of doing projects that EQIP funds and supports would be the fact that I know I'm legal. If I have a project that's designed by NRCS and their engineers, I can be assured it meets all the federal state guidelines, permitting. Nothing's left undone that's going to come back, "Oh, I forgot this and now I have to punt and go backwards." That I like that. The same government that's making the rules is designing my project, so we should be in good shape there and everything done well." - [Farmer 2, Lebanon County]

EQIP participants who were interviewed expressed other reasons for participating including the belief that protecting environmental resources from degradation was the right thing to do, supporting their pro-environmental ethics, as well as enhancing farm sustainability through improved economic viability. Farmer 24, [Center County] explains … "*Just self-satisfaction. It was like that nature. I'm a good steward of the land. It just comes natural to me. I don't know, it just fits. Oh, yeah. So that decision was … much is stewardship."*

Barriers to EQIP Participation

Among the non-participants, inadequate knowledge about the program's existence and goals, as well as a lack of familiarity with representatives of conservation agencies, hindered participation. About four of these farmers had limited interactions with conservation-related agencies and were non-members of farmer organizations or groups.

Both program participants and non-participants indicated that the lengthy application process, complex paperwork, the lengthy wait period for funding decisions, and program focus on large-scale producers were potential barriers to participation. Two non-participants indicated the program guidelines restricting the use of their land when needed during the contract period as a barrier to participation. Farmer 23 [Bedford County] stresses this by saying: "*There are way too many guidelines and too many stipulations …, it severely limits what you can do*."

A few of the EQIP participants and non-participants indicated that religious reasons could serve as a potential barrier to program participation. In all the counties selected for this study, there were populations of plain sect communities that engaged in farming. Interview participants indicated that beliefs within this religious group that stresses the separation of church and state affairs may prevent farmers from participating in EQIP. Farmer 25 [Bedford County], … *And as a Mennonite people, we are interested in [protecting the land] ... We're grateful for the privileges that we have in the land, but we're not looking for the government intervention and the handouts, and we're willing to be a little bit separate from that."*

Four program non-participants mentioned financial constraints as a hindrance to program participation. They indicated that often some of the practices recommended by conservation agencies end up being costly compared to farmers undertaking these practices privately. Another participant expressed that EQIP implementation tends to focus on large-scale producers and funding practices or structures that are cost-intensive as a deterrent to small-scale producers' EQIP participation. Another participant explained that inadequate program funding to support farmers' conservation efforts could affect the population of farmers supported by the program even if there is farmer interest in program participation as expressed below:

> "I mean a lot of it's dependent on funding. If there's 10 farmers and only money for eight of them, then obviously the ranking system is going to kick out those that rank the lowest, and they're going to go with the top eight. It's not an automatic instant guarantee. A lot of it's based on the amount of funding they have."- [Farmer 2, Lebanon County]

Conclusions and Recommendations

Our study findings suggest that farmers differ from each other in relation to their familiarity with federal conservation programs. Consistent with previous research (Reimer & Prokopy, 2014), program participants who had more interactions with governmental and non-governmental agencies focused on conservation compared to non-participants. Both program participants and non-participants shared similar views that conservation programs were matched with local farm management practices and crucial for addressing environmental quality issues

due to agriculture. The findings of our present study showed that most of the farmers interviewed have a positive attitude towards the EQIP. They were of the view that the program provides crucial support to farmers to improve their contributions towards environmental sustainability, such as local water quality improvement, and sustainable agricultural production.

Most program participants indicated financial benefits through cost-share as their primary motive for choosing to participate in EQIP. The cost-share enables farmers to implement practices earlier than anticipated and reduce the cost associated with making changes on the farm (Taylor & Greiken, 2015). Farmers reported environmental benefits accruing to the farm business and the farm locality as important in program participation decisions. Studies show that farmers participate in conservation programs primarily to address environmental issues on their farms and may not be concerned if these benefits accrue to their locality (McCann & Nunez, 2005; Schaible et al., 2015). In our study, it was not clear if environmental benefits to the farm were of more importance to the program participants than benefits to their locality, which require future investigations.

Inadequate information about the existence of conservation programs and what environmental issues they are designed to address was a reported by farmers as a barrier to EQIP participation. Our findings are consistent with that of McCann & Nunez (2005) and Wilson & Hart (2000). In increasing farmers awareness about the program and their willingness to participate in EQIP, there is a need for outreach to be targeted at the broader community of farmers through formal and informal information sources. This effort could motivate farmers to seek more information about the program and subsequently influence participation. Additionally, conservation agencies could make efforts to simplify program requirements and application processes and make these changes widely known in farming communities.

Financial constraints and religious reasons were barriers to EQIP participation. Conservation agencies need to stress other potential sources of funding farmers can access to support their conservation efforts in outreach materials and events. It will be useful for conservation professionals to stress the availability of technical assistance to members of religious sects that frown upon the use of state resources to enable them to address environmental issues on their farms and locality. Further, conservation messages to this group of farmers should incorporate religious messages that stress the importance of conservation to current and future generations.

We observed in our study that farmers generally had a favorable attitude toward EQIP and agri-environmental programs in general. One of the key barriers identified by farmers as constraining their participation is program eligibility requirements and required paperwork. Given that farmers' voluntary participation is crucial for program sustainability in the long term, we suggest a detailed evaluation of program implementation practices across the State to solicit farmers' perceptions of how implementation practices and regulations could be enhanced to improve farmer interest. Further, we recommend that farmers be actively engaged by conservation agencies in policy planning and implementation particularly at the local level. This effort could enhance policymakers' and stakeholders' understanding of the expressed needs of the program target users to improve the program, implementation practices that are suited to addressing these identified needs.

Our study had some limitations that provide opportunity for future research. First, interview participants were selected using purposive and snowball sampling and focused on farmers in three counties in Pennsylvania. Thus, care should be taken in drawing in generalizing

the results to farmers in other watersheds in Pennsylvania and across the northeast U.S. Future studies could explore a statewide study with more farmers from different watershed in Pennsylvania. Future studies in other northeastern states could be conducted to explore the similarity and differences in farmers' perceptions about the facilitators to government-sponsored agri-environmental program participation.

References

Armstrong, A., & Stedman, R. C. (2012). Landowner willingness to implement riparian buffers in a transitioning watershed. *Landscape and Urban Planning*, *105*(3), 211-220.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision* Processes, 50, 179–211. https://doi.org/10.1080/10410236.2018.1493416

Chapman, M., Satterfield, T., & Chan, K. M. (2019). When value conflicts are barriers: Can relational values help explain farmer participation in conservation incentive programs? Land Use Policy, 82, 464-475.

Cocklin, C., Mautner, N., Dibden, J. (2007) Public policy, private landowners: Perspectives on policy mechanisms for sustainable land management. Journal of Environmental Management, 85, 986–998

Creswell, J. W., & Poth, C. (2018). Qualitative inquiry and research design. Sage Publications.

Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention and behavior: An introduction to theory and research. Addison-Wesley. https://doi.org/10.2307/2065853

Greiner, R. (2015). Motivations and attitudes influence farmers' willingness to participate in biodiversity conservation contracts. Agricultural Systems, 137, 154-165.

Liu, P., Wang, Y., & Zhang, W. (2023). The influence of the Environmental Quality Incentives Program on local water quality. American Journal of Agricultural Economics, 105(1), 27-51.

McCann, L. M., & Núñez, J. (2005). Who Participates in EQIP? (No. 378-2016-21394).

Oliver, M. D. (2019). An assessment of farmer participation in the United States Department of Agriculture, Natural Resources Conservation Services' conservation technical assistance program in West Virginia. West Virginia University.

Reimer, A. P., & Prokopy, L. S. (2014). Farmer participation in US Farm Bill conservation programs. Environmental Management, 53(2), 318-332.

Schaible, G. D., Mishra, A. K., Lambert, D. M., & Panterov, G. (2015). Factors influencing environmental stewardship in US agriculture: Conservation program participants vs. non-participants. Land use policy, 46, 125-141.

Stuart, D., & Gillon, S. (2013). Scaling up to address new challenges to conservation on US farmland. Land Use Policy, 31, 223-236.

Sweikert, L. A., & Gigliotti, L. M. (2019). Evaluating the role of Farm Bill conservation program participation in conserving America's grasslands. Land Use Policy, 81, 392-399

Taylor, B. M., & Van Grieken, M. (2015). Local institutions and farmer participation in agri-environmental schemes. Journal of Rural Studies, 37, 10-19.

United States Department of Agriculture – Natural Resources Conservation Service (USDA NRCS 2018). Chesapeake watershed action plan. https://www.nrcs.usda.gov/Internet/FSE_MEDIA/nrcseprd1415210.pdf

U.S. Government Accountability Office. 2017. “USDA’s Environmental Quality Incentives Program could be improved to optimize benefits.” Washington, DC: GAO-17-225.
Wilson, G. A., & Hart, K. (2000). Financial imperative or conservation concern? EU farmers' motivations for participation in voluntary agri-environmental schemes. Environment and planning A: Economy and Space, 32(12), 2161-2185. https://doi.org/10.1068/a3311
Wright, C. (2006). The Impact of the Chesapeake Bay Program on Pennsylvania Application Rates for the Environmental Quality Incentive Program (No. 1097-2016-88673). https://ageconsearch.umn.edu/record/11142/?ln=en
Yin, Robert K. (2014). Case study research: Design and methods. Los Angeles, CA: Sage.

Modeling Michigan School-Based Agricultural Education Teacher Shortage: A System Dynamics Approach

Tiffany A. Marzolino, Michigan State University
Aaron J. McKim, Michigan State University
Michael W. Everett, Michigan State University
Mark Forbush, Michigan State University

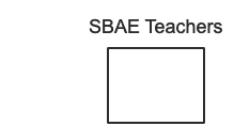
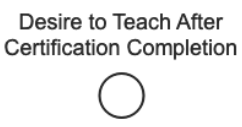
Introduction and Theoretical Approach

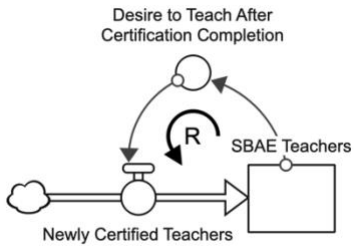
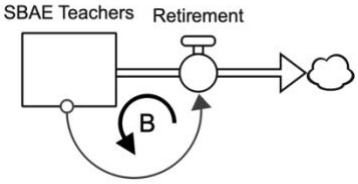
The sustained shortage of teachers in the United States (Lawver et al., 2018; National Center for Educational Statistics, 2022; Sutcher et al., 2016) is due, in part, to early career teachers leaving the profession (Disberger et al., 2023). Curtailing the teacher shortage seems increasingly daunting as teacher burnout (García-Carmona et al., 2019; GBAO Strategies, 2022; Smith & Smalley, 2018) and the strain of the COVID-19 pandemic (McKim & Sorensen, 2020; Shoulders et al., 2021) continue to compound challenges associated with teaching. To better understand the interplay between teacher retention, teacher supply, and demand, a systems perspective is necessary. Therefore, a system dynamics model of agriculture teacher supply and demand in Michigan was created.

Meadows (2008) illustrated the adaptability of system dynamics (i.e., originally developed by Forrester in 1968), an approach used in a variety of contexts, including environmental systems (Ford, 2009). As an approach, system dynamics focuses on (a) modeling complex problems and (b) using those models to better understand problems (Ford, 2009; Meadows, 2008). Not intended to predict the future, system dynamics models yield potential outcomes based on the structure of the model, developed using data. Thus, models are best used as heuristic tools. To understand a system dynamics model, several components must be defined (see Table 1).

Table 1

Key Components of a System Dynamics Model (Meadows, 2008)

Term	Definition	Example	Visual Representation
Stock	A quantity of something.	Population of teachers.	
Flow	A quantity heading into a stock or leaving a stock.	Newly certified teachers entering teaching.	
Converter	A representation that is not a stock or a flow.	Desire to teach after becoming certified.	

Reinforcing Feedback Loop	A structure connecting one aspect of the system back into itself, amplifying growth or decay.	A steady support group of teachers encouraging newly certified teachers.	
Balancing Feedback Loop	A structure connecting one aspect of the system back into itself, creating an equilibrium.	The population of teachers impacts number of retirements.	

Purpose and Research Objectives

We sought to model agriculture teacher supply and demand in Michigan. Of particular interest was the role of early career teacher attrition on supply and demand. The aim of this research was achieved via the following objectives:

1. Create a model of teacher supply and demand in Michigan.
2. Explore Michigan model changes by early career teacher attrition rates.

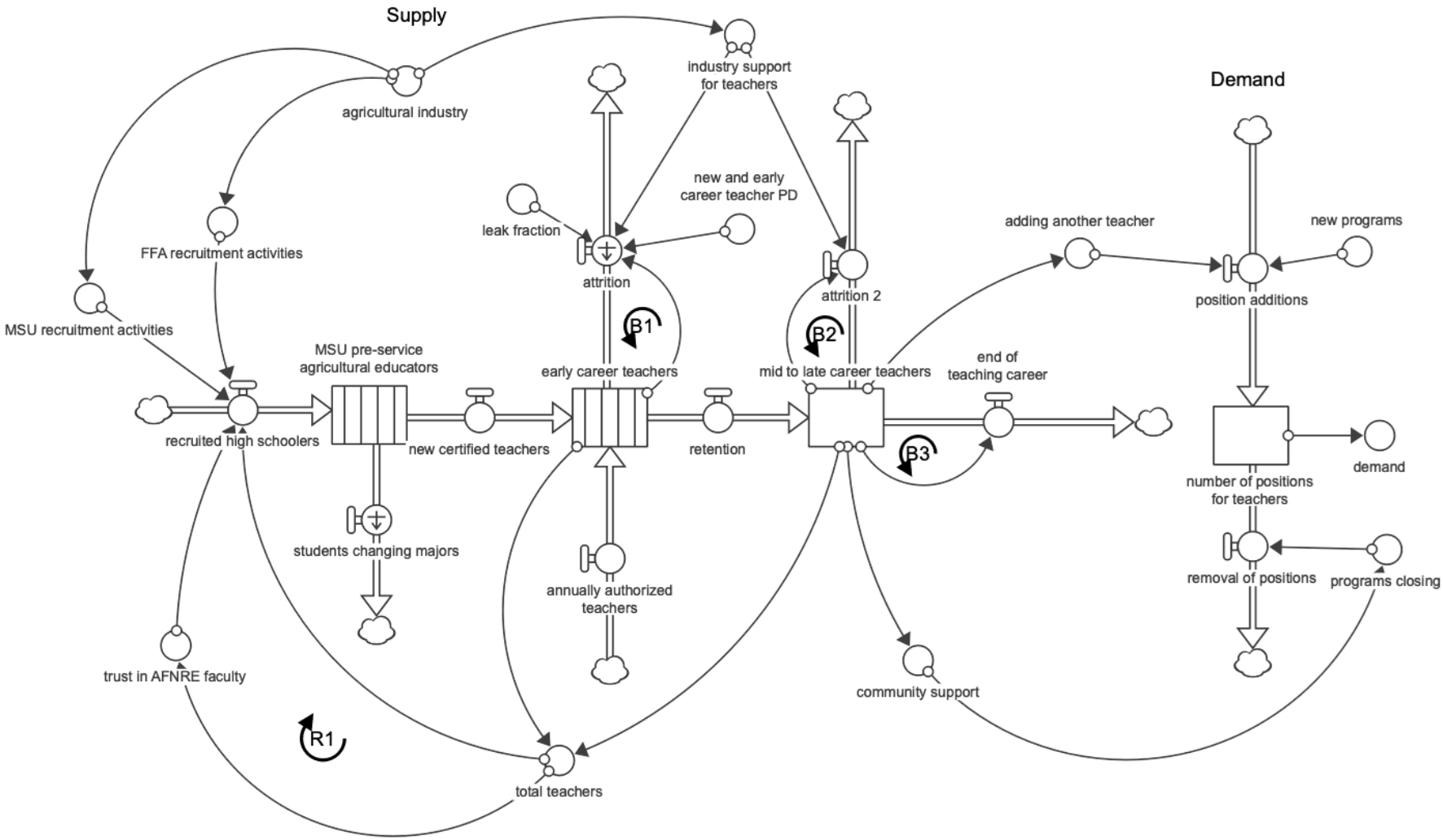
Methods

Secondary data used to construct the model of teacher supply and demand in Michigan were collected via two personal interviews conducted on April 13 and 14, 2023. The first interviewee, Mark Forbush, is the State Supervisor and Michigan FFA Advisor with knowledge of teacher supply and demand. The second interviewee, Michael Everett, is the academic advisor for agricultural education at Michigan State University (MSU) who provided information on students enrolled in agricultural education and the efficacy of recruitment activities. When applicable, data from across three years were averaged to create a representative baseline for the system model. Each interviewee had the opportunity to structurally validate the model, as they are both experts in the field. Their suggestions were considered, and the system structure was adjusted based on their input, increasing the model's face validity (Ford, 2010). The model (see Figure 1) was constructed using Stella Architect Version 3.40 (Stella Architect, 2023) software, which uses a quantitative approach that factors in the variables and their numerical values to create a forecast for what a system might produce over time. Throughout the findings, data are reported to two decimal points to honor the precision of information input into the model.

Findings

Figure 1

A Model of Michigan Agriculture Teacher Supply and Demand



To explore this model (i.e., formulas included in the appendix), we will begin on the left side with university pre-service agricultural educators. This is a conveyor stock that is set to have students graduate after five years (i.e., typical time to complete MSU program). There is a low outflow from this stock (i.e., 6.00%) of students changing majors (Michael Everett, 2023). Once students graduate and become certified, they enter the early career (i.e., less than five years of experience) teacher stock, another conveyor stock. Also entering this stock are annually authorized teachers, an average of eight individuals per year (Mark Forbush, 2023). Flowing out of the early career teacher stock is early career attrition, which accounts for the leak fraction (i.e., rate of early career teachers leaving the profession annually, 3.00%; Mark Forbush, 2023). This leak fraction is subtracted by efforts to retain early career teachers, namely early career teacher professional development (i.e., projected to make teachers 0.50% more likely to be retained, Mark Forbush, 2023) and industry support (i.e., projected to make teachers 0.50% more likely to be retained, Mark Forbush, 2023). This is then multiplied by the stock of early career teachers, creating a balancing feedback loop (B1) that suggests as early career teacher populations increase, more will leave via attrition.

Feeding into industry support for teachers is the agricultural industry, which is assumed to continue to support teachers at 80.00% to 125.00% of past support levels. Agricultural industry also feeds into recruitment efforts through both the FFA and MSU, which help determine a portion of the recruited high schoolers each year. The recruited high schoolers flow feeds into the MSU pre-service educator's stock. This inflow is equal to the efficacy of FFA recruitment activities (i.e., calculated at 5.97%, Michael Everett, 2023) and MSU recruitment activities (i.e., calculated at 16.00%, Michael Everett, 2023) multiplied by those recruited directly via their teacher (i.e., projected to be 10.00% of Michigan teachers, Mark Forbush, 2023). This creates two reinforcing loops; the first is between the combined early career and late career teachers and their recruiting of high school students and the second is between teachers and their trust in AFNRE faculty. The more teachers there are to recruit students, the more students end up in this flow and the more trust in AFNRE faculty, the more students will be recruited. The formulation for the trust in AFNRE faculty variable is 0.30% (i.e., a projection of the role trust in AFNRE faculty at MSU plays in teacher recruitment of students) multiplied by the total number of teachers in Michigan.

Once teachers make it to the mid- to late-career teacher stock, they leave in one of two ways, attrition (i.e., calculated at 2.00% of mid- to late-career teachers leaving, Mark Forbush, 2023) or retirement (i.e., calculated at 2.82% of mid- to late-career teachers retiring, Mark Forbush, 2023). There is a balancing loop between mid- to late-career teachers and attrition, as well as mid- to late-career teachers and retirement, as the more teachers in those stocks, the more available to leave (B2) or retire (B3). From the mid- to late-career teacher stock, teachers begin to influence the demand portion of the model, located on the far right. Teachers who are established may, with or without the assistance of the community, lobby to add an additional teacher to their program. Adding additional teachers (i.e., calculated at 3.26% of programs with a mid- to late-career teacher, Mark Forbush, 2023), combined with new programs starting (i.e., average two per year, Mark Forbush, 2023) feed into new positions for teachers. This is integrated into the number of positions for teachers stock, which is interpreted as demand. The outflow of this stock is the removal of positions, which is programs closing (i.e., average one per year, Mark Forbush,

2023). Programs closing may be modified by community support; thus, if community support is greater than 10 (i.e., calculated by multiplying the number of mid- to late-career teachers by 2.00%), no programs will close.

Once the model was created and structurally validated, a sensitivity analysis was run on the leak fraction for early career teacher attrition. This sensitivity analysis set the value for the rate of early career teacher attrition from 2.00% to 14.90%. Based on the results, it appears there is a floor of teacher supply and demand created between early career attrition rates (see Table 2).

Table 2

Early Career Teacher Attrition Rate Sensitivity Analysis Results on Supply and Demand

Run	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Rate (%)	2.17	2.50	2.72	3.00	4.57	6.11	7.17	7.62	11.30	14.90
Supply	178	134	112	97	78	79	77	78	78	78
Demand	269	259	253	247	236	236	235	236	236	236

Note. These numbers represent where the model predicts supply and demand based on a 25-year simulation. Supply refers to the total number of teachers, demand refers to the total number of positions available, and rate refers to attrition rate of early career teachers.

To show this floor, subsequent runs were distributed at more even intervals (see Figures 2 through 5). Michigan has a current early career attrition rate of 3.00% (Mark Forbush, 2023).

Figure 2

Early Career Teacher Attrition Rates and Projected Early Career Teachers in Michigan

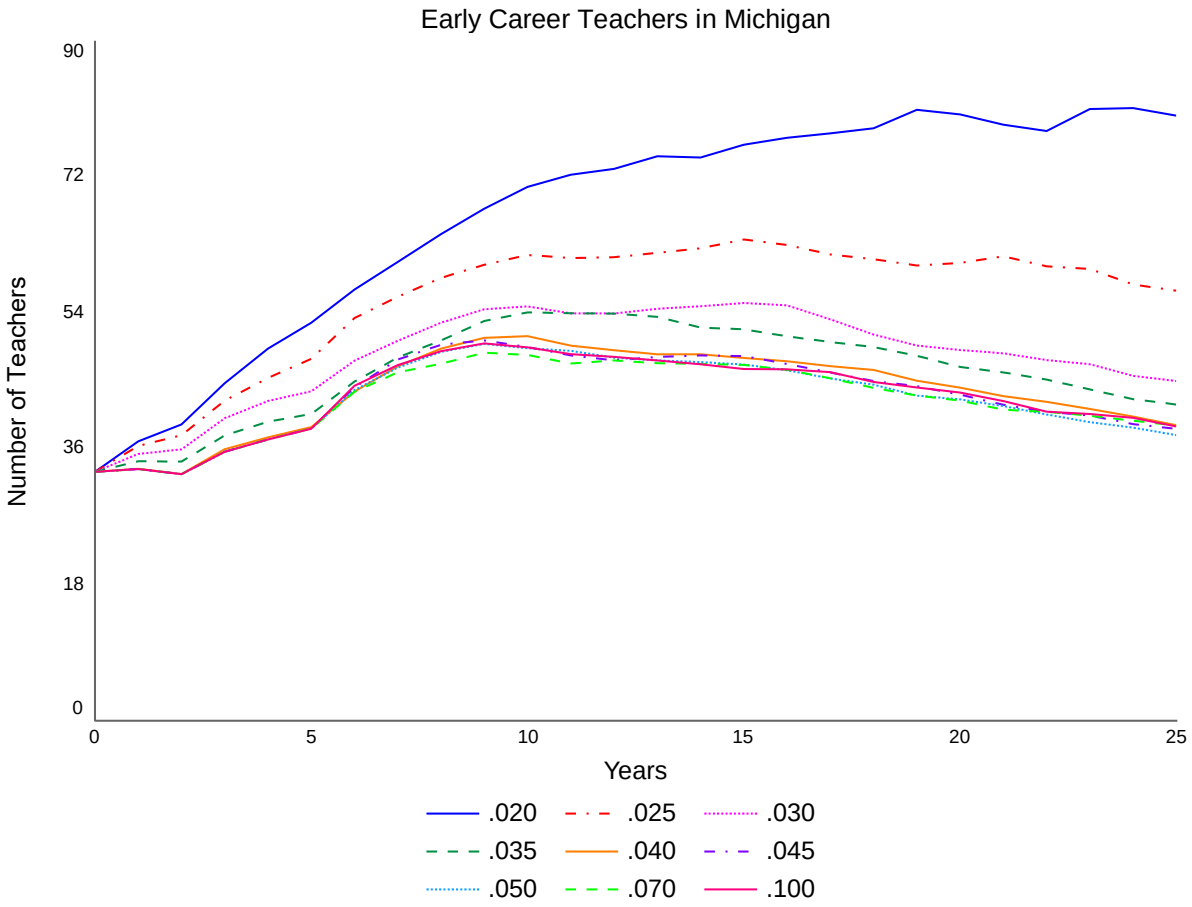


Figure 3

Early Career Teacher Attrition Rates and Projected Mid- to Late-Career Teachers in Michigan

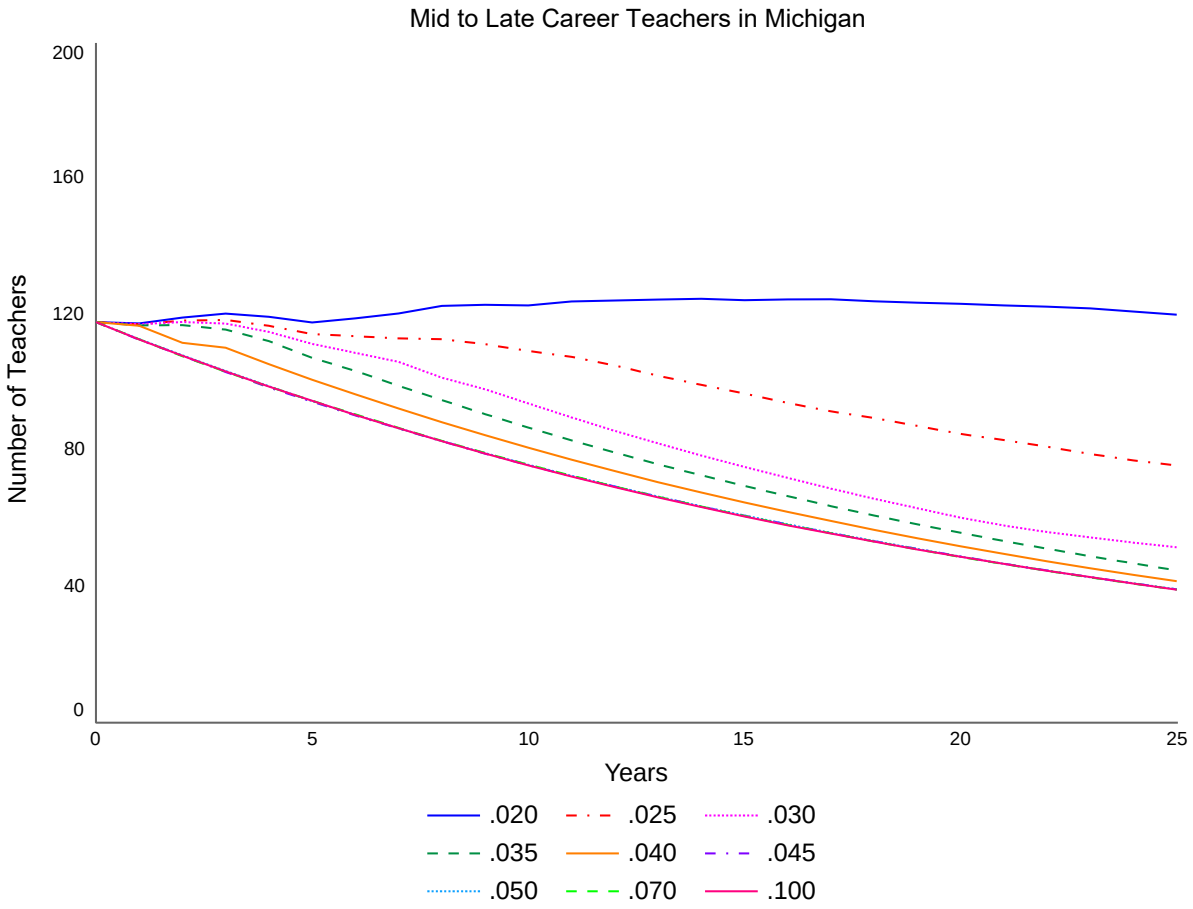


Figure 4

Early Career Teacher Attrition Rates and Projected Total Teachers in Michigan

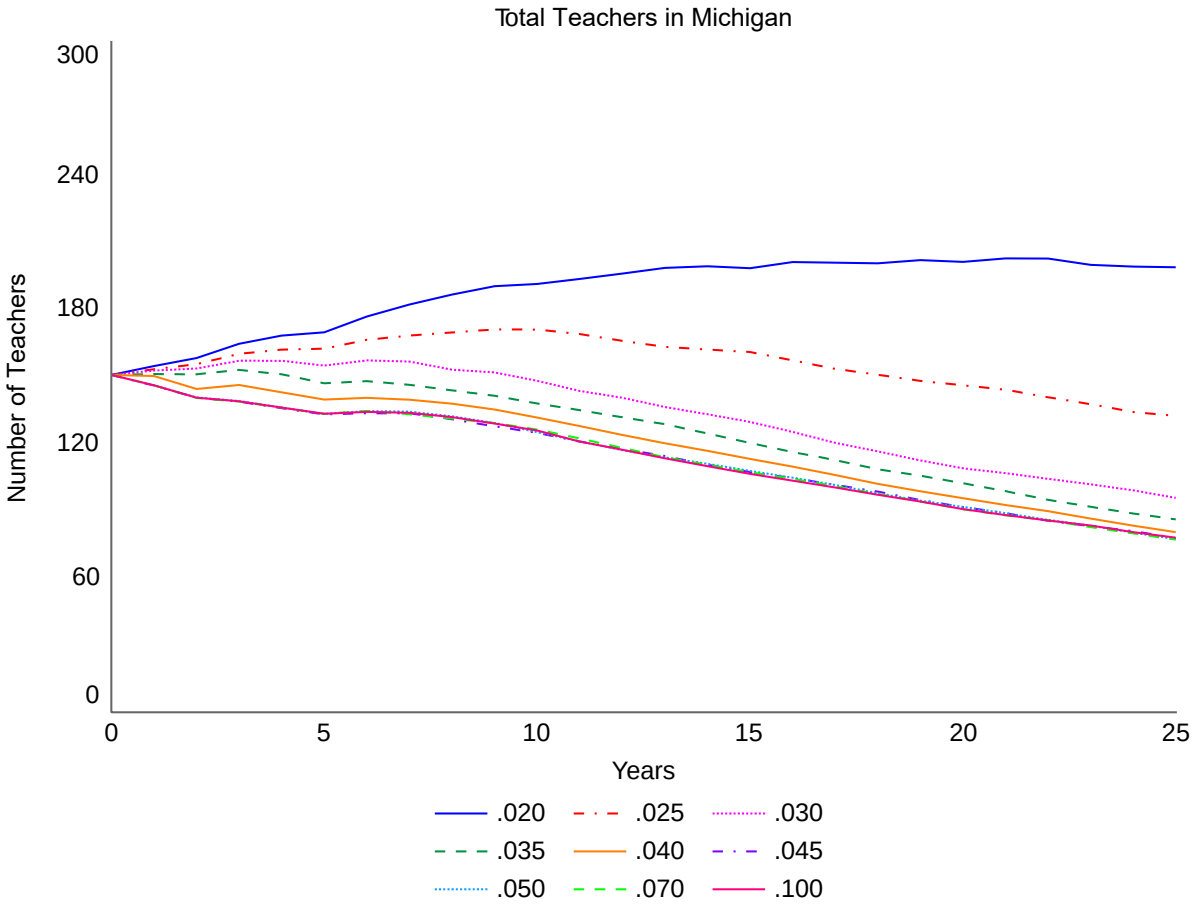
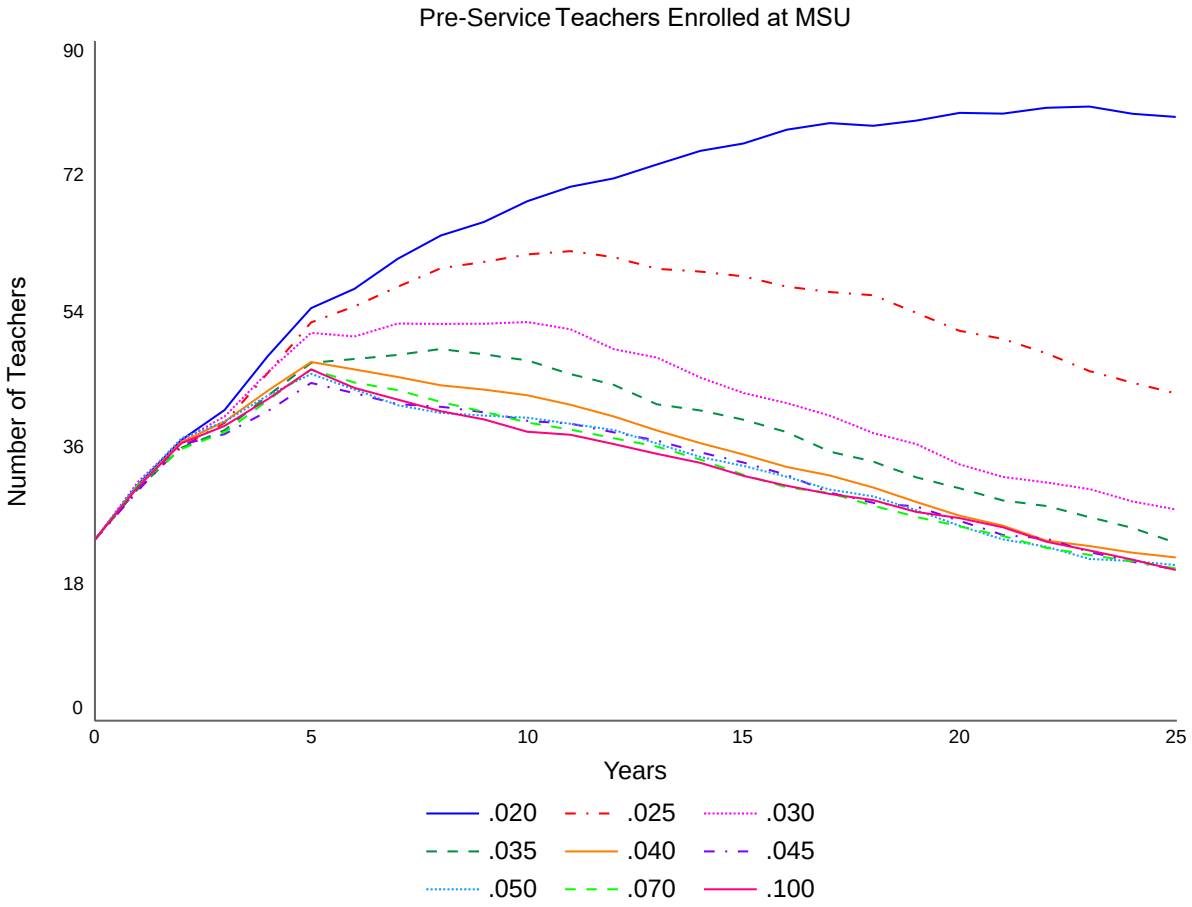


Figure 5

Early Career Teacher Attrition Rates and Projected Pre-Service Teachers at MSU



Discussion and Conclusion

In this research, system dynamics modeling was used to model Michigan teacher supply and demand and to evaluate the modeled impact of early career teacher attrition on the system (Ford, 2009; Meadows, 2008). As with all system dynamics models, the final model is only as good as the data collected, the primary limitation of this work. Authors acknowledge the data represent our current understanding, and these data should be continually refined via additional scholarship in areas like (a) the efficacy of direct efforts to retain teachers (e.g., professional development), (b) the efficacy of indirect teacher retention mechanisms (e.g., industry support), and (c) the career decision making of agriculture teachers.

The final modeled system was found to be highly sensitive to low early career teacher attrition rates. However, as the attrition rate reached 4.57% and above, there was little difference between the results for supply and demand. There was much fluctuation between the rates of 2.00% and 4.00%, suggesting minor shifts in early career retention can have serious impacts on the system. The floor created near 4.00% suggests there is a critical capacity that, once breached, the system tends to line the same path. This could be attributed to teachers' critical recruitment efforts that

are the primary inflow in this model; with less teachers, less students can be recruited to be a future teacher. Once this critical point is reached, there are far less students being recruited by teachers.

This recruitment flow is vital for replacing teachers exiting the profession. While others may not have been enrolled in agricultural education classes and could be recruited from other means, most students in Michigan are recruited by their high school agriculture teachers (Mark Forbush, 2023). Annually authorized teachers can supplement the flow into early career teachers to some extent (i.e., potentially explaining the floor starting at 4.00%), though the reasons annually authorized teachers enter the system were not explored, instead set to a constant of eight, as that was the average number of annually authorized teachers entering the profession.

Ultimately, this model allows us to visualize the system and its different components. Furthermore, this model calls attention to the critical need for continuously collected, empirical data to reinforce and extend the model. Based on the current model, it is imperative to find new ways to retain early career agriculture teachers in Michigan, ideally keeping the rate of attrition to 2.00% or less. Additions could be made to future models to include more information on annually authorized teachers and where they come from, where they are going, and motivations for joining the profession. System dynamics models could also be used for problems outside of retention, like recruitment, time management, and agribusiness ventures. While it is difficult to represent the deeply personal reasons teachers leave the career early, this model may provide insights into program longevity.

References

Disberger, B., Washburn, S., Hock, G., & Ulmer, J. (2023). A qualitative analysis of agriculture teacher's attitudinal changes toward the teaching profession in the first three years of teaching. *Journal of Agricultural Education*, *64*(1), 61–81. https://doi.org/10.5032/jae.v64i1.30

Ford, A. (2009). *Modeling the environment* (2nd ed.). Island Press.

Forrester, J. (1968). *Principles of systems*. Pegasus Communications.

García-Carmona, M., Marín, M. D., & Aguayo, R. (2019). Burnout syndrome in secondary school teachers: A systematic review and meta-analysis. *Social Psychology of Education*, *22*(1), 189–208. https://doi.org/10.1007/s11218-018-9471-9

GBAO Strategies. (2022). *Poll results: Stress and burnout pose threat of educator shortages*. GBAO Strategies. https://www.nea.org/sites/default/files/2022-02/NEA%20Member%20COVID-19%20Survey%20Summary.pdf

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

McKim, A. J., & Sorensen, T. J. (2020). Agricultural educators and the pandemic: An evaluation of work and life variables. *Journal of Agricultural Education*, *61*(4), 214-228. https://doi.org/10.5032/jae.2020.04214

Meadows, D. H. (2008). *Thinking in systems: A primer*. Chelsea Green Publishing.

National Center for Educational Statistics. (2022, March 3). *U.S. schools report increased teacher vacancies due to COVID-19 pandemic, new NCES data show*. Institute of Education Sciences. https://nces.ed.gov/whatsnew/press_releases/3_3_2022.asp#:~:text=Sixty%2Done%20percent%20of%20public,and%20non%2Dteaching%20staff%20vacancies.

Shoulders, C. W., Estepp, C. M., & Johnson, D. M. (2021). Teachers' stress, coping strategies, and job satisfaction in COVID-induced teaching environments. *Journal of Agricultural Education*, *62*(4), 67-80. https://doi.org/10.5032/jae.2021.04067

Smith, A. R., & Smalley, S. (2018). Job stress, burnout, and professional development needs of mid-career agricultural education teachers. *Journal of Agricultural Education*, *59*(2), 305–320. https://doi.org/10.5032/jae.2018.02305

Stella Architect [Computer software]. (2023). Retrieved from http://iseesystems.com

Sutcher, L., Darling-Hammond, L., & Carver-Thomas, D. (2016, September 16). *A coming crisis in teaching? Teacher supply, demand, and shortages in the U.S.* Learning Policy Institute. https://doi.org/10.54300/247.242.

Appendix
Model Formulas

Variable Name	Equation	Properties
early_career_teachers(t)	early_career_teachers(t - dt) + (new_certified_teachers + annually_authorized_teachers - retention - early_career_attrition) * dt	INIT early_career_teachers = 5, 8, 8, 6, 6 TRANSIT TIME = 5 FIFO CONTINUOUS ACCEPT MULTIPLE BATCHES
mid_to_late_career_teachers(t)	mid_to_late_career_teachers(t - dt) + (retention - mid_to_late_attrition - end_of_teaching_career) * dt	INIT mid_to_late_career_teachers = 118
number_of_positions_for_teachers(t)	number_of_positions_for_teachers(t - dt) + (position_additions - removal_of_positions) * dt	INIT number_of_positions_for_teachers = 151
"University_pre-service_agricultural_educators"(t)	"University_pre-service_agricultural_educators"(t - dt) + (recruited_high_schoolers - new_certified_teachers - students_changing_majors) * dt	INIT "University_pre-service_agricultural_educators" = 3, 3, 4, 7, 5 TRANSIT TIME = 5 FIFO CONTINUOUS ACCEPT MULTIPLE BATCHES
annually_authorized_teachers	8	INFLOW PRIORITY: 2
early_career_attrition	LEAKAGE OUTFLOW	LEAKAGE FRACTION = ((leak_fraction-(industry_support_for_teachers+ new_and_early_career_teacher_PD)))*early_career_teachers LINEAR LEAKAGE LEAK ZONE = 0% to 100%
end_of_teaching_career	.0282*mid_to_late_career_teachers	OUTFLOW PRIORITY: 2

mid_to_late_attrition	(.02-industry_support_for_teachers)*mid_to_late_career_teachers	OUTFLOW PRIORITY: 1
new_certified_teachers	CONVEYOR OUTFLOW	INFLOW PRIORITY: 1
position_additions	adding_another_teacher+new_programs	
recruited_high_schoolers	(FFA_recruitment_activities+University_recruitment_activities+trust_in_AFNRE_faculty)*(total_teachers*recruitment_rate)	
removal_of_positions	programs_closing	
retention	CONVEYOR OUTFLOW	
students_changing_majors	LEAKAGE OUTFLOW	LEAKAGE FRACTION = .06 LINEAR LEAKAGE LEAK ZONE = 0% to 100%
adding_another_teacher	mid_to_late_career_teachers*.0326	
agricultural_industry	RANDOM(.80, 1.25)	
community_support	mid_to_late_career_teachers*.02	
demand	number_of_positions_for_teachers	
FFA_recruitment_activities	.0597*agricultural_industry	
gap_between_supply_and_demand	total_teachers-demand	
industry_support_for_teachers	agricultural_industry*.005	
leak_fraction	.1	

new_and_early_career_teacher_PD	.005	
new_programs	2	
programs_closing	IF community_support>10 THEN 0 ELSE 1	
recruitment_rate	.1	
total_teachers	mid_to_late_career_teachers+early_career_teachers	
trust_in_AFNRE_faculty	.003*total_teachers	
University_recruitment_activities	.16*agricultural_industry	

A Twenty-Year Comparison of Traditionally and Alternatively Licensed SBAE Teacher Retention in Kansas

KaCee James, Kansas State University
Dr. Brandie Disberger , Kansas State University
Dr. Gaea Hock , Kansas State University
Dr. Jonathan Ulmer, Kansas State University

Introduction and Need for Study

Teacher shortages continue to be a concern. Nguyen et al. (2022) estimated there were 36,500 vacant teaching positions in the United States in 2022 and more than 1,200 alone in Kansas in 2022. Furthermore, there were 163,650 positions filled by underqualified teachers (Nguyen et al., 2022). Like other disciplines, school-based agricultural education (SBAE) struggles to find qualified teachers (Smith et al, 2021).

Forty-eight new SBAE programs and 63 new SBAE teaching positions have been established in Kansas since 2015 (Smith et al., 2022). The growth of SBAE coupled with high teacher turnover, has contributed to schools struggling to find qualified teachers (Smith et al., 2021). The attrition rate of SBAE teachers reached a record high in 2022 with 12.23% of agricultural educators leaving the classroom in Kansas (Foster et al., 2022).

Recent studies have examined SBAE teacher turnover. Work-life balance was cited as a leading reason for attrition, with Solomonson et al. (2018) reporting teachers enjoy their teaching experiences at the expense of their personal lives. Other research found SBAE teachers leave the classroom due to a lack of self-confidence and low self-efficacy (Solomonson et al., 2018). Some exited the profession because of school culture. Researchers found teachers left because of negative attitudes towards administration or lack of support which contributed to stress (Barry et al., 2022; Solomonson et al., 2018).

Policymakers have looked to solve teacher shortages by increasing the supply through alternative certification programs which postpones formal education training (Ingersoll & Smith, 2003). Researchers have investigated the merit of alternatively certified teachers in SBAE (Bowling & Ball, 2018). Studies show that alternatively certified teachers have a wealth of technical and content knowledge but lack pedagogical and student management skills (Bowling & Ball, 2018). Although alternatively certified teachers may lack educational skills, their existence is necessary for the future of SBAE (Bowling & Ball, 2018).

Conceptual Framework

This study was based on the conceptual framework of Ingersoll's (2003) "The Revolving Door." Ingersoll (2003) found many teachers leave the profession for personal reasons other than retirement which result in school staffing problems. Supply and demand data shows that teacher shortages are not a result of "an insufficient supply of teachers being recruited and trained" but rather a leaky bucket that is losing highly qualified teachers early in their careers (Ingersoll, 2003, p. 17). This study investigated the "revolving door" of teachers in SBAE programs based on their type of licensure in Kansas.

Literature Review

Teacher Certification

As recently as 2021, the United States had a demand of 1,011 SBAE teachers, but agricultural teacher preparation programs had only 789 completers (Foster et al., 2023). Given the shortfall of educators, states rely on alternative certificates, emergency certificates or waivers to increase the supply of teachers (Suell & Piotrowski, 2007). Many alternatively certified teachers entered the profession claiming they had no plan to teach, but the opportunity arose (Cannon et al., 2022).

Between 20 and 30 percent of aspiring teachers enter the teaching profession through one of approximately 130 alternative routes across the country (National Research Council, 2010). Each state has unique requirements for alternative teaching certificates and thus, the substantial number of avenues for individuals to obtain teacher certification creates confusion for tracking and supporting alternatively certified teachers (Claflin, 2020).

Much like novice traditionally certified teachers, alternatively certified teachers need daily contact with a mentor to provide not only technical, but emotional support (Suell & Piotrowski, 2007). It is suggested that alternative certification pathways fail to prepare applicants as they may be teaching in areas in which they have no experience, they have little or no pedagogical knowledge, or they are not required to pass competency examinations for licensure (Bowling & Ball, 2018). Teachers with alternative certifications have demonstrated a lack of basic literacy skills and challenges to use lesson plans (Bowling & Ball, 2018).

Studies that compared the retention and attrition of teachers prepared traditionally versus alternatively have conflicting results. Suell and Piotrowski (2007) found that traditionally certified teachers had higher attrition rates than those of alternatively certified teachers. However, another study found no difference in the two groups (Suell & Piotrowski, 2007). Instead, Zetchner and Schulte (2001) credit subject area, level of teaching, and age as determining factors of attrition. Claflin et al. (2020) found no link between teachers' backgrounds and certification when examining turnover intentions.

Attrition and Retention

While it varies by region, subject area, and school characteristics, the annual national attrition rate is 8% (Carver-Thomas & Darling-Hammond, 2019). Further, Ingersoll et al. (2018) reported 44% of public and private school teachers leave the profession within their first five years of teaching.

There are 13,349 school-based agricultural education teachers nationwide employed in 8,367 programs as of September 2021 (Smith et al., 2022). In 2021, 382 new positions and 220 programs were added (Smith et al., 2022).

Despite an increase in positions and programs, the profession faces rising attrition rates. In 2020-2021, 674 SBAE teachers did not return to the classroom for the following school year (Smith et al., 2022). Research reveals that work-life balance is a primary contributor for educators exiting the profession (Solomonson & Retallick, 2018; Solomonson et al., 2018; Solomonson et al., 2022, Sorenson, 2016). Teachers also left the classroom due to school culture, primarily negative attitudes towards or lack of support from school administration (Barry, 2022; Lemons et al., 2015; Solomonson et al., 2018).

Demand for Teachers

Between 2015 and 2021, 48 new school-based agricultural education programs were established in Kansas (Smith et al., 2022). In conjunction with the program additions, the state has increased student enrollment and FFA membership. In fact, there was a 30% increase in FFA membership in the last decade (Kansas FFA Association, n.d.). The rise in SBAE programs, student enrollment, and FFA membership increased the demand for educators at the same time attrition rates of teachers was rising.

Research Purpose and Questions

The purpose of this study was to analyze the retention and attrition rates of Kansas SBAE teachers over a twenty-year span with a focus on certification type. The research questions were:

1. At which year(s) of teaching were agricultural educators most likely to leave the profession in Kansas?
2. Did certification type impact agriculture teacher retention?
3. On average, how long do traditionally and alternatively certified teachers remain in the classroom?

Methods and Procedures

Document analysis research methods were used in this study (Bowen, 2009). Analyzing documents poses questions to be asked and provides supplementary research data and a means of tracking change and development (Bowen, 2009). A database of Kansas agriculture teacher information kept for 20 years (2003-2022) was analyzed (Disberger, 2023). The data was obtained from the state's novice teacher coordinator who served from 2004-2016 and 2020-present, along with information provided by Kansas Team Ag Ed. The data was collected for each cohort of teachers based on the year they entered the SBAE profession in Kansas. The information included the teacher's name, initial school, number of years taught, and current teaching status. The researchers compared the teacher data to the Kansas vacancy bulletins to verify new teacher hires. Contact was made directly with teachers or veteran teachers in the FFA district to verify missing data.

To investigate the second and third research questions, the researchers contacted the Kansas Department of Education to verify the types of teacher licenses from 2003 to 2022. The license types were classified as "traditional" or "alternative." The researchers entered the name of each teacher on the public Kansas Educator License Lookup website to determine their initial type of

licensure. The data was then entered in the database of Kansas agriculture teachers. Spreadsheets were created for both traditionally certified and alternatively certified teachers.

The data of 383 teachers across 20 years (2003-2022) was included in the study. Formulas in Microsoft Excel were used to determine retention and attrition rates within each year of experience for teachers of each certification type. Attrition from teaching was calculated based on leaving the profession in Kansas. Teachers who left teaching, but returned were considered retained. Due to the inability to track those teaching out of state, teachers who left Kansas were not considered retained.

Findings and Results

The first research question focused on the year SBAE teachers in Kansas left the profession. Tables 1 and 2 show retention and attrition data for SBAE teacher cohorts who were traditionally certified between 2003-2022 in Kansas. The data indicated that most teachers left the classroom after the third year (16.08% attrition). Attrition declined in years four and five but increased after year six (18.69% attrition) before declining through year 20. The overall retention rate of traditionally certified SBAE teachers in Kansas between 2003-2022 was 46.80%.

Teachers who were alternatively certified were found to have initially higher attrition rates than traditionally certified teachers. As seen in Table 3, the attrition rate of alternatively certified teachers after year one was 19.28%. Attrition increased in year two (22.81%) but declined in years three (13.95%), four (6.25%) and five (8.70%). The attrition rate of alternatively certified teachers began to increase in years six (16.67%) through 11 (20.00%). The overall retention rate of Kansas alternatively certified SBAE teachers was 43.37% (see Table 4).

The third research question sought to determine the longevity of teachers by certification type. On average, traditionally certified teachers taught 3.9 years whereas alternatively certified teachers were in the classroom for 3.3 years.

Table 1

Percentage of Traditionally Certified SBAE Teachers Retained in Kansas in Years 1-10

Initial Year	*N*	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
2003-2004	10	90.00	70.00	50.00	50.00	50.00	30.00	30.00	30.00	30.00	30.00
2004-2005	9	100.00	88.89	55.56	55.56	55.56	44.44	33.33	33.33	33.33	33.33
2005-2006	12	91.67	75.00	59.53	58.53	50.00	33.33	25.00	25.00	25.00	25.00
2006-2007	14	85.71	57.14	50.00	42.86	42.86	21.43	21.43	7.14	7.14	7.14
2007-2008	11	81.82	72.73	63.64	45.45	45.45	45.45	45.45	45.45	45.45	45.45
2008-2009	12	91.67	75.00	58.33	58.33	58.33	58.33	50.00	50.00	41.67	41.67
2009-2010	10	60.00	60.00	60.00	60.00	60.00	60.00	50.00	50.00	50.00	40.00
2010-2011	12	91.67	58.33	58.33	50.00	41.67	41.67	41.67	41.67	33.33	33.33
2011-2012	16	87.50	68.75	50.00	43.75	43.75	31.25	31.25	31.25	31.25	31.25
2012-2013	17	88.24	82.35	76.47	70.59	64.71	58.82	58.82	58.82	58.82	52.94
2013-2014	20	90.00	80.00	55.00	50.00	50.00	35.00	35.00	35.00	35.00	30.00
2014-2015	12	83.33	83.33	75.00	75.00	75.00	66.67	58.33	33.33	33.33	
2015-2016	13	100.00	100.00	76.92	61.54	61.54	46.15	38.46	38.46		
2016-2017	14	85.71	71.43	64.29	57.14	57.14	50.00	50.00			
2017-2018	17	76.47	70.59	70.59	64.71	52.94	41.18				
2018-2019	20	95.00	90.00	70.00	50.00	50.00					
2019-2020	17	94.12	88.24	76.47	76.47						
2020-2021	18	100.00	100.00	94.44							
2021-2022	23	91.30	82.61								
2022-2023	20	90.00									
Avg. Retention		89.23	78.70	65.75	57.20	53.42	43.72	40.66	36.90	35.48	33.57
Avg. Attrition		10.77	11.74	16.08	10.00	4.10	18.69	7.50	7.46	3.51	5.88

Table 2

Percentage of Traditionally Certified SBAE Teachers Retained in Kansas in Years 11-20

Initial Year	*N*	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th
2003-2004	10	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
2004-2005	9	22.22	22.22	22.22	22.22	22.22	22.22	22.22	22.22	22.22	
2005-2006	12	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00		
2006-2007	14	7.14	7.14	7.14	7.14	7.14	7.14	7.14			
2007-2008	11	36.36	27.27	27.27	27.27	27.27	27.27				
2008-2009	12	41.67	41.67	41.67	33.33	33.33					
2009-2010	10	40.00	30.00	10.00	10.00						
2010-2011	12	33.33	33.33	33.33							
2011-2012	16	18.75	18.75								
2012-2013	17	52.94									
Avg. Retention		30.89	25.47	24.44	21.79	25.53	21.43	20.00	25.81	26.32	30.00
Avg. Attrition		9.52	6.90	8.33	5.56	0.00	0.00	0.00	0.00	0.00	
Overall Retention		46.80									

Table 3

Percentage of Alternatively Certified SBAE Teachers Retained in Kansas in Years 1-10

Initial Year	*N*	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
2003-2004	0	-	-	-	-	-	-	-	-	-	-
2004-2005	0	-	-	-	-	-	-	-	-	-	-
2005-2006	2	100.00	100.00	100.00	50.00	50.00	50.00	0.00	0.00	0.00	0.00
2006-2007	6	100.00	83.33	66.67	66.67	66.67	50.00	50.00	50.00	50.00	50.00
2007-2008	0	-	-	-	-	-	-	-	-	-	-
2008-2009	3	66.67	66.67	33.33	33.33	33.33	33.33	33.33	0.00	0.00	0.00
2009-2010	1	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2010-2011	0	-	-	-	-	-	-	-	-	-	-
2011-2012	1	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
2012-2013	1	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
2013-2014	3	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	66.67
2014-2015	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2015-2016	5	100.00	100.00	60.00	60.00	40.00	40.00	20.00	20.00		
2016-2017	4	25.00	25.00	25.00	25.00	25.00	25.00	25.00			
2017-2018	7	85.71	71.43	71.43	71.43	57.14	28.57				
2018-2019	9	77.78	33.33	33.33	33.33	33.33					
2019-2020	12	91.67	83.33	66.67	58.33						
2020-2021	9	66.67	55.56	55.56							
2021-2022	5	100.00	20.00								
2022-2023	14	71.43									
Avg. Retention		80.72	63.77	57.81	54.55	48.84	44.12	40.74	39.13	44.44	41.18
Avg. Attrition		19.28	22.81	13.95	6.25	8.70	16.67	15.38	10.00	0.00	12.50

Table 4

Percentage of Alternatively Certified SBAE Teachers Retained in Kansas in Years 11-20

Initial Year	*N*	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th
2003-2004	0	-	-	-	-	-	-	-	-	-	-
2004-2005	0	-	-	-	-	-	-	-	-	-	
2005-2006	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-		
2006-2007	6	33.33	33.33	33.33	33.33	33.33	33.33	33.33			
2007-2008	0	-	-	-	-	-	-				
2008-2009	3	0.00	0.00	0.00	0.00	0.00					
2009-2010	1	0.00	0.00	0.00	0.00						
2010-2011	0	-	-	-							
2011-2012	1	100.00	100.00								
2012-2013	1	100.00									
Avg. Retention		28.57	23.08	16.67	16.67	18.18	25.00	25.00	0.00	0.00	0.00
Avg. Attrition		20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Overall Retention		43.37									

Conclusions, Implications, and Recommendations

This study found retention and attrition trends of SBAE teachers in Kansas are consistent with all teachers across the country. Not only are educators exiting the profession prior to retirement, 44% are leaving within their first five years (Ingersoll, 2003; Ingersoll et al., 2018). Low retention rates of SBAE teachers in the first five years between both traditionally and alternatively certified teachers created SBAE teacher staffing problems as described by Ingersoll et al. (2018) and Nguyen et al. (2022). The "revolving door" (Ingersoll et al., 2018) of teachers increased the need for alternative certification and placed pressure on schools and groups who worked to support and pedagogical resources to early career teachers.

The highest number of traditionally certified teachers were retained after the first year, but almost half left the classroom by year five. Retention of alternatively certified teachers was similar to traditionally certified although they experienced initially higher attrition rates. Retention of alternatively certified teachers was highest after the first year and almost half left the profession by the fourth year of teaching. Overall, however, there was little difference between the retention rate of traditionally and alternatively certified teachers. Because the retention rate of the two certification types is similar, we believe it is important to place equal emphasis on mentorship programs for both. Alternatively certified teachers may be vital to solving the teacher shortage problem. Universities who certify agriculture teachers should consider programs that support alternatively certified teachers to help with the agriculture teacher shortage.

We recommend conducting additional research to compare retention among the different types of alternative licenses. In addition to investigating the nuances of each alternative licensure, it is recommended that traditional and alternatively certified teachers receive separate new teacher induction training programs given their unique needs.

Qualitative studies should be conducted to investigate the experiences and practices of successful alternatively certified teachers. Specifically, research should determine if their maturity and/or phase in life (married, with children, etc.), ties to the local school and community or appreciation of teaching and nonfinancial benefits of teaching contributed to their desire to teach and continue in the profession. Successful alternatively certified teachers could be instrumental in creating professional development for other alternatively certified teachers to help increase retention.

Qualitative studies should also be conducted to understand the experiences of the traditionally certified teacher. Questions specific to if they have ties to the community they teach in, if they appreciate the nonfinancial benefits of teaching, and if they feel appreciated. Qualitative studies that learn about the experiences of teachers who left the profession would provide insight into how we can support early career teachers as well. There may be factors out of our control, but we need to know how we can support them in areas we can help.

References

Barry, D, et al. (2022). Personal resilience of first-year, alternatively certified agriscience teachers. *Advancements in Agricultural Development, 3*(1), 103-114. https://doi.org/10.37433/aad.v3i1.183

Bowen, G. (2009). Document Analysis as a Qualitative Research Method. *Qualitative Research Journal, 9*(2), 27-40. https://doi: 10.3316/QRJ0902027

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

Carver-Thomas, D. & Darling-Hammond, L. (2019). The trouble with teacher turnover: How teacher attrition affects students and schools. *Education Policy Analysis Archives, 27*(36). https:// https://doi.org/10.14507/epaa.27.3699.

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), 128-139.https://doi.org/10.5032/jae.2020.01128

Disberger, B. (2023). [Unpublished raw data on Kansas beginning teacher retention and attrition]. Kansas State University.

Foster, D., Lawver, R., Smith, A., & Rogers, A. (2022*) Kansas agriculture teacher supply and demand profile: 2015-2022 demand.* Retrieved from www.naae.org/whoweare/supplyanddemand.cfm

Ingersoll, R. (2003). *Is there really a teacher shortage?*. Retrieved from https://repository.upenn.edu/gse_pubs/133

Ingersoll, R., & Smith, T. M. (2003). The wrong solution to the teacher shortage. *Retrieved from*

https://repository.upenn.edu/gse_pubs/126

Ingersoll, R., Merrill, E., Stuckey, D., & Collins, G. (2018). Seven trends: The transformation of the teaching force. *Consortium for Policy Research in Education Research Reports, 2018*(2). https://repository.upenn.edu/cpre_researchreports/108

Kansas FFA Association. (n.d.). *About Kansa FFA.* Kansas FFA. https://www.ksffa.org/about/

Lemons, L., Brashears, M.T., Burris, S., Meyers, C., & Price, M.A. (2015). Factors contributing to attrition as reported by leavers of secondary agriculture programs. *Journal of Agricultural Education, 56*(4), 17-30. https://https://doi.org/10.5032/jae.2015.04017

Nguyen, T., Lam, C.B., & Bruno, P. (2022). *Is there a national teacher shortage? A systematic examination of reports of teacher shortages in the United States.* Retrieved from Annenberg Institute at Brown University. *EdWorkingPaper: 22-631*. https://doi.org/10.26300/76eq-hj32

Smith, A. R., Foster, D. D., & Lawver, R. G. (2022). *National agricultural education supply and demand study, 2021 executive summary*. https://www.naae.org/whoweare/NSD/2021ExecutiveSummary.pdf

Solomonson, J. K., & Retallick, M. S. (2018). Over the edge: Factors nudging mid-career, school-based agriculture teachers out of the profession. *Journal of Agricultural Education, 59*(4), 1-19. https://doi.org/10.5032/jae.2018.04001

Solomonson, J., Kprte, D, Thieman, E., Rettalick, M., & Keating, K. (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.2018.02321

Solomonson, J., Still, S., Maxwell, L., & Barrowclough, M. (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

Sorenson, T., McKim, A., & Velez, 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:// https://doi.org/10.5032/jae.2016.04186

Suell, J.L., & Piotrowski, C. (2007). Alternative teacher education programs: A review of the literature and outcome studies. *Journal of Instructional Psychology, 34*(1), 54.

Zetchner, K.M. & Schulte, A.K. (2001). What we know and don't know from peer-reviewed research about alternative teacher certification programs. *Journal of Teacher Education, 52*(4), 263-338. https://doi.org/10.1177/0022487101052004002

To Those Concerned with Teacher Retention: A Collective Thought Experiment

Becky Haddad, University of Nebraska-Lincoln
Aaron J. McKim, Michigan State University
Haley Q. Traini, Oregon State University
Catlin M. Goodwin, Michigan State University

Introduction and Need

We have all left conferences feeling conversations failed to address core issues and controversial topics. As a discipline, we cannot claim to work on systemic challenges via transformational thinking unless we engage in these difficult dialogues. One continual challenge within our discipline is teacher retention (Smith et al., 2022). The status quo approach to scholarship on teacher retention (i.e., collecting more of the same data) has failed to catalyze authentic change; thus, we need to engage with data on teacher retention in new ways. This desire for something new led us to draft a single letter to the profession addressing the structural and systemic challenges of teacher retention. However, we realized one letter, with one voice, could not encompass the complexity of teacher retention. Thus, a collection of letters on teacher retention were developed via elicitation techniques (Barton, 2015) to form a collective thought experiment, an approach which engages solutions to complex challenges via collective thought (Sorensen, 1992). Readers are invited to explore these ideas, grapple with multiple perspectives, and consider the underlying challenges informing the ideas conveyed.

Methodology

In both generating these letters and sharing them as an instrument, we aim to derive novel solutions to teacher retention. Readers are invited to engage in this approach by reflecting on the structures yielding the perspectives shared in the letters (Sorensen, 1992). By inviting engagement with and through these letters, this abstract extends the conversation on teacher retention by attempting the capture the scope of the conversation on teacher retention. By bringing conversations about teacher retention from the hallways where stakeholders in agricultural education convene to a central place, we provide a context to move forward.

A common resistance to this methodology lies in the authenticity of scenarios comprising the experiment (Brown & Yiftach, 2022). The scenarios informing these letters were derived from conversations with members of the profession as scholars in teacher retention, professional development facilitators, teacher educators, and former teachers. No one letter, however, represents one perspective; instead, each letter was written to represent an emergent theme across multiple conversations.

Our goal is to offer readers an engagement mechanism for potentially controversial and abstract ideas around teacher retention. Within elicitation, participants interact with written, visual, or verbal stimuli to encourage idea sharing. We share the essence of these letters as an instrument to further extend the thought experiment though elicitation (Barton, 2015). This approach is recommended when the phenomenon under investigation is tacit, taboo, or difficult to express (Barton, 2015).

Abbreviated Letters

We anticipate each reader will engage differently with the letters based on personal perspective and lived experience. All readers, however, are invited to lean into the difficult conversations implicitly and explicitly shared within the letters. We recommend this four-step process for unpacking the complexity presented within the letters: (a) identify the problem by its symptoms, (b) consider the root cause(s) of the problem, (c) brainstorm solutions which address the root cause(s), and (d) extend the thought experiment by sharing your perspective.

Letter One

I recently attended a national inservice and was struck by the presentation of our current teacher staffing situation, "we're not in a shortage, we just have high demand." To be "in demand" means to be sought after, needed, or wanted. I agree this is true about today's agricultural educators. I am concerned, however, that we are failing to ask why a solution is needed. Why are teachers overwhelmed? Why do they need to build resilience? Why do they feel like they can't set boundaries? Why do they need so much encouragement to get through the day/week/year? Being sought after, in much of the rest of the working world, comes with pay incentives, continuing education opportunities, career scaffolding for success, and intensive onboarding and leadership programs. Being in demand comes with privileges not currently afforded to teachers. Why aren't we advocating for these?

Letter Two

There is a nobility to sacrificing your time for the betterment of others – just as farmers and teachers have done their whole lives. This nobility of sacrifice permeates agriculture. In agriculture, there is something spiritual about waking up early, worn-down clothes, and sacrificing family time. Farmers don't proudly proclaim they slept in. Do we in agricultural education strive to be those we laud? Is it possible working long hours, ignoring our boundaries, and taking on more than we can achieve fulfills our need for noble sacrifice? Imagine a world in which being an agricultural educator requires margin, balance, and boundaries. You see, I can manage the reality of frustrating administration, underfunded budgets, misguided parents, endless papers to grade, poor salary, etc. in the name of noble sacrifice, but not for anything else.

Letter Three

I'm no longer in the high school classroom; thus, I can only speak as an early career teacher. Year 1: the best, most thriving year of my life. I was doing what I was made to do. Year 2: awesome, I could build on year one and put the mistakes in the rearview. I'll get a master's degree, surely that will help. Year 3: Oh wait, we're having a baby? I don't know what I'm doing at all. Strike that. I know what I should be doing, and I'm not even close to that. Please don't start recognizing me for it. Year 4: All. The. Recognition. Agri-Science Teacher of the Year. Academic Challenge Coach. Ideas Unlimited Winner. Co-Region Advisor. Adult FFA Board. Intern host. Placement host. Absolute rockstar. All with a baby in tow. Year 5: Region Advisor.

Thesis defense. Early career teacher of the year. Resignation letter. Grad school search. Student teacher host. Husband relocated for work. Last banquet. Preparing to move. Goodbye.

My husband says "no" to very few of the things I want to chase. We've moved across the country a few times in the name of my dreams, and we've made our marriage harder than it needed to be. Yet, despite the moves and the challenges, my husband would take those moves over me returning to the ag classroom. For every fond memory I have, he has a sour one. While the commitments and plaques accrued, so did longer hours, weekends away, not being able to spend time with family and friends unless it was on the calendar six months in advance. For what?

Letter Four

One month into my first teaching job I had a nervous breakdown and was medically required to resign. I lost 20 pounds in three weeks, landed in the ER twice with panic attacks, and could hardly get myself through the school door for all the stress and anxiety. I wasn't ready for the challenges my students brought to class with them, wasn't ready for the things that would be broken or stolen, and wasn't ready to have to steel myself emotionally. I'm writing because teaching is such big work. It's bigger work than learning your content or learning pedagogy or even building rapport. It's work that you can never be truly prepared for. Things blindside you with their sheer magnitude. The magnitude of all the things you can't unknow once you get to know your students. What am I missing to make that mentally and emotionally sustainable to stay in that for the long haul?

Letter Five

Do you know how many of my graduating class are still teaching? I think there may be two of us. Do you know who they're replaced with? Teachers without licenses who are retained whether they're effective or not. Our retention issue has become our recruitment issue. The foundation of education is cracking underneath us.

The first year is hard because you're drinking out of a fire hose, but honestly, you think you're getting by. And then you get through it and think, "yeah. I can do that again." Except the second year is harder than the first because you know everything you should be doing and you're still not doing it. And then year three, you're doing it, but you're not doing it well.

When we're talking about teacher retention, we're setting examples for our students and our student teachers about what's okay. We're so good at piling more on. What comes off the plate? We can't keep putting more on this cracking foundation. It can't support the weight it's already carrying.

Letter Six

I've seen this change in our profession. Who are these graduates coming out, telling me during their student teaching they're not going to come to 6:30AM practice? The job hasn't changed, but our teachers have. Our concern over burnout has made teachers weak. Has it really become that old school to expect a hard day's work? It takes 60-70 more hours to coach a state winning

CDE team than it does to coach a state winning football team. That's what this profession is—more. All the work they will put in to put that school's program on the map. How do we get new teachers to care as much about these kids as they need to? Kids need what we have to offer. They need the push to see themselves as successful, ready to be productive in the world. Our retention problem is as much a recruitment and preparation problem as anything. Where are the go-getters; why aren't we recruiting them? Probably because our preparation has gotten soft. We don't teach the hard work and technical skills in agriculture anymore. We lose our stars before they even start shining because they'll be pushed harder somewhere else.

Letter Seven

I'm burned out, emotionally drained, stuck. But, I am not sure I see myself doing anything else. This job works for my family, it has a good retirement package and decent benefits. But this job takes so much. There is so much suffering in silence. There are so few opportunities to share legitimate concerns and work toward change, the bureaucracy itself is defeating and deflating. We need to empower teachers. I've spent a year advocating. Ten preps over six periods while nursing wasn't going to be feasible. But that request was denied.

Some of you have already dismissed me as a quiet quitter. But I'm still here. I'm writing this from my classroom. But, why is staying in the classroom a fight? When did enjoying teaching become such idealistic nonsense? One of the hardest parts is constantly having other opportunities. I lose sleep over this job, over these kids that aren't mine, and over decisions I have no control over. What kind of opportunities don't look better than that?

Letter Eight

I have this routine on the last day of school, I sink in my desk chair, take a deep breath, and give thought to some of the more memorable moments from the year. These memories contribute to the bright, warmth of the light I seem to feel. Why does this feeling persist only at the end of the school year? I love questions. The problem is, I have not found the energy to begin exploring "big" questions. Rather, my energy is extinguished by minute questions. Maybe the rays of bright light I feel this time of year persist because they are not dampened by the floods of daily tasks and worries. What amazing, transformational experiences could I co-create with my students and community if I just had the ability to stand, head-above-water, and dream during the school year?

Conclusion and Challenge

Thought experiments are well situated to identify and root out inconsistencies while challenging previous ways of thinking (Sorensen, 1992). By exploring how the discipline discusses teacher retention, we provide a context to identify root causes and challenge established ways of thinking. However, this approach is limited to our - as authors - experiences in agricultural education. Thus, this is only the beginning of the experiment. We encourage your response, not only to the points with which you resonate, but those creating conflict with your own approach and perspective. Further, we ask readers to challenge the structures making these letters the case, and welcome responses, in whatever form, back to the authors.

References

Barton, K. C. (2015). Elicitation techniques: Getting people to talk about ideas they don't usually talk about. *Theory and Research in Special Education. 43*(2). 179-205. https://doi.org/10.1080/00933104.2015.1034392

Brown, J. R. & Yiftach, F. (2022). Thought experiments. In E. N. Zalta & U. Nodelman (Eds.), *The Stanford encyclopedia of philosophy* (pp. 135-142). Stanford University.

Salkind, N. J. (2012). *Encyclopedia of research design.* SAGE Publications, Inc. https://doi.org/10.4135/9781412961288

Smith, A. R., Foster, D. D., & Lawver, R. G. (2022). *National agricultural education supply and demand study 2021 executive summary.* American Association for Agricultural Education.

Sorensen, R. A. (1992). *Thought experiments.* Oxford University Press.

Experiences from a Postsecondary Mentor Education Program

Aaron J. McKim, Michigan State University
Phillip Warsaw, Michigan State University
Douglas L. Bessette, Michigan State University

Introduction

Retaining students within postsecondary programs, especially those in agriculture, food, and natural resources (AFNR), is essential to fulfill workforce demand (Goecker et al., 2015). The need for efforts to retain students is compounded by disruptions to postsecondary education plans brought about by the COVID-19 pandemic (Liu, 2021). Factors which retain students include academic self-efficacy, social connections, and a sense of belonging, which can all be developed through mentoring relationships (Tinto & Pusser, 2006). Therefore, educational experiences preparing students to be effective mentors (i.e., mentor education programs) are important for student retention.

Developing mentor education programs catalyzes peer mentoring (e.g., postsecondary students mentoring other postsecondary students). Receiving peer mentorship is an effective support mechanism, especially for first-year students (Flores & Estudillo, 2018; Fox et al., 2010; Glaser et al., 2006). Importantly, however, peer mentoring is not without risks, which include unhealthy dynamics of power and the mentee becoming reliant on mentor support (Colvin & Ashman, 2010). Therefore, mentor education programs should unpack the notion of power and encourage inclusive mentoring practices (National Academies of Science, Engineering, and Medicine, 2019). Spartans Mentoring Spartans was designed to offer Michigan State University students a mentor education experience tailored to the principles of inclusive mentoring. This case study explored the experiences of participants in Spartans Mentoring Spartans.

Framework

This research was framed using the Input-Environment-Outcome (I-E-O) Model (Astin, 1993). I-E-O is widely used to understand postsecondary student experiences (Goegan & Daniels, 2021). I-E-O suggests evaluating educational experiences requires considering (a) *inputs* - characteristics a learner brings to the learning experience, (b) the *experience*, and (c) the *outcomes* of the experience (Astin, 1993; Astin & Antonio, 2012). In this research, the inputs of interest included perceptions of mentoring; the experience was engagement in Spartans Mentoring Spartans, and the outcomes of interest were motivations, intentions, and ability to offer inclusive mentorship.

Purpose

The purpose of this qualitative research was to explore the experiences of students involved in a mentor education program at Michigan State University. Insights into the experiences of students may inform future mentor education programs.

Methods

A qualitative, case study (Merriam, 2002) design was employed to complete this research. The bounded system was the Spartans Mentoring Spartans program at Michigan State University, offered during the Spring 2022 semester. Spartans Mentoring Spartans included participation in eight, one-hour, synchronous, online seminars. Sample seminar topics include: (a) inclusivity and purpose of mentoring, (b) culturally responsive mentoring, (c) difficult conversations and mental health, and (d) understanding success and imposter syndrome. Participants in Spartans Mentoring Spartans received a $500 scholarship at the completion of the program. A total of eight students participated in the program, all enrolled in a degree program within the Department of Community Sustainability at Michigan State University.

Data Collection and Analysis

Three types of data were collected. First, program facilitators conducted 25-to-40-minute, one-on-one, semi-structured interviews with seven of the eight program participants ($n = 7$). Interviews were conducted within two weeks of program completion. To triangulate, both program curriculum and facilitator observations were included as data.

All interview data were transcribed verbatim in preparation for data analysis. Then, the research team conducted a multi-stage analysis using the constant comparative method (Glaser, 1965). First, one member of the research team read all the interview transcripts to glean an introductory understanding of the data. Then, the same member inductively coded the data based on emergent and overlapping ideas. Then, codes were compared to each other to form overlapping ideas refined into themes. Following this, the research team met to review the data, codes, and emergent themes. Given the research team were also program facilitators, facilitator observations and program curriculum were integrated into the discussion to refine the final codes and themes.

Subjectivity Statement

All researchers on this project were facilitators of Spartans Mentoring Spartans who led the creation of the curriculum. Further, each member of the research team is committed to quality learning and feels inclusive mentoring is an essential skill to develop within postsecondary education.

Findings and Discussion

Four themes emerged from our qualitative analysis: motivation, program structure, impact, and online delivery. Each theme, and embedded codes (i.e., represented in *italics*) are explored below.

Motivation Theme

Students were asked about their motivations for engaging in the program. Students most referenced a *desire for social connections* as their motivation for engaging. One student noted,

"I've just grown to love leadership positions and reaching out to people and talking to people, so I thought it'd be a good opportunity." Another student highlighted a desire for social connections following the COVID-19 pandemic, sharing "I [hadn't] really been involved in stuff because of the pandemic, I [felt] like…in a complacent state where I was…good with doing nothing. And…I wanted to do something that would hopefully benefit me, allow me to meet new people."

The second most prevalent motivation articulated by participants was a *desire to give back by helping others*. A representative quote was, "I wanted to…give back to my community and my department because…this community is very giving and very supportive." Another dimension to this code was students articulating the value of mentorship; one student shared mentorship was something he "[wished] I had when I was a freshman," identifying "connecting with somebody who is older than you" as a valuable experience.

Program Structure Theme

The second theme emerging from our analysis relates to program structure, including elements students appreciated and elements students wished were different about the program. The first code, *discussion groups,* highlights a programmatic element through which students experienced growth. One student noted, "I definitely really did enjoy the breakout rooms that we did, like small group discussions…because it allowed people to kind of interact with each other." Another student noted the discussion groups provided an opportunity to discuss "how we can use this and how we experience this in our lives."

The second code, *importance of assigned mentees,* illustrates that students were divided on the decision to not require mentoring a younger student as a component of the mentor education program. One student reflected, "I think that would have been a cool addition…I think that would help a lot of people, especially in the kind of digital and isolated world." Conversely, another student shared, "I liked the aspect of not having a full mentor relationship…I liked being able to go over the ground rules, in a sense, and then be able to take that by myself."

Impact Theme

The third theme was the impact of the mentor education program. First, participants articulated the experience helped to develop important *conversation skills*. One student noted the experience resulted in "[knowing] how to be the one to carry the conversation, you know, be the one asking the questions." Representing the ideas shared from multiple students, one participant shared they did not "communicate with people…in a professional way" during the COVID-19 pandemic. Continuing, this student worried they had "lost some of that ability;" however, concluded the program "definitely played a role in helping me realize I can still communicate with people in a professional way."

The second code within the theme highlights participants felt they were *more informed mentors now and in the future*. Thinking toward the future, one student noted the program would be beneficial for themselves and their future mentees, because they now know "there should be an end goal, like there should be scheduled meetings, there should be certain criteria that actually makes a mentoring relationship work and work fluidly." Another student shared how they

implemented content from the program in elementary classrooms during the semester, sharing, "I was able to carry a lot of those communication skills and mentorship skills to be able to more effectively teach students."

In an additional code, students shared how the mentor education program afforded them an appreciation for *new and different perspectives*. One student expressed their appreciation for a seminar on "being culturally sensitive, taking into account other people's beliefs." Also referencing the seminar on cultural sensitivity, a student shared in other classes, "we don't discuss, in depth, imposter syndrome or culturally sensitive mentoring," but those discussions, "really changed how I view situations and talk to people and definitely made me feel more confident being a leader." In a reflective manner, one student shared "my hometown, it is like all white people," and that this experience "was important to learn about other things, and open my perspective, and get a different background."

The final code within the impact theme was related to a specific seminar on *imposter syndrome*. Expressing their appreciation, one student noted "it was a really good lesson…understanding you do belong." Another student shared, "talking about [imposter syndrome] with other people, I realized what it really was" expressing it "was interesting to hear…if other students deal with that too."

Online Delivery Theme

The final theme focuses on the online delivery system used to facilitate the mentor education program. The first code within this theme was students expressing *challenges connecting with people* on Zoom. Representing the ideas shared, one student voiced, "I feel like being in person, you are able to cultivate relationships a bit better rather than just seeing a picture on the screen." Reaffirming this perspective, another student shared, "it is just hard to connect with people over the computer."

The larger code within this theme, however, was students *weighing the pros and cons* of the online delivery system. Articulating this balance, one student shared "you can do everything on Zoom that you can do in person, but I do feel like in person you can make conversations flow better." Shifting their reflection to a recommendation, another student shared, "in the future, it might be helpful to do a hybrid format…I think that adds a balance and allows people to kind of have the best of both worlds." Overall, this code included participants negotiating the negatives to online learning (i.e., reduced engagement and learning) with the positives (i.e., flexibility).

Conclusions and Recommendations

This research explored the experiences of participants in a mentor education program. Insights from this research may inform broader mentor education programming; however, it is important to note the limitations of this research. Namely, this research is limited to a single program and the perspectives of seven program participants. Additionally, the research is limited by program facilitators conducting the interviews, increasing the possibility of social desirability bias. Therefore, caution is encouraged when extrapolating the findings to external contexts.

Considering these limitations, our conclusions and recommendations are organized into three over-arching ideas.

Importance of Application

Support was identified for both including and omitting the requirement to mentor during the program; however, most participants suggested the experience would have been enhanced by including a mentoring requirement. The omission of the mentoring requirement within the experience appears to have missed an opportunity to extend learning through application (Astin, 1993; Astin & Antonio, 2012). Therefore, we recommend programs strongly consider the inclusion of an authentic mentoring requirement. As program facilitators, we note the challenges associated with organizing this component; however, feel the effort is worth the added learning benefits.

Introducing New Perspectives

Seminars relating to inclusion, imposter syndrome, and cultural sensitivity were highlighted by students as particularly impactful. Evidence suggests the impact of these seminars comes, in part, from their novelty within postsecondary curriculum (Colvin & Ashman, 2010). Students expressed these components were at the forefront of their lived experiences and future leadership ambitions. Thus, program facilitators are encouraged to implement these topics within their curriculum; additionally, investigation of additional perspective-cultivating topics is warranted.

Hybrid Mentor Education

The final idea is structuring mentor education programs using a hybrid approach, balancing in-person and online learning opportunities. Recognizing mentoring education program are infrequently compulsory, program flexibility may attract a broader range of students. Further, balancing online and in-person learning seizes the opportunity to create a flexible experience via online learning while also affording opportunities for more authentic engagement and relationship building via in-person learning.

Mentor education programs serve a critical role in developing the next generation of inclusive mentors (Flores & Estudillo, 2018; Fox et al., 2010; Glaser et al., 2006). Continuing to inform these programs through diverse scholarship and informed practice is critical to their sustainability and impact.

References

Astin, A. W. (1993). *What matters in college? Four critical years revisited* (1st ed.). Jossey-Bass.

Astin, A. W., & Antonio, A. L. (2012). *Assessment for excellence: The philosophy and practice of assessment and evaluation in higher education.* Rowman & Littlefield.

Colvin, J. W., & Ashman, M. (2010). Roles, risks, and benefits of peer mentoring relationships in higher education. *Mentorship & Tutoring: Partnerships in Learning, 18*(2), 121-134. https://doi.org/10.1080/13611261003678879

Fox, A., Stevenson, L., Connelly, P., Duff, A., & Dunlop, A. (2010). Peer-mentoring undergraduate accounting students: The influence on approaches to learning and academic performance. *Active Learning in High Education, 11*(2), 145-156. https://doi.org/10.1177/1469787410365650

Flores, G., & Estudillo, A. G. (2018). Effects of a peer-to-peer mentoring program: Supporting first-year college students' academic and social integration on campus. *Journal of Human Services: Training, Research, and Practice, 3*(2), 1-25.

Glaser, B. G. (1965). The constant comparative method of qualitative analysis. *Social Problems, 12*(4), 436-445. https://doi.org/10.2307/798843

Glaser, N., Hall, R., & Halperin, S. (2006). Students supporting students: The effects of peer mentoring on the experiences of first year university students. *Journal of Australia and New Zealand Student Services Association, 27*, 4-17. https://doi.org/10.3316/aeipt.150638

Goecker, A. D., Smith, E., Fernandez, J. M., Ali, R., & Theller, R. (2016). Employment opportunities for college graduates in food, agriculture, renewable natural resources, and the environment. *United States Department of Agriculture*.

Goegan, L. D., & Daniels, L. M. (2021). Academic success for students in postsecondary education: The role of student characteristics and integration. *Journal of College Student Retention, 23*(3), 659-685. https://doi.org/10.1177.1521025119866689

Liu, R. (2021). Disparities in disruptions to postsecondary education plans during the COVID-19 pandemic. *American Educational Research Association Open, 7*(10), 1-19. https://doi.org/10.1177/23328584211045400

Merriam, S. (2002). *Qualitative research in practice: Examples for discussion and analysis* (1st ed., Jossey-Bass higher and adult education series). Jossey-Bass.

National Academies of Science, Engineering, and Medicine. (2019). *The science of effective mentorship in STEMM.* The National Academies Press. https://doi.org/10.17226/25568

Tinto, V, & Pusser, B. (2006). *Moving from theory to action: Building a model of institutional action for student success.* Paper presented at the National Symposium on Postsecondary Student Success.

Job crafting among state FFA officers by college major

Dr. John D. Tummons, University of Missouri
Alexandra Gast, University of Missouri
Jennifer Russell, University of Missouri

Introduction/Need for Research

Education is a demanding field; Agriculture teachers report tension and job stress in managing the extended work hours needed to fulfil their roles as an Agricultural Educator (Hainline et al., Lambert et al., 2012, Murray et al., 2011, Sorensen et al. 2017). COVID-19 caused a significant decline in job satisfaction among school-based agricultural educators (McKim & Sorenson, 2020). Burnout and declines in job satisfaction exacerbate teacher shortages (Eck & Edwards, 2019).

Employees who build a resourceful and challenging work environments experience a multitude of positive outcomes which influence employee well-being (Vogt et al., 2016). Seligman (2011) proposed PERMA (positive emotion, engagement, relationships, meaning, and achievement) as the foundation for positive psychology and an individual's well-being. Positive emotion is feeling good and serves as the cornerstone of happiness. Engagement is the intangible quality of an activity which causes an individual to become engrossed/absorbed in tasks. Relationships represent a natural inclination to connect with others. Meaning is working for something bigger than yourself. Achievement is the successful pursuit of a skill, leaving with a strengthened self-worth. Employees can proactively increase their well-being and performance by using PERMA to intentionally craft their jobs to make their work more engaging and meaningful (Schoberova, 2015).

Literature Review

Job crafting is not about changing the job, rather, employees can take initiative to alter job characteristics within the boundaries of specific job tasks (Berg et al., 2011). In a longitudinal study of teachers, van Wingerdern, Bakker, and Derks (2017) found a job crafting intervention led to significant increases in self-efficacy, performance feedback, job performance, and opportunities for professional development. Job crafting during student teaching was significant predictor of job satisfaction, teacher engagement, and learning gains (Dreer, 2022). Job crafting occurs in three vectors: 1) task crafting, where employees take on more or fewer tasks expanding or diminishing their scope of tasks, and changing how one performs tasks; 2) Relational crafting, changing the nature of one's interactions, and 3) Cognitive crafting, or altering how we perceive job tasks as a part of a bigger whole (Berg, et al., 2008).

Preservice agriculture teachers reported high social utility of their degree and value autonomy to craft a job and life they imagine (Marx et al., 2018). Preservice agriculture teachers who chose a career in teaching are more motivated by intrinsic rewards and higher self-efficacy than their non-teaching colleagues (Harms & Knobloch, 2005; Ismail & Miller, 2021). Ingram et al. (2018) found FFA participation beyond the local level motivated preservice agricultural education students to pursue a career in teaching and shaped their perceptions of teaching. Lawver and Torres (2012) found agricultural education classes and FFA contributed to students'

attitudes about their ability to teach agriculture. Similarly, Lawver and Torres (2011) found students' intent to teach was significantly predicted by their loyalty to the profession, are valued by society, and have a well-respected career.

Participation in FFA leadership events, CDEs, and Leadership camp increased the odds of students choosing a career in Ag Education (Thieman et al., 2016). McKay and Nash (2020) found holding an FFA officer position was a significant predictor of choosing an agricultural education major. Conversely, Marx et al.(2014) found serving as an FFA officer as only a moderate predictor of career decisions, and Wolf et al. (2020) found no relationship between FFA membership and career decision self-efficacy among undergraduate students.

State FFA officers often take on roles similar of an agriculture teacher, such as teacher, counselor, and leader. Local FFA members trust and confide in state FFA officers, often more than their own teachers or friends in the chapter (McLain, 2021). State FFA office fosters a strong work-related identity inexorably tied to their role as FFA member and youth leader (Dutton et al., 2020, McLain, 2021). Early field experiences such as these can provide opportunity for career exploration and teacher skill development, and most importantly, affirming the desire to become and agricultural educator (Retallick and Miller, 2010; Smalley and Retallick, 2011). Field experience students engage in near constant value-checking and introspective career evaluation; preservice teachers who were not state FFA officers reported out-group feelings when conversing with peers who formerly served as officers (Marx et al., 2017). State FFA officers reported intense pressure and expectations to perform, and mental health challenges as an officer, but report agriculture is an overall safe and supportive space (McLain, 2021). Almost all state officers reported experiencing lacking self-confidence and self-worth, thus became state officers to bring confidence to members and give them sense of belonging prior officers had instilled in them (Sanok et al., 2015).

A large proportion of state FFA officers pursue careers in Agricultural Education. Understanding the experiences of state FFA officers while serving in teacher roles could unlock valuable insight on which experiences may lead to choosing/affirming a future career in SBAE. This study addresses Ingram et al.'s (2018) recommendation for future research in how school based agricultural education programs influence preservice teachers' choice to teach agriculture.

Theoretical Framework

This study was guided by Wrzesniewski and Dutton's job crafting theory (2001). Job crafting theory suggests employees can redesign their jobs to foster job satisfaction and increase satisfaction, resilience, and thriving at work. Job crafting is an action and refers to how employees intentionally shape, mold and redefine their job, including changing interactions and relationships they have at work (Wrezensniewski and Dutton, 2001). Tims et al. (2012) developed a job crafting scale with four constructs: 1) increasing challenging demands (do employees experience adequate level of challenge to attain more difficult goals?) , 2) decreasing hindering job demands (can employees proactively lower their job demands when they are overwhelmed?), 3) increasing structural job resources (variety, opportunity for development, and autonomy) and 4) increasing social job resources social support, coaching, and feedback) (Tims et al., 2012).

Conceptual Framework

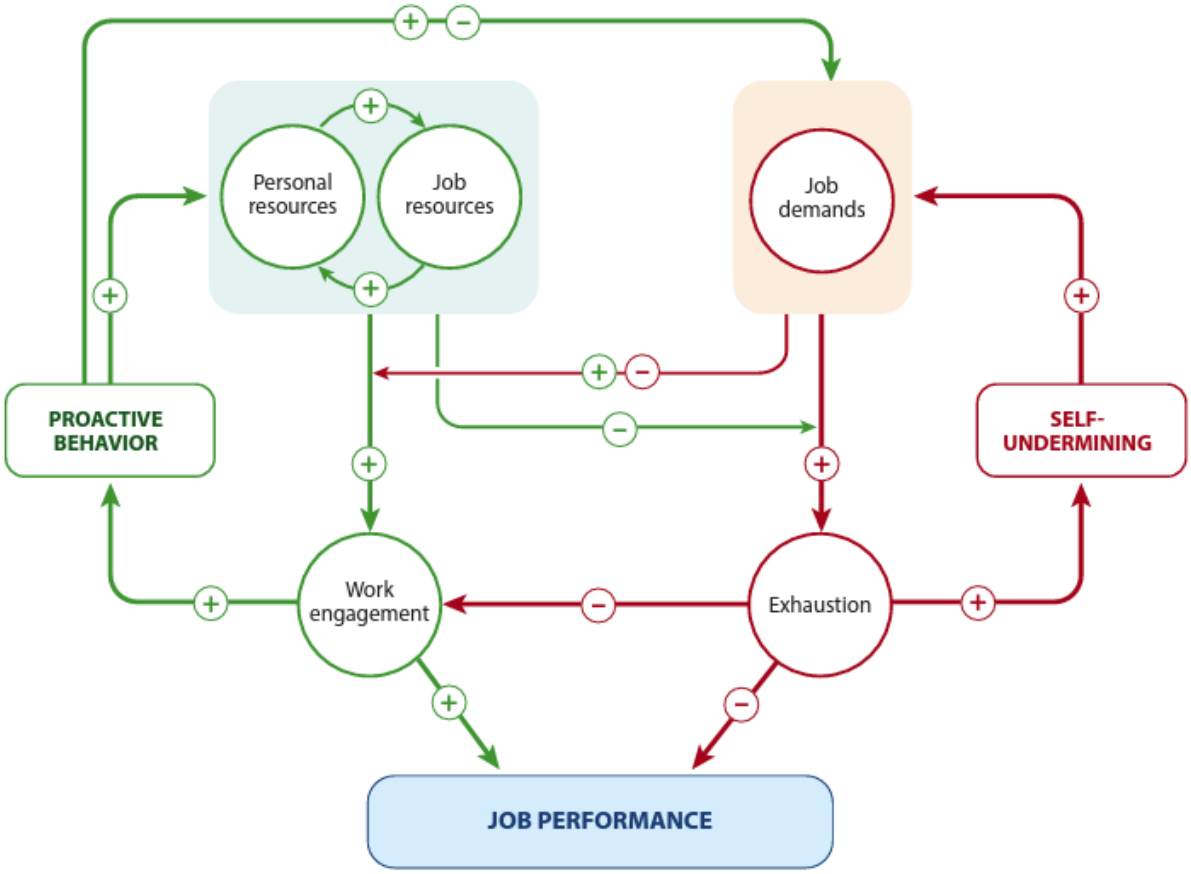


Figure 1. The job demands-resources model (Bakker & Demerouti, 2017).

Job crafting is the most common proactive employee behavior and occurs in demanding, resourceful, and changing work enviornments by employees who are proactive, motivated by growth, or experience misfit between their motivaitonal style and the enviornmental cues (Demerouti, 2023). Job crafting is related to changing a job to create a better fit between individual employee desires and job characteristics (Wrzeniewski & Dutton, 2001).

Purpose

The purpose of this study was to determine to what extent former Missouri FFA officers' perceptions of opportunities for job crafting as an officer differ for those majoring in Agriculture

Education/Communications when compared to non-Agriculture Education/Communications majors.

Objectives:

1. Describe the frequency of major choice among Missouri FFA state officers
2. Describe job crafting (*Increasing structural job resources, Decreasing hindering job demands, Increasing social job resources, Increasing challenging job demands*) levels for former Missouri FFA state officers
3. Identify significant differences in FFA officer job crafting constructs for students choosing a career in agriculture education/communication from non-agriculture education majors.
    a. H_o: No significant differences ($p > 0.05$) between job crafting constructs between Ag Education and non Ag Education majors.

Methodology

The target population of this study was former state FFA officers. The accessible population for this study was Missouri state FFA officers who had served in the past five years. The frame was retrieved from the Missouri FFA officer website. Researchers conducted a census of all 80 individuals who met the criteria. After receiving IRB approval, each participant was sent a google form with prompts for four job crafting constructs, their major in college (if applicable) and their career plans. Researchers utilized the job crafting scale (Timms, M., Bakker, A.B., & Derks, D., 2012), which consisted of four summated constructs of increasing structural job resources, decreasing hindering job demands, increasing social job resources, and increasing challenging job demands, adding "as a state officer" before each statement. Reported reliability for all four constructs exceeded $\alpha = 0.75$. After the initial contact, researchers followed up with three texts and emails, and received 46 usable responses, for a 57% response rate. Significance level was set *a priori* at $p<0.05$. Researchers collapsed career data into two groups- Ag Education/Communications ($n=20$) and non-Agricultural Education/ Communications ($n=26$) to even group sizes and reflect the combination of majors offered within the Agricultural Education departments in Missouri. Researchers conducted a MANOVA to determine if Agricultural Education/Communications majors differed from non-Agricultural Education/Communications majors across the four constructs. Researchers confirmed independence of observations, multivariate normality (Levene's test all nonsignificant), and homogeneity of covariance matrices (Box's $M= 7.09$, $p >0.05$) were tenable. Researchers calculated Wilk's lambda to identify any significant differences between the four job crafting subconstructs. Researchers failed to reject the null hypothesis ($\lambda =0.20$, $p > 0.05$). Readers should not infer findings beyond survey participants.

Findings

Objective two sought to describe the frequency of career choice for state FFA officers. Twenty of the 46 respondents reported majoring in Ag Education/Ag Communications, twelve majored in Agribusiness management, three majored in Biochemistry, four majored in general

agriculture, one student in fisheries and wildlife, two students majored in animal science, one student in plant sciences, one student in business administration, one student in nursing, and one student in broadcast journalism.

Objective two sought to describe the job crafting levels of former state FFA officers in performing the duties of their state office (see Table 1). On a scale from 1=*never* to 5=*always,* officers reported an overall score of 4.45(0.43 *SD)* for *increasing structural job resources*, 2.54 (0.77) for *decreasing hindering job demands,* 3.81(0.72) for *increasing social job resources*, and 3.77 (0.77) for *increasing challenging job demands*

Table 1- *Mean (standard deviation) job crafting scores among state FFA officers (n=46)*

	Overall (*n*=46)	Ag Education and Communications (*n*=20)	Non-Ag Education/ Communications (*n*=26)
Increasing structural job resources	4.45 (0.43)	4.48 (0.38)	4.42 (0.46)
Decreasing hindering job demands	2.54 (0.77)	2.35 (0.84)	2.69 (0.70)
Increasing social job resources	3.81 (0.72)	3.56 (0.76)	4.02 (0.63)
Increasing challenging job demands	3.77 (0.77)	3.68 (0.87)	3.85 (0.68)

Note: summated scale anchors for each is 1=*never;* 5=*often*

Objective three sought to determine to what extent Agricultural Education/ Communications students differed from non-Agricultural Education students in how often they engaged in the four constructs of job crafting (see Table 2).

Table 2- *MANOVA test for significant differences in job crafting constructs between Agricultural Education/Communications majors and non-Agricultural Education/Communications majors (n=46).*

	MS	*F*	η^2
Increasing structural job resources	0.04	0.20	0.01
Decreasing hindering job demands	1.33	2.28	0.05
Increasing social job resources	2.34	4.87*	0.10
Increasing challenging job demands	0.31	0.53	0.01

Note: *$p < 0.05$. Effect sizes Partial Eta Squared (ηp^2): Small effect size= .01; medium effect size = .06; large effect size = .14 (Cohen as cited in Lakens, 2013).

Researchers failed to reject the null hypothesis for Increasing Structural job resources, decreasing hindering job demands, increasing social job resources, and increasing challenging job demands between students Agriculture Education/Communication/Leadership students and non-Agriculture Education majors. Researchers detected a significant (p <0.05) difference between Increasing Structural job resources, with a *medium* effect size.

Conclusions/Implications/Recommendations/Impact on profession

Researchers conclude state FFA officers from this study are engaging in job crafting to some extent in their roles as officers. Job crafting implies proactive actions to increase job

performance, suggesting respondents are taking steps to modify the officer experience to better suit themselves. Those who were seeking careers in Agricultural Education/ Communications were similar to their non-Agricultural Education/Communications counterparts in increasing structural job resources, decreasing hindering job demands, and increasing challenging job demands. Researchers recognize state FFA officers in Missouri have been given clear tasks and expectations for their officer role through extensive training, which may explain the lack of variance in job crafting between groups.

Most surprising to researchers was the significant difference in increasing social job resources- "*I ask my supervisor to coach me", "ask whether my supervisor is satisfied with my work", look to my supervisor for inspiration", ask others for feedback on my job performance".* Ag Education / Communications majors ranked significantly lower than their non- Agricultural Education/Communications peers. Structural job resources refer to resource variety, opportunity for development, and autonomy and are associated with better performance (Tims et al., 2011). Researchers conclude Ag Education/Communications majors engaged in significantly lower crafting in increasing structural job resources because they did not experience misfit between their job expectations and performance. Job crafting is related to changing a job to create a better fit between individual employee desires and job characteristics (Wrzeniewski & Dutton, 2001). Do Ag Education students see state FFA office as a form of field experience for their career?

We recommend futher investigation into job crafting as a theoretical framework for further inquiry into teacher recruitment, mentoring programs, and teacher burnout. Teaching agriculture is a demanding career, yet agriculture teachers often wear their long hours like a badge of honor (Lambert, Henry, & Tummons, 2011). Job crafting can predict both teacher job satisfaction and work-related positive affect (Dreer, 2022). Future studies should investigate to what extent agriculture teachers believe they can craft their job to make it more meaningful, and to what extent job crafting could play a mediating role between heavy work expectations and burnout.

References

Bakker, A. B., Demerouti, E., & Sanz-Vergel, A. (2023). Job demands–resources theory: Ten years later. *Annual Review of Organizational Psychology and Organizational Behavior*, *10*, 25-53.

Berg, J.M., Dutton, J.D., & Wrzesniewski, A. (2011) What is Job Crafting and Why Does it Matter? Retreieved from https://positiveorgs.bus.umich.edu/wp-content/uploads/What-is-Job-Crafting-and-Why-Does-it-Matter1.pdf. University of Michigan Ross School of Business.

Compton, W. C., & Hoffman, E. (2020). *Positive psychology: The science of happiness and flourishing*. SAGE.

Dahling, J., O'Malley, A.L., and Chau, S.L., 2015. Effects of feedback motives on inquiry and 26 performance. Journal of managerial psychology, 30 (2), 199–215. doi:10.1108/JMP-12-2012- 27 28 0409

Demerouti, E. (2014). Design your own job through job crafting. *European psychologist*.

Dreer, B. (2022). Creating meaningful field experiences: the application of the job crafting concept to student teachers' practical learning. *Journal of Education for Teaching*, 1-13.

Eck, C. & Edwards, M. (2019). Teacher Shortage in School-Based, Agriculture Education (SBAE): A Historical Review. 60. 10.5032/jae.2019.042223.

Harms, B., & Knobloch, N. (2005). Preservice teachers' motivation and leadership behaviors related to career choice. *Career and Technical Education Research*, *30*(2), 101-124.

Huang, X., Wang, C., Lam, S. M., & Xu, P. (2022). Teachers' job crafting: The complicated relationship with teacher self-efficacy and teacher engagement. *Professional Development in Education*, 1-18.

Huang,X., Sun, M., and Wang, D., 2022. Work harder and smarter: the critical role of teachers' 20 job crafting in promoting teaching for creativity.Teaching and teacher education 116, 103758.21 doi:10.1016/j.tate.2022.103758

Ingram, M. L., Sorensen, T. J., Warnick, B. K., & Lawver, R. G. (2018). The influence of school-based agricultural education on preservice agriculture teachers' choice to teach. *Journal of Agricultural Education, 59*(2), 64-78 doi:10.5032/jae.2018.02064

Ismail, N., & Miller, G. (2021). Factors That Motivate High School Agriculture Teachers to Teach. *Journal of Agricultural Education*, *62*(1), 331-346. doi:10.5032/jae.2021.01297

Lambert, M. D., Henry, A. L., & Tummons, J. D. (2011). How Do Early Career Agriculture Teachers Talk about Their Time?. *Journal of Agricultural Education*, *52*(3), 50-63. DOI: 10.5032/jae.2011.03050

Lambert, M. D., Torres, R. M., & Tummons, J. D. (2012). The Influence of Time Management Practices on Job Stress Level among Beginning Secondary Agriculture Teachers. *Journal of agricultural education*, *53*(1), 45-56. DOI: 10.5032/jae.2012.01045

Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: A practical primer for t-tests and ANOVAs. *Frontiers in Psychology, 4*(863), 1-12. doi:10.3389/fpsyg.2013.00863

Lawver, R. G., & Torres, R. M. (2011). Determinants of pre-service students' choice to teach secondary agricultural education. Journal of Agricultural Education, 52(1), 61-71. doi:10.5032/jae.2011.01061

Lawver, R. G., & Torres, R. M. (2012). An analysis of post-secondary agricultural education students' choice to teach. Journal of Agricultural Education, 53(2), 28-42. doi:10.5032/jae.2012.02028

Marx, A. A., Simonsen, J. C., & Kitchel, T. (2014). Secondary Agricultural Education Program and Human Influences on Career Decision Self-Efficacy. *Journal of Agricultural Education*, *55*(2), 214-229.

Marx, A. A., Smith, A. R., Smalley, S. W. & Miller, C. (2017). Previous experience not required: Contextualizing the choice to teach school-based agricultural education. *Journal of Agricultural Education, 58*(4) 126-142. doi:10.5032/jae.2017.04126

McKay, C. W., & Nash, D. L. (2020). Factors Contributing to Students' Selection of Agricultural Education as a Major in a 4-Year University. *NACTA Journal*, *65*.

McKim, A. J., & Sorensen, T. J. (2020). Agriculture Educators and the Pandemic: An Evaluation of Work and Life Variable. Journal of Agricultural Education, 61(4).

McLain, S. R. (2021). *Ohio FFA State Officer Experiences with Mental Health Topics in Ohio Agricultural Education Programs* (Doctoral dissertation, The Ohio State University).

Schoberova, M. (2015). Job crafting and personal development in the workplace: Employees and managers co-creating meaningful and productive work in personal development discussions.

Retallick, M. S., & Miller, G. (2010). Teacher Preparation in Career and Technical Education: A Model for Developing and Researching Early Field Experiences. *Journal of Career and Technical Education*, *25*(1), 62-75.

Sanok, D. E., Stripling, C. T., Stephens, C. A., & Griffith, A. P. (2015). Factors Impacting Members Decision to Continue FFA beyond High School. *Journal of Agricultural Education*, *56*(4), 138-152. doi: 10.5032/jae.2015.04138

Smalley, S. W., & Retallick, M. S. (2011). Purposes, Activities, and Documentation of Early Field Experience in Agricultural Teacher Education: A National Delphi Study. *Journal of Agricultural Education*, *52*(3), 100-109. DOI: 10.5032/jae.2011.03100

Thieman, E. B., Rosch, D. M., & Suarez, C. E. (2016). Consideration of Agricultural Education as a Career: A Statewide Examination by High School Class Year of Predicting Factors. *Journal of Agricultural Education, 57*(4), 29-43. doi:10.5032/jae.2016.04029

Tims, M., Bakker, A. B., & Derks, D. (2012). Development and validation of the job crafting scale. *Journal of vocational behavior, 80(1),* 173-186.

Van Wingerden, J., Bakker, A. B., & Derks, D. (2017). The longitudinal impact of a job crafting intervention. *European Journal of Work and Organizational Psychology*, *26*(1), 107-119.

Vogt, K., Halanen, J. J., Brauchli, R., Jenny, G. J., & Bauer, G. F. (2016). The consequences of job crafting: A three-wave study. *European Journal of Work and Organizational Leadership.*

Wolf, K. J., Hoyle, T., Smith, K. L., & Foltz, J. (2020). The Relationship between FFA Participation and Career Decision Self-Efficacy. *NACTA Journal*, *65*.

Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of management review*, *26*(2), 179-201.

Evaluating Collegiate Learning Outcomes *without* Student Surveys

Amy M. Leman, University of Illinois at Urbana-Champaign
Jennifer A. Smist, University of Illinois at Urbana-Champaign

Introduction

Survey research has never been easier. Technology allows for surveys to be created quickly, sent electronically, and completed digitally. As more research and evaluation turn to survey use and people receive multiple and frequent survey requests, surveys may be losing their credibility within our society (Durand, 2017).

The University of Illinois at Urbana-Champaign (UIUC) requires all programs to evaluate their students' knowledge growth against a set of outcomes or standards. Instead of the traditional survey asking students about their career goals and how the program's curriculum outcomes impacted these goals, we restructured a capstone course to answer these questions built into their course assignments. This project is an attempt to evaluate the student program outcomes of a newly formed Agricultural Leadership, Education, and Communications (ALEC) program using evaluation techniques built into a capstone seminar's assignment structure *without* a post-graduation survey.

Agricultural leadership program evaluation offers challenges in the various disciplines and issues included within the curriculum (Kaufman et al., 2012). Adding communications and education only adds to the challenge. While analysis has been published on elements of agricultural leadership programs (i.e., Morgan et al., 2013; Velez et al., 2015), and to some extent, agricultural communications (Aherns & Gibson, 2013) and agricultural education (Birkenholz & Simonsen, 2011), little was found in the literature regarding creating or evaluating ALEC programs through a combined set of outcomes.

The UIUC ALEC program was formed in 2019, allowing the disciplines to create new learning outcomes for their new combined programs. Working with faculty, advisory council members, and industry representatives, the university created undergraduate learning outcomes aligned across all three disciplines. These learning outcomes include the following:

1. Create and lead meaningful experiences for lifelong learning and development.
2. Engage in critical inquiry to understand leadership, education, and communications challenges and opportunities.
3. Assess the human capital needs of a group, organization, or community to understand, formulate, and communicate solutions.
4. Apply theories and practices of leadership, education, and communication(s).
5. Lead, educate, and communicate using ethical and socially responsible principles and practices.

Student Involvement and Engagement Theory

Astin (1999) developed the Student Involvement Theory to describe the importance of involvement in the collegiate academic experience on student learning and development. Defined as both the physical and psychological energy students devote to their collegiate participation, involvement is both about the quantity of time spent and the quality of time spent in academic

pursuits. Astin (1999) specifically notes that the learning associated with an academic program is related to the quality and quantity of the student's involvement in the program activities. More recently, the concept of involvement has been re-named engagement (Kahu, 2013; Krause & Coates, 2008). Whether determined involvement or engagement, the concept is imperative when determining collegiate learning outcomes.

College program learning outcomes are designed to measure the learning achieved from course-related opportunities. The outcomes imply that all learning related to that topic is achieved from the specified academic program. However, college does not happen in a vacuum. Students bring with them outside experiences that shape and inform learning. Astin (1975, 1999) and Pascarella & Terenzini (2005) add the Input-Environment-Outcomes (I-E-O) Model to the Student Involvement Theory. The I-E-O model recognizes that inputs include academic opportunities, personal demographics, and experiences students possess when they arrive at college. The environment includes all people, places, structures, and experiences students experience at college. These two components create a breadth of opportunities leading to knowledge, attitude, and behavior change in college.

Objectives

Before the creation of ALEC at this university, the primary method of collecting student learning outcome data was through a survey sent to graduating seniors, asking to what extent they learned various concepts during their time in college and their plans after graduation. While this method provided data to address learning outcomes, it did not provide enough information to account for specifics about how the university curriculum and experiences impacted their outcome or the extent of their engagement in these experiences. In an effort to determine if students were engaged in their coursework to an extent that they would remember and connect the learning outcomes to their various course experiences, we revised the curricula for the ALEC capstone course to include student reflection projects on coursework in relation to the learning outcomes. Instead of a survey, we collected artifacts from class assignments that allowed students to reflect on their experiences in a broader sense.

The objectives of this project are to:

1. Determine if students connect their involvement in ALEC coursework and experiences to the learning outcomes of the ALEC program.
2. Assess the extent to which students match the ALEC learning outcomes to the individual courses designed to teach each outcome.
3. Evaluate the effectiveness of using capstone course assignments to assess overall program learning outcomes.

Methods

A capstone course, ALEC 451, Professional Development in ALEC, was created with the purpose of providing a professional capstone opportunity for graduating students in the ALEC degree. During the course, students completed a series of assignments designed to evaluate their understanding of program outcomes and the degree to which they found these concepts explicitly or implicitly in their course materials. Students completed two reflective essays about their professional goals and competencies learned through their engagement in ALEC courses, activities to connect their involvement and class experiences in their resume and cover letter, a

current event presentation that applied a specific learning outcome, and a professional portfolio that presented their key experiences and competences.

In the fall 2022 semester, 25 students in the final year of their undergraduate degree were enrolled in the capstone course. Of those students, 22 (88%) provided consent to use their assignments for this project. At the end of the semester, student assignments were downloaded from the course learning management system and de-identified by assigning a unique participant number prior to analysis. In the initial coding, we used two assignments: (1) a personal crosswalk where students connected their core experiences with the skills and outcomes gained from those experiences and (2) a written reflection where students identified how meaningful experiences from their crosswalk were associated with the program learning outcomes.

The assignments went through multiple stages of coding using Dedoose software among three researchers. First, the assignments were open-coded to determine the themes students expressed in their reflections. Then, the student themes were compared to the ALEC learning outcomes. These student themes and learning outcomes were matched with specific courses to determine if students recognized that certain courses designed to teach specific learning outcomes engaged students with these learning outcomes.

In order to determine the effectiveness of using the capstone course to assess learning outcomes, we adapted the list of program requirements for public programs (Kettner et al., 2017) to evaluate the effectiveness of this method. These requirements are included in Table 1.

Table 1.
Program Analysis Categories and Their Defining Question

Category	**Defining Question**
Coverage	Does the assessment method meet the university's needs?
Equity	Does the assessment method serve students of all identities?
Process	Was the assessment method implemented as it was intended in design?
Effort	Did the assessment method produce the desired output for ALEC?
Cost-Efficiency	What did the assessment method cost in terms of both time and inputs?
Results	Did the assessment method answer the question: Is ALEC meeting student learning standards?
Impact	Does the assessment method tell if ALEC is impacting students?

Results

Connecting Coursework to Learning Outcomes

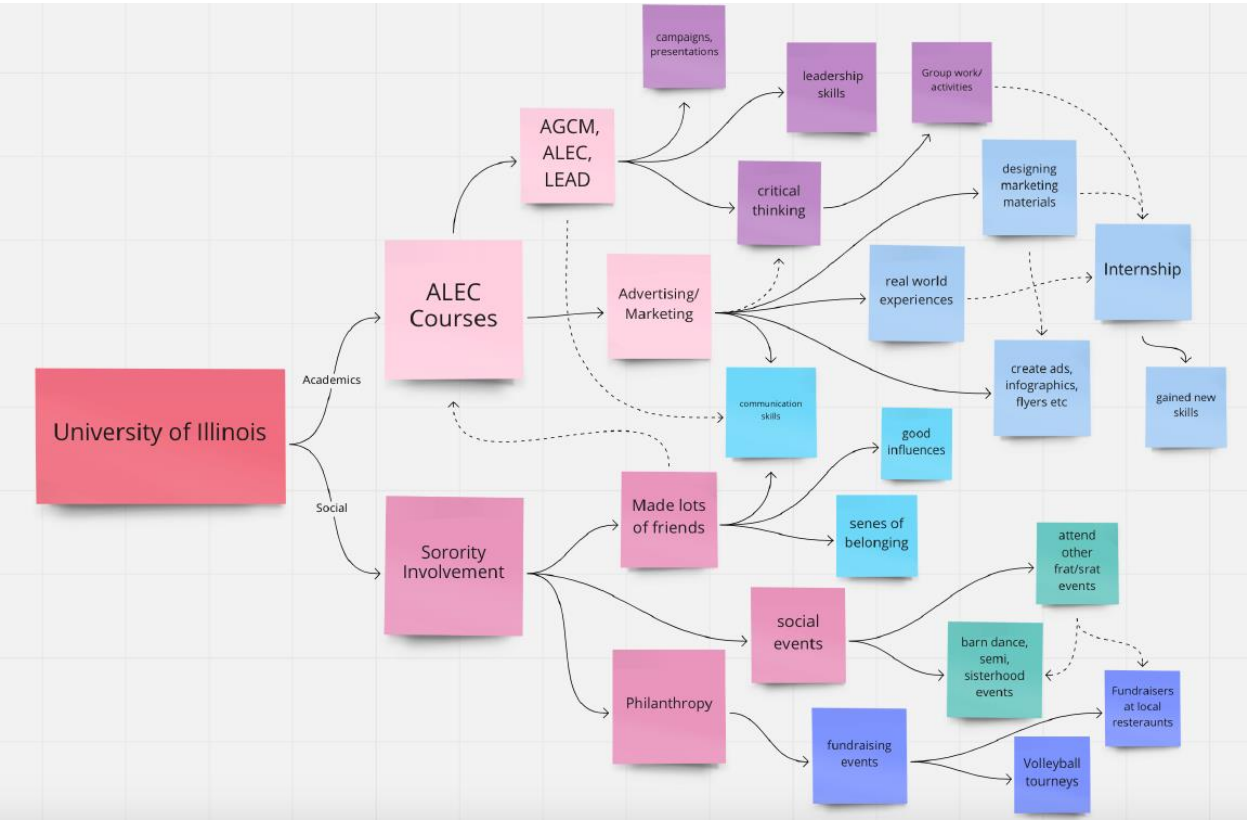
To measure the first and second objectives, we matched the students' reflections about their classroom learning with the five learning outcomes for the ALEC program. All students mentioned at least three of the objectives in their reflections. The codes from the student assignments were matched to the five ALEC learning outcomes. A summary of the students' interpretation of each outcome is provided below.

Creating and leading meaningful experiences for lifelong learning and development.

Students described skills they learned in classes that could help them create and lead meaningful experiences. They talked about understanding the viewpoints of others, leading teams and groups, making quick decisions, and completing tasks in a timely manner. Students felt they learned how to work in a professional environment. Students talked about specific courses where they worked in teams to create programs or create solutions to social problems. Some students used the assignments to visually draw their connection between experiences in college and their growth in skills and experiences. Figure 1 below gives an example.

Figure 1.

Student Depiction of Experiences and Skills Learned during College



Student 5

Engage in critical inquiry to understand challenges and opportunities.
Students referenced skills they learned to use in critical inquiry, such as adapting, organizing, creating, problem-solving, and constantly learning. Students discussed their self-inquiry to better understand their thoughts and feelings and their perceptions of the world and their place within it. They also reflected on the diversity of experiences people bring to the table and the importance of working to make everyone feel comfortable and an important member of a team, demonstrating social-emotional understanding.

> "As I have learned, these issues are complex and often do not have one singular answer. Engaging in critical inquiry has been a popular theme throughout my classes. Without practicing this, we would not have been successful in completing many projects to satisfaction. … In the professional world, there will be many more complex issues we do not understand and must think critically to solve." *Student 21*

Assess the human capital needs to understand, formulate and communicate solutions.
Students discussed assessing human capital needs in the construct of working as a team. They talked about collaborative leadership elements and the importance of teamwork. Elements related to teamwork include the importance of sharing information, trust, negotiation, listening specifically, and communication generally.

> "Being in leadership roles within RSO's [Registered Student Organizations] has taught me how to assess and organize the needs of the group and acknowledge and address them adequately. By working with my team, I am able to properly pull together a solution to issues and implement the plan. LEAD 260 [Foundations of Leadership] taught me to do this as well. I learned in that course and in LEAD 340 [Leadership, Ethics & Society: Addressing Contemporary Challenges] that to understand the people in my team I can better serve them. If I understand their background and where they're coming from I can understand them better and better meet their needs." *Student 18*

Apply theories and practices of leadership, education, and communication(s).
Students reflected on their classwork, clubs, and organizations in which they practiced their leadership, education, and communications skills learned in their coursework. Many gave specific examples of the organization to which they were able to use these theories and skills. Students discussed cross-disciplinary connections between their education, communications, and leadership courses and their applications. As an example, one student listed the specific courses and experiences that allowed them to apply theories and practices in realistic ways.

> "LEAD 321 [Training and Development] Developing a mock and real program. Partnering with students from another school to develop a virtual program.
> ALEC 393 [Internship in ALEC] I applied teamwork skills at my internship when creating the onboarding video and working with my coworkers
> ALEC Ambassador: Wrote letters to incoming students about the ALEC program and provided them information." *Student 17*

Lead, educate, and communicate ethical and socially responsible principles and practices.
Reflections reference students being involved, on many levels, in creating environments that sustain the needs of others. Their responses talked about a commitment to the improvement of other individuals and their community and university organizations and accepting others. Multiple students discussed different individuals having different ideas of ethical decisions and

navigating through the world with this understanding. The term "socially responsible" was very seldom mentioned and only in connection with "ethics."

> "Taking Intro to Ethics and Anthropology gave me a deeper understanding of the world but also why and how society functions. One scenario I think about a lot with ethics is there is a school bus and a prisoner bus that crash. If you go to the school bus and save the children, the prisoners escape. But, if you choose to detain the prisoners, the children will die. I think about this a lot because arguments can be made for either side but a person's decision in this scenario is highly based on personal moral compass. The reason I think about this is because it reminds me you have to be confident in your decisions and know your responsibility for the outcomes and not everyone will benefit from your decisions." *Student 2*

Effectiveness of Reflection

We evaluated the assessment method using eight categories. In terms of *coverage*, the capstone course reflection met the needs of the university evaluation criteria as the criteria are vague and provide few guidelines. By including all graduating students in the analysis, we met this category. For *equity*, the capstone course offered multiple opportunities for students to share their thoughts in diverse ways (concept maps, written reflections), which allows for diverse learners in ways that meet their particular needs. However, the course should be further evaluated for culturally relevant teaching practices. Regarding *process*, we realized we collected more data than we had time to analyze and will consider this for future years. Analyzing *effort*, the process did provide information to adapt the teaching in courses to address learning outcomes more directly. While there are many positive characteristics, this method is not *cost-effective* compared to survey dissemination. The time involved in this method of assessment is far greater than a one-time survey. However, the potential *impact* could be greater if the data is used to re-evaluate course objectives throughout the ALEC major.

Discussion and Implications

Future plans for this project are to first discuss the outcomes with the program faculty. The students mention opportunities to learn information more than apply information. Since the students are not yet in their careers, they might not have been able to apply the information they have learned. In addition, we found that many of the skills related to our outcomes overlap, however, it is up to the student to determine the means by which they apply the skill sets. If the program goal is to provide opportunities for students to apply their skills, then ALEC may need to build on the courses that specifically include applications and attempt to implement similar or related practices in other courses to extend opportunities for application.

The next steps include conducting a more extensive review of the literature about other agricultural leadership, education, and communications undergraduate programs and their outcome measurement. We will find similarities and make generalizable statements about how the ALEC program provides learned outcomes through the student experience that could be used to market the program. The work will also be cross-referenced with industry trends. As we adjust our coding process, we will also develop a set of standardized codes based on each learning outcome to move from open coding to deductive coding.

References

Aherns C.A, & Gibson C. (2013). The evolution of the agricultural communications degree program at Texas Tech University: A historical perspective. *Journal of Applied Communications, 97*(2). https://doi.org/10.4148/1051-0834.1119

Astin, A. W. (1975). *Preventing students from dropping out.* Jossey-Bass.

Astin, A. W. (1999). Student involvement: A developmental theory for higher education. *Journal of College Student Development, 40*(5), 518-529. https://www.middlesex.mass.edu/ace/downloads/astininv.pdf

Birkenholz, R. J., & Simonsen, J. C. (2011). Characteristics of distinguished programs of agricultural education. *Journal of Agricultural Education, 52*(3), 16-26. https://doi.org/10.5032/jae.2011.03016

Durand, C. (2017). Surveys and society. In C. Wolf, D. Joyce, T. W. Smith, & Y. Fu (Eds.), T*he SAGE Handbook of Survey Methodology* (online). Sage Publishing. https://dx.doi.org/10.4135/9781473957893

Kahu, E. R., Picton, C., & Nelson, K. (2019). Pathways to engagement: A longitudinal study of the first-year student experience in the educational interface. *Higher Education, 79*, 657-673. https://doi.org/10.1007/s10734-019-00429-w

Kaufman, E. K., Rateau, R.J., Carter, H.S., & Strickland, L. R. (2012). What's context got go do with it? An exploration of leadership development programs for the agricultural community. *Journal of Leadership Education, 11*(1), 122-139. https://doi.org/10.12806/v11/i1/rf7

Kettner, P. M., Moroney, R. M., & Martin, L. L. (2017). *Designing and managing programs: An effectiveness-based approach*. Sage Publishing.

Krause, K., & Coates, H. (2008). Students' engagement in first-year university. *Assessment & Evaluation in Higher Education, 33*(5), 493-505. https://doi.org/10.1080/02602930701698892

Morgan., C. A., King, D. L., Rudd., R., & Kaufman, E. (2013). Elements of an undergraduate agricultural leadership program. *Journal of Leadership Education, 12*(1) 140-155. https://doi.org/10.12806/v12/i1/140

Pascarella, E. T., & Terenzini, P. T. (2005). *How college effects students. Vol. 2. A third decade of research.* Jossey-Bass.

Velez, J.J., McKim, A.J., Moore L.L., & Stephens C.A. (2015). A nationwide assessment of the scope and impact of agricultural leadership education. *Journal of Agricultural Education. 56*(1), 116-126. https://doi.org/10.5032/jae.2015.01116

Describing 'Do, Reflect, Apply' as a Model for Reflective Writing

Dusti M. Ingles & Michael S. Retallick

Iowa State University

With an increase in automation, there is a pressing need to foster the achievement of the highest levels of cognition for all students (World Bank, 2019). A prominent goal of experiential learning (EL) is to foster higher-order thinking skills so that learners are more equipped as creative problem-solvers, critical thinkers, and lifelong learners by increasing their ability to transfer learning and maximizing transformation through education (AAC&U, 2009, National Research Council, 2000). EL offers a solution to the demand for the achievement of greater learning outcomes.

Reflection is a vital skill for students to maximize their learning while engaging in the experiential learning (EL) process (Boud, 1985; Dewey, 1933; Kolb, 1984/2015; Roberts, 2006). Reflection in learning involves processing what has been experienced (Boud, 1985). EL supports reflection and transfer of learning, providing foundational skills that contribute to lifelong learning (AAC&U, 2009). One approach for engaging learners in reflective practice is through reflective writing in portfolios (Boud, 1985).

Science with Practice (SWP), an undergraduate research and work experience course, provides a platform for EL at Iowa State University. SWP was created with a focus on the development of complex thinking through reflective practice (Retallick et al., 2009). In this semester-long undergraduate EL course students are guided through a research project or work experience. Throughout the experience, students develop a portfolio of artifacts as they engage with a faculty or staff mentor. Reflective practice is encouraged throughout the course as the students complete bi-weekly journal entries and submit a final report.

The *Do, Reflect, Apply* (DRA) model for EL programming is based on Kolb's EL Cycle and popularized by 4-H (Diem, 2001). SWP takes DRA a step beyond programming and aims to apply the model as a structure for facilitating reflective practice. In this way, DRA becomes more than a model for structuring programming, but also a model for guiding personal reflection. SWP is seeking to establish DRA as a scaffold for the development of the individual mind.

In addition to providing support for the philosophical proposition of DRA as a model for structuring reflective thinking, this study purposes to ascertain the content of reflective writing generated in SWP through each phase of the DRA reflective process. While SWP intentionally used DRA as a guide for reflective practice, the prompts provided to students to guide their writing were not explicitly aligned with DRA. Further, an examination of the content of reflective writing in SWP through the lens of DRA allows for a deeper understanding of the cognitive process produced because of *Do*, *Reflect*, and *Apply* as distinct reflective phasis.

Purpose and Objectives

The purpose of this study was to describe DRA as a model for reflective writing in SWP, an undergraduate research or work experience course at Iowa State University. The objectives were to:

- Align reflection prompts used in SWP to the DRA model for reflective thinking; and
- Determine the content of reflective writing generated in SWP in relationship to DRA prompts.

Conceptual Framework

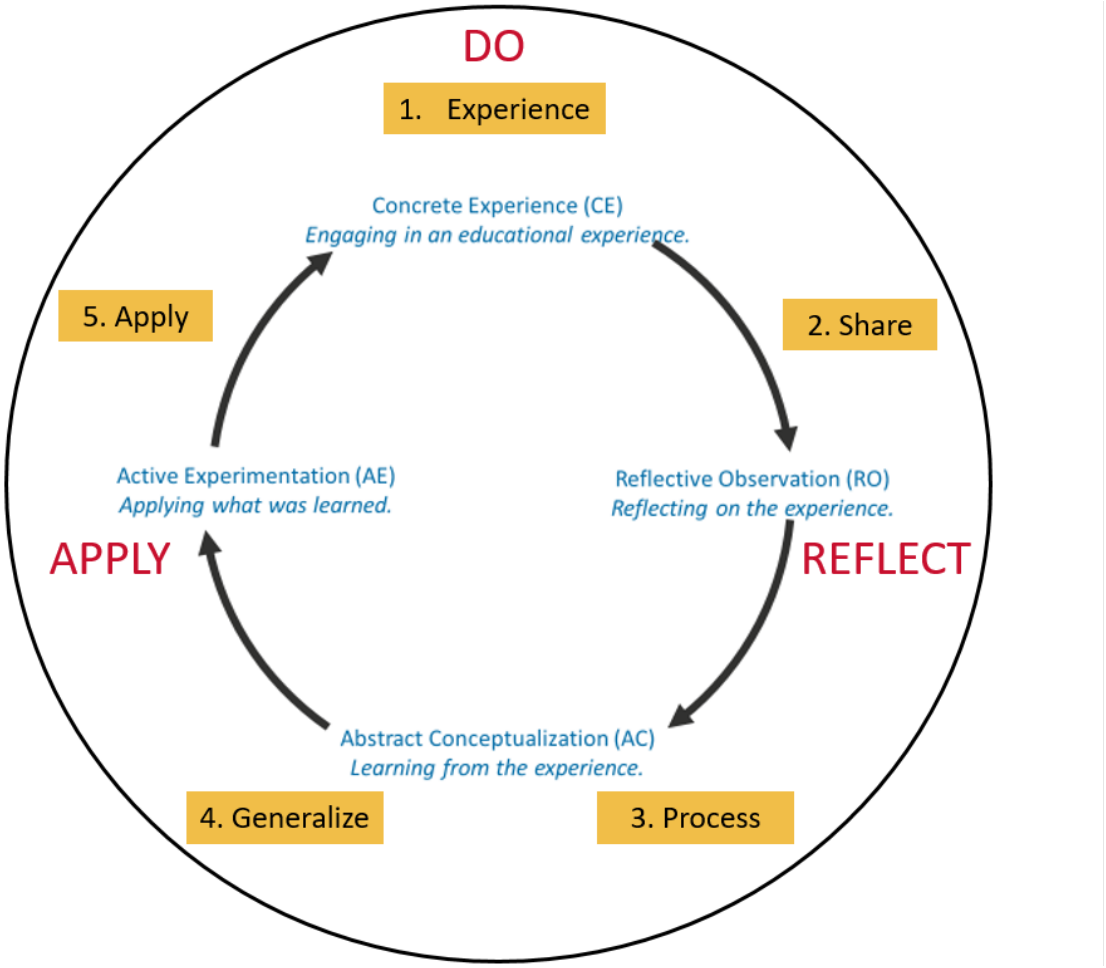
The principles of EL are founded on a constructivist paradigm of learning, providing the assumption that learners construct new understanding from previous knowledge as they engage with environmental stimuli. Modern perspectives of EL are built largely on the works of Dewey (1933, 1938). Dewey provided principles for guiding quality educative experiences in education.

In 1984, Kolb first published a contemporary model for EL. Kolb's EL Cycle is a four-phase process where the learner transitions through modes of learning: concrete experience, reflective observation, abstract conceptualization, and active experimentation. In Kolb's EL Cycle, reflection is an integral component of learning from experiences (Kolb, 1984/2015).

The EL Cycle has been simplified and popularized by 4-H. 4-H is a youth development program supported by the Cooperative Extension System and adopted EL as a strategy for implementing their "learning by doing" slogan (Diem, 2001). In adapting Kolb's EL Cycle to youth development, 4-H proposed three phases: *Do*, *Reflect*, and *Apply* (DRA) as a process for implementing EL-based youth development (Figure 1).

Figure 1

Kolb's EL Cycle aligned with the 4-H EL Model

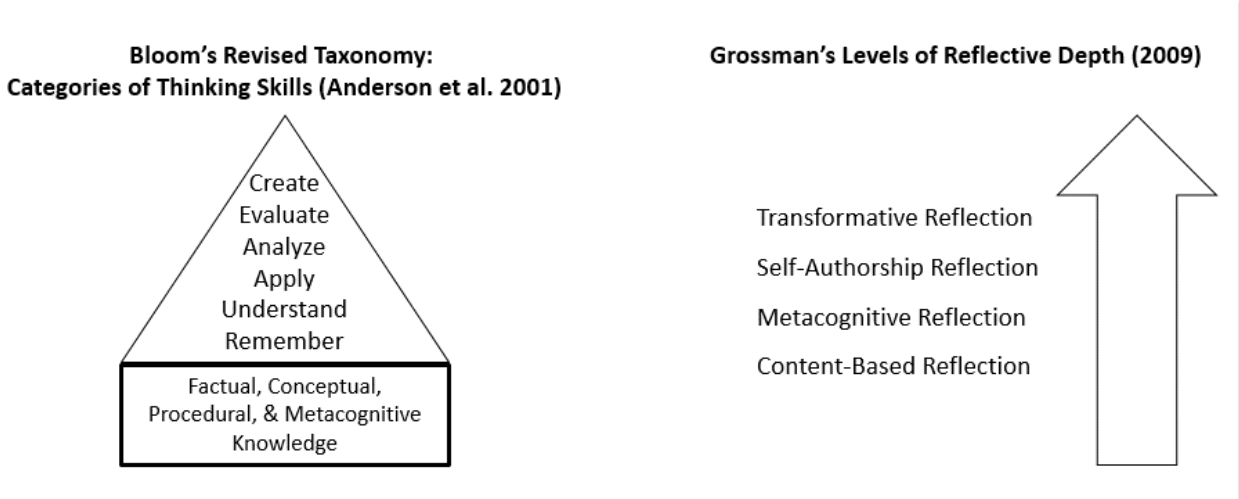


Note. The inner cycle in blue text is Kolb's EL Cyle, the outer cycle in gold highlight is the complete 4-H EL Cycle and the red text indicates the simplified EL model.

Two models contributed to the description of reflective thinking in SWP: Bloom's revised taxonomy (Anderson et al., 2001), and Grossman's levels of reflective depth (2009) (Figure X). These models serve as a foundation for defining the breadth and depth of cognition generated in DRA structured reflective writing in SWP.

Figure 2

Bloom's Revised Taxonomy and Grossman's Levels of Reflective Depth



Note. This figure includes an adaptation of Bloom's Revised Taxonomy (left) and a depiction of Grossman's Levels of Reflective depth (right).

The 4-H Experiential Learning Model provides theoretical foundation for DRA in SWP. This study begins by describing how DRA influenced the structure for reflective thinking generated in SWP. Next, the study seeks to determine the breadth and depth of reflective practice in SWP. Reflective content was described by using Bloom's revised taxonomy for domains of cognition for reflective breadth and Grossman's levels of reflection for reflective depth.

Methods

The methodological orientation of this study was a qualitative analysis (Ary et al., 2018). The student portfolios generated in SWP served to document and summarize the student's learning experiences in SWP and were the primary data source for this study. The International Review Board (IRB) and a representative for the Family Educational Rights and Privacy Act (FERPA) approved the procedures for this research. The data used in this research were de-identified and the research did not impact the completion of student coursework.

SWP was designated for undergraduate students in the College of Agriculture and Life Sciences (CALS). The program was fully launched in 2006. From 2006 – 2019 the lead instructor for the program remained consistent and the offering was in-person. In 2020, the COVID-19 pandemic disrupted the program, leading to the decision limit data analysis to academic semesters prior to 2019. The context of this study is bound to SWP portfolios produced by undergraduate students at Iowa State University from 2006 – 2019. While not generalizable, the findings from this study may be transferable to other EL contexts.

To address credibility as described by Ary et al. (2018), a random sample of 30 portfolios was obtained from the 516 portfolios available. The original intent of this study was to conduct mixed-methods analysis on the data and a sample of 30 portfolios was determined appropriate for obtaining statistically significant results in quantitative analysis. A digital randomizer tool was utilized for selection. Copies of the data removed from storage and de-identified to protect the student. The portfolios were assigned an identification number and later the authors of the portfolios were assigned pseudonyms.

A content analysis was conducted on SWP portfolios and supportive documents including program reports, course syllabi, and assignment descriptions. To further strengthen the credibility of this study, the primary instructor-of-record was consulted in this examination (Elo, 2014; Stahl et al., 2020).

In thematic analysis, the data are reduced and reconstructed to interpret the phenomena being observed (Ary at el., 2018). *Taguette* software was used to accomplish qualitative data analysis. Themes were derived from coding the data to assign meaning to the text. The codes were categorized and organized into themes (Bowen, 2009). Saturation was determined to be sufficiently achieved in review of portfolios 1 – 12, and the remaining 24 portfolios were not included in the analysis.

Findings

The first objective of this study was to align reflection prompts used in SWP to the DRA model for reflective thinking to describe DRA as a reflective model. This was achieved through a content analysis of SWP syllabus, assignment documents, and personal communication with the instructor of record.

Two assignments which focused most heavily on emphasizing DRA and providing prompts for reflection included the journal entry and final report assignments. The original assignment descriptions provided an explanation of DRA and a list of guiding questions. The qualitative analysis of these prompts led to the alignment of assignment prompts with DRA (Table 1).

Table 1

Reflection Prompts Aligned with "Do, Reflect, Apply"

Portfolio Artifact	D/R/A	Prompts
Journal Entries	*Do*	What were your learning experiences?
		What were your job tasks?
		What discussions did you have with your mentors or others?
	Reflect	What thoughts and questions do you have?
		What issues need to be addressed?
		What progress have you made related to your goals and expectations outlined in the learning agreement?
	Apply	How will you use what you learned in the future?
Final Report	*Do*	Focus the report on your development related to the goals and expectations outlined in the learning agreement. List and explain new tasks learned and any skills enhanced.
	Reflect	Were you able to accomplish/learn what you set out to learn? Why or why not? Expand on what you learned, gained, or will take away from this experience.
		What were the highlights of your experience? Why were they the highlights?
		In reviewing your journals, do you see that you made progress and grew throughout the experience?
		What advice would you give another student who may follow or replace you in your current position?
	Apply	What are the three most important things that will you take away from this experience?
		Describe how this experience will/will not benefit you in the future.

Note. This table offers examples of the original assignment prompts provided to guide student reflection which were aligned to DRA for this study.

The second objective of this study was to determine the content of reflective writing generated in SWP in relationship to DRA prompts. To accomplish this, a thematic analysis of the SWP portfolios was completed. Four themes were generated from this qualitative analysis: *Assessment and Analysis*, *Awareness*, *Transformation*, and *Transfer of Learning*. Each theme was aligned with *Do*, *Reflect*, and *Apply* prompts (Table 2).

Table 2

SWP Reflection Themes aligned with "Do, Reflect, Apply"

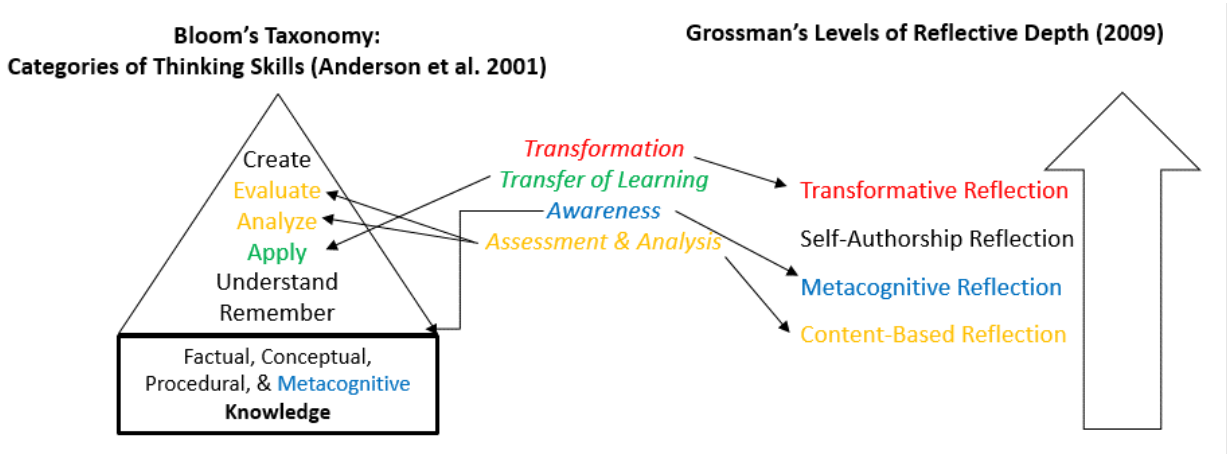
	Do	Reflect	Apply
Assessment & Analysis	✓		
Awareness		✓	
Transfer of Learning			✓
Transformation		✓	

Note. The themes generated from a qualitative analysis of written reflections in SWP were aligned with to Do, Reflect, or Apply based on how reflective prompts and reflective writing compared with definitions for Do, Reflect, Apply according to the EL model.

Further, the themes related to reflective breadth (Bloom's revised taxonomy) and depth (Grossman's levels of reflective depth) to describe the cognition achieved in reflection (Figure 3). It is informative to recognize both where reflective themes generated reflective breadth and depth, and the higher levels of cognition which were not observed in this analysis, which includes creating from Bloom's taxonomy and self-authorship from Grossman's levels of reflection.

Figure 3

SWP Reflection Themes aligned with Bloom's and Grossman's Cognition Models



Note. This figure uses arrows and color-coding to align the themes generated from the qualitative analysis of reflective writing in SWP with the models selected for describing cognitive breadth (Bloom's) and depth (Grossman's).

Prompts relating to *Do* generated *Assessment and Analysis* related reflections. *Assessment and Analysis* describes the highest levels of learning achieved when students were asked what they *did*. Bloom's taxonomy of thinking skills was found to be a useful guide to determine and describe the cognitive processes represented in SWP reflective writing (Anderson et al., 2001). Beyond remembering and understanding the content of their experience, they demonstrated higher order thinking when they assessed their skills and knowledge learned and analyzed the challenges and successes of their experiences. Ashley provides an example of this type of reflection:

> *Science with Practice is a unique program that Iowa State University has the opportunity to offer. In this class, students get hands-on work experience in many different areas ranging from research to communications. Besides the hands-on approach, we as students, also have a classroom portion in the program to develop our professional skills*.

When asked to *Reflect* on their experiences, students' writing demonstrated evidence of their expanding on their *Awareness* and processing the *Transformation* they experienced. *Awareness* was determined a suitable description for the combination of metacognitive awareness and self-knowledge found throughout the reflective writing in SWP portfolios. Metacognitive reflection is described by Grossman (2009) as "thoughts about [one's own] thinking." In Bloom's revised taxonomy, self-knowledge includes "awareness and knowledge of one's own cognition" (Anderson et al., 2001). Demonstrating *Awareness,* Chris attributed their progress in achieving their goals to the reflection process.

Of all the jobs that I have had during my college experiences, I feel that I have gained the most from [my work experience] this semester. Part of it may be because it was tied with Science with Practice which caused me to actually set goals and reflect throughout the semester but I still accomplished more advanced skills that I will be able to use in my future endeavors… One of the main things I have learned from this experience overall is to write goals and actually work towards them. Doing regular reflections is also very important in this process to see what you have accomplished and what should happen next. All areas of my life can benefit from this experience.

Grossman's levels of reflective depth (2009) describe transformative reflections as those where learners provide evidence of being empowered by becoming more responsible and self-directed and critical of their own assumptions because of the experience. Students' perceptions, beliefs, attitudes, and values were transformed during their experience in SWP. Michael shared an example of how students were transformed in his behaviors from the experience:

Since beginning work on the manual, I have grown in motivation, diligence, and precision as a worker I also managed to somehow underestimate the enjoyment I would get from explaining myself and these animals to future readers through my computer.

Lastly, when asked to *Apply*, reflection focused on *Transfer of Learning*. Transfer of Learning involves using prior knowledge in a new context (National Research Council, 2000). Transfer of learning is described in Bloom's revised taxonomy in the *applying* cognitive domain as implementing or using new information to an unfamiliar task (Anderson et al., 2001). Students reflected on their ability to transfer practical interpersonal and job-specific skills they had gained in previous experiences into their SWP experiences. Emily focused on the relevance of prior coursework and lab skills.

I realized why taking microbiology class and lab is important because I used a lot of my knowledge from that class… I used a lot of what I learned in micro lab to identify and understand the micro-organisms on the plates.

Performing a content analysis on SWP documents and portfolios led to a description of how DRA prompts guided reflective writing and informed the content of reflective thinking as SWP students developed skills in reflective practice. Prompts for the journal entries and final report in SWP were categorized by DRA and a thematic analysis of reflective writing revealed how DRA prompts led student thinking.

Conclusions and Recommendations

By using the DRA Model for reflective writing, students were able to move beyond the reporting found in laboratory journals and consider their experiences in detail. In this model, learners begin by recounting what they *did* by explaining what was accomplished or done in their learning experience. Next, learners *reflect* by sharing and processing their experience. Lastly, learners *apply* their experience by generalizing their knowledge to real-world situations and considering how they will apply what they learned in new situations.

Based on this research, recommendations are made for structuring reflection using DRA prompts. When probing into what students *did*, consider asking them to describe their experience, list their tasks, and recall details of what occurred. In addition, prompt students to

describe interactions with others to explore interpersonal dynamics and personal feelings so they may become more critical of their own assumptions.

Asking students to *Reflect* could include asking them to elaborate on their thoughts or feelings, to consider what questions they have or what issues need addressed. Reflection prompts should allow the students to consider how they feel, what they are thinking, and how their thoughts and feelings are related (Grossman, 2009). In identifying the relationship between these, students develop deeper awareness of themselves and the personal impact of their experiences, which fosters self-authorship reflection.

Prompts for *Apply* involve asking the student to determine how they will use their learning in the future and describing how their goals will be affected. By generalizing their experiences, learners can connect them to the real-world and how they will use their learning in new situations. Generating solutions or coming up with new ways to apply learning would help learners achieve the creative cognitive domain. Ask students to provide advice to their past or future selves. Prompts should include questions about how students have become more empowered by becoming more self-directed, responsible, and critical of their own assumptions because of their experience maximizing transformative reflections.

Finally, choose DRA prompts intentionally based on the desired focus of reflection. If the focus is on developing students' *Assessment and Analysis* skills, *Do* prompts should be provided. When developing students' reflective skills in *Awareness* or *Transformation, Reflect* prompts are most constructive. Finally, *Transfer of Learning* is best facilitated with the use of *Apply* prompts from the DRA Model.

In conclusion, a review of SWP documents and portfolios provides the opportunity to suggest improvements facilitating the cognitive development of students in SWP. The DRA model for reflective thinking is recommended as a tool for teaching reflection skills in EL programming. The model lends itself to the use of educators and learners as a starting place for intentionally developing skills in reflective practice.

References

American Association of Colleges & Universities (AAC&U). (2009). *Valid assessment of learning in undergraduate education (VALUE) rubric*. American Association of Colleges & Universities. https://www.aacu.org/initiatives/value

Anderson, L. W., Krathwohl. D. R., Airasian, P. W., Cruikshank, K., A., Mayer, R. E., Pintrich, P. R., Raths, J., Wittrock, M. C. (Eds). (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Longman.

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

Boud, D., Keogh, R., & Walker, D. (Eds.). (1985). *Reflection: Turning experience into learning* (1st ed.). Routledge. https://doi.org/10.4324/9781315059051

Bowen, G.A. (2009), Document analysis as a qualitative research method. *Qualitative Research Journal, 9*(2), 27-40. https://doi.org/10.3316/QRJ0902027

Dewey, J. (1933). *How we think*. University of Wisconsin Press.

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

Diem, K. G. (2001). *Learn by doing the 4-H way*. New Jersey 4-H Leader Training Series. Rutgers Cooperative Extension.

Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K., & Kyngäs, H. (2014). Qualitative content analysis: A focus on trustworthiness. *Sage Open, 4*(1). https://doi.org/10.1177/2158244014522633

Grossman, R. (2009). Structures for facilitating student reflection. *College Teaching*, *57*(1), 15–22. https://doi.org/10.3200/CTCH.57.1.15-22

Kolb, D. A. (2015). *Experiential learning: Experience as the source of learning and development*. (2nd ed.). Prentice-Hall. (Original work published 1984)

National Research Council (2000). *How people learn: Brain, mind, experience, and school*. National Academies Press. https://doi.org/10.17226/9853

Retallick, M. S., & Steiner, C. (2009). A model for implementing a college-wide experiential learning program in higher education. *North American Colleges and Teachers of Agriculture Journal, 53*(1), 2–6.

Roberts, G., (2006). A philosophical examination of experiential learning theory for agricultural educators. *Journal of Agricultural Education 47*(1), 17-29. doi:10.5032/jae.2006.01017

Stahl, N. A., & Kind, J. R. (2020). Expanding approaches for research: Understanding and using trustworthiness in qualitative research. *Journal of Developmental Education, 44*(1), 26–28.

World Bank. (2016). *World development report 2016: Digital dividends*. The World Bank Group.

Examining the Relationship Between School-Based Agricultural Education Teacher Social Media Use and Self-Confidence

Josie Manternach, The Ohio State University
Kellie Claflin, The Ohio State University

Introduction

The immense to-do lists of educators has made teaching one of the most stressful careers (Smith & Smalley, 2018). School-based agriculture education (SBAE) teachers, specifically, must be knowledgeable about agricultural, food, and natural resources (Easterly & Simpson, 2020), manage a FFA chapter (Mundt & Connors, 1999), and meet the needs of the community (Traini et al., 2021). These expectations have SBAE teachers turning to professional development to network, become reenergized, and learn how to handle the stresses within their career (Smalley & Smith, 2017).

However, teachers are looking for alternative outlets for teacher learning opposed to the traditional "one shot, sit and get workshops" (Hunzicker, 2011, pg. 1). Utilizing resources available through social media platforms has allowed teachers to explore their own learning opportunities (Prestridge, 2019; Vu, et al. 2014). Prestridge analyzed the reason for social media use amongst teachers, concluding teachers are going online to self-learn. Ray et al. (2022) found that SBAE teachers are engaging online for their professional learning purposes, especially new teachers. Professional development is also related to increased self-efficacy, including SBAE teachers (McKim & Velez, 2017; Ulmer et al., 2013). Knowing that SBAE teachers are seeking out professional development online and that professional development may impact teacher self-efficacy, this study sought to identify the relationship between SBAE teacher social media use for professional purposes and self-efficacy.

Theoretical Framework

This study was grounded in self-efficacy, a facet of Bandura's (1986) social learning theory. Bandura's social learning theory is based on the idea we learn by observing others in a social context (Bandura, 1986; Nabavi et al. 2012). Bandura's theory and prior research supports the idea that when an individual observes an event and makes sense of their experience it will shape future behaviors (Bandura, 1986; Devi et al., 2017). One tenet of Bandura's work, self-efficacy, refers to the self-perception one has to complete a task and has been used interchangeably with self-confidence (Feltz & Öncü, 2014; Tschannen-Moran et al., 1998). Bandura conceived of four types of experiences that impact the development of self-efficacy. For this study, two of those experiences, vicarious and social persuasion, were used to approach how individuals build their self-efficacy. Vicarious experiences include observing others accomplishing the task, while social persuasion experiences are those where an individual receives feedback from others on their ability (Bandura, 1986, 1997; McKim, 2016). Within educational research, self-efficacy has been identified as having a positive relationship with teacher effectiveness (Tschannen-Moran et al., 1998).

Purpose and Research Questions

The purpose of this study was to describe the self-confidence of SBAE teachers and examine the relationship between the self-confidence and professional use of social media amongst SBAE teachers. The following objectives lead this study:

1. Describe the perceived level of teacher self-confidence in SBAE teachers.
2. Describe the social media engagement of SBAE teachers.
3. Describe the relationship between SBAE teacher social media use and self-confidence.

Methods

A descriptive correlational survey design was used to describe SBAE teacher's level of self-confidence and SBAE teacher's use of social media for professional purposes. A list of 780 SBAE teachers was received from the National FFA Organization with an online survey instrument being distributed in February and March of 2023; 128 teachers responded to the study, resulting in a 16% response rate.

The instrument included three sections: teacher self-confidence, elements of teacher engagement, and demographics. The self-confidence section was adapted from the Teaching Confidence Scale designed by Hoy and Burke-Spero (2005) with a six-point Likert-type scale. The second section focused on social media engagement for professional purposes. Social media use for professional purposes was defined as utilizing a social media platform to network with other teachers and professionals to gain knowledge and use resources to improve one's teaching practice (Prestridge, 2019). This section asked participants to identify the social media platforms they utilized, as well as the elements of teacher engagement (EOTE) scale developed by Ray et al. (2022). The EOTE scale included five subscales based on Krutka et al.'s (2016) elements of teachers' professional learning network activities: sharing, engagement, discovery, experimenting, and reflecting. Participants responded to the prompts using a six-point Likert-type scale. The demographic section included questions about the number of years completed as a teacher, gender identity, the highest level of education they have completed, and their pathway to teacher certification. A description of respondent demographics is in Table 1.

Table 1

Respondent Demographics

Demographic Item	*F*	*%*	*N*
Years Completed as a Teacher			106
0 Years (First Year Teacher)	6	5.7	
1-5 Years	40	37.7	
6-10 Years	14	13.2	
11-20 Years	28	26.4	
21-30 Years	14	13.2	
31-40 Years	4	3.8	
Age			106
18-24	10	9.4	
25-34	40	37.7	
35-44	24	22.6	
45-54	24	22.6	
55-64	7	6.6	

Prefer not to Answer	1	.9	
Gender			106
Male	42	38.7	
Female	62	58.5	
Prefer Not to Answer	3	2.8	
Highest Level of Education			101
Bachelor's Degree	29	28.7	
Some Graduate Course Work	21	20.8	
Master's Degree	47	46.5	
PhD	4	4.0	
Pathway to Teacher Certification			100
Traditionally Certified, Ag Ed BS	54	54.0	
Traditionally Certified, Ag Ed MS	19	19.0	
Alternatively Certified	23	23.0	
Not Certified	1	1.0	
Other	3	3.0	

Note. F = Frequency; *%* = Percentage, *N* = Total Population

Cronbach's alpha was used to analyze the reliability of each construct. The Teaching Confidence scale and elements of EOTE were proven reliable by post hoc analysis. The Teaching Confidence scale had a Cronbach's ⟨ = .920 and the subscales of EOTE were highly reliable, with a minimum Chronbach's ⟨ = .852 amongst the five subscales.

Findings

Research Objective #1

Research question one sought to describe the perceived level of teacher self-confidence in SBAE teachers. The self-confidence construct described perceived levels of teacher self-confidence through a variety of skills in teaching. Self-confidence was measured on a 10-item, six-point Likert-type scale with 1 = *strongly disagree*, 2 = *moderately disagree*, 3 = *disagree more than agree*, 4 = *agree more than disagree*, 5 = *moderately agree*, 6 = *strongly agree.* Means of the ten items included in the scale ranged from 5.27 to 5.64. Standard deviations of the ten items included in the scale ranged from .59 to .95. The complete 10 item self-confidence construct had a grand mean of 5.35 (*SD* = .71). Table 2 displays means and standard deviations of each item.

Table 2
Descriptive Statistics for SBAE Teacher Self-Confidence

Items	*SD* *F (%)*	*MD* *F (%)*	*DMA* *F (%)*	*AMD* *F (%)*	*MA* *F (%)*	*SA* *F (%)*	*M*	*SD*	*N*
Teach basic concepts of agriculture curriculum.	0(0.0)	0(0.0)	1(0.9)	3(2.7)	31(27.9)	76(68.5)	5.64	0.59	111
Evaluate students' work.	0(0.0)	0(0.0)	0(0.0)	15(13.3)	40(35.4)	58(51.3)	5.38	0.71	113
Incorporate different activities into agriculture teaching.	0(0.0)	0(0.0)	2(1.8)	13(11.7)	43(38.7)	53(47.7)	5.32	0.75	111
Locate resources for preparing agricultural science lessons.	0(0.0)	1(0.9)	1(0.9)	13(11.5)	50(44.2)	48(42.5)	5.27	0.77	113
Teach effectively to my students.	0(0.0)	0(0.0)	1(.9)	15(13.3)	50(44.2)	47(41.6)	5.27	0.72	113
Facilitate class discussions.	0(0.0)	1(0.9)	3(2.7)	17(15.0)	37(32.7)	55(48.7)	5.26	0.87	113
Construct student-centered activities.	0(0.0)	0(0.0)	4(3.6)	16(14.4)	40(36.0)	51(45.9)	5.24	0.83	111
Create integrated lessons and units.	0(0.0)	0(0.0)	4(3.6)	16(14.4)	46(41.4)	45(40.5)	5.19	0.82	111
Manage classrooms.	0(0.0)	1(0.9)	6(5.4)	18(16.2)	35(31.5)	51(45.9)	5.16	0.95	111
Use a variety of assessment techniques.	0(0.0)	1(0.9)	6(5.3)	17(15.0)	43(38.1)	46(40.7)	5.12	0.92	113

Note. Scale: SD = strongly disagree, MD = moderately disagree, DMA = disagree more than agree, AMD = agree more than disagree, MA= moderately agree, SA=strongly agree
Note. F = Frequency; % = Percentage; *M*= Mean; *SD* = Standard Deviation; *N* = Total Number of Responses

Research Objective #2

Respondents were asked to select all the social media channels they used for professional purposes related to teachers. Facebook was most utilized with 69.3% of respondents indicating they used it for professional purposes. The next most frequently used social media platforms in order were YouTube with 56.1% of respondents, Instagram with 35.1% of respondents, Pinterest with 28.9% of respondents, and TikTok with 20.2% of respondents.

To describe the elements of online teacher engagement (EOTE) of SBAE teachers, respondents indicated the highest-level agreement with statements about how they used social media for professional purposes. The *discovery* sub-scale of the EOTE scale had the highest level of agreement while the *sharing* sub-scale had the lowest level of agreement. Descriptive statistics for the EOTE subscales can be found in Table 3.

Table 3

Descriptive Statistics for the Elements of Online Teacher Engagement Sub-Scales

Items	*M*	*SD*	*N*
Sharing	3.26	1.52	102
Reflecting	4.10	1.19	102
Discovery	4.68	1.15	100
Engagement	4.17	1.31	100
Experimenting	4.43	1.20	98

Note. *M* = Mean; *SD* = Standard Deviation; *N* = Total Number of Responses

Research Objective #3

Research question 3 sought to describe the relationship between SBAE teacher social media use and self-confidence. The relationship between teacher self-confidence and the EOTE was determined not significant with a negligible association in effect size (Field, 2013). Between the five constructs, discovery, experimenting, and engagement shared a very weak, negative, statistically non-significant relationship with self-confidence. Reflecting and sharing shared a very weak, positive, statistically non-significant relationship with self-confidence. Table 4 provides the correlations of teacher self-confidence and EOTE.

Table 4

Correlations of Teacher Self-Confidence and Elements of Online Teacher Engagement

Items	ρ	r^2	*N*
Sharing	.07	.013	102
Reflecting	.07	.013	102
Discovery	-.01	.001	100
Engagement	-.02	.001	100
Experimenting	-.04	.012	98

Note. Spearman's correlation coefficients (ρ)

Discussion

Overall, the results indicated SBAE teachers are self-confident as a teacher with over 50% of respondents moderately and strongly agreeing to all 10 items. With the demographics of respondents varying in years of teaching from 0-40, this aligns with literature that identifies teacher self-efficacy is stable among agriculture educators at different career stages in agriculture education (McKim & Velez, 2015). Amongst the participants, 92.1% utilize a variety of social media channels within their work with Facebook and YouTube being the most utilized. Within the EOTE, participants indicated the highest-level of agreement with the *discovery* subscale, which reflects their usage of social media for discovering new teaching resources. The fact that *sharing* had the lowest-level of agreeance could reflect the discomfort among participants of sharing feelings and opinions in an online space. Additionally, using social media for professional purposes does not directly correlate with higher levels of teacher self-confidence among SBAE teachers.

The results indicate SBAE teachers are self-confident in the work they are doing in the classroom. These same teachers are also using social media for professional purposes and have positive attitudes in the five elements of online teacher engagements: engaging, discovering, experimenting, reflecting, and sharing. While there is not a statistically significant correlation between self-confidence and the elements of online teacher engagement, additional research is warranted based on prior findings (McKim & Velez, 2017; Ulmer et al., 2013). Future research should analyze the differences between demographic groups (e.g., gender, age, years teaching) to identify if there are differences among specific populations. As we continue to search for new forms of professional learning to support educators, further examination is warranted to identify how social media-based professional learning is impacting educators.

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. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall.

Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher*, *38*(3), 181–199. https://doi.org/10.3102/0013189x08331140

Easterly, R. G., & Simpson, K. A. (2020). An examination of the curricular resource use and self-efficacy of Utah School-based agricultural education teachers: An

Feltz, D. L. and Öncü, Erman. (2014). Self-confidence and self-efficacy. In Papaioannou, A. G., & Hackfort, D. (Eds.). *Routledge companion to sport and exercise psychology: global perspectives and fundamental concepts* (pp. 417-429). Routledge.

Hunzicker, J. (2011). Effective professional development for teachers: A checklist. *Professional Development in Education*, *37*(2), 177–179. https://doi.org/10.1080/19415257.2010.523955

Hoy, A. W., & Spero, R. B. (2005). Changes in teacher efficacy during the early years of teaching: A comparison of four measures. *Teaching and Teacher Education*, *21*(4), 343–356. https://doi.org/10.1016/j.tate.2005.01.007

Krutka, D. G., Carpenter, J. P., & Trust, T. (2016). Elements of engagement: A model of teacher interactions via Professional Learning Networks. *Journal of Digital Learning in Teacher Education*, *32*(4), 150–158. https://doi.org/10.1080/21532974.2016.1206492

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

McKim, A. J., & Velez, J. J. (2015). Exploring the relationship between self-efficacy and career commitment among early career agriculture teachers. *Journal of Agricultural Education*, *56*(1), 127–140. https://doi.org/10.5032/jae.2015.01127

McKim, A. J., & Velez, J. J. (2017). Developing self-efficacy: Exploring preservice coursework, student teaching, and professional development experiences. *Journal of Agricultural Education*, *58*(1), 172–185.

Mundt, J. P., & Connors, J. J. (1999). Problems and challenges associated with the first years of teaching agriculture: A framework for preservice and inservice education. *Journal of Agricultural Education*, *40*(1), 38–48. https://doi.org/10.5032/jae.1999.01038

Prestridge, S. (2019). Categorizing teachers' use of social media for their professional learning: A self-generating professional learning paradigm. *Computers & Education*, *129*, 143–158. https://doi.org/10.1016/j.compedu.2018.11.003

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

Smalley, S., & Smith, A. (2017). Professional development needs of mid-career Agriculture Teachers. *Journal of Agricultural Education*, *58*(4), 282–290. https://doi.org/10.5032/jae.2017.04283

Smith, A., & Smalley, S. (2018). Job Stress, Burnout, and Professional Development Needs of Mid-Career Agricultural Education Teachers . *Journal of Agricultural Education*, *59*(2), 305–320. https://doi.org/doi.org/10.5032/jae.2018.02305

Traini, H., 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). https://doi.org/10.5032/jae.2021.02167

Tschannen-Moran, M., Woolfolk Hoy, A., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and more. Review of Education Research, 68(2), 202-248. https://doi.org/10.3102/00346543068002202

Ulmer, J. D., Velez, J. J., Lambert, M. D., Thompson, G. W., Burris, S., & Witt, P. A. (2013). Exploring science teaching efficacy of CASE curriculum teachers: A post-then-pre assessment. Journal of Agricultural Education, 54(4), 121-133. https://doi.org/10.5032/jae/2013.04121

A Survey of Teacher Creativity in Michigan

Tiffany A. Marzolino, Michigan State University
Aaron J. McKim, Michigan State University

Introduction

Fostering student creativity has long been encouraged (Reilly et al., 2011; Rinkevich, 2011) in part, because it is valued by employers (Robinson, 2009). Creativity is also a valued attribute among educators, including being an outlet for self-expression (Reilly et al., 2011), increasing student engagement (Radeljić et al., 2020; Reilly et al., 2011), and increasing student perceptions of educator effectiveness (Aschenbrener et al., 2010a, 2010b). Given its importance, it is imperative to explore, develop, and sustain creativity among school-based agricultural education (SBAE) teachers. As such, this study explored self-perceived creativity among Michigan SBAE teachers.

The lack of an established baseline for teacher creativity in SBAE limits current understanding. Existing knowledge, however, suggests creativity may vary based on demographic characteristics, such as years of teaching experience and gender (Aschenbrener et al., 2010a, 2010b). As such, this study explored the following research questions:

1. What is the level of self-perceived creativity among Michigan SBAE teachers?
2. How does creativity among SBAE teachers in Michigan differ by demographic variables?

Literature Review

There is a dearth of research exploring teacher creativity in secondary school classrooms, especially in the United States. Cayirdag found creative self-efficacy and teacher self-efficacy were linked to "creativity fostering teacher behaviors," (2017, p. 1969) suggesting more efficacious teachers promote student creativity. Research suggests there are two types of creativity, transformational creativity that shifts paradigms, and everyday creativity that allows people to solve problems (Reilly et al., 2011). Outlets for teacher creativity include "curriculum preparation, teaching methods, connection with students, shaping the environment, and reflection on practice" (Reilly et al., 2011, p. 254). However, Reilly et al. (2011) lament an overfocus on educational outcomes and attempting to teach *all* the content may stifle creativity. Conversely, others suggest teaching the required curriculum in unique and creative ways could circumvent this issue (Cayirdag, 2017).

Teacher creativity has positive benefits for students, including increased engagement (Reilly et al., 2011; Rinkevich, 2011) and reduced boredom (Radeljić et al., 2020). When students are more engaged, they will likely experience more success. Despite these potential bonuses, creativity may also be perceived as a negative by some teachers. Beghetto (2007, as cited in Rinkevich, 2011) noted some teachers regard creativity as an additional duty, adding to their workload. Some also suggest only teachers with an innate creative talent ought to be creative in the classroom, an idea Rinkevich argues "needs squelched" (2011, p. 220) while students are in teacher preparation programs.

Within agricultural education, studies on creativity have been limited, especially scholarship at the secondary school level. Baker and Robinson (2016) examined originality, finding students receiving an experiential learning treatment scored higher in creativity. The findings of Baker and Robinson (2016) suggest SBAE teachers using experiential learning techniques help their students be more creative. Direct instruction, however, may still be selected by SBAE teachers because it is efficient and familiar, potentially reducing student creativity development within SBAE (Baker & Robinson, 2016).

Research at the postsecondary level suggests undergraduate students identify creative teaching behaviors in their instructors and rate creative instructors as more effective (Aschenbrener et al., 2010a). Additional research found postsecondary instructors were strong in elaboration as a creativity technique, but lacked the originality component of creativity (Aschenbrener et al., 2010b). Instructor self-perceptions of creativity were, however, not correlated to teaching experience or gender; conversely, data collected from students suggested a relationship between instructor creativity and teaching experience (Aschenbrener et al., 2010a, 2010b). Outside of instructor creativity, student creativity is also important. Research suggests postsecondary students lack creativity and innovation (Robinson, 2009). Friedel and Rudd (2006) reported a slight relationship between learning styles and creativity among undergraduate students, suggesting students with different learning styles may need different supports.

Theoretical Framework

The 4in1 construct of creativity, conceptualized by Kharkhurin (2014), is a theoretical tool which creates a broad definition for creativity. This construct suggests there are four dimensions of creativity: (a) novelty, (b) utility, (c) aesthetics, and (d) authenticity (Kharkhurin, 2014). *Novelty* is the creation of something new, an original thought, process, solution, or idea. Through a teaching lens, this implies new or original takes on teaching content, integrating new topics into curriculum, or trying new classroom management techniques. *Utility* refers to a creative work as being useful by making a meaningful contribution. In teaching, this could be operationalized as creativity yielding increased student engagement and learning retention. *Aesthetics* strives for creative work to incorporate beauty, also thought of as truth, and may be achieved by sharing important discoveries with fellow teachers or simply orchestrating something well. *Authenticity*, the final component, demands a creative work allows the creator to express themselves and their perceptions. For teachers, this entails being their authentic selves in the classroom. Kharkhurin's (2014) framework was modified and adapted to fit the context of this research. For this study, creativity is evaluated based on reported novelty, utility, aesthetic, and authenticity. The aesthetic value, as it is hardest to define in this context, was the least represented in the instrument.

Methods

Data collected from this research are part of a larger study exploring teacher margin and creativity. The focus of this abstract is teacher creativity.

Population and Response Rate

Michigan SBAE teachers ($N = 150$) during the 2022-2023 school year served as the population. A census was attempted in which all Michigan SBAE teachers received the survey via email. Data were collected during April and May 2023 via Qualtrics. Teachers received four email reminders during that time (Dillman, 2007). A response rate of 60% ($n = 90$) was obtained. Non-response bias was evaluated by comparing on-time respondents ($n = 51$) to late respondents ($n = 39$) for teacher creativity. The lack of statistical significance (i.e., p-value = .852) between the two groups suggests non-response bias was not an issue within this study.

Instrumentation

Two sections of the survey were utilized in this research; the first was 14 questions measuring teacher creativity and the second included demographic data. All questions had item-specific response options (Saris et al., 2010). Blocks contained questions in random order. A reliability analysis was conducted *post hoc*, with the creativity construct measured as reliable ($\alpha = .83$).

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS). For research question one, the 14 teacher creativity items were condensed into the teacher creativity construct, with means and standard deviations reported. For research question two, a multiple linear regression analysis was completed wherein teacher creativity was the dependent variable and selected demographic variables were the independent variables. The assumptions of multiple linear regression were checked and approved prior to running the analysis.

Description of Respondents

The majority of respondents were female ($f = 68$; 75.56%), taught at a comprehensive public high school ($f = 55$; 61.11%), and had completed a teacher preparation program ($f = 60$; 66.70%). The population had an average of 10.70 years of teaching experience.

Results

For research question one, the mean teacher creativity score was 3.05 ($SD = 0.52$), with one being least creative and five being most creative (see Table 1). Teachers reported the highest amount of creativity via authenticity, reporting teaching agriculture is something they are passionate about ($M = 4.10$, $SD = 0.90$), whereas the lowest amount of creativity was reported for teaching using new practices ($M = 2.44$, $SD = 0.79$).

Table 1

Teacher Creativity Construct

Question	*M*	*SD*
To what extent would you say being an agricultural educator is one of your passions?	4.10	0.90
To what extent do you feel that you can be yourself as a teacher?	3.78	0.88
To what extent do you think your personality comes across when you are doing your job?	3.74	0.98
Thinking about premade curriculum or curriculum that others have shared with you, to what extent do you put your own unique twist on those lessons?	3.36	1.07
Do you look for new ways to deliver content to students?	3.14	1.11
Do you actively revise your curriculum to ensure it is having students think critically?	2.98	1.02
How often do you use your imagination to plan lessons?	2.88	1.01
To what extent do you think what you do in your classroom is creative?	2.85	0.78
To what extent do you think what you do in your classroom is innovative?	2.81	0.75
To what extent do your students think what you do in class is creative?	2.76	0.81
Thinking on a year to year basis, how often do you use the same lessons in your classroom?*†	2.68	0.90
Do you use the same methods when you teach?	2.55	0.78
How often do you create new curricular experiences for your classroom?	2.55	0.73
How many of your lessons contain practices you consider to be new?	2.44	0.79
Teacher Creativity Construct	3.05	0.52

Note. Response options differed for each item. *Reverse coded. †Not applicable option provided.

For research question two, a multiple linear regression including teacher creativity and selected demographic characteristics was completed (see Table 2). The collection of selected demographic variables was not statistically significant in modeling teacher creativity (F-value = 0.92; p-value = .494) given the power available in this study.

Table 2

Regression of Teacher Creativity and Selected Demographics

	Dependent Variable: Teacher Creativity					
Predictors	Zero Order Correlation (*r*)	*p*-value (*r*)	*B*	*SEB*	β	*p*-value
Gender[a]	-.08	.467	-.08	.16	-.06	.622
Parent/Guardian Status[b]	.08	.454	.12	.13	.11	.368
Relationship Status[c]	-.09	.441	-.10	.15	-.08	.496
Teacher Preparation[d]	-.11	.324	-.25	.14	-.21	.083
School Type[e]	-.03	.766	-.04	.14	-.03	.803
Mid-Career Teacher	.04	.704	.15	.15	.13	.312
Late Career Teacher	.10	.370	.19	.16	.16	.221

Note. $R = .29$, $R^2 = .08$, F-value = 0.92, p-value = .494. Indicator variables include: [a]Female = 1, [b]Parent/Guardian = 1; [c]In Relationship = 1; [d]Completed Teacher Preparation Program = 1; [e]Vocational/Career Center = 1.

Discussion, Conclusions, and Recommendations

Findings for research question one suggest, overall, teachers perceive moderate levels of creativity. The areas where teachers excelled in creativity were in the authenticity domain, feeling that their personality came across while doing their job, they could be themselves as teachers, and being an SBAE teacher was one of their passions. Areas where creativity scores were the lowest included the frequency of lessons with new practices, creating new curricular experiences, and using the same methods when teaching, all falling into the novelty domain. As such, helping teachers access new teaching methods, practices, or carve out time to create new curricular experiences may be valuable for increasing SBAE teacher creativity.

For research question two, none of the selected demographics were statistically significant predictors of creativity among respondents. These findings suggest no difference between career stages, gender, and creativity, reinforcing findings from Aschenbrener et al. (2010a, 2010b). Accordingly, we conclude other factors impact teacher creativity. Potential factors to be considered in future scholarship include teacher self-efficacy, personal creativity identity, value toward creativity, and workload characteristics (e.g., number of classes taught). Additional recommendations for research include scholarship which gathers student perceptions of teacher creativity to help evaluate learning benefits associated with classroom creativity.

While this study provided important information on SBAE teacher creativity, it does have important limitations. First, the research was limited to a single state. Additionally, data were collected during some of the busiest weeks for Michigan SBAE teachers, which could have influenced responses. As such, a longitudinal study of teacher creativity throughout a school year is recommended to better understand the interplay between program calendar and teacher creativity.

Considering these limitations, we conclude teachers in Michigan have room to expand creativity. Creating a system wherein teachers can flex their creative muscles and maximize impacts in the classroom is essential. Additionally, encouraging all teachers to understand and trust their unique creativity may encourage more creative risks and student engagement in the classroom.

References

Aschenbrener, M. S., Terry, R., & Torres, R. M. (2010a). Creative and effective teaching behaviors of university instructors as perceived by students. *Journal of Agricultural Education*, *51*(3), 64–75. https://doi.org/10.5032/jae.2010.03064

Aschenbrener, M. S., Terry, R., & Torres, R. M. (2010b). Creative teaching behaviors: A comparison of student and instructor perspectives. *NACTA Journal*, *54*(1), 46–53. https://www.jstor.org/stable/nactajournal.54.1.46

Baker, M. A., & Robinson, J. 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

Cayirdag, N. (2017). Creativity fostering teaching: Impact of creative self-efficacy and teacher efficacy. *Educational Sciences: Theory & Practice*, *17*(6), 1959-1975. https://doi.org/10.12738/estp.2017.6.0437

Dillman, D. A. (2007). *Mail and internet surveys: The tailored design method* (2nd ed.). John Wiley & Sons Inc.

Friedel, C. R., & Rudd, R. D. (2006). Creative thinking and learning styles in undergraduate agriculture students. *Journal of Agricultural Education*, *47*(4), 102–111. https://doi.org/10.5032/jae.2006.04102

Kharkhurin, A. V. (2014). Creativity.4in1: Four-criterion construct of creativity. *Creativity Research Journal*, *26*(3), 338–352. https://doi.org/10.1080/10400419.2014.929424

Radeljić, M., Selimović, H., Opić, S., Mulaosmanović, N., & Selimović, Z. (2020). The impact of creative teaching approach on reducing boredom in teaching process. *Croatian Journal of Education - Hrvatski Časopis Za Odgoj i Obrazovanje*, *22*(1), 143-173. https://doi.org/10.15516/cje.v22i1.3553

Reilly, R. C., Lilly, F., Bramwell, G., & Kronish, N. (2011). A synthesis of research concerning creative teachers in a Canadian context. *Teaching and Teacher Education*, *27*(3), 533–542. https://doi.org/10.1016/j.tate.2010.10.007

Rinkevich, J. L. (2011). Creative teaching: Why it matters and where to begin. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, *84*(5), 219–223. https://doi.org/10.1080/00098655.2011.575416

Robinson, J. S. (2009). Assessing the employability skills of University of Kentucky College of Agriculture graduates: A comparison of hard and soft science disciplines. *NACTA Journal*, *53*(4), 56–62.

Saris, W. E., Revilla, M., Krosnick, J. A., & Shaeffer, E. M. (2010). Comparing questions with agree/disagree response options to questions with item-specific response options. *Survey Research Methods*, *4*(1), 61–79. https://doi.org/10.18148/srm/2010.v4i1.2682

Impact of the COVID-19 Pandemic on School-Based Agricultural Education (SBAE) Teachers' Job Satisfaction and Work-Life Balance

Kelly Hoelting, Mission Valley High School, Kansas
Gaea Hock, Kansas State University
Brandie Disberger, Kansas State University
Jonathan Ulmer, Kansas State University

Introduction/Literature Review

The COVID-19 pandemic caused the largest disruption of schools, affecting nearly 1.6 billion students in over 200 countries (Pokhrel & Chhetri, 2021), in our modern history. In the United States, school closures affected millions of children and educators, causing a rapid shift to remote instruction. The closure of schools and other learning spaces had far-reaching consequences for educators, parents, and families. As restrictions eased, schools adopted various mitigation measures, further impacting traditional education practices (Sahu, 2020; Van Lancker & Parolin, 2020). The sudden shift from face-to-face instruction to remote learning exposed challenges related to teacher preparedness and technological capabilities (d'Orville, 2020).

During the 2020-2021 academic year, school districts varied in their instructional delivery methods, increasing the workload of teachers across the country (Clemons et. al, 2021). School-Based Agricultural Education programs (SBAE), known for their hands-on and experiential learning approach, faced unique challenges during the pandemic. SBAE teachers struggled to adapt to remote teaching, limiting their ability to perform day-to-day tasks and manage FFA chapters effectively (Clemons et al., 2021). The shift to online platforms and changes in daily routines increased stress levels and negatively affected job satisfaction among SBAE teachers (Clemons et al., 2021; McKim et al., 2021). The additional responsibilities brought about by remote teaching, combined with personal obligations and health concerns, impacted teachers' ability to manage their roles effectively (Shoulders et al., 2021). Increased stress and responsibility also negatively impact job satisfaction, which is closely tied to teacher retention (McKim & Sorensen, 2020). The traditional three-circle agricultural education model was significantly impacted by the pandemic. SBAE teachers had to adapt their teaching and management practices related to SAE and FFA activities, often relying on synchronous and asynchronous digital classrooms (Clemons, et al., 2021).

Theoretical Framework

The theoretical framework for this study incorporated two theories: the role conflict theory and the conservation of resources (COR) theory. The role conflict theory suggests that individuals face conflicts when balancing multiple life roles, such as work and family, due to limited time and energy resources (Greenhaus & Beutell, 1985). As the demands in one role increase, the strain on both roles also increases. The theory also posits that increased work hours lead to conflict between work and family roles. The COR theory emphasizes the motivation to protect and preserve resources within different life roles, including time (Grandey & Cropanzano, 1999). When time commitments change in one role, it can cause stress and dissatisfaction in another role. Other resources, such as social support, material resources, and

internal resources, also impact job satisfaction and retention. For SBAE teachers, time is a crucial resource, and the demanding nature of the profession, combined with the unique teaching responsibilities during the COVID-19 pandemic, may threaten their time resources and work-life balance.

Purpose and Objectives

The purpose of this study was to explore a regional sample of SBAE teachers' work-life balance, job satisfaction, and the impact of COVID-19 on teacher retention. To achieve this purpose, the following objectives were established:

1. Identify the overall job satisfaction and overall work-life balance of SBAE teachers before and during COVID-19 pandemic.
2. Analyze the impact of COVID-19 on teacher's intent to remain in the SBAE classroom.
3. Examine the challenges faced by agricultural educators during the COVID-19 pandemic and adaptations made in their SBAE programs due to the restrictions faced during the pandemic.

Methods

This study investigated the work-life balance, overall job satisfaction, and challenges faced by SBAE teachers during the COVID-19 pandemic in NAAE Region II. Data was collected from SBAE teachers using an online Qualtrics survey. The instrument was developed based on a previous study by McKim and Sorensen (2020). The study obtained approval from Kansas State University Institutional Review Board (IRB). The population for this study included all middle school and high school agricultural teachers in NAAE Region II (Arkansas, Colorado, Kansas, Louisiana, New Mexico, Oklahoma, and Texas) during the 2021-22 school year (N = 3,472). The names and email addresses of 450 agricultural teachers were obtained from National FFA as a simple random sample of the Region II population.

Data was collected during April and May of 2022 via a maximum of five points of email contact with potential respondents (Dillman, 2007). Of the initial list of 450 educators, 21 email addresses were unusable, reducing the sample frame to 429. A total of 84 teachers completed the survey, resulting in a response rate of 19.95%. The response rate obtained for this study is similar to recent studies using the National FFA frame (e.g. McKim & Sorensen, 2020; Moser & McKim, 2020). Years of teaching experience and overall impact of COVID-19 were compared between on-time to late respondents (Lindner et al., 2001; Miller & Smith, 1983), with no evidence of non-response bias.

The data were analyzed using descriptive statistics. Limitations include the retrospective nature of the data collected and time of year the survey was disseminated. Despite these limitations, the study provides valuable insights into the impact of the COVID-19 pandemic on SBAE teachers in NAAE Region II.

Results

Respondents included agricultural teachers from each state in the region, average years of agricultural teaching experience was 12.91 years, 54.70 % were male and 45.30% were female teachers (Table 1). The responses given in the survey closely resemble the overall demographics of the NAAE Region II teachers.

Table 1

Respondent Characteristics

Personal Characteristics (*n* = 75)		*f*	%
Gender			
	Male	41	54.70
	Female	34	45.30
	Prefer not to say	0	0
	Total	75	100.00%
Age			
	20-29	18	24.00
	30-39	24	32.00
	40-49	14	18.70
	50-59	16	21.30
	60+	3	4.00
	Total	75	100.00%
Years of Teaching Experience	1 year or less	2	2.70
	2-5 years	17	22.70
	6-10 years	15	20.00
	11-15 years	12	16.0
	16-20 years	5	6.60
	21-25 years	12	16.0
	26+ years	12	16.0
	Total	75	100.00
State currently teaching in.	Arkansas	11	14.70
	Colorado	9	12.00
	Kansas	19	25.30
	New Mexico	1	1.30
	Louisiana	5	6.70
	Texas	18	24.00
	Oklahoma	9	12.00
	Other	3	4.00
	Total	75	100.00%

Objective one aimed to identify the overall job satisfaction and overall work-life balance of SBAE teachers before and during the COVID-19 pandemic. The findings revealed a substantive decrease in job satisfaction among SBAE teachers during the COVID-19 pandemic compared to before the pandemic (Table 2). Prior to COVID-19, most teachers (67.8%) reported high satisfaction levels (80-100 points on a 100-point scale). However, during the pandemic, only 10.2% of teachers expressed high job satisfaction, with nearly half reporting satisfaction levels below 50 points. Looking toward the future, most responses indicated satisfaction levels above 50 points, with the highest response rate (33.4%) falling in the 61-80 points range.

Table 2

Job Satisfaction of SBAE Teachers Prior, During, and Perceived Future (n = 80)

		Prior to COVID-19		During COVID-19 pandemic		Perceived future of SBAE teaching	
		f	%	*f*	%	*f*	%
My overall job satisfaction as an agricultural educator	0-20	2	2.6	17	21.4	7	8.9
	21-40	2	2.6	16	20.2	10	12.8
	41-60	7	9.1	20	25.4	13	16.4
	61-80	15	19.0	19	24.2	26	33.4
	81-100	54	67.8	8	10.2	24	30.4

Note: Scale is 0 = least satisfaction-100 is most satisfaction

SBAE teachers reported a lower overall satisfaction of work-life balance during the pandemic compared to before. Prior to COVID-19, the mean satisfaction score was 69.62, while during the pandemic, it dropped to 54.53. However, when asked about their perceived future satisfaction, the mean score was higher (M = 64.44) and closer to pre-pandemic levels (Table 3).

Table 3

Job Satisfaction and Overall satisfaction of work-life balance of SBAE Teachers Prior, During, and Perceived Future (n = 80)

		Before COVID-19 Pandemic		During COVID-19 Pandemic		Perceived Future of Teaching Agricultural Education	
Question	*n*	Mean	SD	Mean	SD	Mean	SD
My overall job satisfaction as an agricultural educator	80	82.61	20.55	46.96	27.34	64.48	26.89
My overall satisfaction of work-life balance as an agricultural educator.	78	69.62	22.61	54.53	28.80	64.44	25.63

Note: Scale is 0 = least satisfaction to 100 = most satisfaction

Research objective two sought to analyze the impact of COVID-19 on teachers remaining in the classroom. The majority of SBAE teacher responded that the COVID-19 pandemic impacted their life in a negative way (74.7%, *n* = 56) (Table 4). When respondents were asked if they will remain in the SBAE classroom, 82.9% (*n* = 63) chose to remain in the teaching profession, 10.5% (*n* = 8) answered no, and 6.6% (*n* = 5) were undetermined.

Table 4

Impact of COVID-19 on SBAE teachers (n = 75)

	Greatly Impacted my life in a negative way		Slightly impacted my life in a negative way		Not negatively or positively impacted my life		Slightly impacted my life in a positive way		Greatly impacted my life in a positive way	
	f	%	*f*	%	*f*	%	*f*	%	*f*	%
Overall Impact of COVID-19 Pandemic	21	28.0	35	46.7	8	10.7	9	12.0	2	2.7

Objective 3 aimed to explore the challenges faced by SBAE teachers and programs during the COVID-19 pandemic and changes made due to the experience. The open-ended questions on the survey were analyzed for common themes. Of the responses provided teachers discussed technology challenges, limitations on FFA events and participation, a degree in student motivation, lower instructional quality, and challenges regarding caregiving responsibilities.

- Technology: Teachers faced difficulties in connecting during remote learning due to limited internet connectivity and the need to understand new technology and learning management systems. Lack of access and equity to resources resulted in students missing meetings or classes.
- FFA The negative impact of canceled FFA events and challenges in preparing FFA members for success were highlighted. Event cancellations led to a loss of participation, momentum, and motivation among students. Recruiting new members and uncertainty about event formats were additional challenges.
- Student Motivation: Teachers reported a decline in student motivation during remote learning, which persisted even after returning to full in-person learning. Students exhibited lazy attitudes and reduced participation in schoolwork, FFA activities, and community involvement.
- Instructional Quality: Teachers struggled to offer the same quality of learning opportunities in remote formats. The inability to provide hands-on or laboratory experiences and support students with special education needs were significant challenges.
- Work-Life Balance: Teachers faced challenges in balancing childcare or adult care responsibilities while teaching remotely. Mental health and motivation were also identified as concerns.

Regarding changes made in SBAE programs due to the pandemic, the main theme was the adoption of online instruction. SBAE teachers used online platforms, such as Google

Classroom, Canva, Teams, iCEV, Edpuzzle, and Zoom, to deliver lessons, engage students, and assess their progress. Some teachers also used packets or physical materials when internet access was limited. However, some teachers reported making no changes to their teaching during the pandemic.

When asked about implementing changes in the future, many SBAE teachers expressed a continued preference for online platforms. They planned to use online resources for classwork, assignments, FFA announcements, study resources, and SAE (Supervised Agricultural Experience) visits. Online testing formats, resources for substitute teachers, and aiding absent students were also mentioned as positive changes to continue. However, a few teachers expressed a reluctance to implement the changes they made during the pandemic into their future SBAE programs.

Conclusions

According to the COR theory (Grandey & Cropanzano, 1999), individuals strive to build and protect resources within the different roles that make up their lives, such as work and family. The impact of COVID-19 provides a shift in the overall manageability of work and life roles during the pandemic, providing individuals with an opportunity to allocate their time according to the needs of their SBAE programs, their community and their life roles.

Over 50% of teachers reported lower job satisfaction during the pandemic, potentially due to the loss of key elements of agricultural education programs, such as in-person instruction, hands-on learning, and FFA gatherings. The overall work-life balance of SBAE teachers also declined during the pandemic. The limitations placed on SBAE programs during the pandemic had a negative impact on both job satisfaction and work-life balance. This is concerning because job satisfaction is connected to teacher retention (McKim & Sorenson, 2020).

The role conflict theory (Greenhaus & Beutell, 1985) suggests that an excessive focus on one role can negatively impact another. Given the high rates stress and decreased job satisfaction among agricultural education teachers, it is crucial to prioritize finding a balance between work and family responsibilities as we strive to decrease teacher attrition. The future of agricultural education depends on high-quality teachers remaining in the classroom.

Recommendations

The COVID-19 pandemic forced teachers to create new and innovative learning experiences for their students. Teachers shared the technology tools they had to quickly learn to accomplish their teaching responsibilities. Further work should be done to investigate what educational practices have continued to be utilized by teachers and schools.

One of the unintended lessons of the pandemic was the need to be nimble and pivot when necessary. Research is recommended to learn more about how the experience has impacted teachers in their ability to navigate major life-disrupting events. Further research and professional development in this area post pandemic is essential to support the well-being of SBAE educators and ensure the continued success of agricultural education programs.

In both preparing and providing professional development for SBAE teachers, research shows the importance of becoming more efficient in time management and utilizing technology in agricultural education programs. Integrating virtual components for content delivery, homework assignments, information dispersal, and educational materials can contribute to a better work-life balance for SBAE teachers. Online meetings have also become a valuable tool for organizations, and boards, reducing travel time and expenses for teachers. The National FFA Organization has adapted by continuing to judge awards virtually and incorporating virtual components into career and leadership development events. It is recommended that additional opportunities and programs utilize technologies that promote a better work-life balance for teachers.

The challenges faced by educators during the pandemic have raised concerns about teacher retention. Continued research on best retention practices is needed to address the challenges. Additionally, professional development should be created to encourage better work-life balance behaviors that encourage teachers to stay in the classroom. Looking ahead, SBAE teachers should reflect upon their roles and responsibilities associated with their careers to determine how to achieve a better balance that enhances overall job satisfaction and work-life balance.

References

Clemons, C., McKibben, J., & Lindner, J. (2021). The masks we wear: A quantitative analysis of motivational factors of school-based agriculture education teachers during a pandemic. Journal of Agricultural Education, 62(2), 83-96. http://doi.org/10.5032/jae.2021.02083

Dillman, D. A. (2007). Mail and internet surveys: The tailored design method (2nd ed.). John Wiley & Sons, Inc

d'Orville, H. (2020). COVID-19 causes unprecedented educational disruption: Is there a road towards a new normal? Prospects, 1. https://doi.org/10.1007/s11125-020-09475-0

Grandey, A. A., & Cropanzano, R. (1999). The conservation of resources model applied to work–family conflict and strain. Journal of vocational behavior, 54(2), 350-370.

Greenhaus, J., & Beutell, N. (1985). Sources of Conflict between Work and Family Roles. The Academy of Management Review, 10(1), 76-88. https://doi.org/10.2307/258214

McKim, A. J., & Sorensen, T. J. (2020). Agricultural educators and the pandemic: An evaluation of work and life variables. Journal of Agricultural Education, 61(4), 214-228. http://doi.org/10.5032/jae.2020.04214

McKim, A. J., Sorensen, T. J., & Burrows, M. (2021) The COVID-19 pandemic and agricultural education: An exploration of challenges faced by teachers. Nat Sci Educ. 2021;50: e 20060. https://doi.org/10.1002/nse2.20060

Pokhrel, S., & Chhetri, R. (2021). A Literature Review on Impact of COVID-19 Pandemic on Teaching and Learning. Higher Education for the Future, 8(1), 133–141. https://doi.org/10.1177/2347631120983481

Sahu P. (2020). Closure of Universities Due to Coronavirus Disease 2019 (COVID-19): Impact on Education and Mental Health of Students and Academic Staff. Cureus, 12(4), 7541. https://doi.org/10.7759/cureus.7541

Shoulders, C. W., Estepp, C. M., & Johnson, D. M. (2021). Teachers' Stress, Coping Strategies, and Job Satisfaction in COVID-induced Teaching Environments. *Journal of Agricultural Education*, *62*(4).

Van Lancker, W., & Parolin, Z. (2020). COVID-19, school closures, and child poverty: A social crisis in the making. The Lancet, 5(5). 243-244. https//doi.org/10.1016/S2458-2667(20)30084-0

Exploring West Virginia University Preservice Teachers' Stress and Coping Abilities: 2nd Year Findings

Aaron J. Giorgi, West Virginia University
Rachel E. Hendrix, West Virginia University

Introduction and Literature Review

Agricultural education is an inherently stressful occupation (Lawver & Smith, 2014; Roberts & Dyer, 2004; Sorensen et al., 2017; Torres et al., 2009). In addition to regular teaching duties, agricultural educators face demands extending beyond the typical work week (Roberts & Dyer, 2004; Torres et al., 2009). Previous studies in agricultural education link career stress with teacher burnout, dissatisfaction, and attrition (Chenevey et al., 2008; Croom, 2003; Dinham, 1992; Sinclair & Ryan, 1987; Smith & Smalley, 2018; Sorenson et al., 2017). With agricultural education facing a shortage of certified teachers, preservice educators must learn to manage their stress and develop coping strategies before entering the classroom. Gustems-Carnicer et al. (2019) found preservice educators were negatively affected by stress and unaware of how to deal with it positively. While preservice teachers do not face the same stressors as in-service educators, academic demands provide opportunities to evaluate responses to stressors and develop coping strategies for future use.

Stress is associated with negative symptoms across physiological, emotional, and behavioral domains (Steinmetz et al., 1982). A stressed individual experiences such symptoms as headaches, exhaustion, physical pains, irritability, worry, forgetfulness, sadness, bossiness, or impatience (Gustems-Carnicer et al., 2019; Steinmetz et al., 1982). Stress decreases one's ability to perform teaching and learning-related functions such as planning, managing behavior, directing attention, using working memory, and transitioning between tasks (Arnsten, 2009; Whiting et al., 2021). Teachers experiencing stress demonstrate higher levels of burnout (Croom, 2003), poorer student-teacher relationships (Yoon, 2002), and increased attrition risk (Dinham, 1992; Sinclair & Ryan, 1987). Teachers who effectively cope with career stressors report higher levels of job satisfaction and longevity (Shoulders et al., 2021).

Lazarus (1966) defined *coping* as a specific strategy or behavior employed by an individual to manage stressful events or situations. Whatever impact remains after implementing the strategy is stress (Folkman et al., 1986). Most experienced teachers deal with stress through positive means (Shoulders et al., 2021; Zurlo et al., 2007). However, preservice educators frequently do the opposite (Gustems-Carnicer et al., 2019) and are linked other negative outcomes (Butler et al., 2010; Deasy et al., 2016; Sun et al. 2011).

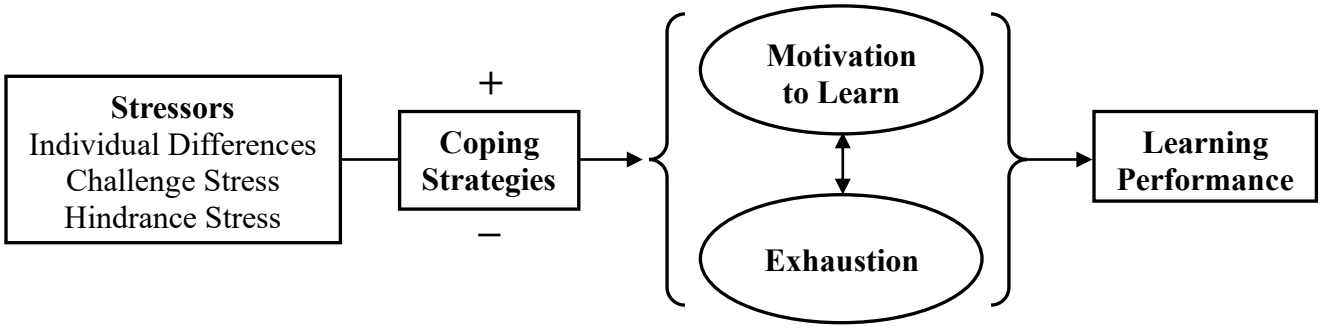
Frameworks

As represented in Figure 1, this study was guided by the conceptual stress framework espoused by LePine et al. (2004) moderated by coping strategies as defined by Carver (1997). Within the LePine et al. (2004) framework individual characteristics, stress from challenges, and hindrances (stressors) collectively influence a feedback loop of motivation to learn and exhaustion ultimately impacting learning performance. Coping strategies are espoused to moderate this feedback loop through reinforcement of positive or negative feedback impacting learning performances. Stress in this framework is define by LePine et al. (2004) as "individual's psychological response to a situation in which there is something at stake," (p. 883) and where

the individual's capacity are taxed or exceeded. Based on this conceptualization, participant espoused stress is the stressor, coping is self-reported, and qualitative responses are operationalized as indicators of the feedback loop.

Figure 1

Conceptualization of Stressors Mediated By Coping (LePine et al., 2002)



Purpose and Objectives

The guiding research question was, 'how do preservice teacher cope with academic stressors?' The following objectives will help guide this research:

1. Determine the level of academic stress preservice teachers espoused.
2. Identify events preservice teachers espoused as causes for stress.
3. Describe preservice teachers coping strategies.
4. Relate preservice teaching espoused stress to coping.

Methods

A longitudinal, explanatory, nested mixed methods (Creswell, 2014; Plano Clark et al., 2008), holistic single-case design (Iskar & Bakar, 2014) was used to describe and determine espoused stress levels, self-reported sources of stress, and coping strategies in preservice agricultural education teachers. This abstract focused on year two of a multi-year overall study. Mixed-method design was chosen to allow further exploration of quantitative findings with qualitative follow ups (Creswell, 2014). Quantitative data were collected via weekly surveys and through a final end-of-term survey. Qualitative data sources were personal written reflections, course and university schedules, course assignments, and program exit interviews (Ary et al., 2019). A holistic single-case design was warranted due to revelatory nature of sample cases as the experts on their lived experiences (Yin, 2009). The nested approach of data collection is a subset of an embedded data collection design for mixed methods. Within an embedded data collection design, quantitative and qualitative data are collected concurrently, analyzed independently, and qualitative results are used to enhance quantitative conclusions (Plano Clark et al., 2008). Informed analysis using survey responses, reflections, and schedules allowed for a richer exploration of preservice agriculture teachers stress, academic stressors, and learning performances.

A convenience sample of preservice agricultural education teachers at West Virginia University enrolled in the mixed-level teaching methods class and teaching lab (n = 11) was used. Participant anonymity was maintained by a third-party removing identifying information and assigning individuals randomly generated gender-neutral pseudonyms.

The Brief COPE (Carver, 1997) was used to assess coping strategies due to instrument's wide usage across disciplines and settings with consistent validity and reliability (Rodrigues et al., 2022). Items asked participants to rank how often they engaged in various coping behaviors. Behavior rankings were then combined into Carver's (1997) espoused coping strategies construct list and ranked from most to least prevalently used strategies. Carver (1997) espoused responses should be used alongside other data to support broader understanding of coping abilities. This assertion was congruent with the study's mixed-methods, wholistic, single-case design. This study is limited by many factors (Ary et al., 2019). Conclusions are not intended to be transferred.

Results and Conclusions

Objective 1: Stress

Students were asked to rate their perceived stress on a one (low) to four (very high) scale. On average, students espoused they felt a *high* (2.82) level of stress. Average stress, completion percentage, causes, and residency status by student are presented in Table 1. Similar to year one findings (see McPhillips et al., 2022), participants' weekly response rates varied highly from 30.8% (n = 4) to 84.6% (n = 13). This inconsistency in response rates is a limitation to using the global mean when evaluating student stress. Therefore, perceived stress changes compared to previous weeks is asserted as a more complete stress indicator. When students reported their current stress in comparison to how they felt the week prior, increases in stress were reported twice as many times (40) as no change (19) or a decrease (20). Based on these findings, it is concluded students perceive a high amount of academic stress.

Objective 2: Sources of Stress

For objective 2, data from surveys, written student reflections, and program exit interviews were analyzed concurrently. Unlike year one findings, no single academic event emerged as a stressor; in year one lesson planning was the most stress inducing event (McPhillips et al., 2022). When lesson planning was mentioned by this group of participants in reflections, they felt the "format was confusing." Only one participant attributed lesson planning as a specific stressor (Table 1).

Participants frequently named factors outside the control of the program and social interactions as sources of academic stressors. Wilder specified "feeling dumber than peers," and "juggling to please everyone," in their final written reflection. Taylor commented in a verbal teaching debrief, "With family issues, mental health issues, multiple deaths in my family, as well as the overall success of trying to be as perfect as I can be in the classroom it all seemed too much to bear." Oakley's reflection further showcased the multiple outside influences causing stress on students' academic abilities commenting, "Overall workload stressed me out, but cannot be placed solely on the program. I work 20 to 30 hours outside of school…" Therefore, it

is concluded that students perceive a variety of sources, both from inside and outside the academic realm, as academic stressors.

Table 1

Students' espoused stress and attributed causes.

Students	Stress (*M*)	Survey %[a]	Summary Causes[b]	Residency[c]
Cleo	2.33	84.6	Whole classes	Spring '23
Reese	1.67	46.2	Coordination of due dates	Spring '23
Leslie	3.33	53.8	Lesson planning	Fall '23
Ali	2.80	46.2	Feeling behind[d]	Fall '23
Wilder	3.50	30.8	Social comparisons[d]	Spring '23
Taylor	3.00	46.2	Assignments (variable), coordination	Yearlong
Oakley	3.43	53.8	Assignments (variable), workload	Changed Major
Halo	2.57	53.8	Balancing workloads	Spring '23
Wren	3.00	46.2	Outside of school events[d]	Spring '23
Micah	2.40	69.2	Workload, varied priorities	Spring '23
Rebel	3.00	76.9	Interactions and communication[d]	Spring '23
Overall	**2.82 (high)**	**55.2**		

[a]Percetage completion of weekly surveys.
[b]Summary of free response causes.
[c]Term of student teaching.
[d]Espoused stressors unrelated to academic events.

Objective 3: Coping

For objective 3, engagement in coping strategies were calculated according to the Brief COPE instructions (Carver, 1997). Coping strategies reported in Table 2 were the top strategy constructs participants reported based on calculated espoused usages of the related behaviors. While many of the coping construct may be perceived as positive or negative strategies, the authors purport Carver's (1997) assertion that results are documentation of how individuals cope, not if that coping is positive or negative.

Table 2

Top coping strategies by students according to the Brief COPE (Carver, 1997).

	First	Second	Third
Cleo	Emotional Support, Acceptance		Active Coping
Reese	Humor, Active Coping, Self-Distraction		
Leslie	Substance, Humor, Religion		
Ali	Did not respond.		
Wilder	Self-Distraction	Active Coping, Humor	
Taylor	Religion, Self-Blame		Active Coping
Oakley	Did not respond.		
Halo	Self-Distraction, Self-Blame		All other strategies
Wren	Self-Blame	Self-Distraction, Planning, Humor, Religion	
Micah	Religion	Self-Distraction	Acceptance, Positive Reframing
Rebel	Active Coping, Planning, Religion, Self-Blame		

Note: Multiple strategies are delimited when a tie was calculated.

Self-blame, *self-distraction*, and *active coping* were found to be top coping strategies espoused by participants. While Ali did not respond to the Brief COPE, they did comment, "I had so much self-doubt and feelings of defeat and inadequacy throughout this semester that it overwhelmed me and hindered my ability to persevere and succeed in my studies," which could imply *self-blame* is a top coping strategy for this individual. Active coping is operationalized as attempting to actively reduce the precursor stressors (Carver et al., 1989). It is concluded that a variety of coping strategies were utilized by respondents.

Objective 4: Stress and Coping

For objective 4, anecdotal relationships between quantitative results, as well comparisons supported by qualitative sources were used. Anecdotal relationships are warranted due to limited sample size, inconsistent response rates, and mixed-methods design. It was found that eight participants reported an average stress above a 2.5, implying an average trend of *high* stress. One anecdotal relationship that emerged was five of those reporting an average *high* stress also reported *self-blame* as a top coping strategy. *Emotional support*, which is the single overtly social coping strategy, was only reported as a top strategy by Cleo who also reported an average *moderate* (2.33) stress level. Those who reported *self-blame* as a coping strategy also reported versions of social comparison in their reflections and interview.

Micah offered a novel comment describing how their perceptions and focused changed during the Fall term. Near the end of the term, Micah commented, "I've just taken a chance to not care and take my time." This occurred during a week that their stress was reported to "decrease," compared to previous weeks. For objective 4, it is therefore concluded that coping strategies related social comparisons or assigning blame may relate to higher perceived stress.

Discussions, Implications, and Recommendations

Since it has been documented that experiences stress associate with many negative outcomes for teachers (Croom, 2003; Dinham, 1992; Sinclair & Ryan, 1987; Yoon, 2002), exploring the stress levels and stressors of preservice teachers prior to entering the profession is salient. Findings from this study are offered to showcase that preservice teachers may be entering the profession already experiencing high stress. While reducing academic rigor should not be our profession's goal, supporting student's abilities to productively struggle with academic rigor and professional responsibilities is an implication of these findings.

Recently, Shoulders et al. (2021) reported positive relationships between effective coping and job satisfaction and longevity for agricultural teachers. Conversely, it has been documented that preservice educators frequently do the opposite and engage in negatively associated coping strategies (Gustems-Carnicer et al., 2019). Findings from this study are cloudy, as only anecdotal relationships between coping and espoused stress were present. But many respondents did espouse coping behaviors that would align with Gustems-Carnicer et al.'s (2019) findings about preservice teacher coping. As teacher educators, we must assist our students in developing positive coping strategies for stressful situations associated with teaching and learning. Doing so will improve not only the quality of preservice teachers' future careers, but also their lives. It is recommended for practice that agricultural education faculty partner with university or private

services to support undergraduate student development of positive coping strategies. It is additionally recommended that coping strategies be researched for SBAE teachers at various career stages.

References

Arnsten, A. F. (2009). Stress signaling pathways that impair prefrontal cortex structure and function. *Nature Reviews Neuroscience*, *10*(6), 410–422. https://doi.org.10.1038/nrn2648

Ary, D., Jacobs, L. C., Sorensen Irvine, C. K., & Walker, D. A. (2019). *Introduction to research in education* (10th ed.). Cengage.

Butler, A. B., Dodge, K. D., & Faurote, E. J. (2010). College student employment and drinking: A daily study of work stressors, alcohol expectancies, and alcohol consumption. *Journal of Occupational Health Psychology*, *15*, 291–303. https://doi.org.10.1037/a0019822

Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief COPE. *International Journal of Behavioral Medicine*, *4*, 92-100.

Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, *56*, 267-283.

Chenevey, J. L., Ewing, J. C., & Whittington, M. S. (2008). Teacher burnout and job satisfaction among agricultural education teachers. *Journal of Agricultural Education*, *49*(3), 12-22. https://doi.org.10.5032/jae.2008.03012.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Sage.

Croom, D. B. (2003). Teacher burnout in agricultural education. *Journal of Agricultural Education*, *44*(2), 2-13. https://doi.org.10.5032/jae.2003.02001

Deasy, C., Coughlan, B., Pironom, J., Jourdan, D., & Mannix-McNamara, P. (2016). Psychological distress and help seeking amongst higher education students: Findings from a mixed method study of undergraduate nursing/midwifery and teacher education students in Ireland. *Irish Educational Studies*, *35*(2), 175–194. https://doi.org.10.1080/03323315.2016.1146157

Dinham, S. (1992). Teacher induction: Implications for administrators. *Practicing Administrator*, *14*(4), 30-33.

Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. (1986). The dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology*, *50*(5), 992-1003. https://doi.org.10.1037/0022-3514.50.5.992

Gustems-Carnicer, J., Calderon, C., & Calderon-Garrido, D. (2019). Stress, coping strategies and academic achievement in teacher education students. *European Journal of Teacher Education*, *42*(4), 1-16. https://doi.org.10.1080/02619768.2019.1576629

Iskar, N. M., & Barak A. Y. (2014). Developing sampling frame for case study: Challenges and conditions. *World Journal of Education,4*(3), 29-35. http://dx.doi.org/10.5430/wje.v4n3p29

Lawver, R. G., & Smith, K. L. (2014). Coping mechanisms Utah agriculture teachers use to manage teaching related stress. *Journal of Agricultural Education*, *55*(1), 76-91. https://doi.org.10.5032/jae.2014.01076

Lazarus, R. S. (1966). *Psychological stress and the coping process*. McGraw Hill.

LePine, J. A., LePine, M. A., & Jackson, C. L. (2004). Challenge and hindrance stress: Relationships with exhaustion, motivation to learn, and learning performance. *Journal of Applied Psychology, 89*(5), 883-891. https://doi.org10.1037/0021-9010.89.5.883

McPhillips, A. K., Giorgi, A. J., Byrd, A. P., & Hendrix, R. (2022). An Exploration into Preservice Teacher's Time-Management and Stress Level. *Research Conference Proceedings of the North Central Region American Association for Agricultural Educators,* 66-73.

Plano Clark, V. L., Huddleston-Casas, C. A., Churchill, S. L., Green, D. O., & Garrett, A. L. (2008) Mixed methods approaches in family science research. *Journal of Family Issues, 29*(11), 1543-1566. https://doi.org.10.1177/0192513X08318251

Rodrigues F, Figueiredo N, Rodrigues J, Ferreira R, Hernández-Mendo A, & Monteiro D. (2022). A Comprehensive Review and Bifactor Modeling Analysis of the Brief COPE. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*, *59*. https://doi.org.10.1177/00469580221108127

Roberts, T. G., & Dyer, J. (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

Shoulders, C. W., Estepp, C. M., & Johnson, D. M. (2021). Teachers' stress, coping strategies, and job satisfaction in COVID-induced teaching environments. *Journal of Agricultural Education*, *62*(4), 67-80. https://doi.org.10.5032/jae.2021.04067

Sinclair, K. E., & Ryan. G. (1987). Teacher anxiety, teacher effectiveness, and student anxiety. *Teaching and Teacher Education, 3*(3), 249-253. https://doi.org.10.1016/0742-05X(87)9000-2

Smith, A. R., & Smalley, S. (2018). Job stress, burnout, and professional development needs of mid-career agricultural education teachers. *Journal of Agricultural Education*, *59*(2), 305-320. https://doi.org.10.5032/jae/2018.023-5

Sorensen, T. J., McKim, A. J., & Velez, J. J. (2017). A national study of work characteristics and work-family conflict among secondary agricultural educators. *Journal of Agricultural Education*, *58*(2), 214-231. https://doi.org.10.5032/jae.2017.02214

Steinmetz, J. I., Kaplan, R. M., & Miller, G. L. (1982). Stress management: An assessment questionnaire for evaluating interventions and comparing groups. *Journal of Occupational Medicine*, *24*(1), 923-931.

Sun, J., N., Buys, D. Stewart, & D. Shum. (2011). Mediating effects of coping, personal belief, and social support on the relationship among stress, depression, and smoking behavior in university students." *Health Education*, *111*, 133–146. https://doi.org.10.1108/09654281111108544

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

Whiting, S. B., Wass, S. V., Green, S., & Thomas, M. S. C. (2021). Stress and learning in pupils: Neuroscience evidence and its relevance for teachers. *Mind, Brain, and Education*, *15*(2), 177-188. https://doi.org.10.1111/mbe.12282

Yin, R.K. (2009). *Case study research: Design and methods* (4th ed.). SAGE Publications.

Yoon, J. S. (2002). Teacher characteristics as predictors of teacher-student relationships: Stress, negative affect, and self-efficacy. *Social Behavior and Personality*, *30*(5), 485-493. https://doi.org.10.2224/sbp.2002.30.5.485

Zurlo, M. C., Pes, D., & Cooper, C. L. (2007). Stress in teaching: A study of occupational stress and its determinants among Italian schoolteachers. *Stress Health*. https://doi.org.10.1002xsmi.1141

A Qualitative Analysis of Factors Impacting an Agriculture Teacher's Ability to Achieve Positive Work-Life Integration

Jay K. Solomonson, Illinois State University
Lucas D. Maxwell, Illinois State University
Kara Barling, Illinois State University
Liz Harris, Illinois State University

Introduction/Theoretical Framework

The United States has faced an exodus of teachers with attrition rates higher than many global counterparts (Garcia et al., 2022, Hopkins et al., 2020). School-Based Agricultural Education (SBAE) has been no exception to this problem. According to the 2021 National Agricultural Education Supply & Demand Study, 674 agricultural education teachers left the profession with over 70% leaving the profession for reasons other than retirement (Smith et al., 2022). Researchers state common reasons for SBAE teacher attrition are an extensive workload outside of contract hours and family and/or personal reasons (Solomonson et al., 2018).

Related to both, a lack of work-life balance has often been cited as a leading reason SBAE teachers leave the profession (Sorensen et al., 2016). On average, SBAE teachers spend 55-58 hours per week outside of contracted hours on tasks related to their position (Murray et al., 2011; Hainline et al., 2015; Sorenson et al., 2016). Moreover, the feeling of personal responsibility to meet the expectations of local communities and administration creates additional pressures to work extensive hours for many teachers (Traini et al., 2019). This perceived need spills over into the home often causing turmoil (Hopkins et al., 2020).

We framed our study around the concept of spillover. Work-life spillover refers to the interaction between individuals' work and personal lives, whereas the experiences in one domain impact the other. This phenomenon encompasses both positive and negative aspects and is often a two-way street where individuals' work experiences impact their personal lives, and vice versa (Allen et al., 2000; Voydanoff, 1980). Positive spillover occurs when experiences, skills, or attitudes acquired from work or home enhance the other domain, while negative spillover involves the transfer of stress, conflicts, and strain (Frone et al., 1997; Grzywacz & Marks, 2000). This documented relationship has been a focus of inquiry for centuries but has garnered increased attention since the onset of the industrial revolution (Wilensky, 1960). The "spillover leisure hypothesis" (p. 544) attempts to explain the cognitive impacts of interaction between work and personal life. Guided by the concept of spillover, we developed our purpose and research questions.

Purpose and Research Questions

The purpose of our qualitative study was to examine factors impacting a current SBAE teacher's ability to achieve positive work-life integration. Our research questions included:

1. What specific out-of-classroom expectations impact the SBAE teacher's ability to achieve positive work-life integration?
2. What policies and procedures currently being implemented by Illinois Agricultural Education have had a positive impact on the SBAE teacher's experience as it relates to positive work-life integration?
3. What policies and procedures could be implemented by Illinois Agricultural Education to positively impact the SBAE teacher's experience as it relates to positive work-life integration?

It should be noted this project was part of a larger study examining work-life integration of SBAE teachers in Illinois.

Methodology

After receiving IRB approval, we developed and distributed an electronic questionnaire sent to all 519 full-time SBAE teachers in Illinois via Qualtrics. Contact information was obtained from the online agriculture teachers' directory. Our instrument consisted of two sections: (1) Three open-ended questions, one mirroring each of our research objectives, and (2) Demographic questions. Each open-ended question was carefully reviewed for content and face validity by a panel of experts. We followed Dillman et al.'s (2014) tailored design method resulting in 165 responses (31.79% response rate) over our four-week data collection period.

The demographic data were analyzed using SPSS© version 26.0. Our typical respondent was female (*f* = 93, 56.36%), married (*f* = 119, 72.12%), with children living at home (*f* = 94, 56.97%), possessed a traditional teaching license (*f* = 136, 82.42%), currently receiving the state supported extended contract grant (*f* = 131, 79.39%), worked in a single-teacher program (*f* = 84, 50.91%), and were classified as an early-career teacher (*f* = 63, 38.18%).

Fraenkel & Wallen (2007) stated that the use of codes/themes and performing frequency counts are two of the most common processes of organizing qualitative data. To analyze our three open-ended questions, each member of our research team conducted an independent analysis using an open-coding process to reveal the codes/themes. We then conducted a microanalysis (Corbin & Strauss, 2008) of each member's codes to increase validity. After reaching a consensus, we performed frequency counts of the codes. If codes/themes yielded less than 5% of the total responses for a particular question, the codes were removed, as

recommended by Wright (2015). Further, we followed recommendations of Lincoln and Guba (1985) and Creswell (2013) to ensure a high level of trustworthiness in our research process.

Findings

Research Question 1

The first research question was used to determine specific out-of-classroom expectations impacting the SBAE teacher's ability to achieve positive work-life integration. Fourteen unique codes transpired through the coding process (see Table 1). The leading five factors found impacting a SBAE teacher's ability to achieve positive work-life integration included Career Development Events (CDEs), evening and overnight FFA activities, meetings, facility operation and maintenance, and weekend FFA activities.

Table 1

Frequency of Codes/Themes on Specific Out-of-Classroom Expectations Impacting an Illinois SBAE teachers Ability to Achieve Positive Work-Life Integration

Codes/Themes	*f*	Representative Quote
Career Development Events	71	"The vast amount of CDE's that are spread out throughout the year. There isn't a break it in the calendar. It would be way less stressful if we could condense and combine events onto the same days, so we had fewer days of FFA events."
Evening and Overnight FFA Events	47	"Since most [FFA events] happen in the evening, it can be hard to balance that time. I also live an hour away from my school so that adds stress to the situation."
Meetings	29	"Meetings. Meetings with individual students. Meetings with individual stakeholders at certain times of the year."
Facility Operation & Maintenance	28	"It takes a lot of time to clean and organize the shop and maintain the greenhouse."
Weekend FFA Events	22	"Having [FFA] events on Saturdays when my family plans activities."

Supervised Agricultural Experiences	21	"I also focus a lot on SAE's and want students to receive awards from them."
Paperwork, Reports, & Applications	18	"There is a ridiculous amount of FFA and School Paperwork. I have to complete 3 forms for every field trip, IFG, CTEI, and Perkins."
Lesson Planning & Grading	17	"Grading assignments and prepping for classes… I spend a lot of time preparing lessons, creating guided notes, modifying PowerPoints, creating interest approaches, creating activities."
Community Service	17	"Expectations to be constantly involved in the community is a key stressor."
Shopping and Ordering Supplies	16	"I also have to order or buy all supplies myself so shopping/ordering can add 1-2 hours a week."
Meeting Personal Expectations	11	"Maybe it isn't from others necessarily, but I just have probably too high expectations for myself. I just feel like I should be doing more and more, which no doubt leads to me becoming and being more stressed than I need to. I just, and I know this is AWFUL, find myself comparing myself to others and just think I could put more effort and time into some things."
Fundraising	9	"Fundraisers…. take a lot of my time."
Summer FFA Activities	8	"Expected to utilize summer to attend multiple FFA events…It was difficult to plan a vacation around each event making the summer feel like I had no time off."

Note. The total number of usable responses for this open-ended question was 164.

Research Question 2

The second research question was used to identify policies and procedures currently being implemented that have had a positive impact on the SBAE teacher's experience as it relates to positive work-life integration. Seven codes/themes were discovered through our analysis (see Table 2). The leading three variables included the state extended contract grant, the consolidation of events, and our agricultural education state staff.

Table 2

Frequency of Codes/Themes on Current Illinois Agricultural Education Policies and Practices Positively Impacting a SBAE teachers Ability to Achieve Positive Work-Life Integration

Codes/Themes	*f*	Representative Quote
3-Circles [extended contract] Grant	42	"The 3 Circles [extended contact] grant because at least I get some additional income to provide for my family."
Consolidation of Events	19	"I appreciate the consolidation of contests to try to free up some time."
Agricultural Education State Staff	15	"I like that the FCAE [state agricultural education] staff has to come out to our programs and meet with us teachers because it can be hard for us to speak up and ask for help."
Professional Development Offerings	9	"The new Ag teacher conference and the meetings are very helpful. It gave me better ways to balance my work-life."
AET Record keeping System	6	"Evaluating record books ahead of time in the AET has been a MAJOR help in reducing stress and made it easier to get home from district and state competitions in a reasonable time."
Virtual Meetings	6	"The ability to use virtual meetings for organizations and professional development."
New State Website	6	"Having everything located on one website has streamlined things."

Note. The total number of usable responses for this open-ended question was 116.

Research Question 3

The third research question was used to identify potential policies and procedures that could be implemented to achieve a positive impact on the SBAE teacher's experience as it relates to work-life integration. Seven codes/themes were also discovered through our analysis on this question (see Table 3). The leading three factors included having more events during

contractual hours, consolidating more FFA events, and providing more "turnkey" instructional resources.

Table 3

Frequency of Codes/Themes on Potential Policies and Practices the Could Positively Impact an Illinois SBAE teachers' Ability to Achieve Positive Work-Life Integration

Codes/Themes	*f*	Representative Quote
Have More Events during Contractual Hours	15	"Move more FFA activities during the school day, so I can have more time available after school and on the weekends."
Consolidate More Events	11	"Encourage sections and districts to combine events whenever possible … Cutting the number of events would be helpful."
"Turnkey" Curriculum Resources	9	"More curriculum resources to decrease planning efforts and free up mental space to do other program wide things.
Maintain/Expand the 3-Circles [extended contract] Grant	7	"Continue to maintain the 3-Circles grant program. The [3-Circles Grant] make me feel better about what I do outside of contract time."
Reevaluate Deadlines and Registrations	7	"Refrain from having deadlines after 5 pm on a Friday until 8 am on Monday morning."
Reduce Non-essential Paperwork	7	"Reduce paperwork that have no REAL purpose, like the Chapter Strategic Plan."
Provide Professional Development on Work-Life Integration	6	"Offer workshops on how to delegate some tasks to the officer team…workshops on how to time manage better and how to prioritize"

Note. The total number of usable responses for this open-ended question was 121.

Discussion, Implications, and Recommendations

The number of scheduled events, particularly those in the evening, overnight, or on weekends, seem to be the leading factor limiting SBAE teachers' ability to establish positive work-life integration. With 164 respondents, CDEs and the amount of FFA events were noted

collectively 129 times or in 79% of responses. These findings are consistent with Solomonson et al.'s (2018) research identifying out-of-classroom expectations as a leading reason teachers leave the profession.

The most common policy/procedure teachers indicated positively impacting their work-life integration was the 3-Circles [extended contract] grant which provide funds for out-of-classroom responsibilities. This factor was identified 42 times or in 36.2% of responses implying that although work-life integration is challenging, appropriate compensation for extra hours and effort helps to keep SBAE teachers in the profession. Further study examining extra compensation and its relationship impacting positive work-life integration should be conducted.

Scheduling more events during contractual hours and consolidation of events were the two most frequently identified potential policies and procedures suggested to positively effect work-life integration. Through our analysis, we provide the following recommendations to Illinois Agricultural Education boards, executive staff, and other relevant decision-makers:

1. Program and event schedules should be evaluated. Activities should be consolidated to offer multiple opportunities at one time and moved during contractual hours to reduce evening and weekend obligations.
2. Non-essential paperwork, reports and applications should be identified and eliminated to relieve pressure and fatigue on SBAE teachers. Deadlines should be evaluated to avoid due dates falling on evenings and weekends.
3. The 3-Circles [extended contract] grant should be maintained and/or expanded as teachers have identified this positively impacts their work-life integration.
4. Professional development related to work-life integration should be provided to help teachers establish positive work-life integration.

References

Allen, T. D., Herst, D. E. L., Bruck, C. S., & Sutton, M. (2000). Consequences associated with work-to-family conflict: A review and agenda for future research. *Journal of Occupational Health Psychology, 5*(2), 278–308. https://doi.org/10.1037/1076-8998.5.2.278

Corbin, J., & Strauss, A. (2006). *Basics of qualitative research*. Sage Publications.

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches*. Sage Publications.

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.

Fraenkel, J. R., & Wallen, N. E. (2007). *How to design and evaluate research in education* McGraw-Hill Inc.

Frone, Russell, M., & Cooper, M. L. (1997). Relation of work-family conflict to health outcomes: A four-year longitudinal study of employed parents. *Journal of Occupational and Organizational Psychology*, *70*(4), 325–335. https://doi.org/10.1111/j.2044-8325.1997.tb00652.x

Garcia, E., Han, E. & Weiss, E. (2022). Determinants of teacher attrition: Evidence from district-teacher matched data. *Education Policy Analysis Archives, 30*(25). https://doi.org/10.14507/epaa.30.6642

Grzywacz, & Marks, N. F. (2000). Reconceptualizing the work–family interface: An ecological perspective on the correlates of positive and negative spillover between work and family. *Journal of Occupational Health Psychology*, *5*(1), 111–126. https://doi.org/10.1037/1076-8998.5.1.111

Hainline, M. S., Ulmer, J. D, Ritz, R. R., Burris, S., & Gibson, C. D. (2015). Career and family balance of Texas agricultural education teachers by gender. *Journal of Agricultural Education*, *56*(4), 31-46. doi:10.5032/jae.2015.04031.

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

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalist inquiry*. Sage Publishing.

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.

Smith, A. R., Lawver, R. G., & Foster, D. D. (2022). National agricultural education supply and demand study, 2021 executive summary. Retrieved from https://www.naae.org/whoweare/supplyanddemand.cfm

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.2018.02321

Sorensen, T. J., McKim, A. J., & Velez, J. J. (2016). A national study of work-family balance and job satisfaction among agriculture teachers. *Journal of Agricultural Education*, *57*(4), 146-159. https://doi.org/10.5032/jae.2016.04146

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

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.

Wright, C. (2015, September). *Open-ended survey coding: 10 steps for coding the responses.* https://www.infosurv.com/how-to-code-open-end-survey-question-responses

Information Sources Used by Farmers in Developing Conservation Plans and Adoption of Best Management Practices (BMPs) in Pennsylvania: Implications for Program Design and Delivery

Elsie Assan PhD, Purdue University
Rama Radhakrishna, PhD, Purdue University
Anil Kumar Chaudhary, PhD, The Pennsylvania State University

Introduction

Environmental sustainability, particularly water quality improvement in surface water sources, is of important concern to federal, state, local and private conservation agencies across the United States. Pennsylvania is committed to reducing the deposition of non-point source pollutants from all sources, including agricultural production activities, in its surface water sources to improve water quality (Pennsylvania Department of Environmental Protection, 2021). Agricultural production activities are the third most important of all non-point source (NPS) pollutant sources of streams, rivers, lakes, and other open water sources across Pennsylvania. Annually, federal, state, and local governments invest millions of dollars in developing solutions to NPS pollution and provide incentives and technical assistance to encourage farmers' voluntary adoption of best management practices (BMPs) (Mullendore, Ulrich-Schad, & Prokopy, 2015) through conservation programs. Thus, farmers could play a crucial role in helping to improve water quality in impaired waters, particularly in the Pennsylvania's share of the Chesapeake Bay Watershed by "balancing environmental conservation, farm management and social responsibility" (Barbercheck, Brasier, Keirnan, Sachs, & Trauger, 2014; Shennan, 2008).

The adoption of BMPs among farmers vary significantly (Liu, Bruins, & Heberling, 2018; Yang & Sharp, 2017). Existing literature shows that BMPs adoption among farmers can be influenced by farm and farmer characteristics, access to information on available BMPs, and access to resources needed for practices implementation and maintenance (Baumgart-Getz, Prokopy, & Floress, 2012; Reimer, Weinkauf, & Prokopy (2012). However, there is a paucity of research in the Pennsylvania context assessing farmers' adoption of conservation plans and their use of different information delivery channels. The present study seeks to address this gap. Access to educational messages on agri-environmental conservation through appropriate delivery methods is important. Thorn et al (2017) grouped information delivery methods into three: traditional and media publications (newsletters, agricultural magazines, scientific literature, radio, television, and videos), electronic dissemination (websites of conservation agencies and social media), and face-to-face (field tours, one-on-one farm visits, on-farm demonstrations, and workshops). Studies have shown that farmers tend to use multiple information delivery methods with the degree of use of each method varying according to certain farmer demographic and farm characteristics methods (e.g., Licht & Martin, 2006; Israel & Wilson, 2006; Tweeten & Paulsen, 2020). For instance, Suvedi et al, (1999) found that larger scale and high-income farmers are more likely to use all three groups of information delivery methods whereas Diekmann and Batte (2009) observed that farmers were more likely to use traditional methods compared to electronic delivery channels.

Conceptual Framework

As conservation specialists and Extension educators are involved in disseminating information on best management practices, tools, and ideas that impacts program design and delivery, it is important to understand the selection and appropriateness of delivery methods in which a new practice or practices may be accepted into a group. We used two models to develop a conceptual framework for this study. First, we reviewed Roger's Adoption-Diffusion theory (1995) to determine the parameters that help select appropriate delivery methods for acceptance of a new practice or practices especially when innovations or new practices or program are complex, and to some extent controversial, for example, climate change. Second, we examined the conceptual model for selecting delivery methods developed by Radhakrishna, Olson, and Chaudhary, 2019. As shown in Figure 1, three foundational scholarly works of Bloom, et al, Dale and Bennett are connected depending on the level of change desired in participants and the selection of delivery methods to bring about the desired change. As posited by Radhakrishna, et al., (2019) the conceptual model helps extension educators in many ways, including the nature of the extension program, background of participants, understanding the interconnectedness between the three scholarly works, and the potential impact of the methods selected, resources needed, level of audience engagement and the ease of delivery.

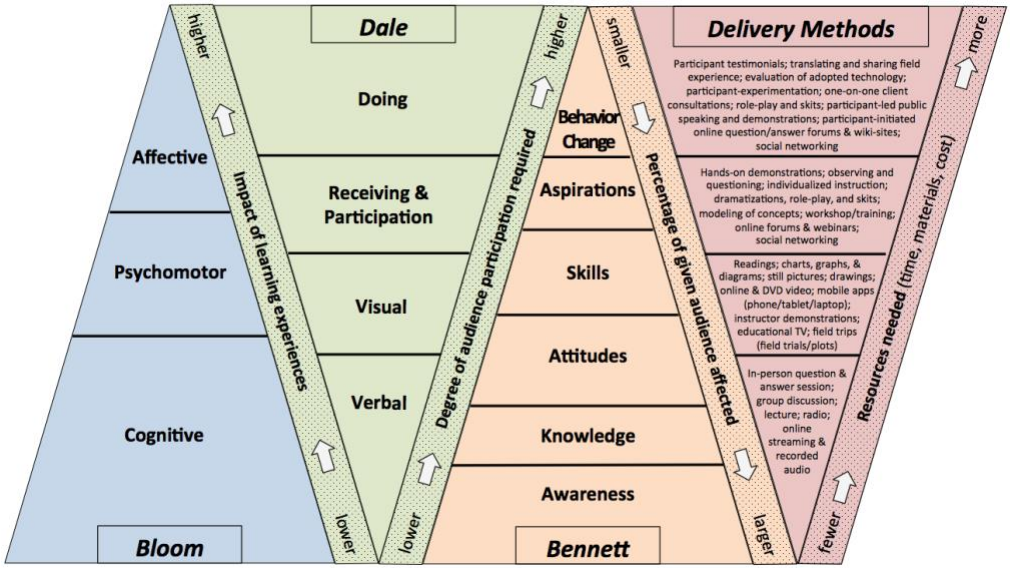


Figure 1: Conceptual framework connecting three educational models and delivery methods

Purpose and Objectives

The purpose of the study was to determine the adoption of conservation plans (CP) and implementation of best management practices (BMPs) that form part CPs by farmers in Pennsylvania Chesapeake Bay Watershed. The specific objectives of the study were to:

1. Describe the demographic characteristics of farmers in Pennsylvania watershed;
2. Describe the adoption of Conservation Plans (CPs) by farmers within Pennsylvania Watershed;

3. Determine the level of BMPs adoption by farmers with existing conservation plans for their farm businesses;
4. Describe the information delivery channels through which farmers learn about CP development; and
5. Determine differences in information delivery channels used by farmers and their select demographic characteristics.

Methodology

Population and Sample

The target population for this study was livestock and crop producers representing 33, 000 farms across 43 counties in Pennsylvania watershed (Pennsylvania Department of Environmental Protection; Pennsylvania DEP, 2021). Four counties were purposively selected for this study because they contributed the highest amount of pollutants in the watershed. The Agriculture Marketing and Consultation firm, DTN, developed the sampling frame for the study. The researchers requested that each participant selected should have a physical mailing and email address contact information, with 4067 producers fitting the criteria. A sample of 990 for a 97% confidence interval and 3% margin of error was utilized (Krejcie and Morgan, 1970).

Instrumentation

The data for the study came from a larger dataset funded by the [State] department of agriculture. The data for the study was collected using a survey instrument developed by researchers. Following Barbercheck et al., (2014), we developed a list of 12 structures and practices that have been evaluated by the USDA Natural Resources Conservation Service as important for addressing environmental quality issues in agriculture and promoting agricultural production. This list of BMPs was included in the survey and respondents were asked to indicate if the practice was part of their conservation plan (Yes/No) and if the practice is installed or used (Yes/No) on their farm. We used a Four-point Likert type question (1 = *Never* to 4 = *Often*) to measure respondents' use of diverse information delivery channels. We also measured farmer and farm characteristics. The instrument was reviewed by a panel of experts with expertise in Extension programming, Natural Resources Management, and survey methodology for face and content validity. We conducted a pilot test of the instrument with a sample not part of the target population and found acceptable reliabilities which ranged from .918 to .970 for the scale variables reported. Following Thorn et al (2017), we categorized the 12 delivery methods into three groups: traditional and media publications (newsletters, agricultural magazines, scientific literature, radio, television, and videos), electronic dissemination (websites of conservation agencies and social media), and face-to-face (field tours, one-on-one farm visits, on-farm demonstrations, and workshops). Reliability estimates for the categories are shown in Table 1.

Table 1 Reliability Estimates for Traditional Written and Media Outreach, Electronic Outreach, and Face-to-Face Outreach

Delivery method category	No. of Items	Frequency of Use (Cronbach's alpha)
Traditional written and media outreach	6	.749
Electronic outreach	2	.532
Face-to-Face outreach	4	.758

Data Collection and Analysis

We collected data for this study following an adjusted three wave mailing procedure that included two reminders to respondents (Arbuckle, Prokopy, Haigh, et al., 2013) from February – April 2022. First, we mailed a survey packet to 1200 participants, and after a mix of two mail and email reminders to non-respondents, 216 surveys were returned for an 18% response rate. A total of 161 (123 first contact and 38 second contact) completed surveys were considered useful in analysis. The response rate for the survey was low compared to other studies that used surveys (e.g., Reimer & Prokopy, 2012). We used descriptive and inferential statistics to analyze the survey data using SPSS.

Results

Objective one: Demographic characteristics

The majority (56.3%) of the respondents were in the age range of 60+, followed by those within the 51 – 60 years (26.1%) and with the least (17%) being 50 years and below. 97.9% of the farmers identified as males. Most of the respondents (70.3%) had some high school education, followed by "undergraduate" or "professional" degree (23.6%).

About a quarter (24.6%) reported an annual income of "$200,000+" followed by 20.3% reporting a total income of "$0 up to $24,999" and 18.1% indicating an annual income of "$150,000 - $74.999." About 37.3% of farmers indicated membership in one or more farmer groups or organizations. The groups of membership included the Pennsylvania Farm Bureau (82.4%), agricultural commodity group (e.g., [State] Dairymen's Association) (26.8%), County Conservation group (19.0%), and Pennsylvania Farmers' Union (17.1%).

Objective two: Conservation Plan adoption by participants

Respondents were asked to indicate whether they had developed a CP for their farm business or intended to develop one in the future. As shown in Figure 4, the majority of the respondents (87.8%) reported having developed a CP for their farm business and using it, as shown in Figure 2.

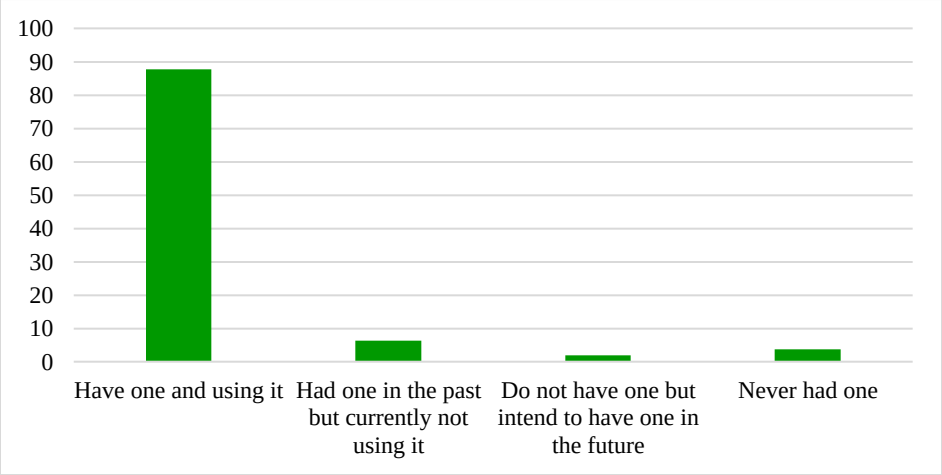


Figure 2: Distribution of farmers according Conservation plan adoption

Objective three: BMPS that are installed or used by respondents as part of CPs

Respondents were asked to indicate which of the practices are installed or in use on their farms – these could be part of their CP or not. The five common practices reported by respondents included conservation tillage (93.5%), crop rotation (92.5%), soil testing (91.9%), rotations for soil fertility (90.8%), and manure management or manure storage (88.7%). One out of the five practices were applicable to animal rearing and the remainder related to crop production. The less common practices reported as installed or in use by respondents included stream bank fencing (50.0%), stream bank crossing (47.5%), and riparian buffers (39.6%).

Objective four: Delivery channels used by farmers in soliciting BMPs and Conservation planning information

We asked respondents to indicate different information delivery methods they use to learn about CP development and or BMPs. As shown in Figure 2, the top five information delivery methods mostly (sometimes or often) used by respondents include Agriculture magazines (78.6%), newsletters (65.4%), one-on-one visits farm visits by conservation professionals or advisors (54.7%), workshops (38.6%), and field tours of BMPs on other farms (37%). Conversely, information delivery channels that appeared to be least (rarely or never) used by the study participants include social media (91.3%), Radio programs (89.2%), Television (81.3%), and websites of conservation agencies or groups (79.7%).

Table 2 BMPs installed or used by respondents

BMPs Installation/Use	**Yes (%)**	**No (%)**	**Total (n)**
Streambank fencing	50.0	50.0	110 (100)
Rotational/prescribed grazing	56.1	43.9	107 (100)
Stream crossing	47.5	52.5	99 (100)
Managing manure nutrient/manure storage	88.7	11.3	124 (100)
Rotations for soil fertility	90.8	9.2	120 (100)
Soil testing	91.9	8.1	123 (100)
Vegetated buffers	70.4	29.6	115 (100)
Grassed waterways	76.7	23.3	120 (100)
Filter strips	58.3	41.7	108 (100)
Riparian buffers	39.6	60.4	101 (100)
Conservation tillage (e.g., no till)	93.5	6.5	124 (100)
Cover crops	84.4	15.6	122 (100)
Crop rotation	92.5	7.5	122 (100)

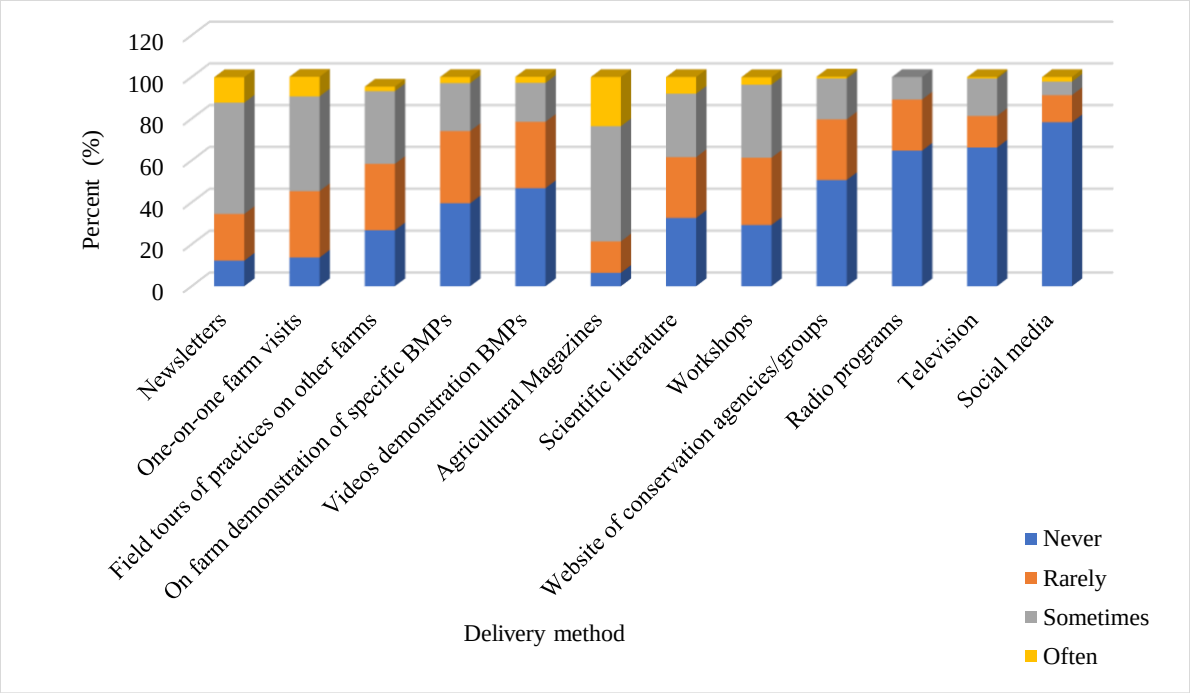


Figure 3: Farmers' use of information delivery methods to learn about BMPs and conservation in general

Objective five: Differences Among Farmers in Information Delivery Methods

We conducted an analysis of variance to determine the differences in the use of information delivery channels among farmers. There were no significant differences among farmers with regards to age, highest level of agriculture related formal education, and income level and their use of any of the three categories of information delivery channels. An independent samples t-test conducted showed that there was a difference among farmers who were members of a farmer organization (M =2.46; SD = .56) and those who were not (M = 2.04; SD = .66) in terms of use of face-to-face channels $t(3.596) = 122$, $P<.01$ and traditional mass media channels $t(1.871) =125$, $p = .032$. Also, there was a significant difference between male (M=2.22, SD=.651) and female farmers (M=1.42, SD=.38) and the use of face-to-face interactions, $t(2.13)=(122)$, $p = .035$ to learn about conservation. A Spearman's rho correlation showed a significant but weak positive relationship between years of farming and the use of traditional mass media, $r([120] =22.5$, $p = .013$.

Conclusions and Recommendations

Generally, many of the study participants had conservation plans developed for their farm businesses and have implemented at least two of the recommended BMPs on their farms. Of the BMPs that were listed by respondents as being part of CPs, eight of them were reported as being part of CPs by more than 50% of the respondents. With regards to CP BMPs installed, the majority (>85%) of respondents used or installed conservation tillage, crop rotation, soil testing, rotations for soil fertility, and manure storage/manure management. All of these practices, except one (rotation for soil fertility), are designed to protect water quality by preventing deposition of sediment and nutrients runoff into water bodies and enhance farm economic viability through efficient resource use. The widespread adoption of CPs and implementation of

recommended practices could serve as an indication of farmers' commitment to environmental quality improvement while improving the environmental performance of their business. Our study did not measure whether farmers received any financial support from conservation agencies towards BMPs use and maintenance. Future studies could explore the role of financial incentives in farmers' adoption decisions and continued use of BMPs (particularly vegetative and operational practices).

Access to information could equip farmers to make well informed decisions about (non-) adoption of BMPs (Comerford, 2014). Our study findings suggest that farmers access conservation mostly through traditional information delivery channels via print media (e.g., agricultural magazines) and interpersonal channels (e.g., face-to face visits of conservation professionals). Existing studies have shown that traditional information delivery channels that include print media and face-to-face interaction continue to be crucial in disseminating conservation information to diverse farmers (Thorn et al., 2017). Further, the study shows that very few farmers seek conservation related information through more modern delivery channels such as social media and websites of conservation agencies consistent with previous studies (Radhakrishna, Nelson, Franklin, & Kessler, 2003). Our study also showed that information delivery channels used by farmers differed with regards to gender, participation in a farmer organization, and farming experiences. In all cases there seem to be a preference for face-to-face interactions by farmers and traditional mass media channels consistent with existing studies. The differences in farmers' use of delivery channels needs to be considered in conservation programming to enhance efficient use of program resources in conservation awareness creation.

We believe that selection of appropriate program delivery methods and desired level is critical in designing programs that lead to better program outcomes. Further, linking delivery methods to program outcomes is also important. We suggest that discussion on the linkage should occur at the beginning of the program, and not as an afterthought in the program planning process.

We suggest that conservation specialists, extension educators, and practitioners involved in conservation education programs should apply the ley components of the integrated model to determine if a particular delivery method or a combination of delivery methods resulted in better program outcomes.

References

Barbercheck, M., Brasier, K., Kiernan, N. E., Sachs, C., & Trauger, A. (2014). Use of conservation practices by women farmers in the Northeastern United States. *Renewable Agriculture and Food Systems, 29*(1), 65-82.

Baumgart-Getz, A., Prokopy, L. S., & Floress, K. (2012). Why farmers adopt best management practice in the United States: A meta-analysis of the adoption literature. *Journal of Environmental Management, 96*(1), 17–25. https://doi.org/10.1016/j.jenvman.2011.10.006

Bennett, C. (1975). Up the hierarchy. *Journal of Extension,* 13 (2) 2-12. Retrieved from http://www.joe.org/joe/1975march/1975-2-1l.pdf

Bloom, B.S., Engelhart, M.D., Furst, E.J., Hill, W.H. & Krathwol, D.R. (1956). Taxonomy of educational objectives, handbook 1: Cognitive domain. New York, NY: David McKay Company.

Comerford, E. (2014). Understanding why landholders choose to participate or withdraw from conservation programs: A case study from a Queensland conservation auction. *Journal of*

Environmental Management, 141, 169-176.
Dale, F. (1970) A truncated section of the cone experience. *Theory into Practice, 9* (2), 96-100.
Diekmann, F., & Batte, M. T. (2009). Examining Information Search Strategies of Ohio Farmers. *The Journal of Extension*, 47(6), Article 8. https://tigerprints.clemson.edu/joe/vol47/iss6/8
Israel, G. D., & Wilson, K. M. (2006). Sources and channels of information used by educational program clients. *Journal of Applied Communications, 90*(4), 6.
Krejcie, R., & Morgan, S. (1970). Sample size determination. *Business Research Methods, 4*(5), 34-36.
Licht, M. A. R. and Martin, R. A. (2006) Iowa Corn and Soybean Producers' Use of
Communication Channels. *Journal of Applied Communications*, *90*(4), 19-38 https://doi.org/10.4148/
1051-0834.1264
Liu, T., Bruins, R. J., & Heberling, M. T. (2018). Factors influencing farmers' adoption of best management practices: A review and synthesis. *Sustainability*, *10*(2), 432.
Mullendore, N. D., Ulrich-Schad, J. D., & Prokopy, L. S. (2015). US farmers' sense of place and its relation to conservation behavior. Landscape and Urban Planning, *140*, 67-75.
Pennsylvania Department of Environmental Protection. (2021). *Phase 3 of Pennsylvania's Chesapeake Bay Watershed Implementation Plan (WIP3)*. Pennsylvania Department of Environmental Protection.
Radhakrishna, R., Olson, B.L., & Kumar Chaudhary, A. (2017). A Conceptual Model for Selecting Extension Delivery Methods. *Journal of Human Sciences and Extension*, *5*(3), 133-142.
Radhakrishna, R. B., Nelson, L., Franklin, R., & Kessler, G. (2003). Information sources and extension delivery methods used by private longleaf pine landowners. *The Journal of Extension, 41*(4), 12.
Reimer, A. P., Weinkauf, D. K., & Prokopy, L. S. (2012). The influence of perceptions of practice characteristics: An examination of agricultural best management practice adoption in two Indiana watersheds. *Journal of Rural Studies*, *28*(1), 118–128. https://doi.org/10.1016/j.jrurstud.2011.09.005
Rogers, E.M. (2003). Diffusion of Innovations (5th ed.) New York, NY: Free Press.
Shennan, C. (2008). Biotic interactions, ecological knowledge, and agriculture. Philosophical Transactions of the Royal Society B: *Biological Sciences, 363 (1492)*, 717-739.
Suvedi, M., Campo, S., & Lapinski, M. K. (1999). Trends in Michigan farmer's information seeking behaviors and perspectives on the delivery of information. *Journal of Applied Communications, 83, (3),* 33-50.
Thorn, K., Tobin, D., Radhakrishna, R., Chatchyan, A., Chan, J., & Allred, S. (2017). Usefulness of delivery methods for climate change programming: Perspectives of extension and research faculty. *The Journal of Extension*, *55*(5), 22.
Tweeten, J. F., & Paulsen, T. H. (2020). Perceptions of Communication Tools as Defined by Iowa Cattle Producers. *NACTA Journal*, *65*.
Yang, W., & Sharp, B. (2017). Spatial dependence and determinants of dairy farmers' adoption of best management practices for water protection in New Zealand. *Environmental management, 59(4),* 594-603.

Examining the use of social media applications by West Virginia agricultural producers

Mikayla Hargis, West Virginia University
Dr. Haley Rosson, West Virginia University
Dr. Aaron Giorgi, West Virginia University

Introduction

Social media has become a part of the typical everyday routine. A Pew Research Center (2021) study reported 72% of Americans use social media, the most popular being Facebook and Instagram, followed by Twitter, YouTube, Pinterest, TikTok, and Snapchat. Social media is a primary source for information-seeking behavior among individuals (Osatuyi, 2013). Because of this behavior, as well as the speed with which social media can reach people (Cui, 2014), businesses and organizations have increasingly implemented social media to communicate with their customers (Osatuyi, 2013).

Rapp et al. (2013) found that social media continues to change business communications across distribution channels and with customers, including the agricultural industry. According to the USDA-Economic Research Service, 1.4% of the U.S. population accounted for direct on-farm employment (2022). There is a growing disconnect between those involved in agriculture and the general population (Irani & Doerfert, 2013). Relatedly, U.S. agriculturists need to understand consumers' public knowledge and opinions on agriculture (Elliot, 1999). Social media platforms could allow agriculturists to gain networking opportunities with the intended audience (Morris & James, 2017). Information provided by agriculturists could help consumers gain understanding of how food is produced, eliminate myths about agricultural practices, and combat negative perceptions of agriculture, ultimately bridging the gap between farmers and consumers (Allen et al., 2010).

While increasing numbers of agriculturists are using social media to send information and educate the public about agriculture (Allen et al., 2010; Rodriguez, 2009), this is an area where agriculture has been laggard (Barrett et al., 2010). Agriculturists are not necessarily against participating in social media, but they may not understand the advantages and benefits of utilizing social media to promote their operation (Baumgarten, 2012). There may also be some hesitation in adoption due to farmers' lack of familiarity with social media (Pechrov'a et al., 2015). Studies have been conducted on the utilization and perceptions of social media by individuals and organizations associated with the agriculture industry (Bowen, 2012; Bowman et. al, 2014; Daigle & Hess, 2021; Rhoades & Aue, 2010), with several reporting positive motivation and/or competence toward social media usage by agriculturalists (Meyers et al., 2014; Morris & James; Telg & Barnes, 2017; White et al., 2014).

West Virginia has approximately 22,300 agricultural operations, a substantial majority (80%) of these farms generating income of less than $10,000 (USDA-National Agricultural Statistics

Services (NASS), 2021). In 2021, 73% of farms in West Virginia had internet access, which is just below the national rate at 82%. With increased initiatives to promote local foods, farmers markets, and other agritourism attractions (West Virginia Department of Agriculture, 2020), there is an increased need to examine social media adoption or rejection by agricultural producers in the state.

Theoretical Framework

Diffusion, defined by Rogers (2003), is "the process by which an innovation is communicated through certain channels over time among the members of a social system" (p.5). By using the Diffusion of Innovation theory, we can see the level and rates of adoption of social media usage into an agricultural operation, examining several factors that could affect adoption or rejection of the innovation.

Rogers (2003) depicted a model of the Innovation-Decision Process which illustrates the process of an individual's decision of an innovation over time with a series of actions. Rogers' (2003) model consists of five stages: 1) Knowledge; 2) Persuasion; 3) Decision; 4) Implementation; and 5) Confirmation. Within the "Persuasion" stage of the Innovation-Decision Process Model, Rogers (2003) listed five perceived characteristics of the specific innovation: (1) Relative Advantage, (2) Compatibility, (3) Complexity, (4) Trialability, and (5) Observability. These five attributes affect the adoption decision by the individual and will lead to their decision to adopt or reject an innovation (Rogers, 2003). It's important to note that these characteristics are based on the perceptions of the innovation itself, and not the use of the innovation (Rogers, 2003).

The perceived attributes of an innovation are vital to the rate of adoption (Rogers, 2003). The variance in the rate of adoptions of innovations are often explained by the aforementioned five attributes - relative advantage, compatibility, complexity, trialability, and observability - in addition to the nature of communication channels, the social system the innovation is diffusing in, the type of decision made, and the extent of change agents' efforts all affect the adoption rate.

Purpose and Objectives

This study's purpose was to examine utilization or rejection of social media platforms by West Virginia agricultural producers. In order to achieve this purpose, the following objectives will be in place:

1. Describe utilization of social media by West Virginia agricultural producers;
2. Describe perceived characteristics of social media by West Virginia agricultural producers; and
3. Describe willingness to adopt social media by West Virginia agricultural producers.

Methods

This study was part of a larger research project that utilized a mixed-methods, explanatory sequential research design. For the purposes of this abstract, the methodology and findings reported are from the quantitative aspect of the project. This portion of the study followed a descriptive, non-experimental design utilizing a survey instrument for data collection. Descriptive statistics allow the researcher to organize, summarize, and describe observations (Ary et al., 2019). The survey instrument was adapted and slightly modified from Bowen (2014) and Moore and Benbasat (1991). A census allowed researchers to collect data from agricultural producers. Printed copies of the instrument were administered at the 2022 West Virginia Farm Bureau conference. Printed instruments were intentionally utilized for this study in order to attempt to reach all adopters and non-adopters of social media.

The target population of this study consisted of West Virginia agricultural producers. USDA Rural Business-Cooperative Services defines an agricultural producer as those "that engage in the production or harvesting of an agricultural product. Producers may or may not own the land or other production resources" (2004). A non-probability, convenience sampling method was used due to the access and influx of agricultural producers in one location. Sample population was taken from attendants at the Annual West Virginia Farm Bureau Meeting in the fall of 2022.

The instrument contained four sections. Section one contained multiple choice and matrix questions to determine the utilization of social media. Section two included multiple choice and Likert-type scale questions to determine the willingness to adopt social media into their operations. Section three included Likert-type scale questions to determine the perceived attributes of social media by West Virginia agricultural producers. The final section consisted of demographics.

Face and content validity were assured by a panel of experts. Cognitive interviews with five agriculture producers were conducted to ensure validity of the instrument with members of the target population, who were removed from the sample. Cognitive interviews were conducted to help ensure respondents understood and accurately answered the questions in the instrument (Dillman, 2014). After the cognitive interviews, the researcher made changes to wording and design of questions to better suit the target population.

Reliability of the instrument was previously determined by Bowen (2014) and Moore and Benbasat (1991) utilizing Cronbach's alpha coefficient. Bowen (2014) calculated Cronbach's alpha level of 0.742 for usage of social media and 0.877 for perceptions of social media. Moore and Benbasat (1991) calculated Cronbach's alpha for each construct as follows: relative advantage ($\alpha = 0.92$); compatibility ($\alpha = 0.83$); ease of use (complexity) ($\alpha = 0.80$); trialability ($\alpha = 0.71$); and visibility ($\alpha = 0.73$). Moore and Benbasat (1991) determined "observability" as a characteristic was quite complex in the instrument development process and therefore used result demonstrability and visibility in place because the results are visible and amenable to a potential adopter (Moore & Benbasat, 1991).

Data were analyzed using Microsoft Excel to run descriptive statistics, including mean, frequencies, and standard deviations. Results of the analyses were represented as the mean and standard deviation and as frequencies and percentages. Seven survey responses were excluded due to consistent, incomplete questionnaires.

Results and Conclusions

Respondents were asked to report demographics (see Table 1). Over half of the respondents were over the age of 45 (*n* = 24, 54.54%), a majority were male (*n* = 27, 61.36%), and predominantly racially White (*n* = 42, 95.45%).

Table 1

Demographics of agriculture producers: gender, age, race

	f	%
Gender		
Male	27	61.36
Female	16	36.36
Age		
18-24 years	2	4.54
25-34 years	11	25.00
35-44 years	6	13.64
45-54 years	1	2.27
55-64 years	5	11.36
65-74 years	15	34.09
75 years or older	3	6.82
Race		
White	42	95.45
Native American or Alaskan Native	1	2.27

Note. Demographics that were not reported are not shown.

A majority of respondents (89%, *n* = 39) indicated that they directly engage in the production of an agricultural commodity in West Virginia. Producers were asked to classify their agricultural operations. Of those responding, 34.09% selected Wholesale (*n* = 15), 54.55% selected Direct Market (*n* = 24), 47.77% selected On Farm Sales (*n* = 21), 20.45% selected Retail (*n* = 9), and one participant responded as a Broker.

Personal and professional use of social media was reported among respondents. 75.00% of respondents indicated they use social media for personal use (*n* = 33), whereas 56.82% of respondents indicated they use social media for professional use (*n* = 25).

Weekly personal and professional use of social media was reported by participants (see Table 2). For both types of usage, personal and professional, a majority used social media four or fewer hours a week.

Table 2

Hours per week spent on social media sites

	f	%
Personal Use		
0-2 hours	15	34.09

3-4 hours	7	15.91
5-6 hours	6	13.64
7-8 hours	5	11.36
9-10 hours	5	11.36
11+ hours	2	4.54
Professional Use		
0-2 hours	20	45.45
3-4 hours	5	11.36
5-6 hours	2	4.54
7-8 hours	3	6.82
9-10 hours	2	4.54
11+ hours	2	4.54

Producers reported the devices they use to connect to social media. Respondents indicated 31.82% use a Desktop PC (*n* = 14), 34.09% use a Laptop computer (*n* = 15), 22.73% use an iPad or Tablet computer (*n* = 10), and an overwhelming majority, 75.00%, use a smartphone with internet access (*n* = 33).

Respondents were asked which social media platforms they believed to be useful to utilize as an agricultural producer (Table 3). Of those responding, 84.09% selected Facebook (*n* = 37), 34.09% selected Instagram (*n* = 15), 15.91% selected Twitter (*n* = 7), 56.82% selected YouTube (*n* = 25), 15.91% selected Snapchat (*n* = 7), 22.73% selected TikTok (*n* = 10) and 25.00% selected an online blog (*n* = 11).

Table 3

Social media platforms producers believe are useful to use

	f	%
Facebook	37	84.09
Instagram	15	34.09
Twitter	7	15.91
YouTube	25	56.82
Snapchat	7	15.91
TikTok	10	22.73
Online blog	11	25.00

Note. Respondents were able to select more than one option.

Over half of respondents, 52%, indicated the agriculture producer they work for, or themselves, use social media to interact with various audiences (*n* = 23). Respondents were then prompted to select how they, or their employer, utilizes social media to interact with their audience. 43.18% utilize social media for direct communication with audiences (i.e., sharing Facebook messages, Instagram direct messages, Twitter direct messages) (*n* = 19), 36.36% use social media for in-direct communication with audiences (i.e., posting to an agriculture interest group, sharing information via Twitter post updates, Instagram post updates, or Facebook post updates) (*n* = 16), and 29.55% use social media to share/mass communication with audiences (i.e., creating an agriculture focused blog, Facebook page, YouTube account, to share general information with a large group) (*n* = 13).

Respondents were asked how important they believe it is for an agricultural producer to actively engage in social media. Overall, producers believed it was *moderately important* (*M* = 3.45; SD = 1.02) for producers to actively engage in social media.

Utilization of social media was also determined by Likert-scale items. Some items were reverse coded to measure overall utilization score (see Table 4). With a large standard deviation, producers *neither agreed nor disagreed* about having the resources and knowledge necessary to use social media. Additionally, they *somewhat agreed* when asked about apprehensiveness towards using social media and hesitation due to online privacy concerns. Overall, producers *neither agree nor disagreed* about feelings of utilizing social media.

Table 4

Utilization of social media by agriculture producers

	M	*SD*
I have the resources necessary to use social media.	3.55	1.41
I have the knowledge necessary to use social media.	3.55	1.23
*I feel apprehensive about using social media.	2.95	1.35
*I hesitate to use social media because of online privacy concerns.	2.88	1.32
Overall utilization score	3.23	0.97

Note. Likert Scale: 1 = *Strongly Disagree,* 2 = *Somewhat Disagree,* 3 = *Neither agree nor disagree,* 4 = *Somewhat Agree,* 5 = *Strongly Agree*
* Indicates reverse coded items

Therefore, it is concluded that a majority of agricultural producers are utilizing social media for personal and professional purposes. Producers *neither agree nor disagree* about utilizing social media, but see the importance of being actively engaged on social media platforms.

Perceived characteristics outlined in the instrument adapted from Moore and Benbasat (1991) were measured. Likert-scale type questions were utilized to determine mean and standard deviation for each construct. Result demonstrability (*M* = 3.22; *SD* = 0.73) and Visibility (*M* - 3.06; *SD* = 0.78) were the only characteristics of social media that producers determined they *neither agree nor disagree.* Relative advantage (*M* = 2.85; *SD* = 1.27), Compatibility (*M* = 2.59; *SD* = 1.34), Complexity (*M* = 2.91; *SD* = 0.95) and Trialability (*M* = 2.63; *SD* = 0.98) were characteristics of social media that producers *somewhat disagreed.* Based on these results, it is concluded that social media as an innovation is not perceived well by West Virginia agricultural producers.

The willingness to adopt social media included reverse coded items to receive an overall construct mean and standard deviation; however, is listed by item to provide clarity to questions asked by the researchers (see Table 5). Producers *neither agreed nor disagreed* when asked about interest using social media for their operation, willingness to use social media but do not know how, and willingness to share knowledge with other agriculture producers. On the contrary, producers *somewhat disagreed* when asked if they were willing to attend an online training session learning how to use social media. The standard deviations for each item

represent variation among respondents' answers. Overall, respondents *neither agreed nor disagreed* on willingness to adopt social media. In conclusion, producers felt neutral towards willingness to adopt social media into their agriculture operations.

Table 5

Willingness to adopt social media by agriculture producers

	M	*SD*
I have no interest in using social media for my operation.*	3.55	1.41
I would be willing to use social media for my operation, but I do not know how.	3.55	1.23
I would be willing to participate in an online training session to learn how to use social media for my operation.	2.95	1.35
I would be willing to learn about social media and share my knowledge with fellow agriculture producers.	3.30	1.30
Overall willingness to adopt score	3.23	0.92

Note. Likert Scale: 1 = *Strongly Disagree,* 2 = *Somewhat Disagree,* 3 = *Neither agree nor disagree,* 4 = *Somewhat Agree,* 5 = *Strongly Agree*
* Indicates reverse coded items

Discussion, Implications and Recommendations

The purpose of this study was to examine the social media usage by West Virginia agricultural producers. Through the analysis of data, several discussion points, implications, and recommendations emerged. There was much variation on West Virginia agricultural producers' utilization of social media. This is consistent with the findings from Telg and Barnes (2017), where members of the Florida Farm Bureau Young Farmers & Ranchers had opposing views on social media in two separate focus groups. While both focus groups disagreed on comfort using, both groups saw benefits from using social media (Telg & Barnes, 2017). The qualitative aspect of this study further explains the perceived attributes and the barriers of adopting social media by the same population as examined in this current study.

Variance in the producers' perceived characteristics of social media and willingness to adopt can be discussed by noting that some attributes are important in specific contexts and individuals depending on the innovation. Rogers (2003) stated that diffusion scholars should be open to exploring other attributes that may affect an individual's need or want to adopt a specific innovation. In a study conducted by Carroll and colleagues (2022), Extension Service clientele over the age of 50 utilized newspaper and word of mouth for preference of communication channels, whereas clientele under 50 used social media and the internet. Further research is recommended to examine generational social media usage differences.

Living in a digital age, internet access is vital for education, employment, and day-to-day functioning. The USDA-NASS (2021) reported that 73% of farms in West Virginia had internet access, which is below the national average at 82%. This is not an issue that only West Virginia faces but encompasses surrounding states within the Appalachian region. The Appalachian region was five percentage points below the national average of broadband access (Population

Reference Bureau (PBR), 2023). Many Appalachian residents are at a disadvantage due to this digital gap (PBR, 2023). It is recommended to conduct further research to determine how internet access impacts these rural, agricultural households and examine the resultant barriers.

Lastly, producers felt online training to learn about social media for their operations would not be beneficial; however, producers also reported they *neither agreed nor disagreed* that they had the knowledge and resources necessary to use social media. It is recommended that agricultural outreach and programming services, like the Cooperative Extension Service, provide more resources regarding social media usage for agriculture producers. In addition, further research should be conducted to determine what types of training programs and/or resources agriculture producers need to manage and operate social media pages for their agricultural operation.

References

Allen, K., Abrams, K., Meyers, C., & Shultz, A. (2010). A little birdie told me about agriculture: Best practices and future uses of twitter in agricultural communications. *Journal of Applied Communications, 94*(3). https://doi.org/10.4148/1051-0834.1189

Ary, D., Jacobs, L. C., Sorenson, C., & Walker, D. A. (2019). Introduction to research in education (10th ed.). Cengage Learning.

Barrett, C. B., Carter, P. R., & Timmer, C. P. (2010), A century-long perspective on agricultural development. *American Journal of Agricultural Economics, 92*(2), 447-468. https://doi.org/10.1093/ajae/aaq005

Baumgarten, C. (2012) *The agriculture industry goes social.* Retrieved from https://mashable.com/2012/08/31/agriculture-industry-social-media/

Bowen, R. (2012). *Diffusion of social media among county 4-H programs in Tennessee.* (1134) [Master's Thesis, University of Tennessee]. Tennessee Research and Creative Exchange.

Bowman, B., Settle, Q., North, E. G., and Lewis, K. C. (2018). Comparison of extension personnel and supervisor perceptions of communications activities. *Journal of Applied Communications, 102*(4). https://doi.org/10.4148/1051-0834.2229

Copp, J. H., Sill, M. L., & Brown, E. J. (1958). The function of information sources in the farm practice adoption process. *Rural Sociology, 23*(2), 146-157.

Cui, Y. (2014). Examining farmers markets' usage of social media: An investigation of a farmers market Facebook page. *Journal of Agriculture, Food Systems, and Community Development, 5*(1), 87-103. http://dx.doi.org/10/5304/jafscd.2014.051.008

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 Inc.

Elliot, J. (1999). Food and agricultural awareness of Arizona public school teachers. In Proceedings of the Western Region Agricultural Education Research Conference. Retrieved from http://pubs. aged.tamu.edu/conferences/WRAERC1999/pdf/wr-1999-207.pdf

Irani, T. & Doerfert, D. (2013). Preparing for the next 150 years of agricultural communications. *Journal of Applied Communications, 97*(2). https://doi.org/10.4148/1051-0834.1109

Kaplan, A. M., & Haenlein, M. (2010). Users of the world unite! The challenges and opportunities of social media. *Business Horizons, 53*(1), 59-68. https://doi.org/10.1016/j.bushor.2009.09.003

Martin, L. M., & Matlay, H. (2003). Innovative use of the internet in established small firms: The impact of knowledge management and organisational learning in accessing new opportunities. *Qualitative Market Research, 6*(1), 18-26. http://dx.doi.org/10.1108/13522750310457348

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

Morris, W., & James, P. (2017) Social media, an entrepreneurial opportunity for agriculture-based enterprises. *Journal of Small Business and Enterprise Development, 24*(4). https://doi.org/10.1108/JSBED-01-2017-0018

Myers, C., Shaw, K., Irlbeck, E., Doerfert, D., Abrams, K., and Morgan, C. (2014). Identifying agriculturists' online communication tool training needs. *Journal of Applied Communications, 99*(3), 6-18. https://doi.org/10.4148/1051-0834.1052

National Association of State Departments of Agriculture. (n.d.). West Virginia department of agriculture. https://www.nasda.org/organizations/west-virginia-department-of-agriculture

Osatuyi, B. (2013). Information on sharing on social media sites. *Computers in Human Behavior, 29*(6), 2622-2631. https://doi.org/10.1016/j.chb.2013.07.001

Pechrov'a, M., Lohr, V., and Havlicek, Z. (2015). Social media for organic products promotion. *AGRIS On-line Papers in Economics and Informatics, 7*(1), pp. 41- 50.

Pew Research Center (2021). Social media fact sheet. https://www.pewresearch.org/internet/fact-sheet/social-media/

Population Reference Bureau. (2023). *Appalachia's digital gap in rural areas leaves some communities behind*. PRB. Retrieved January 17, 2023, from https://www.prb.org/resources/appalachias-digital-gap-in-rural-areas-leaves-some-communities-behind/

Rapp, A., Beitelspacher, L.S., Grewal, D., & Hughes, D.E. (2013). Understanding social media effects across seller, retailer, and consumer interactions. *Journal of the Academy of Marketing Science, 41*, 547-566.

Rodriguez, R. (2009). Facebook draws a growing crop of farmers. *The Fresno Bee.* Retrieved from http://www.fresnobee.com/local/story/1670850.html

Rogers, E. M. (2003). *Diffusion of innovations*. New York: Free Press.

Stanley, S. (2013), "Harnessing social media in agriculture", a report for the Nuffield Farming Scholarship Trust, Lincoln.

Tavakol, M., & Dennick, R. (2011). Making sense of cronbach's alpha. *International journal of medical education, 2*, 53-55. https://doi.org/10.5116/ijme.4dfb.8dfd

Telg, R., and Barnes, C. (2012). Communication preferences of Florida farm bureau young farmers & ranchers. *Journal of Applied Communications, 96*(2). https://doi.org/10.4148/1051-0834.1155

United States Department of Agriculture. (2022, February 22). *Ag and food sectors and the economy.* Economic Research Service. Retrieved October 2, 2022, from https://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/ag-and-food-sectors-and-the-economy/

United States Department of Agriculture. (2022, February 25). *USDA's national agricultural statistics service West Virginia field office.* National Agricultural Statistics Service. Retrieved October 2, 2022, from https://www.nass.usda.gov/Statistics_by_State/WestVirginia/index.php

United States Department of Agriculture, Rural Business-Cooperative Service. (2004). General requirements for cooperative services grant programs, value-added producer grants, agricultural innovation centers and rural cooperative development grants. Federal Register. https://www.federalregister.gov/documents/2004/04/29/04-9671/general-requirements-for-cooperative-services-grant-programs-value-added-producer-grants-agriculture

White, D., Myers, C., Doerfert, D. & Irlbeck, E. (2014). Exploring agriculturalists' use of social media for agricultural marketing. *Journal of Applied Communications, 98*(4), https://doi.org/10.4148/1051-0834.1094

West Virginia Department of Agriculture. (2020). *Agritourism*. https://agriculture.westvirginia.gov/ag-business/agritourism/

Describing Collaborations between SBAE and Extension Educators in West Virginia

Creed Ammons, West Virginia University
Aaron J. Giorgi, West Virginia University
Haley Rosson, West Virginia University

Introduction and Literature Review

School-based Agricultural Education (SBAE) and the Cooperative Extension Service educate citizens on the agricultural industry and prepare individuals for careers in agriculture. Each entity shares common missions to educate; however, each entity educates in different settings in order to reach these goals. Historically, SBAE and Extension share creation influences tied to the Morrill Act and Hatch Act. When both entities began, they had to work together to eliminate duplication problems and align responsibilities (Hillison, 1996). As budget cuts and demand rise, it has never been more important for collaboration to take place (Hillison, 1996). Research has been conducted studying collaboration as it is crucial for both entities to succeed. Diatta and Luft (1985) found slight cooperation taking place but was dependent upon the distance between the local Extension office and high school. More recent studies have found that limited cooperation takes place between both entities (Ricketts & Place, 2005). This study seeks to expand the literature of previous studies by identifying specific barriers to collaboration.

Professional Purpose

The Cooperative Extension Service was established to serve as an outreach of knowledge and resources to rural America (Seevers & Graham, 2012). Extension serves individuals on behalf of the land grant colleges through non-formal education and consists of programmatic areas: agriculture and natural resources, family and consumer sciences, 4-H youth development, and community and economic development.

Since their inception in 1917 with the Smith-Hughes act, SBAE programs have sought to develop skills and knowledge related to agricultural occupations and entrepreneurship, as well agricultural literacy (Phipps et al., 2008). SBAE is known for the "systematic instruction in agriculture and natural resources," (p. 3), and serves three main purposes, including: (1) prepare people for careers in agriculture, (2) promote job creation and entrepreneurship, and (3) increase agriculture literacy (Phipps et al., 2008).

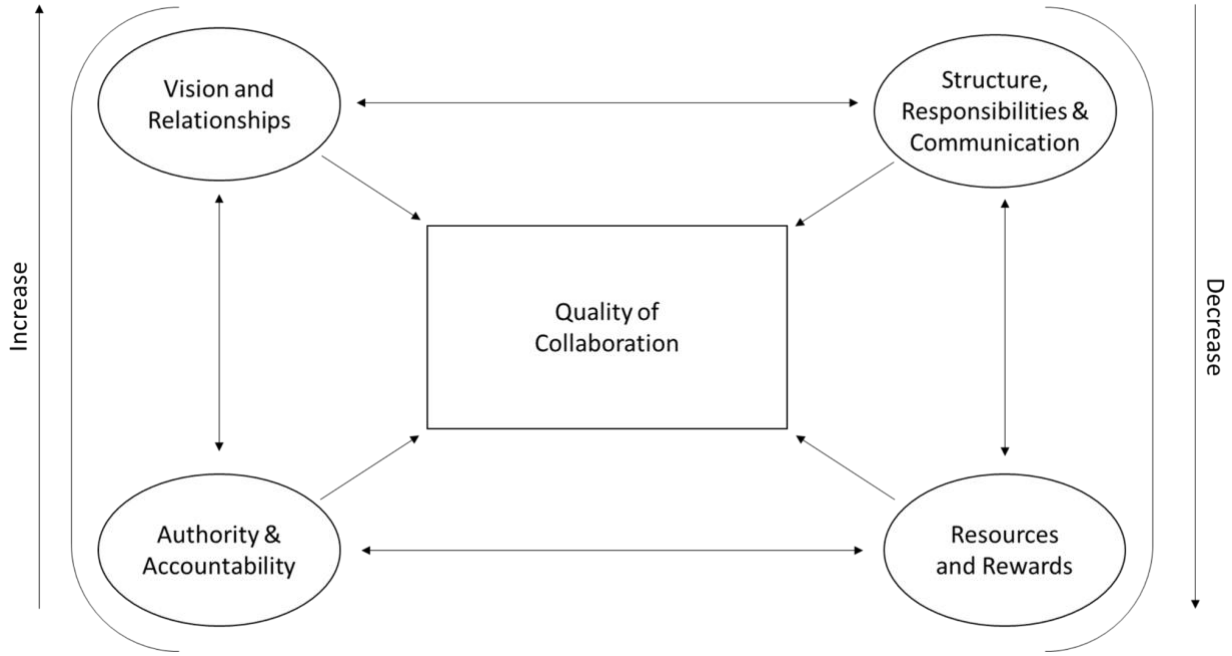
Benefits of Collaboration

Deutsch's Theory of Cooperation (1949) stated that cooperation is a social concept that can be limited by an individual's knowledge and motives of the social construct. These motives are driven by effectiveness, efficiency, and satisfaction. Green and Johnson (2015) claimed that interprofessional collaboration increases the amount achieved by the individuals. This allows them to serve larger groups of people and grow at individual and professional levels.

Conceptual Framework

This study was guided by Mattessich and Monsey's (1992) conceptualization of *collaboration,* which views collaboration as the function of essential elements for levels of collaboration. Cooperation, coordination, and collaboration are regularly interchanged, but are different in levels of *essential elements* utilized. Mattessich and Monsey (1992) use these essential elements to make a spectrum, with lower levels being cooperation and higher levels being collaboration. The levels are characterized by use of different actions within partnerships. As displayed in Figure 1, the essential elements listed by Mattessich and Monsey (1992) are vision and relationships; structure, responsibilities, and communication; authority & accountability; and resources and rewards.

Figure 1
Mattesich and Monsey's (1992) Relationship of Essential Elements



Purpose and Objectives

This study sought to describe elements of collaboration between SBAE teachers and Extension personnel in West Virginia.

1. Describe level of collaboration between SBAE and Extension educators.
2. Describe espoused barriers to collaboration between professions.
3. Compare SBAE and Extension educator's espoused successes and barriers.

Methods

A descriptive, non-experimental design utilizing a survey instrument for data collection was used. The population for this study is high school School-Based Agricultural Education teachers (n = 100) and Extension personnel located in counties that have SBAE teachers (n = 78) in West Virginia. A census of the population was attempted. A researcher-developed, online instrument was distributed via Qualtrics. Instrument items were developed using the Mattessich

and Monsey's (1992) Elements of Collaboration as guiding language. SBAE and Extension professionals received versions appropriate to their professional role. For example, when SBAE teachers were asked about leadership, the question was related to principals or deans. Leadership support for Extension professionals was framed as support from personnel working in the state Extension office. Participants were emailed a pre-notification, followed by distribution and two subsequent reminders (Dillman, 2017). A final, usable response rate for SBAE teachers was 46.0% (n = 46), and 38.4% (n = 30) for Extension personnel.

The instrument consisted of demographic questions related to professional engagement. To assess research objectives, respondents were asked to describe a time they collaborated with their professional counterpart. Those items were aligned to the essential elements of the guiding frameworks. All participants were then asked to rank barriers to collaboration with their counterpart, including an option of non-applicable.

Data was compiled in separate Excel files to review both professions separately. Descriptive statistics were used to address the research objectives. According to Ary et al. (2010), descriptive statistics are appropriate for organizing and summarizing observations to describe overall phenomenon. Frequencies, percentages, and ranges are presented where appropriate to answer the research objectives.

Results and Conclusions

Demographics for each type of professional was reported. SBAE teachers reported an average age of 35.15 years, with a range of 23 - 61 years of age, while Extension personnel reported an average age of 39.54 years, with a range of 26 - 59. A majority of SBAE teachers reported being male (n = 26, 56.5%) while the majority of Extension personnel reported being female (n = 18, 62.1%).

As related to tenure in current positions, SBAE and Extension professionals differed in their longevity. SBAE teachers reported a trend in less time at their current position. Specifically, 40.4% (n = 19) of SBAE have been in their position for less than 3 years, 10.6% (n = 5) have been in their position for 3 - 5 years, 29.8% (n = 14) have been in their position for 5-10 years, and 19.2% (n = 9) have been in their position for more than 10 years. Conversely, a majority (50.2%, n = 14) of Extension professionals reported having been in their position for 10 or more years. The remainder reported as follows: 10.3% (n = 3) have been in their position for less than 3 years, 17.2% (n = 5) have been in their position for 3 - 5 years, and 24.1% (n = 7) have been in their position for 5-10 years.

Data will be presented discriminately for Objectives 1 and 2, while comparisons to achieve Objective 3 will be commented on within data presentations.

Objective 1 - Level of Collaboration

Levels of collaboration were assessed in two ways within the instrument. Participants were asked to describe specific events of collaboration and thematic summaries of those

descriptions were analyzed. Additionally, items related to the *Essential Elements* were evaluated based on frequency of occurrence when SBAE and Extension professionals collaborated.

When SBAE teachers described events of collaboration, 73.3% (n = 22) of the collaborations were described as county fair and livestock shows, and 20% (n = 7) were described as coaching various contest team collaborations. This was mirrored in responses from Extension professionals with 92.9% (n = 26) of collaborations described as collaborating at County fairs and livestock shows and 40.7% (n = 11) were described as coaching various judging contest teams.

Essential Elements of Collaboration (Mattessich & Monsey, 1992) were assessed by indicators. A complete listing of occurrences by sub-groups and indicator is presented in Table 1. When SBAE and Extension personnel collaborated, all but one indicator was found to be present at some level for a majority of the collaborations. The indicator least reported was *reification*, with less than 30% of either professionals reporting occurrence during collaborations. *Reification* relates to award and recognition structures being similar and honoring both collaborators. SBAE and Extension personnel espoused similar occurrences for the remaining *Essential Elements* and indicators except the indicator of *common goals.* A difference of 31.3% between SBAE and Extension personnel existed when reported for *common goals*. It is concluded that when SBAE and Extension collaborate, they ensure similar elements of success are present in their collaborations.

Table 1

Comparison of SBAE and Extension personnel's espoused Essential Elements by Indicator

Essential Elements	SBAE, *f* (%)	Extension, *f* (%)
Vision and Relationships	37 (97.4)	27 (100)
Leadership Support	34 (94.4)	17 (63)
Common Goals	31 (86.1)	26 (96.3)
Outlined Goals		
Structure, Responsibilities and Communication	27 (75.0)	19 (70.3)
Division of Responsibilities	34 (94.4)	27 (100)
Channels of Communication		
Authority and Accountability	27 (75.0)	23 (85.2)
Shared Ownership	26 (74.3)	17 (65.4)
Shared Risk		
Resources and Rewards	30 (83.3)	24 (88.9)
Resources Shared	31 (86.1)	22 (81.5)
Shared Outcomes	10 (28.6)	7 (25.9)
Reification	37 (97.4)	27 (100)

Objective 2 - Espoused Barriers

Barriers to collaboration were identified using a select and rank item. Participants were instructed to rank and order a provided list of barriers based on Diatta and Luft's (1986) previous research. Participants were allowed to type in additional barriers and rank order those as well. For both SBAE teachers and Extension professionals, *Time* was ranked as the largest barrier.

SBAE teachers ranked *Time* as a barrier 31 times, one ranked it as a non-applicable barrier. The average rank of *Time* was 1.68, the highest ranked barrier. Extension personnel ranked Time as a barrier 19 times, while only 3 listed it as non-applicable. The average rank of *Time* was 1.58, the highest ranked barrier. Conversely, Diatta and Luft (1986) found that *age difference between collaborators* was a barrier to collaboration. Both professional groups reported *age difference* to be the smallest barrier. Of those who ranked barriers, 22 SBAE teachers and 16 Extension personnel ranked *age difference* as non-applicable. Therefore, it is concluded that the largest barrier to SBAE and Extension personnel collaborations is *Time*.

Based on the findings for level and elements of collaboration, and espoused rankings of barriers, it is concluded that SBAE and Extension personnel share similar perspectives for the elements needed for successful collaborations and barriers to collaborating.

Discussions, Implications, and Recommendations

Based on findings from this study, it is asserted that some collaboration does take place between SBAE teachers and Extension personnel in West Virginia. This finding is congruent with past research (Diatta & Luft, 1986; Murphrey et al., 2011; Ricketts & Place, 2005). These collaborations will become points of efficiency (Hillison, 1996) for each organization as demands for a well-educated agricultural workforce continues to increase.

The congruent finding that *reification* was not present within collaborations should be further explored. A large percentage of collaborative activities reported involved events housed within the youth organizations of FFA and 4-H. Both organizations regularly recognize supporters at annual banquets, though this low reification may suggest that collaborators are not being recognized at collaborator's events. This lack of recognition may imply lack of perceived value for the collaboration as end-result rewards are not being reported as shared between the collaborators. Continued research into increasing effective collaborations while reducing barriers is warranted.

The top ranked barrier of *Time* for collaborations in this study was congruent with previous findings (Ricketts & Place, 2005). As there is an increase in demand for SBAE teachers and Extension personnel, it will remain difficult for both professions to find time to work together and plan collaborative efforts. Ricketts & Place (2005) reported both professions being hesitant to enter new collaborative efforts due to upfront commitment of time. It is recommended that collaborative planning events be facilitated by faculty to model and intentionally plan efforts between the professions.

Both professions reported similar events of collaborations, experiences for indicators of *Essential Elements*, and similar rankings of barriers. This congruence across professions and collaboration experiences should be seen as a benefit to supporting future collaborations as needs are the same and interventions can target both audiences. Additionally, if Extension personnel and SBAE teachers attend the state's only licensure and land-grant institute, they will be in similar classes with faculty from both SBAE teacher and Extension education. It is recommended for practice that faculty begin modeling collaboration for undergraduate and graduate students to support future professional's collaborative skills development.

References

Ary, D., Jacobs, L. C., Sorensen Irvine, C. K., & Walker, D. A. (2019). *Introduction to research in education* (10th ed.). Cengage.

Deutsch, M. (1949). A theory of co-operation and competition. *Human Relations, 2*(2), 129-152.

Diatta, S., & Luft, V. D. (1986). Cooperation between North Dakota secondary vocational agriculture teachers and county agents in carrying out selected activities and programs. *Journal of Agricultural Education, 27*(1), 7–12. https://doi.org/10.5032/jaatea.1986.01007

Green, B. N., & Johnson, C. D. (2015). Interprofessional collaboration in research, education, and clinical practice: Working together for a better future. *Journal of Chiropractic Education, 29*(1), 1-10. https://doi.org.10.7899/jce-14-36

Hillison, J. (1996). Agricultural education and cooperative extension: The early agreements. *Journal of Agricultural Education, 37*(1), 9-14.

Mattessich, P. W., & Monsey, B. R. (1992). *Collaboration: What makes it work. A review of research literature on factors influencing successful collaboration.* Amber H. Wilder Foundation.

Murphrey, T. P., Harlin, J. F., & Rayfield, J. (2011). An evaluation of successful collaboration among agricultural science teachers and Extension agents in Texas. *Journal of Agricultural Education, 52*(3), 36-49.

Phipps, L. J., Osborne, E. W., Dyer, J. E., & Ball, A. (2008). *Handbook on Agricultural Education in Public Schools* (6th ed.). Delmar.

Ricketts, K. G., & Place, N. T. (2005). Cooperation between secondary agricultural educators and Extension agents. *Journal of Extension, 43*(6).

Seevers, B., & Graham, D. (2012). Education through Cooperative Extension (3rd ed.). Fayetteville, AR: University of Arkansas. ISBN: 1-56502-107X

Gender Bias Experiences in School-Based Agricultural Education

Kaley Mumma, Iowa State University
Katherine Hartmann, Iowa State University
Michael J. Martin, Iowa State University

The increasing number of women in School Based Agricultural education (SBAE) will mean these women might encounter gender-based bias. In this study, we interviewed women SBAE teachers to explore what form gender bias takes within SBAE. We found women experienced gender bias from students, peers, and from within the agriculture industry. We propose recommendations including trainings and support for students entering the profession and for current teachers, and more research about women agriculture teachers' experiences in SBAE.

Introduction

Women teaching in agriculture classrooms has steadily increased since the 1990s. Enrollment of women in agricultural education at the collegiate level has continued to increase since 1991 (Retallick & Martin, 2008). As of 2000, women accounted for 15.77% of the agriculture educator population (Foster, 2003); this number rose to 27% in 2007 (Kantrovich, 2007). By 2010, women made up most recent agricultural education graduates, although in the career, men still dominate with a 2:1 ratio (Kantrovich). The most recent National Agricultural Education Supply & Demand Study indicates 76% of license-eligible agricultural education program completers identify as female (Smith, Foster, Lawver, 2022). The survey does not provide data on the number of women currently serving as SBAE teachers. The increasing number of women in agricultural education raises questions on how gender relations in agricultural education have evolved.

The 20th century brought about changes in gender roles in society and agriculture. During both World Wars, women filled key roles in agriculture and industry (Litoff, 1993). It should be noted the way women interacted with agriculture is highly dependent on the woman's identities beyond their gender. The agricultural experiences of Indigenous women and Women of Color differ due to unique cultural traits and systemic oppression. After the World Wars, education for primarily white women focused on home economics, encouraging existing gender roles. The barriers facing women from being in male-dominated spheres can be seen in through women's delayed admittance into the FFA and agricultural education (Enns & Martin, 2015).

Gender bias was a deterrent for women entering agricultural education and the small number of women in agricultural education would be attributed to male dominance in the field, lack of acceptance from community, and the high stress and amount of time that can be spent as a teacher (Foster, Pikkert, & Husmann, 1991; Foster, 2001). While these studies are not recent, it is important to note that these barriers for women in agricultural education have remained the same over time. Women in agricultural education face barriers to entry, such as lack of acceptance, struggle to find work and family balance, and lack of role models (Baxter, Stephens, & Thayer-Bacon, 2011; Foster, 2003; Kelsey, 2006a; Seevers & Foster, 2003). The barriers to entry experienced by women agriculture teachers deters women from continuing to teach in agricultural education. Lack of support and feelings of unacceptance push women agriculture teachers from their teaching positions or deter women from entering the career altogether.

Barriers to entry have remained as a constant for women in agricultural education since they first entered the career. In response to this, women some have developed high levels of self-efficacy (Baxter, Stephens, & Thayer-Bacon, 2011; Kelsey, 2007). Some women do not contain the same levels of self-efficacy in response to gender bias. A study of agricultural educators and preservice teachers reported 64% of women participants had faced gender bias within their careers, some feeling so unaccepted they left the career altogether (Kelsey, 2007).

Purpose of the Study

The purpose of this study was to explore the sources of gender bias experienced by women teachers in SBAE.

Theoretical Framework

This study was guided by the work of feminist researchers. Feminist researchers contend society, including agricultural spaces, is dominated by the patriarchy in which women are kept from positions of power (Lerner, 1979; Murphy & Venet, 1997). Epistemological and methodological feminist perspectives "…recognize the importance of women's lived experiences to the goal of unearthing subjugated knowledge" (Hesse-Biber, 2014, pg. 3). Feminist theory as a theoretical framework was utilized to highlight participant voices and perspectives. "Feminist research begins with questioning and critiquing androcentric bias within the disciplines, challenging traditional researchers to include gender as a category of analysis" (Hesse-Biber, 2014, pg. 5. The challenging of traditional research and the questioning of male-centered bias gives rise to this research. It is necessary to apply these tenants of feminist research to the culture found with agriculture, and then more specifically, agriculture education as feminist research studying women's perspectives within agriculture and agricultural education is severely lacking.

Gender bias is a term frequented by feminist scholars, used to describe prejudiced thoughts and actions guided by the belief that men and women are not equal (European Union, 2023). The term "gender bias" is used throughout the study as the mode in which women experience gender-based mistreatment within their careers in SBAE. Gender bias has been clearly documented within agricultural education research (Baxter, Stephens, & Thayer-Bacon, 2011; Donaldson, 2022; Enns & Martin, 2015; Foster, 2003; Kelsey, 2006a; Kelsey, 2006b; Kelsey, 2007; Kleihauer et al., 2013). Based on current research we might expect gender bias in SBAE to present itself as barriers to entry, such as lack of acceptance, struggle to find work and family balance, and absence of role models (Baxter, Stephens, & Thayer-Bacon, 2011; Foster, 2003; Foster, 2001), and lack of support (Kelsey, 2006a). This study analyzed gender bias in agricultural education through interviews of current school-based agricultural educators as well as those who left the career that self-identify as women.

Methods/Procedures

Data was gathered through interviews. IRB required that the women who participated in the study would have their identities protected using pseudonyms and the redaction of identifiable information. Consent forms were created to communicate the rights of participants regarding the data collected prior, during, and after their interviews. The study focused on the experiences of women agriculture teachers from Illinois and Wisconsin.

Interviews were utilized as they align with feminist theory. “Interviewing is a powerful research tool for feminist researchers interested in exploring women's experiences and the contexts that organize their experiences” (Hesse-Biber, DeVault, & Gloss, 2014, pg. 192). For the interviews, an initial group of five women were located by looking up local directories. A snowball technique of participant recruitment was employed, resulting in a total of eight agreed to be interviewed. Prior to the interview, demographic forms and consent forms were sent. Interviews consisted of four sections of questions: background information, career information, career influencers, and gender bias. To answer the study’s research question, interview questions focused on four potential sources of gender bias for the interviewees: students, coworkers, community members, and agricultural professionals. Interviews were scheduled for an hour, most taking 30-45 minutes, over Zoom and the recordings were then transcribed utilizing the Zoom transcription service. All interview transcripts were then edited to match the interview recordings.

An initial set of four codes were created to match the anticipated participants sources of gender bias. The coding process was thereby simplified as the codes aligned with the interview questions. During a second round of data coding, the four codes pertaining to sources of gender bias were refined into three codes as gender bias from community members often fell within the theme of gender bias from agricultural industry. The final codes were bought to the research team by the lead researcher to validate the data analysis.

The research team's positionality was considered during the research process. The lead author is an agricultural education master's student who is an insider to agricultural education through experiences in FFA, high school and collegiate agriculture coursework, and student teaching in agricultural education. The second author is a female faculty member and is an educational researcher, but an outsider to SBAE. The third author is a male agricultural education faculty member who was an insider to SBAE through teaching and advising experiences as well as experienced in critical SBAE research.

Results/Findings

The participants described experiencing gender bias in three different interaction types: 1) their students; 2) peers; 3) and members of the agricultural industry.

Gender Bias from Students

Participants explained that students, particularly students who identify as men, often challenged their expertise about course content. Of the eight interviewees, four experienced gender bias from their students. In SBAE, students can be found to have differing relationships with their teachers based on the instructor’s gender. Shannon described an experience she had as an example of this:

> … There are students that I know they wouldn’t have pulled the same things with my co-teacher who was a man at the time. I had one of my FFA officers call me a bitch on his Twitter account during class because I disciplined him for doing something. Those are not things and relationships that they ever had with my co-teacher at the time. You know, he walked in like they were angels, because I was a woman, I was a young teacher they felt they could get away with those things.

Shannon received backlash from students due to her disciplinary actions, yet when her male-presenting co-teacher interacted with the students, they changed their attitude.

Lisa also described a similar experience she had during teacher training with a student on multiple occasions.

> And we were going over balance statements and one of the boys sits back in his chair and he goes, 'Why the hell should we listen to you? You're just a damn girl.'... And he, and he never made another comment, he did try to hit on me one day at National Convention, I put him back in its place.

These negative interactions with students not only undermine the teacher's knowledge but can impact the teacher's relationships with other students as they undermine these women's authority in their own classrooms. Both experiences highlight a challenge that participants faced often in their classrooms based on their gender as students question their expertise in agriculture. Within their SBAE classrooms, women agriculture instructors can face gender bias from their students through retaliation, blatant disrespect, and sexual harassment.

Gender Bias from Peers

Half of the participants faced gender-based discrimination from their peers within both formal and informal settings. Lisa served on a board of directors which happen to be primarily comprised of all women. Male agriculture teachers relayed their displeasure with the abundance of women on the board, "'Y'all are going to bicker and that's all it's going to be' and I was like, … 'I'm very capable of getting work done just like you are, … Just because I have ovaries doesn't mean I can't do that job.'" Lisa's peers utilized gender stereotypes of women having the inability to get along with one another to denigrate the contributions of women serving on the board of directors. Women who experience this form of gender bias from peers may be discouraged from taking leadership roles in the future.

Within her two-teacher agriculture program, Bailey incurred gender bias from a coworker through their refusal to discuss mechanical issues with her, and instead insists on speaking to her co-teacher. Bailey primarily teaches plant and animal science to freshmen and sophomores while her co-teacher handles upper-level mechanics coursework, but Bailey still holds a working knowledge in mechanics. "Someone was asking about, um, like an engine in their vehicle. That's all it was like it, but… I say he's like 50, male teacher like just having conversation like I'm trying to talk to him he's like "I'll just talked to (co-teacher)." Later in the interview, Bailey responds to this covert gender bias, "…it was just those little things kind of get to you. Like, 'Oh, no. I can- I can try and help you too.'" Bailey's experiences are the perfect example that covert gender bias can still have an impact on women agriculture teachers.

Not only does gender bias from peers occur in formal and professional settings, but informal settings as well. Clara reflects on her gender bias experiences from her social peers:

> I have introduced myself as an agriculture teacher and they have either gotten the comment 'you don't look like an agriculture teacher' or 'my high school agriculture teacher wasn't as pretty as you...' There's been like sexist things regards so that it just like undercuts my intelligence and you know you're just literally looking at me as a pretty thing, as opposed to an intelligent educator so that has happened multiple times too.

These statements reduced Clara to a sex object rather than her professional abilities as an agriculture educator. Comments such as this from peers undermined the intelligence and

professional standing of women agriculture teachers. Women agriculture educators experiencing gender bias from peers experience this bias within formal settings, such as stereotyping or covert gender bias, and informal settings, such as sexual harassment.

Gender Bias in Agriculture Industry

Five of the eight participants had experienced gender bias from members of the agricultural industry. Rebecca scratched the surface of this issue while alluding to its prevalence, "When I worked at the feed store, yes, there was major bias. When I worked with cattle, there was major… I can tell you stories." Rebecca experienced gender bias at multiple companies while working in the agriculture industry in addition to this, Carla recounted her own experiences working within the corporate world of agriculture:

> …But after being there for a year, you looked around and there were offices and then there were people in the central part like a general desk area. And all of the offices were male offices and everybody in the center were female or female people it didn't matter how much experience you had... But because I was a female, there was no way they were ever going to ask me questions about it [dairy science], even though I was still production agriculture…

The degree of gender bias present within Carla's workplace eventually led to her leaving the career altogether.

Gender bias from the agricultural community also impacts women agriculture teachers within their classrooms. Shelby recounts bias from a parent in her community, "He just worked with…the marketing of crops… It's still not something I'm comfortable with teaching necessarily and… he was just like well why don't you do this, and why don't you do that…" The parent's questioning undermines Shelby's expertise and authority in her classroom. Pervasive gender bias within the agricultural industry impacted over half of the interviewed participants before and during their time working as an agriculture teacher. The final source of gender bias from the agriculture industry takes the form of stereotyping, the questioning of expertise, and disregarding the professional abilities of teachers.

Discussion

This research concludes gender bias continues to be prevalent for women agriculture educators throughout their careers. Participants experienced gender bias from students, peers, and industry professionals. This gender bias took many forms which includes retaliation, disrespect, sexual harassment, cover gender bias, stereotyping, the questioning of expertise, and disregarding professional abilities. The findings of this research demonstrate how gender bias continues to prevail within agricultural education regardless of the gendered population shift within agricultural education (Baxter, Stephens, & Thayer-Bacon, 2011; Enns & Martin, 2015; Foster, 2003; Kelsey, 2006a; Kelsey, 2006b; Kelsey, 2007; Kleihauer et al., 2013).

A few important recommendations emerged from this study. First, given the experiences of the participants and the pervasiveness of gender-related bias across many areas of their profession, it is important these issues be discussed during teacher preparation programs with all students regardless of their gender (Kelsey, 2006b). Preparing potential teachers for this reality it necessary. Not only should students who identify as women will understand the potential gender bias in their classrooms, but they can be prepared for how gender bias presents itself. All

students regardless of gender should be included in changing the culture of SBAE to be more inclusive for women before they enter the classroom. This can only be done if they are appropriately educated on gender bias within their prospective career.

Second, it is important to support women agriculture teachers once they enter the profession, both to retain them as teachers and to support their success and health. Support for teachers might take the form of training or professional development opportunities for teachers and administrators or the creation of supportive peer groups within the profession (Kelsey, 2007). As gender bias experienced by participants had similar sources, there is a common ground for women to create a sense of community for women agricultural teachers.

Because women are continuing to make up a larger proportion of agriculture teachers and the lack of research that has been done on gender bias in agricultural education, it is important the researchers continue to investigate how gender bias impacts the agricultural education profession and how to support teachers in their success. The hope for this study is to be expanded upon in the future by making the research more geographically widespread to recognize how gender bias appears dependent on state or region. Also, research is needed to explore the reasoning behind women exiting teaching positions in SBAE. This recommendation was inspired by interview participant Carla, "There are negative sides and there have been some people leave education, but you're not going to interview them because we're not going to tell you those people because they're not around any longer." Finding and speaking to women agriculture teachers who have left the career can provide an unseen perspective in gender bias research in ag ed.

There needs to be widespread change within agriculture to support women within the field. Women cannot be expected to take full responsibility for changing the climate of agriculture as all people in the field can benefit from more inclusive practices. The participants experienced gender bias from the agricultural industry with an alarming regularity. On a larger scale, organizations within agricultural education and the agricultural industry must evaluate their structures and priorities as it relates to women.

References

Baxter, L., Stephens, C., & Thayer-Bacon, B. (2011). *Perceptions and barriers of four female agricultural educators across generations: A qualitative study.* Journal of Agricultural Education, 52(4), 13-23. doi: 10.5032/jae.2011.04013

Donaldson, A. (2022). *Experiences of recently graduated Women School Based Agricultural Education Students in Arizona: A critical feminist approach* (dissertation). The University of Arizona.

Enns, K., & Martin, M. (2015). *Gendering agricultural education: a study of historical pictures of women in the agricultural education magazine.* Journal of Agricultural Education. 56(3). doi: /10.5032/jae.2015.03069

European Union. (2023). *Gender bias*. European Institute for Gender Equality. https://eige.europa.eu/publications-resources/thesaurus/terms/1320?language_content_entity=en

Foster, B. B. (2001). *Choices: A dilemma of women in agricultural education teachers.* Journal of Agricultural Education, 42(3), 1-10. doi: 10.5032/jae.2001.03001

Foster, B. (2003). *Profiling female teachers of agricultural education at the secondary level.* Journal of Career Technical Education, 19(2), 15-28. doi: 10.21061/jcte.v19i2.614

Foster, R., Pikkert, J., Husmann, D. (1991). *Self-Perception of Gender Bias Among Women Agriculture Teachers*. American Vocational Association.

Hesse-Biber, S. N., DeVault, M., & Gross, G. (2007). Feminist Interviewing: Experience, Talk, and Knowledge. In *The Handbook of Feminist Research: Theory and praxis* (1st ed., pp. 173–197). essay, Sage.

Hesse-Biber, S. (Ed.). (2012). *Handbook of Feminist Research: Theory and praxis* (2nd ed.). SAGE.

Iowa FFA Association. (2021). *2021 State Officer Candidate Exam Resource.* https://www.iowaffa.com/CMDocs/IowaFFAassociation/Officers/SOSP/SOC%20Exam%20Resources_2021.pdf

Kantrovich, A. (2007). *A national study of the supply and demand for teachers of agricultural education from 2004–2006.* American Association for Agricultural Education. Retrieved from https://www.naae.org/whoweare/NSD/2004-06Study.pdf

Kantrovich, A. (2010). *A national study of the supply and demand for teachers of agricultural education form.* American Association for Agricultural Education. Retrieved from http://aaaeonline.org/files/supply_demand/2010%20Supply%20and%20Demand%20stuy%20report%20v5.pdf

Kelsey, K. (2006a). *Teacher attrition among women in secondary agricultural education.* Journal of Agricultural Education, 47(3), 117-129. doi: 10.5032/jae.2006.03117

Kelsey, K. (2006b). *A case study of women's experiences in a preservice teacher preparation program.* Journal of Agricultural Education, 47(4), 123-133. doi: 10.5032/jae.2006.04123

Kelsey, K. (2007). *Overcoming gender bias with self-efficacy: A case study of women agricultural education teachers and preservice teachers.* Journal of Agricultural Education, 48(1), 52-63. doi: 10.5032/jae.2007.01052

Kleihauer, S., Stephens, C. A., Hart, W. E., & Stripling, C. T. (2013). *How six women deans of agriculture have attained their leadership role: A qualitative study.* Journal of Agricultural Education, 54(3), 15-27. doi: 10.5032/jae.2013.03015

Lerner, G. (1979). *The majority finds its past: Placing women in history.* Oxford, England: Oxford University Press.

Litoff, J., & Smith, D. (1993). *The women's land army during World War II.* Prologue Magazine, 25(4). https://www.archives.gov/publications/prologue/1993/winter/landarmy.Html

Murphy, L. E., & Venet, W. H. (Eds.). (1997). *Midwestern women: Work, community, and leadership at the crossroads.* Bloomington, IN: Indiana University Press.

Retallick, M. S., & Martin, R., (2008). *Fifteen-year enrollment trends related to the three components of comprehensive agricultural education programs.* Journal of Agricultural Education, 49(1), pp. 28-38. doi: 10.5032/jae.2008.01028

Seevers, B., & Foster, B. (2003). Women in Agricultural and Extension Education: A Minority Report. *NACTA Journal*, 47(1), 32–37.

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

Agricultural Teacher views on Importance of Entrepreneurial Competencies for Student Career Success

John Tummons, University of Missouri
Stephen C. Mukembo, University of Missouri
Nathan Smith, Oklahoma State University
Jon Simonsen, University of Missouri

Introduction/Literature Review/Need for research

Worldwide economic growth and food security are key goals of our food and natural resource systems. The success of these systems requires an innovative and skilled workforce who are equipped with requisite competencies, such as entrepreneurship, to meet dynamic labor market demands (United States Department of Agriculture, National Institute of Food and Agriculture, 2023). Entrepreneurship competencies are essential for students as they cultivate and nurture an entrepreneurial mindset (Neck et al., 2021), which is necessary to tackle the persistent challenges in the agricultural sector while advancing professionally in their careers. Schools, especially School Based Agricultural Education (SBAE), play a central role in achieving this mission by offering students comprehensive, formal and informal *hands-on, minds-on* learning experiences through its three-circle model (Croom, 2008; Mukembo et al., 2020; Phipps et al., 2008).

Entrepreneurship education embedded in SBAE, especially Supervised Agricultural Experiences (Brown & Knobloch, 2022) aims to teach students critical thinking, innovation, opportunity recognition, and problem-solving to address future career challenges, self-employment, and career success. Inculcating such competencies helps agriculture teachers build human capital for economic development (Canziani & Welsh, 2021; Venesaar, et al., 2022). Although many studies have identified general competencies needed for workforce development (Pang et al., 2019; Spowart, 2011) and employability skills (Cassidy, 2006; Kenayathulla et al., 2019; Robinson & Garton, 2008), little attention has been devoted to exploring entrepreneurship competencies needed for career success (Venesaar, et al., 2022). Agriculture teachers play a pivotal role in crafting learning experiences to prepare students for the world of work and post-high school education, including equipping them with entrepreneurial competencies (Mukembo et al., 2020). Consequently, delving into their perceptions regarding the significance of entrepreneurial competencies in fostering students' career success holds significant importance for agricultural workforce development.

Theoretical Framework

This study was undergirded by Human Capital Theory [HCT] (Schultz, 1961, 1972; Becker, 1993). HCT posits individuals can enhance potential and future earnings by investing in education to acquire knowledge, skills, abilities, and competencies, thereby enabling them to be highly effective in their work (Zula & Chermack, 2007). Individual educational investments yield increased returns in better wages, better decision-making, improved community livelihoods, and increased longevity (Becker, 1993). Further, societies who invest in their citizens reap economic benefits such as an expanded tax base and skilled workforce, contributing

to the economic development of the nation (Sweetland, 1996). The differences in productivity and economic growth/development among countries, in part, can be attributed to investments made in building human capital (Almendarez, 2013). Schultz (1961) added human capital, "combined with other human investments, account for the productive superiority of the technologically advanced countries" (p. 3).

Purpose of the Study

This study aimed to delve into the perceptions of agricultural teacher's regarding the significance of entrepreneurial competencies in nurturing students' career success, including how often they integrate entrepreneurship concepts in their teaching. In addition, we thought to identify if differences in agriculture teacher entrepreneurship coursework and sex accounted for variations in integrating entrepreneurship concepts into their classes.

Objectives:

1. Describe agriculture teachers' perceived entrepreneurial competencies needed for student career success.
2. Examine the frequency agriculture teachers integrate entrepreneurship concepts in their classes.
3. Describe to what extent agriculture teachers received entrepreneurship instruction in their teacher preparation coursework.
4. Establish if differences between teachers integrating entrepreneurship concepts can be explained by certain characteristics such as sex and having taken entrepreneurship courses during their training as agriculture teachers.
    i. Ho_1: No significant differences exist between males and females in integrating entrepreneurship concepts into class.
    ii. Ho_2: No significant differences exist between individuals receiving entrepreneurship coursework and those without coursework and integrating entrepreneurship concepts into class.
    iii. Ho_3: No significant interactions exist between sex and individuals receiving coursework in integrating entrepreneurship concepts into class.

Methodology

This descriptive-relational *ex post facto* study employed survey methodology to collect quantitative data. Survey questions were derived from two established entrepreneurial competency instruments developed by Morris et al. (2013) and Mukembo (2017). The instrument was created in Qualtrics and reviewed by a panel of experts from the Division of Applied Social Sciences at the University of Missouri to ensure face and content validity (Creswell, 2014). Prior to data collection, the researchers received approval from the University of Missouri's Institutional Review Board. We conducted a pilot test with 26 student teachers from the state of Oklahoma and based on their feedback, we revised the instrument to improve its readability and length. We distributed the final version of the instrument to all agriculture teachers in the state of Missouri (N= 535) using Qualtrics. To encourage participation, we offered an incentive - a chance to win one of ten Amazon gift cards, each valued at $50. Three weekly follow up email

reminders were sent out to nonrespondents. A total of 301 surveys were completed for a response rate of 56.26%. Out of the 301 responses received, 44 (14.62%) participants submitted empty surveys and were excluded. This left us with a total of 257 valid responses (48.08%), which we analyzed using SPSS, version 28. With a teacher population of 535, our valid responses (n = 257) met the criteria set forth by Krejcie and Morgan (1970) for establishing appropriate sample size for research.

Findings/Results

Description of participants: 50.6% identified as female and 49.4% male. Most participants (89.5%) self-identified as White. The most represented age group was 35-44 years (27.6%), followed by 25-34 with 25.7%. Most of the participants (53%) reported having or pursuing a graduate degree and 38.5% had a bachelor's degree. The median teaching experience was 12 years (M = 13.05, SD = 8.89).

Objective #1: Describe agriculture teachers' perceived entrepreneurial competencies needed for student career success.

Agriculture teachers identified perceived entrepreneurial competencies deemed crucial for student career success based on a single Likert item for each competency (see Table 1). All the nine entrepreneurial competencies include in the survey received high rankings (above 84% *agree* or *strongly agree)* from teachers for student career success. Four competencies tied for the top; a large majority of teachers (*n =246*, 95.72%) *strongly agreed* or *agreed* that Independence or Autonomy in decision making, Social networking, Leadership, and Resilience were essential for student career success. Other competencies above 90% included Personal self-efficacy *(n* =241, 93.77%) and Risk management techniques (*n* =232, 90.27%). Respondents indicated Leveraging or bootstrapping existing resources was important, with 89.11% (*n* =229) of respondents *strongly agreeing* or *agreeing*. Opportunity recognition garnered the fifth rank, with 85.60% (*n* =220) of respondents *strongly agreeing* or *agreeing* to this competency. The sixth-ranked entrepreneurial competency was Opportunity assessment with 84.82% (*n* =218) *strongly agreeing* or *agreeing* to its relevance.

Table 1

Teachers' perceptions of entrepreneurial competences essential for student career success (N=257)

Rank[a]	Entrepreneurship Competency	Strongly Agree/Agree		Neither Agree nor Disagree		Strongly Disagree/Disagree	
		n	*%*	*n*	*%*	*n*	*%*
1[t]	Independence or autonomy in decision making	246	95.72	10	3.89	1	0.39
1[t]	Networking and Social	246	95.72	10	3.89	1	0.39
1[t]	Leadership	246	95.72	9	3.50	2	0.78

1[t]	Resilience	246	95.72	8	3.11	3	1.17
2	Personal Self-efficacy	241	93.77	14	5.45	2	0.78
3	Risk management techniques	232	90.27	23	8.95	2	0.78
4	Leveraging or bootstrapping existing resources	229	89.11	26	10.12	2	0.78
5	Opportunity recognition	220	85.60	31	12.06	6	2.33
6	Opportunity assessment	218	84.82	35	13.62	4	1.56

Note: Scale was 1=*strongly disagree,* 2= *disagree,* 3= *neither agree nor disagree,* 4= *agree,* 5= *strongly agree.* [a] *Ranking was based on summation of the percentages of strongly agree and agree responses.*

Objective #2: Examine the frequency agriculture teachers integrate entrepreneurship concepts in their classes.

All teachers reported integrating concepts of entrepreneurship in their teaching (see Table 2). However, the integration frequency varied. The most frequently chosen option was *often (n* = 121, 47.1%), followed by *sometimes* (*n* = 99, 38.5%), and only 10% (n = 27%) of the respondents indicated that they *always* integrate entrepreneurship concepts in their classes. A small minority of respondents (*n* = 10, 3.9 %) indicated they *rarely* integrated entrepreneurship concepts in their classes.

Table 2

Teachers' perception of how often they integrate entrepreneurship competencies into their class (N=257).

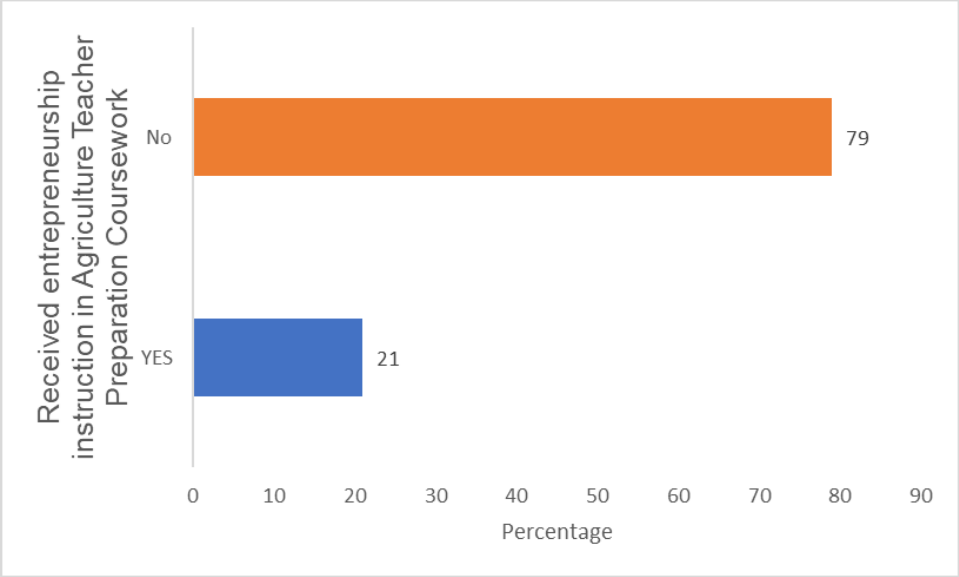
How often entrepreneurship integrated into class.	*f*	*%*
Never	0	0.00%
Rarely	10	3.90%
Sometimes	99	38.50%
Often	121	47.10%
Always	27	10.50%
Total	257	100

Objective #3: Describe to what extent agriculture teachers received entrepreneurship instruction in their teacher preparation coursework.

A large majority of respondents (n = 203, 79%) did not receive any entrepreneurship training during their teacher preparation coursework (See Figure 1).

Figure 1

Percentage of agriculture teachers receiving entrepreneurship instruction in their teacher preparation coursework (N=257)



Objective #4: Establish if differences between teachers integrating entrepreneurship concepts can be explained by certain characteristics such as sex and having taken entrepreneurship courses during their training as agriculture teachers.

We conducted a Univariate Analysis of Variance (ANOVA) to explain differences in teachers integrating entrepreneurship concepts and participant characteristics such as sex and having taken entrepreneurship courses. There were no significant issues with homogeneity of variance with Levene's test ($F(3, 231) = 2.017$, $p = .112$). Null hypothesis one was rejected; a statistically significant main effect ($p<0.05$) with a *small* effect size was found between sex and in integrating entrepreneurship concepts into class $F(1, 231) = 5.38$, $p = .02$, $\eta_p^2 < 0.02$). Post hoc pairwise mean comparison among the sexes revealed that male teachers (M =3.91, SE = 0.08) were more likely than female teachers (M = 3.65, SE = 0.08) to integrate entrepreneurship concepts in their classes. Also, we rejected the second null hypothesis because statistically significant ($p<0.05$) differences with a *small* effect size were found between individuals receiving entrepreneurship coursework and those without coursework and integrating entrepreneurship concepts into class $F(1, 231) = 11.54$, $p <.01$, $\eta_p^2 < .01$). Post hoc mean pairwise comparison indicated that teachers that received entrepreneurship coursework (M =3.97, SE = .10) were more likely to integrate entrepreneurship concepts into their classes than those

without (M =3.59, SE = .05). We failed to reject the third null hypothesis because no statistically significant (p>0.05) differences were found in the interaction between sex and training for teachers integrating entrepreneurship concepts in class (see Table 3).

Table 3

Analysis of variance for agriculture teachers integrating entrepreneurship concepts in their classes, sex, and having taken entrepreneurship courses (N=257).

Predictor	*SS*	*df*	*MS*	*F*	*p*	Partial Eta Squared (η_p^2)
Intercept	2266.66	1	2266.66	4650.46	<0.001	0.95
Received entrepreneurship instruction in teacher preparation coursework	5.62	1	5.62	11.54	0.01**	0.05
Sex	2.62	1	2.62	5.38	0.02*	0.02
Received entrepreneurship training * Sex	0.12	1	.12	0.25	0.62	0.001
Error	112.59	231	0.49			
Total	3293.00	235				

a. R Squared = .090 (Adjusted R Squared = .079)

b. Computed using alpha = .05

*Statistically significant difference at p<0.05. ** Statistically significant difference at p < .01. Effect sizes Partial Eta Squared (ηp^2): Small effect size = .01; medium effect size = .06; large effect size = .14 (Cohen as cited in Lakens, 2013).

Conclusions/Recommendations/Implications

A large majority of teachers reported entrepreneurship competences were essential for student career success. We conclude agriculture teachers believe entrepreneurship competencies are important for student career success. This conclusion supports entrepreneurship as a component of Human Capital Theory and highlights the importance of equipping students with entrepreneurial competencies to foster critical thinking and problem-solving skills, (Brown & Knobloch, 2022; Mukembo et al., 2020) which are crucial to addressing future workforce demands. Further, by equipping students with entrepreneurial competencies, they are likely to develop an entrepreneurial mindset which is necessary to tackle the persistent challenges in the agricultural sector and ensure global food security.

Further, while all teachers indicated that they incorporate entrepreneurship concepts into their teaching, only 10.5% indicated that they always do so. Could this be due to lack of enough knowledge about entrepreneurship and how it can be integrated in the various topics, given most teachers reported not having received any entrepreneurship training? Researchers recommend teachers look for ways to integrate entrepreneurial concepts into their class to enhance students' entrepreneurial competencies.

Teachers who received entrepreneurship training during their teacher preparation coursework were more likely to integrate entrepreneurship concepts than their peers. Therefore, if we are to effectively equip students with entrepreneurship competencies, it is crucial teachers asked to teach entrepreneurship receive appropriate experiences and knowledge during teacher preparation programs. Researchers recommend professional development on entrepreneurship and believe instruction will likely increase the chances of teachers integrating these concepts in their teaching.

Further, our findings indicate that males were more inclined than females to integrate entrepreneurship concepts in their teaching. This finding supports previous research that males tend to be more entrepreneurial than females (Mukembo, 2017; Kickul et al., 2008). This led the researchers conjecturing whether the female teachers' perceived knowledge of entrepreneurship and related self-efficacy to be lower than their male counterparts. These findings warrant further investigation to understand why females were less likely than their male counterparts to integrate entrepreneurship concepts in their classes. By exploring the barriers experienced by the females, then policy recommendations can be developed to address this discrepancy and promote gender equity to equip young people with entrepreneurship competences and we work to build a skilled and innovative workforce for the agricultural sector.

References

Almendarez, L. (2013). Human Capital Theory: Implications for Educational Development in Belize and the Caribbean. *Caribbean Quarterly*, *59*(3/4), 21–33. http://www.jstor.org/stable/43488193

Becker, G. S. (1993). Human capital: A theoretical and empirical analysis, with special reference to education (3rd ed.). Chicago, IL: The University of Chicago Press.

Brown, A., & Knobloch, N. (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

Cassidy, S. (2006). Developing employability skills: Peer assessment in higher education. *Education + Training*, *48*(7), 508–517. https://doi.org/10.1108/00400910610705890

Canziani, B. F., & Welsh, D. H. B. (2021). How entrepreneurship influences other disciplines: An examination of learning goals. *The International Journal of Management Education*, *19*(1), 100278. https://doi.org/10.1016/j.ijme.2019.01.003

Creswell. J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications

Croom, D. B. (2008). The development of the integrated three-component model of agricultural education. *Journal of Agricultural Education, 49*(1), 110-120. https://*doi*.org/*10.5032/jae.2008.01110*

Kenayathulla, H. B., Ahmad, N. A., & Idris, A. R. (2019). Gaps between competence and importance of Employability Skills: Evidence from Malaysia. *Higher Education Evaluation and Development, 13*(2), 97–112. https://doi.org/10.1108/heed-08-2019-0039

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607-610. https://doi.org/10.1177/001316447003000308

Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: A practical primer for t-tests and ANOVAs. *Frontiers in Psychology, 4*(863), 1-12. https://doi.org/10.3389/fpsyg.2013.00863

Morris, M. H., Webb, J. W., Fu, J., & Singhal, S. (2013). A competency-based perspective on entrepreneurship education: Conceptual and empirical insights. *Journal of Small Business Management, 51*(3), 352–369. https://doi.org/10.1111/jsbm.12023

Mukembo, S. C. (2017). Equipping youth with agripreneurship and other valuable life skills by linking secondary agricultural education to communities for improved livelihoods: A comparative analysis of project-based learning in Uganda (Doctoral dissertation, Oklahoma State University). Available from ProQuest Dissertations and Theses database. (UMI No. 10608552).

Neck, H. M., Neck, C. P., & Murray, E. L. (2021). *Entrepreneurship: The practice and mindset*. Sage.

Pang, E., Wong, M., Leung, C. H., & Coombes, J. (2019). Competencies for fresh graduates' success at work: Perspectives of employers. Industry and Higher Education, 33(1), 55–65. https://doi.org/10.1177/0950422218792333

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

Robinson, S., & Garton, B. (2008). An assessment of the employability skills needed by graduates in the College of Agriculture, Food and Natural Resources at the University of Missouri. *Journal of Agricultural Education, 49*(4), 96–105. https://doi.org/10.5032/jae.2008.04096

Schultz, T. W. (1972). Human capital: Policy issues and research opportunities. *Journal of Human Resources, 6*(1), 1-86. Retrieved from https://www.nber.org/system/files/chapters/c4126/c4126.pdf.

Schultz, T. W. (1961). Investment in human capital. *The American Economic Review, 51*(1), 1-17. http://www.jstor.org/stable/1818907

Spowart, J. (2011). Hospitality students' competencies: Are they work ready? *Journal of Human Resources in Hospitality & Tourism*, *10*(2), 169–181. https://doi.org/10.1080/15332845.2011.536940

Sweetland, S. R. (1996). Human capital theory: Foundations of a field of inquiry. *Review of Educational Research*, *66*(3), 341–359. https://doi.org/10.3102/00346543066003341

United States Department of Agriculture, National Institute of Food and Agriculture. (2023). Request for applications Agriculture and Food Research Initiative Competitive Grants Program Education and Workforce Development. Author. https://www.nifa.usda.gov/sites/default/files/2023-05/FY23-AFRI-EWD-RFA-F.pdf

Venesaar, U., Antonelli, G., Dorożyński, T., Duarte, H., Kallaste, M., Riviezzo, A., Räisänen, M., & Santos, S. C. (2022). Entrepreneurship competence among students and employees: A Comparative Study in five European countries. *Annals of Entrepreneurship Education and Pedagogy – 2023*, 120–144. https://doi.org/10.4337/9781803926193.00015

Wilson, F., Marlino, D., & Barbosa, S. D. (2008). Are misalignments of perceptions and self-efficacy causing gender gaps in entrepreneurial intentions among our nation's teens? *Journal of Small Business and Enterprise Development, 15*(2), 321-335. https://doi.org/10.1108/14626000810871709

Zula, K. J., & Chermack, T. J. (2007). Integrative literature review: Human capital planning: A review of literature and implications for human resource development. *Human Resource Development Review*, *6*(3), 245–262. https://doi.org/10.1177/1534484307303762

Transforming Traditional School-Based Agricultural Education in an Urban Context

Michael J. Martin, Iowa State University
Kaley Mumma, Iowa State University
Blake van der Kamp, Iowa State University

The implementation of urban school-based agricultural education programs has been a topic of growing interest. The literature indicates that urban programs are increasing in numbers and yet present unique challenges in implementation and programming. This case study examined a program which had traditional programmatic elements but in an urban community. The program utilized some traditional elements such as a barn with livestock and greenhouse focused on floral production. The program also layered elements of non-traditional programs including an emphasis on DEI work, deemphasizing the FFA, and curriculum to food production in the greenhouse. The implications of this case study for urban program design are important in that there is no one size fits all in programming for urban programs.

Introduction

Implementing new urban school based agricultural education (SBAE) programs has been the greatest opportunity for growth as well as one of the greatest challenges over the past two decades. According to the National FFA Organization, FFA membership in SBAE programs grew by 221,456 individuals with shift from 27% to 39% non-rural representation from 2015 to 2022. The organization also noted a racial and ethnic population increase with a non-exclusively white participation increase of 5.5% in the five-year span between 2017 to 2022 (National FFA Foundation, 2017, 2015, 2022).

Previous programmatic design research on urban SBAE programs has focused on a variety of curricular and instructional approaches. These range from traditional production livestock facilities and curricular topics community-centered agricultural education content (such as small animal care) in urban centers (Brown & Kelsey, 2013; Estes & Bowen, 2005; Martin et al., 2014). Recently, more research has been conducted on important diversity and inclusion implications of urban SBAE design, such as multiculturalism (Vincent & Torres, 2015), critical pedagogy (Hartmann & Martin, 2021), and agrarianism (Martin & Kitchel, 2013).

Further, the research into this topic has focused on numerous aspects of urban SBAE, including youth-adult relationships (Bird et al., 2013), program design (Lambert et al., 2018), FFA (Martin & Kitchel, 2015), careers (Henry et al., 2014; Smith & Baggot, 2012), and diversity issues (Cano & Moore, 2010; Croom & Alston, 2009; Elliot & Lambart, 2018). These studies have highlighted the unique circumstances involved with urban SBAE programs. The findings of these studies indicated that urban context presents numerous challenges for agriculture teachers, FFA advisors, and FFA members, yet more research is needed to explore urban SBAE programmatic designs. This study examined a SBAE program with traditional programmatic elements serving primarily urban students with no agricultural background and who were racial and culturally diverse.

Purpose and Research Questions

The purpose of this case study was to explore an urban school-based agriculture education program which served predominantly non-traditional agriculture students. The following research questions guided the study:

1. How did the program design experiential learning experiences?
2. How did the program attempt to connect with the students?

Methods

This study followed a constructivist epistemology utilizing case study methods. Specifically, we used an emergent case study approach. The emergent design approach is consistent with the intrinsic case study approach outlined by Stake (1995). Constructivist epistemologies and emergent design depend on participant voices to guide the study rather than theoretical or conceptual frameworks. The inclusion of a theoretical framework would have required us focus on theory rather than the participant voices. This study was approved by a university institutional review board (IRB) as an exempt research project exploring educational practices. Thus, we could observe what happened in the classroom, analyze documents used in the program, and interview the teachers of the program. We could not interview or directly observe students. We observed the first-year agriculture class of the program. The case study was singly bounded to one agriculture program.

The researcher included three members. The first member was as a faculty member who was a former agriculture teacher and FFA advisor with experience in qualitative research and urban programs. The second member was a graduate student who had student taught in agriculture and experience with researching SBAE diversity. Finally, the third member of the research team was an undergraduate student in conducting research for an honors project.

The program is located within a metropolitan area in a midwestern state. At the time of the study the program had two agriculture teachers, two facility managers, and around 100 students from around the city. The hands-on facilities included science lab, a barn containing livestock, and a range of greenhouse and nursery structures and spaces. The two teachers, Tyler and Meg, had less than 10 years of teaching experience. The two facility managers were Dave and Mary. Each teacher and facility manager had a particular focus, either livestock with the barn area or plants in the greenhouse and nursery. The curriculum was designed so that first year agriculture students in the introduction classes were exposed to both curricular tracks, allowing them choice in their advanced coursework.

Data was collected through multiple site visits over the course of a semester. Data included classroom and laboratory observations of the teachers and facility managers, program and classroom documents, and interviews with the teachers. During the data collection, pseudonyms were given to protect identities of the teachers and facility managers. Identifying information of places and events were also omitted as much as possible to protect identity. We collected nine field observations (almost 15 hours in total), two teacher interviews (two hours in total), and

collected over 20 documents. The three different sources of data allowed us to reach triangulation.

We utilized a constant comparative data analysis approach, which is aligned with emergent design (Glaser & Strauss, 1967). We conducted four rounds of data analysis that went from codes to categories to themes. The first round of data analysis identified 34 codes. The second round of coding resulted in 19 of categories to guide further data analysis. After another individual round of data analysis, we translated the 19 identified to categories into three themes with a possible fourth theme. The possible last these required another smaller round of data analysis which led to the four themes of the study: 1) student voices being heard; 2) use of extra teachers to facilitate learning; 3) traditional curriculum elements and non-traditional approaches; and 4) diversity, equity, and inclusion.

We employed various standards of trustworthiness for this project, including maintaining an audit trail, data triangulation, as well as providing rich descriptions of the case and themes. Methodological triangulation was accomplished by balancing the data sources. Investigator triangulation was achieved by conducting rigorous data analysis meetings (Stake, 1995). We strove for a consensus amongst team members. Credibility of the research was maintained by a regular peer debriefing and development of an audit trail (Ary, Jacobs, & Razavieh, 2002).

Findings

Theme 1: Student Voices Being Heard

Student voice is central to the program curriculum and activities. This is a mindset that the teachers cultivate with their students and highlight within their classrooms. In his one-on-one interview, Tyler discussed the following, “Students will gravitate toward what they're interested in. And if you have low class numbers somewhere, you probably are creating a product that kids aren't interested in...” The likening of the program’s courses to a product demonstrates a prioritization of student voices being heard. Tyler and Meg demonstrated this philosophy during classroom observations multiple times.

A student asked Tyler who was Fredrick Douglas during a lesson covering Black agriculturalists during Black History Month. While Fredrick Douglas did not pertain to the lesson at hand, Tyler encouraged student discovery by prompting students to Google the question to find the answer. He gave the students a few minutes to research the question for themselves and then went around the room, asking the students if they would like to share what they found. Students were encouraged to ask questions and Tyler responded by hearing student voices by making sure their questions were answered. Tyler employed this technique every day that he was observed.

This philosophy of student voice carried over to daily casual interactions with students. These casual interactions are ones that may not appear to hold much weight, but they show a level of respect the teachers have for their students’ non-curricular interests. For example, before class began, Meg entertained students joking about their future musical album, asking if she would be willing to buy or listen to it. Later, during the class opener, Meg announced to the class to “keep

an eye out for the [student's] album dropping." While her statement earned a chuckle from the rest of the class, Meg took the time to listen to her student interests, allowing her students to be heard. These strategic and casual classroom interactions gave students ownership in their learning and the program.

Theme 2: Use of extra teachers to facilitate learning

Dave and Mary, the two facility managers, played a crucial role in setting up experiential learning within their respective laboratory spaces. During the field observations, Mary was often observed interacting with students in the greenhouse as they completed their daily assignments. Mary served as a co-teacher in key moments in the laboratory space. For example, Meg dismissed students to go to the greenhouse while she remained in her classroom to begin preparing for a lesson about the New Farmers of America. Meg trusted Mary to guide instruction in the greenhouse. Mary then went on to help some students through spider plant propagation and others through the importance of deadheading annual flowers.

Facility managers are also utilized within day-to-day lessons to facilitate learning. During a lesson on the New Farmers of America, Tyler, Meg, and Dave displayed a high level of teacher cooperation as they used walkie talkies to manage the students' rotations from station to station. The lesson was complex as it utilized six stations within multiple classrooms, but it was kept manageable as instructors worked in tandem with Dave to keep the lesson running smoothly.

The importance of facility managers can even be found at the curriculum level as their skills are integrated into forming worthwhile lessons for students. The horticulture program was trying to find ways to be more community-centered with the curriculum. Meg related Mary's role in this process, "Mary and I [Meg] were just talking about... what can we do to utilize the [greenhouse] space better in the fall... We're thinking even just a little thing next year using fruits and vegetables to then grow our own." On a regular basis, Meg works *with* Mary to create innovative and worthwhile experiences for students. The presence of facility managers aiding and enhancing lessons cannot be understated. Dave and Mary were not just assistants, they were utilized as instructors and had a role in designing curriculum.

The facility managers are well integrated into the curriculum and program, so much so that students see them as a resource for personal issues. Meg recalled a situation where a student was having an off day, and Mary was the person he trusted to share his troubles with, "…he ended up going to the greenhouse with our greenhouse manager. She was able to talk to him, which I think was really beneficial, and really, he just needed somebody to listen…" This instance shows how Mary isn't just the greenhouse manager, but rather she is there to help the students academically *and* emotionally.

Theme 3: Traditional Curriculum Elements and Non-Traditional Approaches

The agriculture program featured many traditional elements of SBAE with non-traditional conceptualizations. Tyler explained this during his interview, "I would describe it as a holistic

approach to education with an emphasis on preparing students for a broad range of agriculture, a broad range of agricultural careers in the industry." We observed this firsthand with the work they did with students in the barn and greenhouse laboratories. Tyler and Meg were not focused on getting students into agricultural careers, rather they used the laboratory spaces for general career readiness education. Tyler said, "It's about the context and not necessarily the content." When reviewing program documents centered on students working in the barn, there is a heavy emphasis on barn work (chores) over animal science.

The element of casual interactions factored into the non-traditional style of the program. We observed many trees being planted in the nursery section. The lesson before this focused on proper planting strategies for all students. Instead of just asking their students to complete the tree planting as an independent activity, the teachers and facility managers facilitated the planting of said trees by working alongside their students. The entire agriculture program was involved and to complete this task, the students were split into two teams: those who would transport soil and those who would plant trees. Tyler and Dave worked alongside the first team, pushing wheelbarrows of soil into trenches for students to spread while Mary and Meg completed tree planting demonstrations with 12 groups of three. The emphasis was not the science, or the skill involved, the emphasis was on expanding the program for future generations.

This causal programmatic approach also influenced how they thought about utilizing the FFA within their program. Meg and Tyler did not approach the FFA in the traditional way, but rather, they viewed the organization as a tool. Tyler said that the FFA was not even a necessity, "... We don't have a major FFA focus here... I like to say, if FFA went belly up, would this program still be here? And yes, it would be." While this statement may be a bit hyperbolic, the program utilizes the FFA to enhance the classroom experiences rather than urging students to join the organization out of the sake of tradition alone. Tyler said, "We're not saying... we're going to do soil judging [just] because... we integrate contests into the curriculum. And if there are kids that enjoy it, then we'll say, 'Hey, you should do this.'" Both Meg and Tyler see FFA as an organization to be used when students show the interest in CDEs and LDEs - an approach that can be seen as nontraditional when compared to a typical agricultural education classroom.

Theme 4: Diversity, Equity, Inclusion (DEI)

Tyler and Meg's agricultural education program actively recognized the diversity of their students and worked to provide them with curriculum to address DEI in their classroom. During the research team's second visit, we witnessed a lesson covering the New Farmers of America (NFA)and their participation in agriculture before the nation underwent desegregation. The lesson included six stations with the goal of analyzing the impact the NFA has had on agricultural education and how those in the FFA can honor the history of the NFA. Through the lesson, students were able to see the historical involvement of Black students in agricultural education.

The prioritization of DEI in the classroom can be seen in the language used by teachers when approaching potentially sensitive topics. Early into the observations, Tyler began a lesson on Black History Month, and started by recognizing his whiteness. This act allowed him to be upfront and honest with his students before delving into a potentially challenging topic. Tyler

emphasized he wanted to recognize the good, bad, and the ugly about the past and the present of Black involvement in agriculture. The candidness Tyler provided before beginning his lesson on Black History Month provides evidence for the program's dedication to providing a program that is responsive to their students' DEI needs.

The program's DEI work spans further than the classroom as they begin building up a MANRRS chapter. During his interview, Tyler emphasized the importance of alternative extracurriculars for the program's student body. Tyler explained, "This is our first year being a MANRRS chapter. And so, we're still trying to flush out how do we get kids more engaged in that organization, because it's a phenomenal organization, especially for representation, phenomenal." MANRRS seeks to empower minorities in agriculture, natural resources, and related sciences. The push for increased student involvement in an organization such as MANRRS drives home the importance of inclusivity within their program.

Discussion and Implications

This case study offered a unique view of how to transform SBAE for an urban community. Some of the elements of this program were typical of traditional programs, including a barn with livestock and greenhouse structures focused on production. The agriculture teachers also utilized student-centered approaches to teaching. Yet, nestled in these more traditional experiences, were elements that are more non-traditional, including a heavy emphasis on DEI work, less emphasis on the FFA, and more emphasis on the context of agriculture and agricultural work rather than agricultural content. The curriculum of the program was slowly shifting to be more non-traditional as well with the decision to include more food production content over greenhouse production activities. These shifts are comparable to other empirical and philosophical research in urban and non-traditional SBAE programming (LaVerge et al., 2011; Hartmann & Martin, 2021; Martin et al., 2023).

The implications of this case study for urban SBAE design are important. The agriculture program found success, as defined by the agriculture teachers, utilizing a middle of rural-urban continuum approach. They have not shifted away from animal science in favor of veterinary science (Martin et al, 2014). The program has a greenhouse with a production focus while slowly increasing food-related curriculum. The agriculture students are involved in the FFA and even traditional FFA activities (Yopp et al., 2018), while the agriculture teachers also place emphasis on DEI topics (Barajas et al., 2020). This case study highlights that there is no one size fits all in SBAE programming.

We need to be able to support programs that want to diversify and experiment with program design. More research is needed to identify the wide variety of programmatic designs whether from rural, suburban, or urban communities. This research can help us train and support teachers as well as refine how we measure program effectiveness. We must be open and ready to share explore program designs to meet this challenge.

References

Ary, D., Jacobs, L. C., & Razavieh, A. (2002). *Introduction to research in education*. Wadsworth/Thompson Learning.

Barajas, G., Crump, M. K., Vincent, S. K., & McCubbins, O. P. (2020). Somos nosotros! Lived experiences of Latinx ELL youth enrolled in secondary agricultural education. *Journal of Agricultural Education, 61*(4), 143-155. http://doi.org/10.5032/jae.2020.04143

Bird, W. A., Tummons, J. T., Martin, M. J., & Henry, A. (2013). Engaging students in constructive youth-adult relationships: A case study of urban school-based agriculture students and positive adult mentors. *Journal of Agricultural Education, 54*(2), 29-43. doi: 10.5032/jae.2013.02029

Brown, N. R., & Kelsey, K. D. (2013). Sidewalks and city streets: A model for vibrant agricultural education in urban American communities. *Journal of Agricultural Education, 54*(2), 57-69. doi: 10.5032/jae.2013.02057

Cano, J., & Moore, E. A. (2010). Preparing teachers for diverse audiences. Pre*paring and advancing teachers of agriculture education* (R. M. Torres, T. Kitchel, & A. L. Ball, Eds.). Curriculum Materials Service, The Ohio State University.

Croom, D. B, & Flowers, J. L. (2001). Factors influencing an agricultural education students perception of the FFA organization. J*ournal of Agricultural Education, 42*(2), 28-37. doi:10.5032/jae.2001.02028

Elliott, K. M., & Lambert, M. D. (2018). Urban and rural Latino students' experiences in agricultural education: toward defining rural privilege. *Journal of Agricultural Education, 59*(3), 198-212

Esters, L. T. & Bowen, B. E. (2005). Factors influencing career choices of urban agricultural education students. *Journal of Agricultural Education, 46*(2), 24-35.

Glaser, B. G., & Strauss, A. (1967). *Discovery of grounded theory: Strategies for qualitative research*. Aldine-Transaction.

Hartmann, K., and Martin, M. J. (2021). A Critical Pedagogy of Agriculture. *Journal of Agricultural Education, 62*(3), 51-71. doi: 10.5032/jae.2021.03051

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. doi: 10.5032/jae.2014.03089

Lambert, M. D., Stewart, J., Claflin, K. (2018). Understanding characteristics, uses, perceptions, and barriers related to school farms in Oregon. *Journal of Agricultural Education, 59*(2), 197-214 https://doi.org/10.5032/jae.2018.02197

LaVergne, D. D., Larke, A., Jr., Elbert, C. D., & Jones, W. A. (2011). The benefits and barriers toward diversity inclusion regarding agricultural science teachers in Texas secondary agricultural education programs. *Journal of Agricultural Education, 52*(2), 140-150. doi: 10.5032/jae.2011.02140

Martin, M. J., & Kitchel, T. (2013). Agrarianism: An ideology of the National FFA Organization. *Journal of Agricultural Education, 54*(3), 28-40. doi: 10.5032/jae.2013.03028

Martin, M.J., & Kitchel, T. (2015). Advising an Urban FFA Chapter: A Narrative of Two Urban FFA Advisors. *Journal of Agricultural Education, 56*(3), 162-177. doi: 10.5032/jae.2015.03162

Martin, M. J., Tummons, J. T., Ball, A., & Bird, W. A. (2014). Dogs in the hall: A case study of a veterinary program in an urban high school. *Journal of Career and Technical Education, 29*(1), 1-16.

Martin, M. J., Hartmann, K., and Archibeque-Engle, S. (2023). A Critical Whiteness Exploration of the National FFA Organization. *Journal of Agricultural Education, 64*(1), 136-155. doi.org/10.5032/jae.v64i1.34

National FFA Foundation. (2015). *2015 Annua Report*. https://ffa.app.box.com/s/c87new5wj8pap1nuej8bajhgt8fxmeia/file/318208863471

National FFA Foundation. (2017). *2017 Annual Report*. https://ffa.app.box.com/s/c87new5wj8pap1nuej8bajhgt8fxmeia/file/312874421284

National FFA Foundation. (2022) *2022 Annual Report.* https://www.annualreport.ffa.org/

Smith, B. S., & Baggett, C. D. (2012). Perceptions of agriculture and perceived enrollment barriers to agricultural programs of select Southern New Jersey high school students. *NACTA, 56*(1), 48-56.

Stake, R.E. (1995) *The Art of the Case Study*. Sage Publications.

Vincent, S.K., and Torres, R.M. (2015). Multicultural competence: A case study of teachers and their student perceptions. *Journal of Agricultural Education, 56*(2), 64-75. doi: 10.5032/jae.2015.02064

Yopp, A. M, McKim, B. R., & Homeyer, M. M. (2018). Flipped programs: Traditional agricultural education in non-traditional programs. *Journal of Agricultural Education, 59*(2), 16-31 https://doi.org/10.5032/jae.2018.02016

Triumphs and Tribulations: Student Teacher Needs-Supporting and -Frustrating Experiences Through Guided Reflective Journaling

Hannah C. Parker, The Ohio State University
Kellie Claflin, The Ohio State University
Amanda M. Bowling, The Ohio State University

Introduction

Teaching is complex and demanding (Clark & Lampert, 1986) as teachers learn to teach through practice (Darling-Hammond & Sykes, 1999). Teacher educators are tasked with preparing teachers who make multiple choices informed by several distinct types of knowledge (Darling-Hammond & Bransford, 2005). Within teacher education programs, student teaching allows preservice teachers to continue developing their content and pedagogical knowledge and skill, as well as teacher identity (Edgar et al., 2011; Franzak, 2002). One way to prepare teacher candidates to balance the multitudes of demands is through on- or in-action reflection (Schön, 1987). Reflection is a critical aspect to learning and further supports preservice teachers learning experiences (Mezirow, 1991). The importance of reflection for preservice agriculture teachers is clear with research examining the types of reflection (Epler et al., 2013; Greiman & Covington, 2007; Lambert et al., 2014), and reflection through metacognition (Bowling et al., 2022). Sorensen et al. (2018), utilized student teacher reflective journals to understand student teacher development through the lens of teacher concerns.

Although literature has highlighted the importance of self-efficacy during student teaching (Swan et al., 2011; Wolf et al., 2010) and the relationship with the cooperating educator (Edgar et al., 2011; Jones et al., 2014), little is known about student teacher motivation. Student teacher motivation can influence their desire to teach and the length of teacher tenure (Sinclair, 2008). Understanding the motivational aspects of student teachers' experiences through reflective journals will provide a deeper look into their experiences to add to the literature, as well as provide concrete ideas of how mentors can help support student teachers.

Theoretical Framework

Self-Determination Theory (SDT) views motivation as the extent one's basic psychological needs, autonomy, competence, and relatedness, are met (Ryan & Deci, 2017). Autonomy is bound by intrinsic feelings within oneself. Competence is expressed by feeling successful or efficacious. Lastly, relatedness is the feeling of being connected to others. Ryan and Deci (2017) argue social context factors play an essential role to advance or halt motivation. Student teaching occurs in a highly social learning context often described as a community of practice (Lave & Wenger, 1991). The facets of SDT apply to student teaching as the need for autonomy is met when preservice teachers follow their interests and include their values as they change their behavior as a novice educator (Deci & Ryan, 2008). However, when autonomy is not met, and the student teacher experiences pressure thus thwarting autonomy (Martinek et al., 2020). Competence can be expressed by feeling efficacious in the interaction with social environments and positive experiences exploring new skills (Ryan & Deci, 2000). Lastly, relatedness can be fulfilled through positive interactions with colleagues and peers. (Ryan and Deci, 2017). Relatedness contributes to a sense of belonging which promotes collaboration and sharing of resources (Ryan & Deci. 2017). Needs-satisfying experiences can increase student teachers' motivation (Kaplan & Madjar, 2017) and feelings of fulfillment, being challenged, and

feeling satisfied (Deci & Ryan, 2008). In contrast, needs-frustrating experiences can lead to maladaptive functioning, negative emotions and stress (Bartholomew et al., 2011; Haerens et al., 2015). For example, a needs-frustrating experience may be the demanding pressure from school administration of minimum scores on state standardized tests, resulting in an autonomy thwarted experience. (Kaplan & Madjar, 2017). However, a needs-satisfying experience could be feeling a sense of accomplishment after teaching a difficult lesson, resulting in a autonomy satisfied experience for the preservice teacher (Kaplan & Madjar, 2017).

Purpose and Research Question

We aimed to explore Ohio State University (OSU) SBAE student teachers' experience through the lens of motivation. The following central question guided the research: How do student teachers discuss triumphs (needs-satisfying) and tribulations (needs-frustrating) through reflective journaling?

Methods

This study utilized a directed content analysis approach (Hsieh & Shannon, 2005) to expand on existing preservice teacher motivation literature. We structured the analysis in SDT's basic psychological needs: autonomy, competence, and relatedness. OSU SBAE preservice teachers completed weekly guided reflective journal entries over a period of fifteen weeks during the spring 2023 semester. Data were exported and were first sorted by participants and then by weeks of the student teaching experience.

Guided reflective journals were completed on a Qualtrics form utilizing skip logic depending on if the preservice teacher sought to reflect on a triumph or tribulation. Questions were framed by SDT and previous literature and guided students to reflect on a specific experience related to needs-satisfaction (triumphs) and needs-frustrations (tribulations). Preservice teachers responded to both closed- and open-ended questions.

We used qualitative approaches to analyze 147 independent and complete journal entries from 13 preservice teachers. The first round of qualitative coding was deductive in nature utilizing SDT needs-satisfying and needs-frustrating experiences. Items that did not fit within those categories were not included in the first round of coding. In the second round of coding, data which were not previously coded was reviewed to create new codes and emerged into categories. Codes and categories were then collapsed into themes. Representative quotes were used to capture raw data of participants in their journal reflections and used in the findings section. Trustworthiness was upheld through peer debriefing between researchers, utilizing raw data for analysis and representative quotes, and transparency of our methodology (Lincoln & Guba, 1985).

Findings

The findings are categorized in needs -supporting and -frustrating theme. Representative quotes are labeled as "(student #, week #)."

Autonomy-Support

Preservice teachers expressed the importance of seeking student interests in the first few weeks. Student teachers identified interests of students through a variety of methods: informal conversations, first-day introductions, and questionnaires. Seeking out student interests and incorporating what students wanted to learn was associated with triumphal reflections, "...I was

surprised by the amount of things students wanted to learn and how fast I was able to contort lessons without giving up the integrity of standards," (4, W1). However, tribulation reflections showed student teachers creating goals to gain student interests and overcome a challenging experience.

Beyond student interest, preservice teachers expressed the need for flexibility in planning, perseverance to overcome challenging experiences, and the opportunity to reflect on their own or with their mentors, "...the most important thing you can do is pick yourself up reflect on where you went wrong and make appropriate changes to let it never happen again," (6, W2).

Competency-Support

As preservice teachers recognized their teaching ability, their teaching identity began to shift, "I felt more confident in my abilities to teach/plan lessons following the standards. I feel a lot better about my abilities and position at the school" (1, W3).

Additionally, reflections revealed enjoyment of teaching when students acknowledged the preservice teachers' ability, "...the last 3.5 years were finally paying off and this is just the beginning. It's nice to know that your students appreciate what they are learning...it makes all the long planning hours' worth it." (10, W12).

Preservice teachers demonstrated growth in their ability to modify lessons. Students felt frustrated but understood flexibility is inevitable. However, they acknowledged previous experiences, courses, or resources they were using to support their planning process, "I used knowledge I had from my time as a vet assistant to develop the injection lab and resources from my farm's veterinarian for supplies," (3, W12).

Relatedness-Support

Preservice teachers identified individuals who made up their community of support. Individuals who support preservice teachers included university supervisor, cooperating educator, cohort, and teachers from other districts. Preservice teachers felt isolated but appreciated that peers were experiencing similar challenges. Preservice teachers enjoyed connecting with colleagues outside of the classroom, "I attended state degree evaluations and was able connect with several ag teachers. I felt welcomed and appreciated" (11, W3).

Preservice teachers appreciated positive, encouraging conversations with cooperating educators. Several pointed out that it was nerve-racking to ask for help or bounce ideas off their CE. However, once the channel of communication was open, preservice teachers expressed that their fears faded. Student 4 reflected, "...it's okay to ask [CE] for help. I was nervous at first ...maybe fear of disappointment? Once I opened that channel of communication, I was able to overcome the block that interfered with my planning. (W2)

Finally, establishing rapport with students supports the need for relatedness. Preservice teachers reflected on relationship building early into the field experience, stating, "build those relationships with students! They will respect, listen, learn, and enjoy having you as their teacher" (2, W2).

Autonomy-Frustration

The lesson plan template was the greatest barrier for preservice teachers. The template was described as lengthy and took time away from the creative aspect of planning. Additionally, the deadline added stress to preservice teachers as their workload increased throughout the

experience. “The OSU lesson plan began to hurt the quality of my lessons. So, I stopped using [the template] and the quality of my lessons increased” (1, W9).

Beyond the lesson plan template being a constraint, frustration with last-minute changes was noted. Some students contributed to this a lack of time management or planning, while others responded by fixing the lesson and moving on:

> On Friday the old saying rained true, no plan survives first contact with the enemy, the plan being my original lessons, and the enemy being confusion and implementation. I spent my lunch and second period fixing my lessons. (6, W1)

Competency-Frustration

Low efficacy was expressed in pedagogy and behavior management, but most prevalent of confidence in content knowledge. Pressure to turn in lesson plans, feeling like they must “get it right” or lacked resources to successfully plan contributed to feeling frustrated, “some days I am disappointed with myself... I struggle to take content deeper. I lack knowledge in certain topics. I feel incompetent” (8, W8).

Additionally, preservice teachers noted external pressures that contributed to their ability, mainly licensure requirements. Teaching evaluation and test requirements added additional stress on top of the day-to-day expectations. Student 9 expressed, “just the amount of stress and anxiety coming from wondering if I’ll be able to turn in my university licensure assessment on time. I have also have my last test coming up for licensure. I am just overwhelmed,” (W6).

Relatedness-Frustration

Fear of managing student behavior, specifically confronting misbehavior, was a challenging task. Preservice teachers reflected on the need to manage behavior “better” and set goals for future challenging experiences, “I am bad at being upfront/confrontational/direct with students. The poster projects would likely have been on task if I had monitored students differently” (11, W11).

Outside of the classroom, students described an internal struggle with balancing life in and out of the school setting. Many reflected about feeling guilty for leaving before their CE or prioritizing something that was not school related.

> I had to leave early (around 5) to help my dad on the family farm. I feel bad I had to leave before [my CE] did, but I had to help my dad. It was something he couldn’t do without me. I had everything ready for my class the next day but still felt guilty and I’m unsure why. (6, W4)

Discussion

Our findings highlight how student teachers within an agriculture teacher preparation program discussed their psychological needs through the lens of SDT (Deci & Ryan, 2017). The student teachers highlighted both triumphs and tribulations in their guided reflective journals as they grappled with learning to teach. While the findings of this study are similar to prior research in SBAE related to student teacher concerns (Sorensen et al., 2018), self-efficacy (Swan et al., 2011; Wolf et al., 2010), and the importance of relationships (Edgar et al., 2011; Jones et al., 2014), utilizing motivation as a lens provides a new perspective in understanding the experience of student teachers. The findings of this study build on the research on student teachers,

especially around the idea of self-efficacy, as it goes beyond their feelings competency and or concerns by discussing their challenges in terms of psychological needs being met or unmet. We recommend teacher educators, cooperating educators, and university supervisors utilize SDT when supporting student teachers by recognizing successes and challenges through their autonomy, competency, and relatedness needs being either supported or frustrated. Additionally, we need to help student teachers understand their own psychological needs and how they relate to the learning process. These findings showed through the power of reflection participants were able to take a needs-frustrating experience to a needs-satisfying experience. The reflection itself is autonomy-supporting as they self-regulate and make sense of the experience. Future research should be conducted using motivational theories to provide a better understanding of how to prepare and support student teachers.

References

Bartholomew, K., Ntoumanis, N., & Thøgersen-Ntoumani, C. (2011). Self-determination theory and the darker side of athletic experience: The role of interpersonal control and need thwarting. *Sport and Exercise Psychology Review, 7*(2), 23-27.

Bowling, A., Rice, A. H., Curry, K., & Marx, A. (2022). The essence of agricultural education teachers motivational beliefs across career stages. *Teaching and Teacher Education, 114*, 103691. https://doi.org/10.1016/j.tate.2022.103691

Carmignola, M., Martinek, D., & Hagenauer, G. (2021). 'At first I was overwhelmed, but then—I have to say—I did almost enjoy it'. Psychological needs satisfaction and vitality of student teachers during the first Covid-19 lockdown. *Social Psychology of Education,* 24(6), 1607-1641. https://doi.org/10.1007/s11218-021-09667-2.

Clark, C., & Lampert, M. (1986). The study of teacher thinking: Implications for teacher education. *Journal of Teacher Education*, *37*(5), 27–31. https://doi.org/10.1177/002248718603700506

Darling-Hammond, L., & Bransford, J. (2005). *Preparing Teachers for a changing world: what teachers should learn and be able to do*. Jossey-Bass, An Imprint of Wiley.

Darling-Hammond, L., & Sykes, G. (1999). *Teaching as the learning profession: Handbook of policy and practice.* Jossey-Bass Inc.

Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian psychology, 49*(3), 182.

Edgar, D., Roberts, G., & Murphy, T. (2011). Exploring relationships between teaching efficacy and student teacher – cooperating teacher relationships. *Journal of Agricultural Education*, *52*(1), 9–18. https://doi.org/10.5032/jae.2011.01009

Epler, C., Drape, T., Broyles, T., & Rudd, R. (2013). The influence of collaborative reflection and think-aloud protocols on pre-service teachers' reflection: A mixed methods approach. *Journal of Agricultural Education*, *54*(1), 47–59. https://doi.org/10.5032/jae.2013.01047

Greiman, B. C., & Covington, H. K. (2007). Reflective thinking and journal writing: Examining student teachers' perceptions of preferred reflective modality, journal writing outcomes, and journal structure. *Career and Technical Education Research*, *32*(2), 115–139.

Haerens, L., Aelterman, N., Vansteenkiste, M., Soenens, B., & Van Petegem, S. (2015). Do perceived autonomy-supportive and controlling teaching relate to physical education students' motivational experiences through unique pathways? Distinguishing between the bright and dark side of motivation. *Psychology of sport and exercise, 16,* 26-36.

Hsieh H. & Shannon S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277–1288.

Jones, C. K., Kelsey, K. D., & Brown, N. R. (2014). Climbing the Steps Toward a Successful Cooperating Teacher/Student Teacher Mentoring Relationship. *Journal of Agricultural Education*, *55*(2), 33–47. https://doi.org/10.5032/jae.2014.02033

Kaplan, H., & Madjar, N. (2017). The motivational outcomes of psychological need support among pre-service teachers: Multicultural and self-determination theory perspectives. *Frontiers in Education,* 2, Article 42, 1-14. https://10.3389/feduc.2017.00042

Lambert, M. D., Sorensen, T. J., & Elliott, K. M. (2014). A comparison and analysis of preservice teachers' oral and written reflections. *Journal of Agricultural Education, 55*(4), 85–99. https://doi.org/10.5032/jae.2014.04085

Lave, J. and Wenger, E. (1991). *Situated Learning: Legitimate Peripheral Participation*. Cambridge: Cambridge University Press.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry*. Beverly Hills, CA: Sage Publications, Inc.

Mezirow, J. (1991). *Transformative dimensions of adult learning.* Jossey-Bass, 350 Sansome Street, San Francisco, CA 94104-1310.

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary educational psychology, 25(*1), 54-67.

Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford publications.

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. Basic Books.

Sinclair, C. (2008) Initial and changing student teacher motivation and commitment to teaching, *Asia-Pacific Journal of Teacher Education,* 36(2), 79-104, https://doi.org/10.1080/13598660801971658

Sorensen, T., Lawver, R., Hopkins, Ni., Jensen, B., Dutton, C., & Warnick, B. (2018). Preservice agriculture teachers' development during the early phase of student teaching. *Journal of Agricultural Education*, *59*(4), 105–119. https://doi.org/10.5032/jae.2018.04105

Swan, B. G., Wolf, K. J., & Cano, J. (2011). Changes in teacher self-efficacy from the student teaching experience through the third year of teaching. *Journal of Agricultural Education*, *52*(2), 128–139. https://doi.org/10.5032/jae.2011.02128

Wolf, K. J., Foster, D. D., & Birkenholz, R. J. (2010). The relationship between teacher self efficacy and the professional development experiences of agricultural education teacher candidates. *Journal of Agricultural Education*, 51(4), 38-48. https://doi.org/10.5032/jae.2010.04038

Agricultural Educators' Perceptions of Supervisors' Instructional Feedback

Brooke L. Thiel, North Dakota State University
Justin V. Benna, North Dakota State University
Breanna Pastir, North Dakota State University
Nikki Fideldy-Doll, North Dakota State University

Introduction

When done well, instructional feedback shared with teachers can support their development and improve instructional practices (Drago-Severson & Blum-DeStefano, 2016). Do teachers across content areas perceive feedback differently? Scholars have explored differences in teacher perceptions, beliefs, and practices as they relate to unique content specialty, however, less is known about their perceptions of instructional feedback (Grossman & Stodolsky, 1995). Furthermore, much of the research that has focused on instructional feedback in specific content areas has been studied in elementary school settings (e.g. Nelson, 2010; Nelson & Sassi, 2000). Arguing Career and Technical Education (CTE) disciplines are uniquely positioned across secondary school content areas, Westbury and Addison-Stewart (2023) make the call for expanded investigation of instructional feedback. In this study, we aim to contribute broadly to the field of instructional leadership and specifically to what is known about SBAE teachers' perceptions of the instructional feedback they receive.

Conceptual Framework

Effective instructional supervision hinges upon quality instructional feedback (Glickman et al, 2014; Sergiovanni & Starratt, 2007). Not only can feedback inform the daily practice of teachers (Grissom et al. 2013; Hill & Grossman, 2013), it is argued feedback is, "the *most* important way," to transform instruction (Drago-Severson & Blum-DeStefano, 2016, p. 35). Despite its importance, there is limited research about how secondary-level administrators engage with teachers to provide content-specific instructional feedback (Gomez Johnson, 2023; Kubasko et al, 2019). Furthermore, we posit the uniqueness of agriculture education and CTE have clear implications for teacher supervision (e.g. Paulsen & Martin, 2013, 2014; NAAE, 2020). This study builds upon the work of Lochmiller (2016) who explored the perceptions of both high school principals and teachers—specifically science and math teachers—regarding the nature and efficacy of instructional feedback.

Purpose and Objectives

The aim of this study was to examine the feedback SBAE teachers receive from their supervisors. Additionally, the study explored how supervisor experiences impacted the feedback they provided to the SBAE teachers they supervise.

1. Describe SBAE teachers' perceptions of supervisor feedback.
2. Determine the association between SBAE teacher characteristics and their perceptions of supervisor feedback.

3. Determine the relationship between administrator experiences and SBAE teachers' perceptions of supervisor feedback.

Methods

The population of interest was SBAE teachers in North Dakota. The total population was estimated to be 108 (*N*). The study employed a one-measurement cross-sectional survey design (Cohen et al., 2011) where teachers completed an online questionnaire via Qualtrics to acquire demographic information and their perceptions of their experiences with supervision and evaluation. Data were collected via email using a census of all agriculture teachers during early 2023. Three reminder emails were sent via the AgEd listserv. A total of $N = 41$ surveys were returned, achieving a 38% response rate. In total, three surveys were incomplete and removed, leading to a usable sample of $n = 38$ (35% response rate).

The Instructional Feedback Perceptions - Teacher Scale (IFP-TS) was developed specifically for this study. Using the findings from Lochmiller (2016), five a priori constructs were developed for the instrument. Within those constructs, 46 Likert-type scaled items were drafted. A five-point scale and descriptors were used for responding and included: 1 (*strongly disagree*), 2 (*disagree*), 3 (*neither agree/disagree*), 4 (*agree*), and 5 (*strongly agree*). The items were subjected to test-retest reliability and 34 items were retained with a minimum $r = 0.7$ Pearson's correlation coefficient and a p value of less than 0.5.

A panel of two faculty experts ($n = 2$), reviewed the instrument for content validity. The faculty experts had experience as principals and supervisors, which allowed them to view the instrument through the lens of a practitioner. Adjustments were made to the final instrument based upon feedback from the experts.

The instrument was subjected to an exploratory factor analysis (EFA) using principal axis factoring (Field, 2013). After the initial factor extraction, the data was evaluated for multicollinearity and minimally correlated variables. Horn's Parallel Analysis (Horn, 1965) was used to determine that a four-factor solution was the most appropriate for the instrument. After the final factor solution was tested, the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) was found to be .94. The final resulting factors were (a) General Feedback (7 items, $\alpha = .95$); (b) CTE Specific Feedback (3 items, $\alpha = .88$); (c) Affirmative Feedback (6 items, $\alpha = .95$); and (d) Lived Experience Feedback (5 items, $\alpha = .78$). The overall reliability of the instrument was $\alpha = .95$. Construct definitions can be found in Table 1.

In addition to the items included in the constructs, there were $n = 3$ additional single-item questions included in the instrument as well. These questions sought to gather information about teachers' preferences regarding the type of feedback they preferred to receive from their supervisor (pedagogical or content-specific feedback), as well as whether or not they wanted to receive feedback about their teaching and their role in their Ag Ed program. The final section of the survey included five demographic questions and statements to collect information regarding years of experience, content area taught, method of earning teaching licensure, and size and type of the school in which they work.

Table 1

Instructional Feedback Perceptions - Teacher Scale (IFP-TS) Construct Definitions

Construct	Definition
General Feedback	Feedback associated with teaching strategies, content specific practices, and teacher growth
CTE Specific Feedback	Feedback addressing components of CTE such as CTSOs, work-based learning, and overall program goals
Affirmative Feedback	Feedback that offers support and encouragement, validates a teacher's practice, and expresses positive belief.
Lived Experience Feedback	Feedback related to the supervisor's prior experience as an educator

Descriptive statistics were used to analyze demographic information of the respondents. Characteristics of the sample are found in Table 2.

Table 2

*Demographic Characteristics of Participating Teachers (*N *= 37)*

Variable	*n*	%
Years of Experience		
0-5 years	12	32.4
6-10 years	7	18.9
11-15 years	5	13.5
16-20 years	5	13.5
21-25 years	2	5.4
26 or more years	5	13.5
Missing	1	2.7
Licensure		
Traditional Licensure	31	83.8
Praxis Test	1	2.7
Alternative Licensure	3	8.1
Teacher Licensure Option	1	2.7
Missing	1	2.7

Variable	*n*	%
Type of School Taught in		
Traditional High School	33	89.2
CTE Center	3	8.1
Missing	1	2.7
Size of School		
Small (fewer than 30 in graduating class)	23	62.2
Medium (31-100 in graduating class)	8	21.6
Large (more than 100 in graduating class)	5	13.5
Missing	1	2.7

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) software version 28. Descriptive statistics were run to analyze independent and dependent variables, including means and standard deviations. To compare the differences of perceptions between demographic groups, a series of one-way ANOVAs and independent samples *t*-tests were run with a 95% confidence level.

Results

Objective one was to describe SBAE teachers' perceptions of supervisor feedback. Teachers reported receiving the most affirmative feedback from their supervisors (M = 3.80, SD = 0.75), while receiving the least amount of CTE specific feedback (M = 2.82, SD = 1.04). CTE administrators provided the most balanced feedback with a mean difference of 0.58 between the four constructs, as well as the most CTE specific feedback (M = 3.71, SD = 0.78). Additionally, when asked what type of feedback was more important to them, 75% of SBAE teachers reported it was more important to receive pedagogical feedback than content specific feedback from their supervisor. Table 3 reports the detailed results of teachers' perceptions of the feedback received from their various supervisors.

Table 3

SBAE Teachers' Perceptions of Supervisor Feedback (N = 38*)*

	All (n=38)		**Principals (n=30)**		**Instructional Coaches (n=1)**		**CTE Administrators (n=7)**	
Construct	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***
General Feedback	3.44	0.91	3.39	0.94	3.43	-	3.67	0.91
CTE Specific Feedback	2.82	1.04	2.63	1.01	2.00	-	3.71	0.78

	All (n=38)		Principals (n=30)		Instructional Coaches (n=1)		CTE Administrators (n=7)	
Construct	***M***	***SD***	***M***	***SD***	***M***	***SD***	***M***	***SD***
Affirmative Feedback	3.80	0.75	3.79	0.75	2.83	-	3.98	0.79
Lived Experience Feedback	3.07	0.77	2.98	0.78	3.40	-	3.40	0.71

Note. IFP-TS utilized a 5-point scale with descriptors at 1 (*strongly disagree*), 2 (*disagree*), 3 (*neither agree/disagree*), 4 (*agree*), and 5 (*strongly agree*).

Objective two was to describe the relationship between teacher characteristics (years of teaching experience, method of earning licensure, and the size and type of school in which they work) and their perceptions of supervisor feedback. On average, teachers who earned their license through an alternative pathway reported receiving more affirmative feedback (M = 3.60, SE = .28), than teachers who earned their license through a traditional teacher preparation pathway (M = 2.84, SE = .08). Additionally, the identified difference, -0.80, was significant $t(33) = -2.11$, $p = .043$. Cohen's d = .72, which is a medium effect size (Field, 2013).

Alternatively certified teachers also reported receiving significantly more lived experience feedback (M = 4.00, SD = 0.33) than their traditionally certified counterparts (M = 3.01, SD = 0.73) $t(33) = -2.68$, $p = 0.11$. The resulting effect size was measured using Cohen's d, and was found to be .70, which is also a medium effect size (Field, 2013). Additional results of the independent samples t-tests related to pathway to licensure can be found in Table 4. The comparisons between groups of SBAE teachers based upon years of teaching experience, school size, and school type found no significant relationships between those professional characteristics and teachers' reported feedback from supervisors.

Table 4

The Difference between Teachers' Perceptions of Feedback from Supervisors (N = 97)

	n	***M***	***SD***	**SE**	***t***	***df***	**Sig. (2-tailed)**
General Feedback					1.95	35	.060
Former CTE teacher	9	3.97	0.67	0.22			
Not former CTE teacher	27	3.33	0.91	0.17			
CTE Specific Feedback					3.57	34	.001*
Former CTE teacher	9	3.78	0.65	0.22			
Not former CTE teacher	27	2.56	0.95	0.18			
Affirmative Feedback					1.90	35	.066
Former CTE teacher	9	4.22	0.53	0.18			
Not former CTE teacher	27	3.69	0.78	0.15			

	n	*M*	*SD*	SE	*t*	*df*	Sig. (2-tailed)
Lived Experience Feedback					3.29	35	.002*
Former CTE teacher	9	3.73	0.40	0.13			
Not former CTE teacher	27	2.86	0.75	0.14			

Note. * indicates <.05 significance.

Objective 3

When comparing the differences in feedback from supervisors with or without a CTE background, on average, teachers whose supervisors were also CTE teachers reported significantly more CTE specific feedback (M = 3.78, SD = .07), than teachers whose supervisors were not former CTE teachers (M = 2.56, SD = .0.95), $t(34) = 3.57$, p = .001. Cohen's d resulted in a large-effect size (d = 0.89) (Field, 2013). SBAE teachers also reported receiving more lived experience feedback from supervisors who were former CTE teachers f(M = 3.73, SD = 0.40) compared to supervisors who were not former CTE teachers (M = 2.86, SD = 0.75), $t(33) = 3.29$, p = .002. Cohen's d was calculated and found to be 0.70, which is a medium effect size (Field, 2013). Additional results of the independent samples t-tests can be found in Table 5.

Table 5

Teachers' Perceptions of Feedback from Supervisors With or Without Similar Backgrounds (N = 97)

	n	*M*	*SD*	SE	*t*	*df*	Sig. (2-tailed)
General Feedback					1.95	35	.060
Former CTE teacher	9	3.97	0.67	0.22			
Not former CTE teacher	27	3.33	0.91	0.17			
CTE Specific Feedback					3.57	34	.001*
Former CTE teacher	9	3.78	0.65	0.22			
Not former CTE teacher	27	2.56	0.95	0.18			
Affirmative Feedback					1.90	35	.066
Former CTE teacher	9	4.22	0.53	0.18			
Not former CTE teacher	27	3.69	0.78	0.15			
Lived Experience Feedback					3.29	35	.002*
Former CTE teacher	9	3.73	0.40	0.13			
Not former CTE teacher	27	2.86	0.75	0.14			

Note. * indicates <.05 significance.

Conclusions, Recommendations, and Implications

The purpose of this study was to examine SBAE teachers' perceptions of the feedback they receive from their supervisors. Because effective feedback is critical to teacher growth and development (Burch & Spillane, 2003; Drago-Severson & Blum-DeStefano, 2023), and little is

known about how SBAE teachers perceive the feedback they receive from their supervisors, this study is timely and relevant. Specifically, this study hoped to identify the content specific needs of SBAE teachers as they relate to the type of feedback they receive from their supervisors. Though teaching agriculture is different from teaching other subjects, we found that 75% of SBAE teachers preferred to receive pedagogical feedback from their supervisors, compared to content specific feedback, which aligns with the findings of Lochmiller's study (2016).

Supervisors who had experience as former CTE teachers shared significantly more CTE specific feedback and lived experience feedback than those supervisors who were not former CTE teachers. Logically, former CTE teachers would be more knowledgeable about the extra responsibilities and challenges associated with teaching agricultural education. Additionally, former CTE teachers likely saw more opportunities to share their lived experience feedback with SBAE teachers because of content and experience similarities. A recommendation for practice would be to ensure supervisors who have less familiarity with CTE and SBAE receive adequate training to understand the unique aspects of managing a complete Ag Ed program (SAE, FFA, and classroom instruction), as well as a CTE program (Perkins funding, advisory boards, etc.).

Since the purpose of supervision is to provide ongoing support for teachers' professional learning and growth (Glickman et al, 2014; Darling Hammond, 2013), it is logical that teachers who entered the profession via an alternative licensure pathway reported receiving greater amounts of lived experience feedback and affirmative feedback than teachers who were trained to enter the profession via a traditional teacher licensure program. Though this study focused on SBAE teachers, it's important to remember that the purpose of supervision is still to provide support for teachers' professional learning and growth, which is likely needed the most early in one's career as an educator, and especially when entering the profession via an alternative pathway.

References

Burch, P., & Spillane, J. P. (2003). Elementary school leadership strategies and subject matter: Reforming mathematics and literacy instruction. *Elementary School Journal, 103,* 519-535. https://doi.org/10.1086/499738

Cohen, L., Manion, L., & Morrison, K. (2011). *Research methods in education*. Routledge.

Darling-Hammond, L. (2013). *Getting teacher evaluation right: What really matters for effectiveness and improvement*. Teachers College Press.

Drago-Severson, E., & Blum-DeStefano, J. (2023). Developmental and differentiated feedback for educators. In Lavigne, A.L., and Derrington, M.L. (eds). *Actional feedback to PK-12 Teachers,* (pp. 35-47). Rowan & Littlefield.

Drago-Severenson, E., & Blum-DeStefano, J. (2016). *Tell me so I can hear you: A developmental approach to feedback for educators.* Harvard Education Press.

Field, A. (2013). *Discovering statistics using IBM SPSS Statistics* (4th ed.). Sage Publications Inc.

Hill, H. C., & Grossman, P. (2013). Learning from teacher observations: Challenges and opportunities posed by new teacher evaluation systems. *Harvard Educational Review, 83,* 371-384.

Glickman, C.D., Gordon, S.P., & Ross-Gordon, J.M. (2014). *SuperVision and instructional leadership: A developmental approach.* Pearson.

Gomez Johnson, K. (2023). Mathematics instructional leadership: Self-efficacy development for elementary school administrators. *Journal of School Administration and Development, 8*(1), 1-12. https://doi.org/10.32674/jsard.v8i1.3692

Grissom, J. A., Loeb, S., & Master, B. (2013). Effective instructional time use for school leaders: Longitudinal evidence from observations of principals. *Educational Researcher, 42,* 433-444. https://doi.org/10.3102/0013189X13510020

Grossman, P. L., & Stodolsky, S. S. (1995). Content as context: The role of school subjects in secondary school teaching. *Educational Researcher, 24*(8), 5-23. https://doi.org/10.3102/0013189X024008005

Kubasko, D., Rhodes, G., & Sterrett, W. (2019). A case study approach to STEM supervision: A collaborative model of teaching and principal preparation. *Journal of Interdisciplinary Teacher Leadership, 4*(1), 1-11. https://doi.org/10.46767/kfp.2016-0029

Lochmiller, C. R. (2016). Examining administrators' instructional feedback to high school math and science teachers. *Educational Administration Quarterly, 52*(1), 75–109. https://doi.org/10.1177/0013161X15616660

NAAE. (2020). What is Agricultural Education? *The National Association of Agricultural Educators (NAAE)*. https://www.naae.org/whatisaged/

Nelson, B. S. (2010). How elementary school principals with different leadership content knowledge profiles support teachers' mathematics instruction. *New England Mathematics Journal, 42*, 43-53.

Nelson, B. S., & Sassi, A. (2000). Shifting approaches to supervision: The case of mathematics supervision. *Educational Administration Quarterly, 36*, 553-584. https://doi.org/10.1177/00131610021969100

Paulsen, T.H., 7 Martin, R.A. (2014). Supervision of agriculture educators in secondary schools: What do teachers want from their principals? *Journal of Agricultural Education, 55*(2), 136-153. https://doi.org/10.5032/jae.2014.02136

Paulsen, T.H., 7 Martin, R.A. (2013). Instructional supervision of agricultural education teachers; Perceptions regarding selected beliefs. *Journal of Agricultural Education, 54*(2), 99-113. https://doi.org/10.5032/jae.2013.02099

Quebec Fuentes, S., & Jimerson, J. B. (2020). Role enactment and types of feedback: The influence of leadership content knowledge on instructional leadership efforts. *Journal of Educational Supervision, 3*(2),6-31. https://doi.org/10.31045/jes.3.2.2

Sergiovanni, T., & Starratt, R. (2007). *Supervision: A redefinition* (8th ed.). McGraw-Hill.

Westberry, L. and Addison-Stewart, S. (2023). The value and necessity of differentiation and feedback for career and technical education teachers. In Lavigne, A.L., and Derrington, M.L. (eds). *Actional feedback to PK-12 Teachers,* (pp. 163-175). Rowan & Littlefield.

Help! A Qualitative Investigation of Social Support Early Career Agriculture Teachers Find Most Beneficial

Amy M. Leman, University of Illinois at Urbana-Champaign
Jay K. Solomonson, Illinois State University
Claire E. Smith, University of Illinois at Urbana-Champaign
Adrian Hernandez, University of Illinois at Urbana-Champaign

Introduction/Conceptual Framework

Across the United States, public schools face a continued and increasing shortage of qualified teachers, as not enough students are entering the profession, along with teachers leaving 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 a solution to the problem, it may prove more effective to focus on retaining existing teachers. Research shows 44% of teachers leave the profession within five years (Ingersoll et al., 2018), suggesting an opportunity to increase support and thereby retain teachers during that time.

In the field of education, increased teacher self-efficacy has been continuously linked to decreased work-related stress and job burnout (Klassen & Chiu, 2010; Schwarzer & Hallum, 2008; Skaalvik & Skaalvik, 2017; Yu et al., 2014). Providing additional support to early career teachers (ECT), or those with five years or less experience, may increase a novice teacher's sense of efficacy which in turn may lead to higher retention (Korte & Simonsen, 2018).

House (1981) defined social support as "a person's relationships with partners, friends, work colleagues, and work supervisors" and linked 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. The framework lists 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) individuals. We used the social support construct of Korte and Simonsen's (2018) model as the framework to guide our study.

Purpose and Objectives

The study's purpose was to examine the social support most beneficial to agricultural education ECTs. Our specific objectives were to:

1) Determine when ECTs most need support by examining perceived levels of stress and confidence during the school year.
2) Identify specific areas of difficulty for ECTs.
3) Determine the types of social support ECTs find most beneficial.

Methodology

Our qualitative study utilized a basic interpretive approach framed in 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 Illinois agricultural education state staff and sent a recruitment email to all 126 SBAE teachers in their second to fifth year of teaching. Nineteen ECTs agreed to participate in our study. Consent documentation and demographic information were collected via Qualtrics.

Each ECT participated in a semi-structured, 45-minute virtual interview using Zoom in the fall 2022 semester. The interviews were recorded and transcribed verbatim. As part of the interview, participants were shown a graph with the months of the school year and a 10-point scale (10=high) and asked to recall their levels of *stress* and *confidence* for each month during their first-year teaching. The word *confidence* was used to collect perceived self-efficacy (Klassen & Chui, 2010). Participants used the Annotate feature on the Zoom shared screen to record their responses. The interviewer took a screenshot of the screen.

All interview data were analyzed using an open-coding technique by each member of our research team. The codes were used to reveal concepts that further developed into our final themes. The reliability and validity of our study were achieved based on the recommendations of Lincoln and Guba (1985) and Creswell (2013).

Our participants included ten teachers with traditional teaching licenses and nine teachers with alternative licenses. Six identified as male, and 13 as female. All identified as white or Caucasian. Five worked in a school district with one SBAE teacher, and 14 worked in a multi-teacher program. Pseudonyms were used to protect the participants' identities.

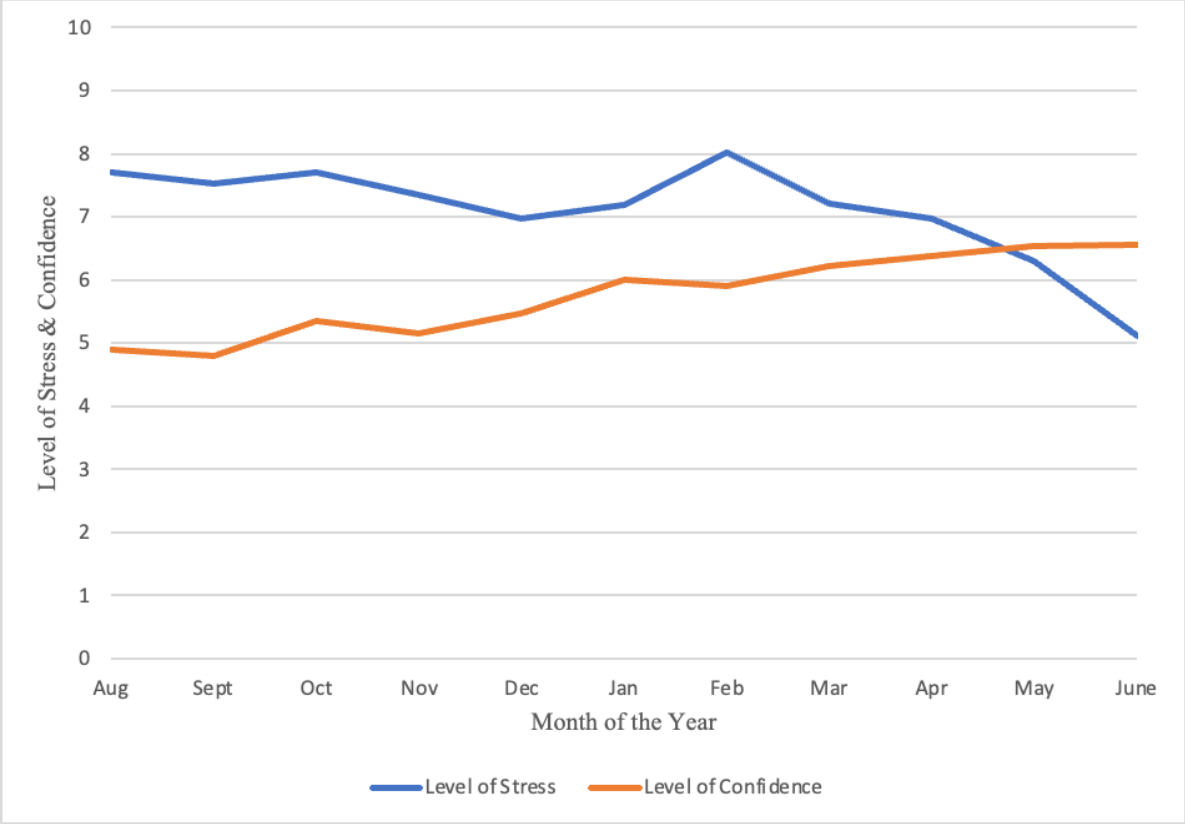
Findings

Objective 1

The purpose of objective one was to determine when during the school year ECTs most need support by examining perceived levels of stress and confidence. In Figure 1, the perceived average level of stress at the beginning of the school year was relatively high (M= 7.71; SD = 1.16), then remained fairly steady through October, finally declining into December. During the second semester, stress levels increased, peaking in February (M= 8.03; SD = 1.59), with a steady decrease through the end of the school year.

Figure 1

Average Perceived Levels of Stress and Confidence of ECTs During Their First Year Teaching



To start the school year, confidence levels of ECTs were fairly low (M = 4.89; SD = 2.49). Their confidence levels had a steady increase throughout the year, dipping between the months of October and November and January and February, however increasing to an apex in June (M = 6.56; SD = 1.46). The months with the greatest differences between confidence and stress levels were August, September, October, November, and February.

Objective 2

In order to address the second research objective, specific areas of difficulty for ECTs, we identified four themes through our analysis.

Theme 1: The school environment and classroom climate are instrumental in determining the difficulty of adjusting to teaching as a profession.

Teachers 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 and what they needed to discuss with their principal. Etta was an ECT so stressed out about classroom management she went on medication her first year. She disclosed, "the thing that stressed me out the most was just like dealing with the discipline of students… I literally went to the doctor

and went on medication because I was so stressed out… It was a rough first year." ECTs also discussed addressing the social-emotional needs of students and the changing needs of students since COVID. Matilda expressed her views on how different she finds students post-COVID. She said, "Accountability is a huge issue right now with having students care and do their homework and do it on time."

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. Darla indicated, "Colleges did not prepare us well… to be FFA advisors. They do a really good job preparing us to be Ag teachers, but not FFA advisors."

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 an agricultural mechanics curriculum. When asked where a learning gap exists, Marjorie, like many others, admitted, "Without a doubt, ag mechanics would be my number one thing." Further, some teachers were also teaching middle school courses and did not feel prepared for this audience.

Theme 4: ECTs struggled to attain positive work-life integration with the expected workload.

Teachers talked about the struggle of teaching five to seven different class preps a day, while finding time to plan and teach new content to themselves, manage the FFA chapter, and maintain a personal life. Earl told us,

> That first year was really stressful. I brought work home a lot and so my work-life balance was not the greatest because I just found myself every night for 1-2 hours coming home… I didn't have enough time in the day to then figure out what tomorrow is going to look like.

Objective 3

To address the third research objective, the assistance ECTs find most beneficial, 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 with whom they 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. Earl agreed and said, "I think other ag teachers are, first and foremost, the best resource to bounce ideas off of. Not that my school's bad, but they may not understand what I need if it's related to the Ag classroom." ECTs also felt that support from people they did not already know was not as welcome or important.

Theme 2: ECTs appreciate timely answers to various questions as they occur.
Teachers went to the person with the timeliest response and answer to their questions. They used email and text messages, the priority being the most efficient method to get a quick response. Norma told us state staff is who she went to most. She said, "[STATE STAFF] is amazing. She, anytime I call, text, email, anything, she's on it. She answers all our questions."

Discussion, Implications, & Recommendations

While the concepts of self-efficacy, social support, job stress, and retention are found frequently in the literature pertaining to the teaching profession in general, the work in SBAE is limited. SBAE provides unique challenges that are absent from other content areas. SBAE requires a higher number of classes to prepare for and includes the facilitation of FFA and Supervised Agricultural Experiences programming, per the Three-Circles Model (Croom, 2008). Further, these occur both during the school day and outside contractual time. In our study, these added responsibilities outside of contract time seem to be the cause for stress and the subject of needed support for ECTs.

Our study confirms past work chronicling the challenges of SBAE teaching (Clemmons et al., 2021; Disberger et al., 2022; Haddad et al., 2023; Hopkins et al., 2020; Moser & McKim, 2020; Mundt & Connors, 1999; Solomonson et al., 2018; Traini et al, 2020). The teachers in our study felt they needed more support when stress levels were high. Our findings show this was typically in the first semester and then again in February. At the same time, the topics of needed support and who they preferred support from varied greatly, providing a "one-size-fits-all" answer to teacher support unlikely. These findings are consistent with those of Korte & Simonsen (2018).

Interestingly, our participants did share a need for real-time responses to questions. All were short on time and often realized they needed assistance at the last minute before due dates or events. Providing support and information in a variety of ways, from text messaging to phone calls to emails, was appreciated. While there are many databases and searchable resources for SBAE teachers, our participants did not seem to have the time to sift through multiple resources and find their answers. They needed simple answers they could implement and use immediately.

The diversity of needs of SBAE teachers makes generalizable recommendations difficult. In addition, each state offers different levels of state-wide resources and state-wide support staff. Perhaps exploring ways to simplify the job duties during the first years of teaching would allow teachers to gain the confidence to expand their responsibilities as they continue their careers. Our sample included many teachers who are part of multi-teacher programs. Teachers in our sample who had a second SBAE teacher in their school reported relying on the advice and support from this second teacher. A teacher in the same school has experience with the nuances of the school district that make each teaching position unique. We recommend further research comparing the self-efficacy, stress, and retention of teachers in multi-teacher programs.

References

Clemmons, C. A., 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. https://doi.org/10.5032/jae.2021.01095

Crewell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches*. Sage Publications.

Croom, D. B. (2008). The development of the integrated three-component model of agricultural education. *Journal of Agricultural Education, 49*(1), 110-120. https://doi.org/10.5032/jae.2008.01110

Disberger, B., Washburn, S. G., Hock, G., & Ulmer, J. (2022). Accomplishments and challenges experienced by beginning agriculture teachers in their first three years: A collective case study. *Journal of Agricultural Education*, *63*(1), 115–131. https://doi.org/10.5032/jae.2022.01115

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/

Haddad, B., Traini, H., & McKim, A. (2023). We've crossed a line: A philosophical examination of systemic implications surrounding SBAE teachers' attempts at boundary setting . *Journal of Agricultural Education*, *64*(1), 82–95. https://doi.org/10.5032/jae.v64i1.31

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

House, J. S. (1981). *Work, stress and social support.* Addison-Wesley Publishing Company.

Ingersoll, R., Merrill, E., Stuckey, D., & Collins, G. (2018). *Seven trends: The transformation of the teaching force, updated October 2018. CPRE Research Reports (#RR-2018-2)*. University of Pennsylvania. https://repository.upenn.edu/cpre_researchreports/108/

Klassen, R. M., & Chiu, M. M. (2010). Effects on teachers' self-efficacy and job satisfaction: Teacher gender, years of experience and job stress. *Journal of Educational Psychology, 102*(3), 741-756. https://doi.org/10.1037/a0019237

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. M., & McKim, A. J. (2020). Teacher retention: A relational perspective. *Journal of Agricultural Education, 61*(2), 263–275. https://doi.org/10.5032/jae.2020.02263

Mundt, J. P., & Connors, J. J. (1999). Problems And challenges associated with the first years of teaching agriculture: A Framework For Preservice And Inservice Education. *Journal of Agricultural Education, 40*(1), 38–48. https://doi.org/10.5032/jae.1999.01038

Schwarzer, R., & Hallum, S. (2008). Perceived teacher self-efficacy as a predictor of job stress and burnout: Mediation analyses. *Applied Psychology: An International Review, 57*, 152-171. https://doi.org/10.1111/j.1464-0597.2008.00359.x

Skaalvik, E. M. & Skaalvik, S. (2017). Teacher stress and teacher self-efficacy: Relations and consequences. In T. M. McIntyre, S. E. McIntyre, & D. J. Francis (eds.) *Educator Stress: Aligning Perspectives on Health, Safety and Well-being* (pp. 101-125). Springer International Publishing.

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.2018.02321

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

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. https://doi.org/10.5032/jae.2020.04175

Yu, X., Wang, P., Zhai, X., Dai, H., & Yang, Q. (2014). The effect of work stress on job burnout among teachers: The mediating role of self-efficacy. *Social Indicators Research*, *122*, 701-708. https://doi.org/10.1007/s11205-014-0716-5

A Brief Primer for Critical Research in School-Based Agricultural Education

Katherine Hartmann, Iowa State University
Michael J. Martin, Iowa State University
Colby Gregg, University of Illinois Urbana-Champaign

Critical research argues that schools are places where the power structures of society are produced and reproduced or challenged. Recent research indicates that these power structures exist in school-based agricultural education as well. Critical research can help school-based agricultural education researchers explore the challenges of implementing programs in diverse and non-traditional communities. The purpose of this methodological paper is to provide a primer for conducting critical research in school-based agricultural education. We provide an overview of critical research epistemologies, methodology, as well as methods and then connect critical research to possible research questions in school-based agricultural education. We argue that critical research can be an important tool to help create a more equitable school-based agricultural education.

Introduction

School-based agricultural education (SBAE) is not a discipline separate from the pressures of an evolving society. While agricultural education has historically been part of what Mayer and Mayer (1974) termed the *island empire*, the pressures of an urbanizing populace and an increased awareness of how history continues to impact us today have required bridges to be built between traditional, rural, and urban, diverse audiences. Crossing these proverbial waters means that agricultural education must explore the structures of power and privilege historically and contemporarily (Freire, 2003; Giroux, 1981; McLaren, 2009). Thankfully, we have a tool for this: critical research. Critical research has been an indispensable tool for helping identify how educational practitioners can serve marginalized students. As agricultural education continually expands outside of our island, critical research can help illuminate ways to adapt and serve new audiences. This paper will explore how critical research can help agricultural education reach that goal.

Theoretical Framework

Critical research is used in a variety of academic fields but is generally concerned with the asymmetrical systems of power and privilege that exist in social, political, legal, and other areas of life (Freire, 2003). While each researcher has specific goals related to their work, critical researchers should be concerned with the liberation and equity of marginalized peoples by transforming existing systems through action (Kincheloe, 1991). The knowledge created through critical research can inform us of the action to take to dismantle inequitable systems and bring about change (Apple, 2004; Giroux, 1981; Hartmann & Martin, 2021; McLaren, 2009).

Critical research argues that schools – in addition to other formal and nonformal education settings – are places where the power structures of society are produced and reproduced or challenged (Kincheloe, 2001; Kincheloe et al., 2012). Education can reproduce the social inequalities of a society or provide equality for the disadvantaged (Freire, 2003). From a critical research perspective, it is important to consider how the construction of knowledge implies the construction of values. Learning and teaching have societal implications and the

system of education is a part of the social production and reproduction process. The content we teach and ways in which we teach it perpetuates social knowledge and relations of power (Guba, 1990).

Critical research is an umbrella concept to include a variety of theories, including critical theory, feminism, critical race theory, whiteness, tribal critical race theory, queer theory, and more. The central feature to these theories is that the experiences of the disadvantaged and oppressed are centered. Critical research is different than multicultural education research in that critical research focuses on the power structures underlying issues of inequity in education to bring about change (Jay, 2003).

Purpose

The purpose of this methodological paper is to provide a primer for conducting critical research in SBAE. There were three research questions which guided this study:

1. What epistemology is used in critical research?
2. What are the research methodologies and methods used in critical research?
3. How can critical research serve SBAE?

Methods

This methodological paper was guided by philosophical research (Burbules & Warnick, 2006). Philosophical research does not often have a single prescribed method which guides the whole study. Rather, the research process is dialectical with a heavy emphasis on citing claims and building arguments (Elliot, 2006). The goal was to create an abstract grounded in the literature and centered towards SBAE.

The definitions of key concepts utilized in this abstract were guided by leading researchers in various fields, including the philosophy of education research, research epistemologies, and critical research perspectives. The application of critical research to the context of SBAE was guided by the perspectives of leading researchers in these areas. While some research published in SBAE utilizes critical methods, we did not treat these studies as theoretical work in critical fields. Critical research in SBAE was discussed in the conclusions. For the third research question, focusing on how critical research can serve SBAE, the research team focused on critical issues identified in SBAE research.

Trustworthiness in the findings was built by exploring the data from multiple perspectives through critique and dialogue. These perspectives include the various critical theories as well as our expertise in those areas as researchers. We committed to exploring critical research and SBAE from a multitude of epistemologies (critical race theory, feminism, queer theory, etc.) rather than just a single viewpoint (Guba & Lincoln, 2005).

The positionalities of the researchers were considered during the construction of this paper. The first author is a faculty member and educational researcher with experience conducting critical research in SBAE and Extension. The second and third authors are both former SBAE high school teachers and current faculty members with experience in conducting critical research in SBAE; the second author utilizing critical theory and whiteness epistemologies, and the third utilizing queer theory.

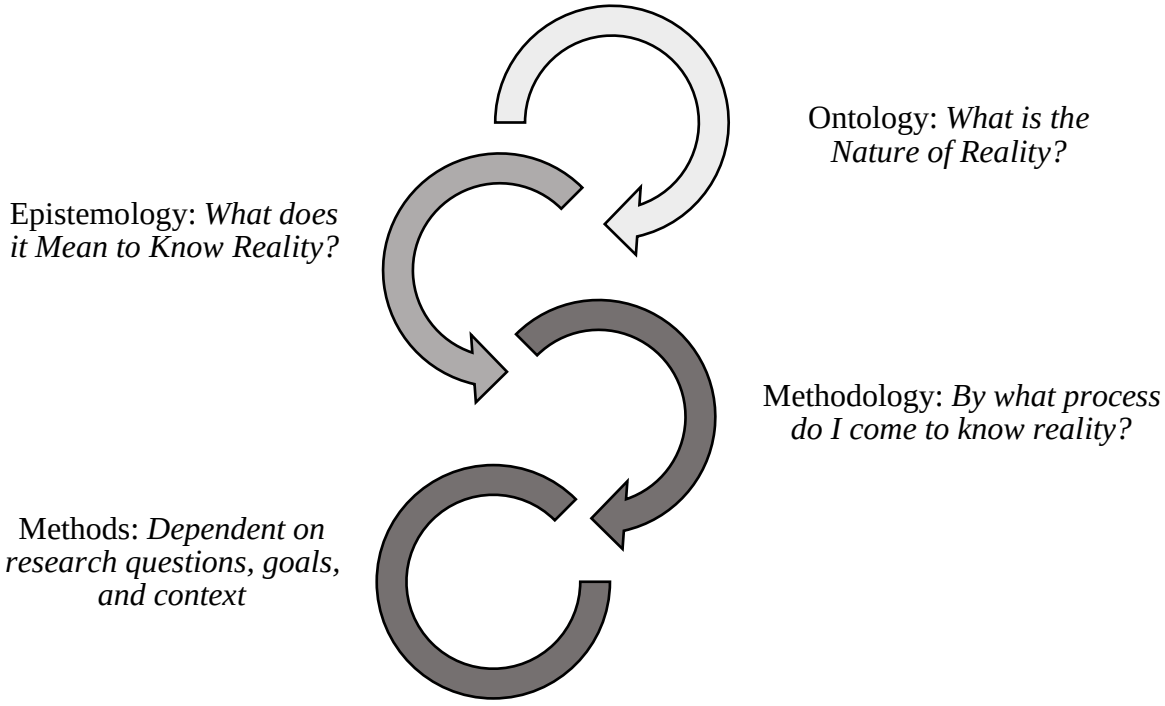
Findings

Ontology and Epistemology

Epistemology is the investigation of what distinguishes justified true belief from opinion (see Figure 1). It is the theory of knowledge, especially regarding its methods, validity, and scope. Each theoretical perspective will have its own commitments to the nature of reality and how one can come to know that reality. When formulating a research project, it is important to understand what epistemological and theoretical commitments are integral to the study and should be chosen based on the individual project's research questions and goals (Crotty, 1998; Guba & Lincoln, 2005).

Figure 1

Reality and the Hierarchical Process of how We Come to Know Reality



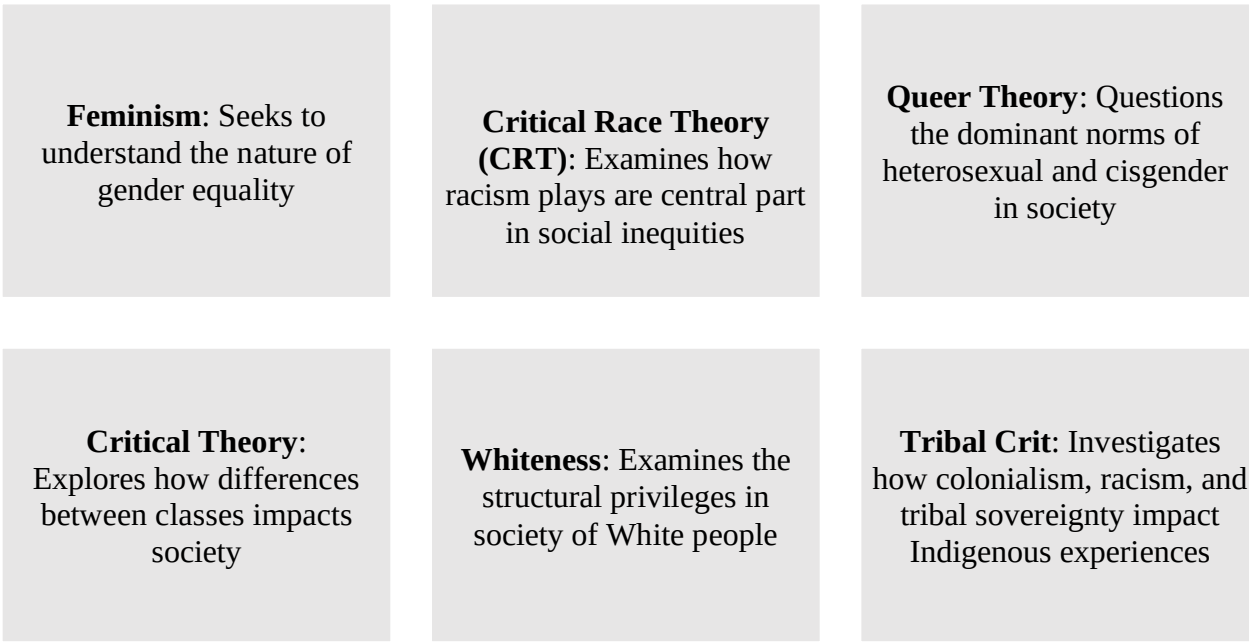
Scholars of critical research aim to explore systems of power and privilege and how they impact their chosen field of study. These studies should prioritize the liberation and emancipation of oppressed groups by critically interrogating the pedagogical relationships between history, culture, economics, ideology, and power to promote transformation of existing inequalities in the education system (Darder, 2017). The power of critique in this framework is to reveal and analyze social inequalities and oppressive systems to transform them through action. The knowledge produced through education can change existing structures through the empowerment of oppressed people. Knowledge should be in the context of action and the search for freedom (Crotty, 1998). Critical researchers obtain knowledge about the world independently of individual and social reality, while accepting that scientific knowledge is uncertain and

incomplete. In this way, critical research resembles post-positivism except that critical researchers would contend that knowledge is framed by systems of power and privilege which need to be examined and deconstructed.

Not all marginalized people interact with systems of power and oppression in the same ways, reflecting their different origins and struggles. Because of this, distinct theoretical frameworks have emerged that focus on different historical perspectives, gendered, racialized, and colonized peoples, and issues of agency and voice to specifically address these histories and contexts (see Figure 2). Two such frameworks, Latino and Asian Critical Race Theories, emerged to address prejudice related to immigration and language. However, LCRT has additional foci on identity and culture while ACRT focuses additionally on naturalization (Brayboy, 2005).

Figure 2

Incomplete List of Epistemologies in Critical Research



Note. CRT was historically developed to explore issues of inequality facing African Americans. There are epistemologies which have emerged from CRT, including Lat Crit and Asian Crit for specific groups.

Research Methodology and Methods of Critical Research

There are a variety of methods which are utilized in critical research. In fact, no single epistemology or theory necessitates or prohibits the use of any method. Traditional methods of data collection and analysis such as interviews, surveys, focus groups, and even statistical and demographic analysis can be used in critical research if their design, collection, and analysis are centered in the theoretical commitments of critical research. The methods used can be highly dependent on the context and critical approach utilized. Furthermore, multiple epistemologies may utilize the same methodology (Koro-Ljungberg, 2012; Matias, 2021). There are some methodological stances that critical researchers often take, however. For example, post-modern

methods, auto-ethnography, and counter-storytelling are an important methodology for many critical theory epistemologies. Detailing all the methods which can be utilized for each methodology was beyond the scope of this manuscript.

Counter-storytelling seeks to cast doubt on the accepted norms of the majority through the stories of the marginalized (Delgado & Stefancic, 2001; Parker & Lynn, 2002). While the voices most often valued, heard, and researched are those of the majority, it is imperative to highlight the voices of marginalized people to understand their more-often silenced perspectives. Delgado (1989) also emphasized how counter stories can serve a destructive function. He writes that stories can change mindsets because, "they can show that what we believe is ridiculous, self-serving, or cruel. They can show us the way out of the trap of unjustified exclusion. They can help us understand when it is time to reallocate power" (Delgado, 1989, p. 2415). For example, a study by DeCuir and Dixson (2004) from *Educational Researcher* utilized counter-storytelling methods within a CRT framework to explore how African American students experienced learning in a largely White and affluent high school. The experience is centered on the marginalized and not the school, white students, or the researcher.

In many epistemic perspectives such as post-positivism, the researcher's voice and perspective is prioritized given their training and positionality to the research. Given the theoretical commitments of critical research, this is not always prioritized. For example, various critical epistemologies deconstruct Western research traditions through collaboration between the researcher and the participants by pushing researchers to acknowledge and evaluate various ways of knowing, their legitimacy, and how our complex identities impact knowledge creation (Battiste, 2008). This implies problematizing the relationship between knowledge and power (Jankie, 2004). Often, critical research includes participant collaboration at many or all phases of the process including development of questions, collection and analysis of data, interpretation of findings and implications, and the dissemination of information; making findings available in relevant ways to the shareholders; and always interrogating privilege, while strengthening alliances (Battiste, 2008; Mutua & Swadener, 2004).

How can Critical Research Serve School-Based Agricultural Education

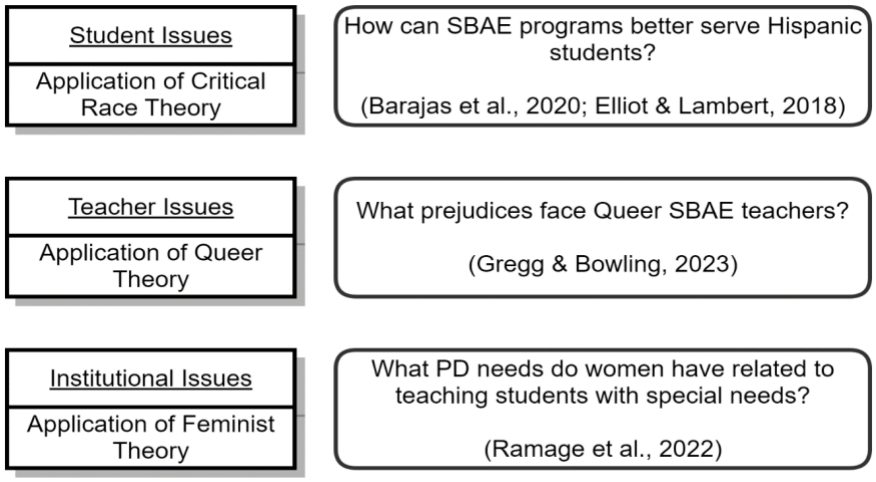
When working with a critical lens, whether research or pedagogy, we must also always remember that critical work is a call to action. This action in the education context typically involves helping people or communities that are marginalized find some equity in society through education. Critical research is a valuable tool for exploring the successes and challenges of SBAE efforts to connect with various communities who have been marginalized in the context of SBAE. The key to utilizing critical research effectively is to know when to leverage your epistemology, research methodology, and individual research methods. Researchers need to be deeply attuned to the context of the research questions they are addressing. Because of this, individual researcher positionality and identities should be considered when engaging with those in marginalized communities. It is particularly important for researchers to identify and acknowledge the power dynamics that will inevitably come into play when working with such groups.

Given the fact that critical research should be undertaken with the goal of bringing about equitable change, the best approach recommended by our team is to identify research questions being asked by stakeholders at all levels of SBAE. For instance, Murray and colleagues (2020) provided multiple potential questions and corresponding tools to advance inclusion of the queer

community in Ag-Ed spaces. Previous research published in the *Journal of Agricultural Education* and in the proceedings of the *American Association of Agricultural Education* also serve as examples to some of the possible topics which can be examined using critical research methods (see Figure 3). Examples of additional research topics in Ag-Ed that could benefit from critical approaches include environmental racism, rural internet access (or lack thereof), or how symbols within FFA are seen as inappropriate in various cultures.

Figure 3

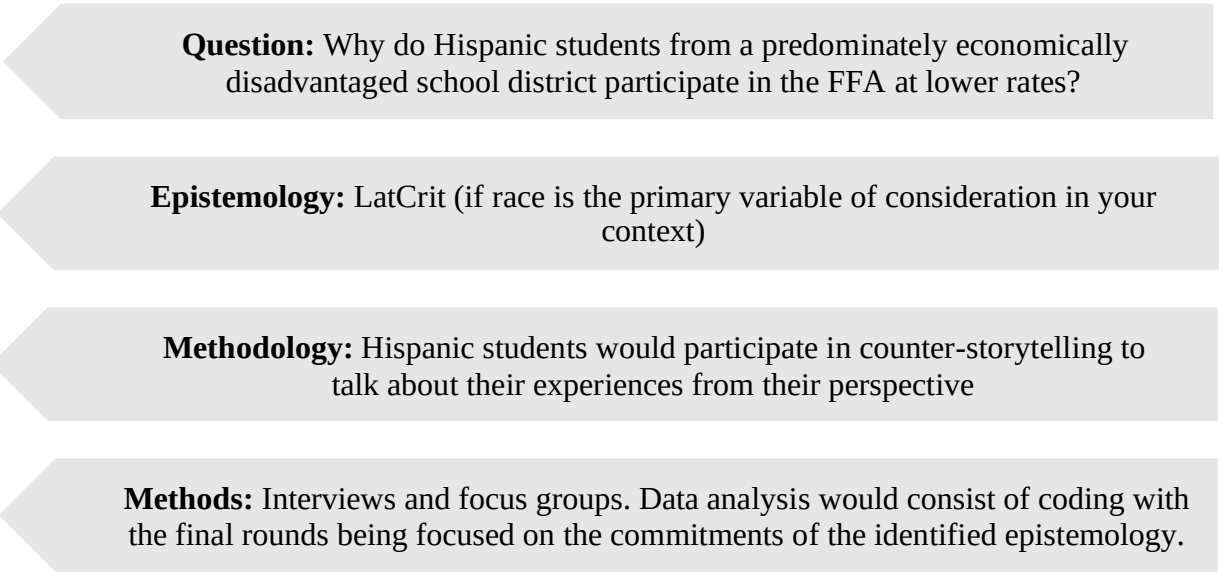
Possible Applications of Critical Research in SBAE from the Literature



After identifying a research question to address, the researcher then must identify which epistemology and subsequent methodological approaches would best answer the question being asked based on the context. When designing research with marginalized communities, these steps are essential to assure that you are matching the proper tools to help understand the experiences of your participants, thus enhancing validity of the research approach. Figure 4 presents an example of how a researcher might think about and conduct a research study using a critical approach.

Figure 4

Example of Critical Approach for SBAE



Discussion

Critical research provides SBAE with answers to questions that other epistemologies and research methods cannot effectively answer. The historical context of SBAE has left many participants out of our research focus or examined through research frames which do not fit. Furthermore, critical research is a call to action. Critical research, combined with critical pedagogy, research provides practitioners and researchers with more precise tools to explore some of the most challenging questions in SBAE. Critical research is not a panacea to the issues under examination. Critical research can provide guide stones to the future that when paired with other research methods and epistemologies, will lay the groundwork for a more inclusive SBAE.

The utilization of critical research also provides challenges for researchers. Since the social context facing education has changed overtime, the critical epistemologies have regularly evolved. SBAE researchers working with these various epistemologies need to be aware of the contemporary key ideas for each area. Furthermore, almost all the critical research epistemologies have well developed literature bases with unique theories and concepts which apply. While this may present a challenge to SBAE researchers, there are also opportunities. Critical research in SBAE has a high level of appeal to readers in critical journals because of the unique context and history of SBAE.

We need to know when and how to use critical research in SBAE. These answers depend entirely on the research questions being asked, context in the field, and the goals of the researcher. Researchers in agricultural education have only just recently begun to utilize this tool to answer important questions in the *Journal of Agricultural Education* (Barajas et al., 2020; Elliot & Lambert, 2018; Hartmann & Martin, 2022; Martin et al, 2023; Martin & Kitchel, 2015a). As agricultural education begins to expand beyond our island empire, we must be ready to serve new populations who are previously or are currently marginalized by the structural systems present in rural communities, agriculture, and education. If we work together to identify

the structural inequalities that exist in agricultural education, then we can work together to make it more equitable.

References

Apple, M. W. (2004). *Ideology and curriculum*. New York: Routledge.

Barajas, G., Crump, M. K., Vincent, S. K., & McCubbins, O. P. (2020). Somos nosotros! Lived experiences of Latinx ELL youth enrolled in secondary agricultural education. *Journal of Agricultural Education, 61*(4), 143-155. http://doi.org/10.5032/jae.2020.04143

Battiste, M. (2008). Research ethics for protecting Indigenous knowledge and heritage. *Handbook of critical and Indigenous methodologies* (N. K., Denzin, Y. S., Lincoln, & L. T., Smith, Eds.). Sage.

Brayboy, B. M. (2005). Toward a tribal critical race theory in education. *The Urban Review, 37*(5). https://doi:10.1007/s11256-005-0018-y

Burbules, N. C. & Warnick, B. R. (2006). Philosophical inquiry. *Handbook of complementary methods in education research* (J. L. Green, G. Camilli, P. B. Elmore, A. Skukauskaitė, & E. Grace, Eds.). Lawrence Erlbaum Associates.

Crotty, M. (1998). *The Foundations of social research: Meaning and perspective in the research process*. Sage.

Darder, A., Torres, R. D., & Baltodano, M. (2017). *The critical pedagogy reader*. Routledge.

DeCuir, J. T., & Dixson, A. D. (2004). "So when it comes, they aren't surprised that it is there": Using critical Race Theory as a tool of analysis of race and racism in education. *Educational Researcher, 33*(5), 26-31. https://doi.org/10.3102/0013189X033005026open_in_new

Delgado, R. (1989). Storytelling for oppositionists and others: A plea for narrative. *Michigan Law Review*, 87, 2411.

Delgado, R. & Stefancic, J. (2001). *Critical race theory: An introduction*. New York University Press.

Elliott, J. (2006). Educational research as a form of democratic rationality. *Journal of Philosophy of Education, 40*(2), 169-185.

Elliott, K. M., & Lambert, M. D. (2018). Urban and rural Latino students' experiences in agricultural education: Toward defining rural privilege. *Journal of Agricultural Education, 59*(3), 198-212. https://doi.org/10.5032/jae.2018.03198

Freire, P. (2003). *Pedagogy of the oppressed*. Continuum

Giroux, H. A. (1981). *Ideology culture and the process of schooling*. Temple University Press.

Gregg, C., & Bowling A. (2023, May 15th-18th). *The rainbow owl: A phenomenological analysis of LGBTQ+ agriculture education teacher experiences* (paper presentation). American Association of Agricultural Educators Meeting, Raleigh, NC, United States.

Guba, E. G. (1990). *The paradigm dialog*. Sage Publications.

Guba, E.G. & Lincoln, Y.S. (2005). Paradigmatic controversies, contradictions, and emerging confluences. *The Sage Handbook of Qualitative Research* (N.K. Denzin & Y.S. Lincoln, Eds.). Sage Publications.

Hartmann, K. & Martin, M. (2021). A critical pedagogy of agriculture. *Journal of Agricultural Education, 62*(3), 51-71. https://doi.org/10.5032/jae.2021.03051

Kincheloe, J. L. (1991). *Teacher as researcher: Qualitative inquiry as a path to empowerment*. New York: The Falmer Press.

Kincheloe, J. L. (2001). Describing the bricolage: Conceptualizing a new rigor in qualitative research. *Qualitative Inquiry, 7*, 679-692. http://doi: 10.1177/107780040100700601

Kincheloe, J. L., McLaren, P. L., & Steinberg, S. R. (2012). Critical pedagogy and qualitative research: Moving to the bricolage. *Critical Qualitative Research Reader* (S. R. Steinberg & G. S. Cannella, Eds.). Peter Lang.

Koro-Ljungber, M. (2012). Methodology is movement is methodology. *Critical Qualitative Research Reader* (S. R. Steinberg & G. S. Cannella (Eds). Peter Lang.

Jankie, D. (2004). "Tell me who you are": Problematizing the construction and positionalities of "insider"/ "outsider" of a "Native" ethnographer in a postcolonial context. *Decolonizing research in cross-cultural contexts: Critical personal narratives* (K. Mutua & B. B. Swadener, Eds.). State University of New York Press.

Jay, M. (2003). Critical Race Theory, Multicultural Education, and the hidden curriculum of hegemony. Multicultural Perspectives, 5(4), 3-9. http://dx.doi.org/10.1207/S15327892MCP0504_2

Martin, M. J., Hartmann, K., and Archibeque-Engle, S. (2023). A Critical Whiteness Exploration of the National FFA Organization. *Journal of Agricultural Education, 64*(1), 136-155. https://doi.org/10.5032/jae.v64i1.34

Martin, M. J., & Kitchel, T., (2015a). Critical theory view of the National FFA Convention. *Journal of Agricultural Education, 56*(2), 122-137. https://doi.org/10.5032/jae.2015.02122

Martin, M. J., and Kitchel, T. (2015b). Advising an urban FFA chapter: A Narrative of two urban FFA advisors. *Journal of Agricultural Education, 56*(3), 162-177. https://doi: 10.5032/jae.2015.03162

Matias, C. E. (Ed.) (2021). *The handbook of critical theoretical research methods in education*. Routledge.

Mayer, A., & Mayer, J. (1974). Agriculture, the island empire. *Daedalus, 103*(3), 83-95.

McLaren, P. (2009). Critical pedagogy: A look at the major concepts. *The critical pedagogy reader (*A. Darder, M. P. Baltodano, & R. D. Torres, R. D., Eds). Routledge.

Mutua, K., & Swadener, B. B. (2004). *Decolonizing research in cross-cultural Contexts: critical personal narratives*. State University of New York Press.

Parker, L., & Lynn, M. (2002). What's race got to do with it? Critical race theory's conflicts with and connections to qualitative research methodology and epistemology. *Qualitative Inquiry, 8*(1), 7–22. https://doi.org/10.1177/10778004020080010

Ramage, R., Stair, K. S., Roberts, R., & Blackburn, J. J. (2022). Female agriculture teachers' lived experiences and perceived professional development needs when teaching students with special needs. *Journal of Agricultural Education, 63*(4), 105-118. https://doi:10.5032/jae.2022.04105

Retaining School-Based Agricultural Educators: A System Dynamics Approach

Tiffany A. Marzolino, Michigan State University
Aaron J. McKim, Michigan State University

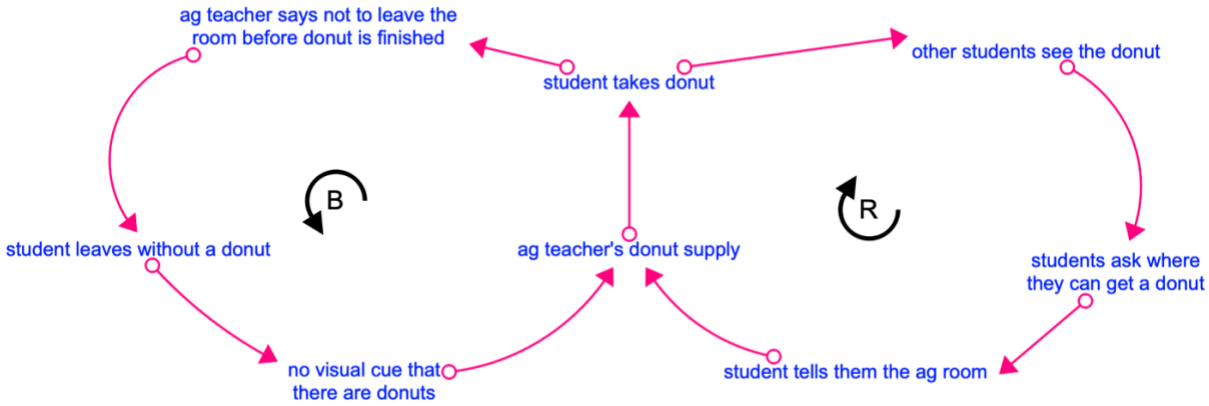
Introduction

The continual exodus of teachers from their jobs, 8.0% leaving teaching annually in general education and 6.8% in agricultural education (Lawver et al., 2018), has led the profession to be deemed a "leaky bucket" (Sutcher et al., 2016). In agricultural education, teacher attrition has been identified as the most significant challenge facing the profession (National FFA Organization, 2022). Research notes personal factors, working conditions, teacher development, and compensation as reasons for agriculture teacher attrition (Solomonson et al., 2018). Stated simply, the solution is to plug the holes in the leaky bucket by retaining teachers (Disberger et al., 2023; Kelsey, 2006; Sutcher et al., 2016); unfortunately, execution of this solution is much more complex. In fact, a growing clamor within the literature suggests systems perspectives are essential to exploring this complex issue (Haddad et al., 2023; Pauley et al., 2019). Within this philosophical manuscript, we employed a system dynamics approach to better understand the teacher attrition phenomena within agricultural education.

System dynamics, a specific facet of systems thinking, is used to model complex problems by identifying causal relationships between variables and potential solutions to persistent problems (Duffy, 2008; Forrester, 1968; Kim, 2008; Meadows, 2008), making it an ideal approach to explore teacher attrition. This approach relies on systems, defined as "an interconnected set of elements that is coherently organized in a way that achieves something" (Meadows, 2008, p. 11). By graphically representing systems, this approach illuminates key system elements like feedback loops (i.e., interactions between varying factors that magnify a response in one or more variables [Meadows, 2008]) and leverage points (i.e., points within a system where small interventions create systemwide changes [Meadows, 2008]). One graphical representation of complex systems is achieved by the creation of causal loop diagrams (CLDs, see Figure 1 for an example).

Figure 1

Example Causal Loop Diagram



Note. The *elements* of the system are represented in blue. The *interconnections* are represented by pink arrows. The R represents the *reinforcing loop* (i.e., cyclical system interaction that amplifies an effect) and the B represents the *balancing loop* (i.e., cyclical system interaction that balances the impact of an effect).

Theoretical Framework

Our model of agriculture teacher attrition was framed using the Theory of Margin (McClusky, 1963). This theory is comprised of three key concepts. First, *load* is all the things an individual is tasked with that require energy, including both internal (e.g., personal goals) and external (e.g., work and family tasks) components (Hiemstra, 1993; McClusky, 1963). Second, *power* is the energy an individual possesses to accomplish their load, which also includes internal (e.g., stamina) and external (e.g., support networks) components (Hiemstra, 1993; McClusky, 1963). Finally, *margin* is the difference between power and load (McClusky, 1963). An individual with margin, where their power exceeds load, has energy available to innovate, learn, and experiment with new ideas; alternatively, an individual without margin, where their load exceeds power, will be bogged down by obligations, precluding them from fully engaging in life (Merriam et al., 2006).

The Theory of Margin was developed to inform adult learning; however, it also has utility in our modeling of agriculture teacher attrition. Individuals are more resilient within, and committed to, systems that afford margin (Biney, 2021). Therefore, modeling the capacity for margin within agricultural education is critical to understanding agriculture teacher retention. Furthermore, margin is a prerequisite to teachers bettering the system in which they operate (McKim & McKim, 2022), suggesting margin is critical to continual system adaptation, led by teachers, to be more aligned to their needs, goals, and values.

Purpose

The purpose of this philosophical manuscript was to model agriculture teacher attrition and retention by employing system dynamics and the Theory of Margin. The utility of this approach includes providing the agricultural education discipline with new (a) understandings of leverage points within the system, (b) vocabulary to describe the system, and (c) understandings of one of the many systems teachers navigate throughout their careers.

Methodology

Causal Loop Diagramming

The model developed takes the form of a causal loop diagram (CLD). The CLD was created using Stella Architect Version 3.4 (Stella Architect, 2023). The final diagram was informed by the researcher and a literature review of scholarship published in the *Journal of Agricultural Education* since 2000. Obtaining research for the literature review was facilitated by searching the following keywords: agrarianism, stress, attrition, system, teaching attitude, work-life balance, and job satisfaction. The initial collection of 57 articles was refined to 16 articles based on an analysis of the article titles and review of the abstracts. Salient conclusions within each of the 16 articles were incorporated into the model development process, as highlighted within our presentation of the CLD.

The initial CLD, developed by the lead researcher and informed by the literature review, was evaluated for face and structural validity by two teacher educators and one inservice agriculture teacher (Burns & Musa, 2001). Modifications were made to enhance the final CLD, which is shared within the Findings (see Table 1 for symbols used within CLD).

Table 1

Symbol Used	Meaning
+	Direct relationship between two variables (e.g., as one increases, the other increases).
-	Inverse relationship between two variables (e.g., as one increases, the other decreases).
=	Delay in information between two variables.
→	Relationship between two variables.
R	Reinforcing feedback loop.
B	Balancing feedback loop.

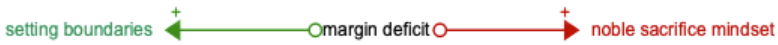
Findings and Discussion

The final CLD is presented incrementally to allow for focused explanation of each component. Given attrition is a key concern within the discipline (Lawver et al., 2018), our model begins

with a teacher lacking margin. Two options are presented to address the margin deficit (i.e., key to retention, Biney, 2021), establish boundaries or adopt a noble sacrifice mindset (see Figure 1).

Figure 1

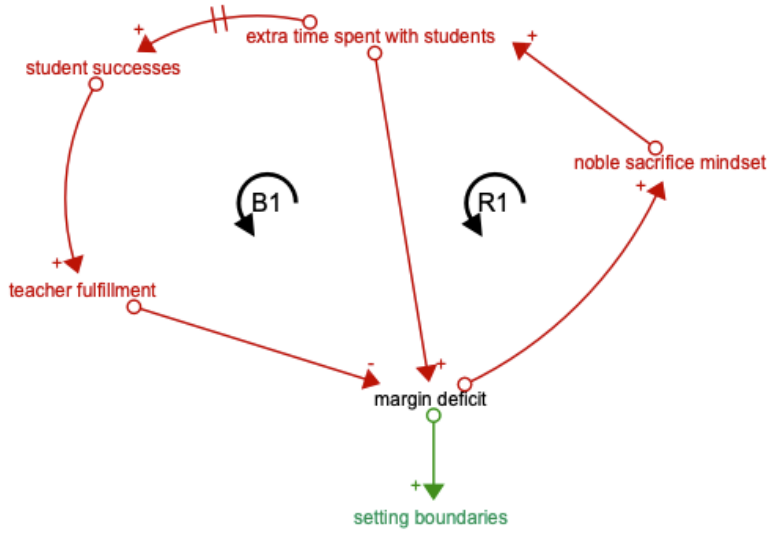
Core Decision Point



To address margin deficit, teachers may adopt the noble sacrifice mindset. Noble sacrifice is defined as a teacher intentionally sacrificing loads in other life domains (e.g., family and community responsibilities) to afford more power to accomplish a larger load associated with the agriculture teaching profession. The existence of this mindset connects to agrarianism and agrarian ideology, which exists among agriculture teachers (Martin et al., 2022; Martin & Enns, 2017; Martin & Kitchel, 2013); specifically, dependence on self and loyalty to tradition. The noble sacrifice mindset entails the teacher dedicating extra time to achieve a tradition-defined notion of program success (e.g., contest wins, extensive facilities). The feasibility of the noble sacrifice mindset is uncovered by observing the entire noble sacrifice pathway (see Figure 2).

Figure 2

Noble Sacrifice Pathway



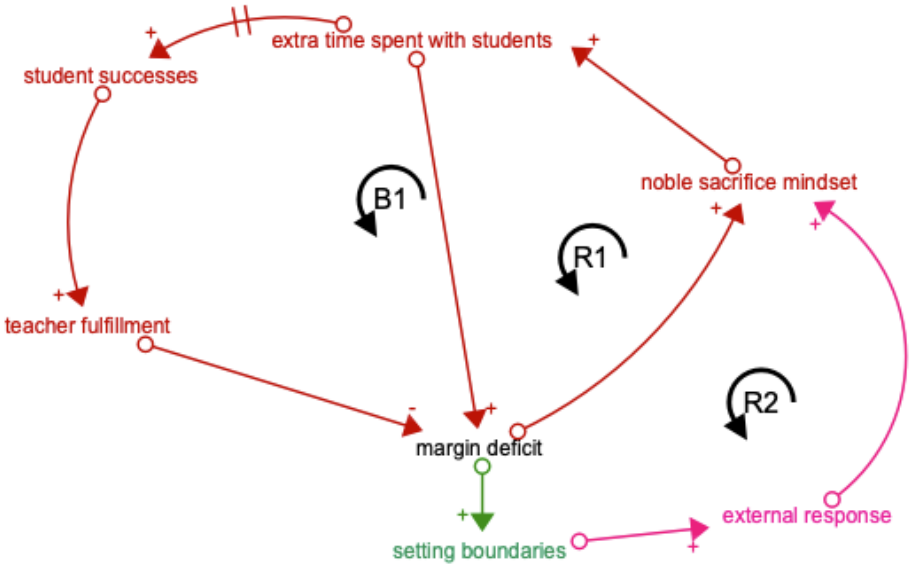
In the noble sacrifice pathway, teachers increase their load and, thus, increase their margin deficit by spending extra time on the program, creating our first reinforcing loop (R1). The relief, however, comes via the fulfillment obtained from seeing students succeed, delayed because program success takes time. This balancing loop (B1) yields margin because teacher fulfillment increases power. Our literature review revealed evidence of the noble sacrifice mindset; as an

example, Clark et al. (2014) identified teachers extending their work hours by sacrificing family obligations. Additionally, Torres et al. (2009) noted teachers continually place demands on themselves on top of demands emanating from students, parents, and administrators.

Importantly, however, the noble sacrifice mindset might be forced upon some teachers lacking the agency to establish boundaries due to external forces (Haddad et al., 2023), especially new and early career teachers (Disberger et al., 2023). This mandatory noble sacrifice mindset is represented in Figure 3.

Figure 3

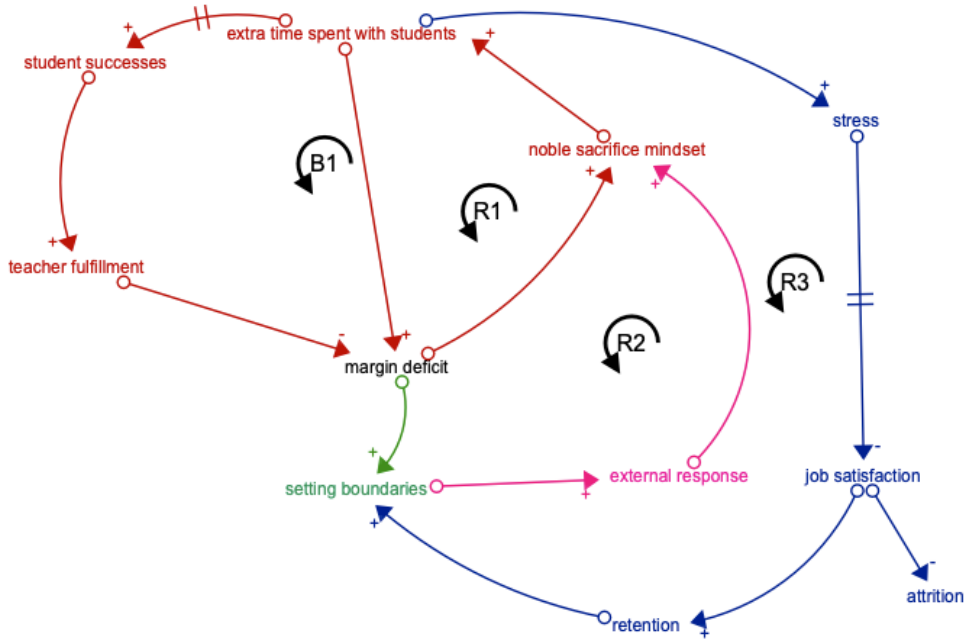
Mandatory Noble Sacrifice



Regardless of agency, noble sacrifice will inevitably increase teacher stress (see Figure 4). Torres et al., (2009) found working additional hours was one of the greatest stressors amongst agriculture teachers. Supporting the presence of the noble sacrifice mindset, numerous studies have found agriculture teachers are stressed (King et al., 2013; Lambert et al., 2012; Ritz et al., 2013). Further, stress has been associated with job dissatisfaction (Kitchel et al., 2012) and teacher attrition (Ryan et al., 2017).

Figure 4

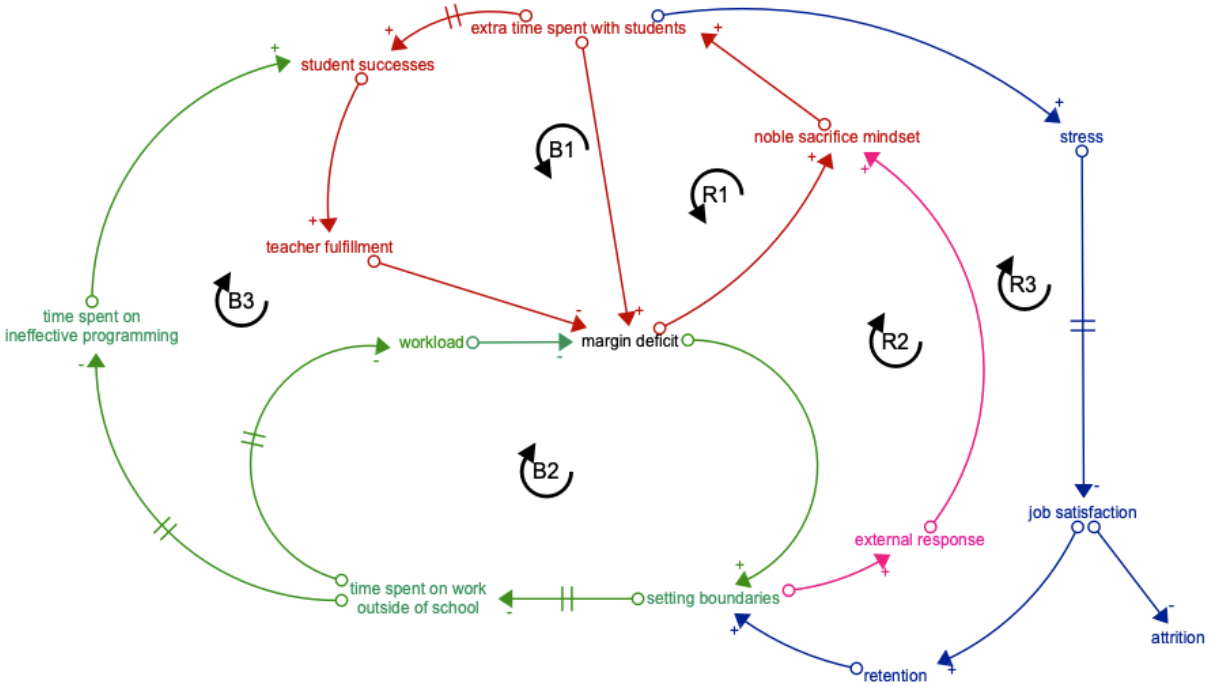
Noble Sacrifice and Stress



Within the noble sacrifice pathway, teachers may face a point when growing job dissatisfaction due to stress forces a decision to leave the profession or stay. For those who stay, their past experiences with job dissatisfaction may motivate them to establish boundaries. This creates another reinforcing loop (R3) where margin deficit can be addressed via boundaries, provided external forces in the system allow for boundaries. The full boundaries pathway is illustrated in Figure 5.

Figure 5

Setting Boundaries Pathway



For those teachers who (a) opt to set boundaries and (b) have the agency to do so, setting boundaries will yield less uncompensated time spent on work and reduced workload, each delayed by time (e.g., eliminating obligations that occur in the future). In total, this pathway creates another balancing loop (B2) which addresses the margin deficit. The additional offshoot within the boundaries pathway explores the impact of specializing on activities. Teachers establishing boundaries will likely focus their reduced time on fewer tasks (i.e., specialize), potentially making them more effective on those fewer tasks, leading to student success. This creates the final balancing loop (B3) which alleviates the margin deficit via increased power obtained through teacher fulfillment as a product of increased student success.

Conclusions and Recommendations

This research leveraged a new approach in agricultural education to better understand teacher attrition. Importantly, our approach has limitations to consider. First, the CLD established was evaluated by teachers and experts *post hoc* instead of initially created by a collection of experts via participatory research methodology, the recommended approach. Second, the representation is based on our current understanding and should be enhanced with additional scholarship on teacher attrition. Third, the CLD is a system-wide representation that does not account for individual, school, or community differences that also impact teacher attrition. Acknowledging these limitations, the resultant CLD provides a valuable tool to consider agriculture teacher attrition from a systems perspective.

Analysis of our CLD suggests it exemplifies a system archetype: shifting the burden or addiction (Kim, 2008; Meadows, 2008). This archetype is characterized by treating the symptoms of an issue instead of its root cause. In our research, margin deficit is the root cause of teacher attrition and relying on the noble sacrifice mindset is a way to partially alleviate margin deficit, but it is not the true solution, which is the freedom to set and maintain boundaries. Meadows (2008) presents two solutions to this system archetype, (a) avoid the system or (b) treat the root cause without addiction. In this system, the noble sacrifice mindset is the addiction. Thus, all actors within the system must work to prevent teachers, especially those early in their career, from depending on the noble sacrifice mindset and, instead, encourage and afford boundaries. This, however, requires counteracting deeply rooted ideologies within the discipline, like agrarianism and perceptions of success within the discipline.

Creation of the CLD yielded a variety of recommendations for research and practice. For research, scholarship is recommended on differences between early, mid, and late career teachers and their power, load, and margin to include these potential differences within the model. Additionally, future work within the discipline using system dynamics and causal loop diagramming is recommended to illuminate root causes of challenges, important feedback loops, and critical leverage points throughout the discipline. Shifting to recommendations for practice, we encourage discipline-wide conversations about established norms which (a) disallow educators from establishing boundaries and (b) require the adoption of the noble sacrifice mindset. Importantly, shifting ideologies within a discipline is a time-intensive, challenging process, but it must begin with conversations that foreground the voices of teachers. Our recommendation, however, is not to completely remove the noble sacrifice mindset from the profession. Noble sacrifice mindset amongst some teachers has, likely, contributed to many positive learning experiences for students. For those adopting the noble sacrifice mindset, however, we recommend initially investing your time on fewer experiences to increase the likelihood of seeing student success as a product of your sacrifice, leveraging the balancing loop (B1) that leads to increased margin and, hopefully, retention.

References

Biney, I. K. (2021). McClusky's Theory of Margin and its implications on adult learners in higher education institutions. *Journal of Adult and Continuing Education, 28*(1), 98–118. https://doi.org/10.1177/1477971421989337

Burns, J. R., & Musa, P. (2001). Structural validation of causal loop diagrams. In *Atlanta SD Conference*.

Clark, M. S., Kelsey, K. D., & Brown, N. R. (2014). The thornless rose: A phenomenological look at decisions career teachers make to remain in the profession. *Journal of Agricultural Education, 55*(3), 43–56. https://doi.org/10.5032/jae.2014.03043

Disberger, B., Washburn, S., Hock, G., & Ulmer, J. (2023). A qualitative analysis of agriculture teacher's attitudinal changes toward the teaching profession in the first three years of teaching. *Journal of Agricultural Education, 64*(1), 61–81. https://doi.org/10.5032/jae.v64i1.30

Duffy, F. M. (2008). Open systems theory and system dynamics: The twin pillars of transformational change in school districts. In *System thinkers in action: a field guide for effective change leadership in education* (pp. 1–23). Rowman & Littlefield Education.

Forrester, J. (1968). *Principles of systems*. Pegasus Communications.

Haddad, B., Traini, H., & McKim, A. (2023). We've crossed a line: A philosophical examination of systemic implications surrounding SBAE teachers' attempts at boundary setting. *Journal of Agricultural Education, 64*(1), 82–95. https://doi.org/10.5032/jae.v64i1.31

Hiemstra, R. (1993). Three underdeveloped models for adult learning. In S. B. Merriam (Ed.), *An Update on Adult Learning Theory* (Vol. 57, pp. 37–46). Jossey-Bass Publishers.

Kelsey, K. D. (2006). Teacher attrition among women in secondary agricultural education. *Journal of Agricultural Education, 47*(3), 117–129. https://doi.org/10.5032/jae.2006.03117

Kim, D. H. (2008). *Systems archetypes I: Diagnosing systemic issues and designing high-leverage interventions*. Pegasus Communications.

King, D., Rucker, K. J., & Duncan, D. (2013). Classroom instruction and FFA/SAE responsibilities creating the most stress for female teachers in the southeast. *Journal of Agricultural Education, 54*(4), 195–205. https://doi.org/10.5032/jae.2013.04195

Kitchel, T., Smith, A., Henry, A., Robinson, S., Lawver, R., Park, T., & Schell, A. (2012). Teacher job satisfaction and burnout viewed through social comparisons. *Journal of Agricultural Education, 53*(1), 31–44. https://doi.org/10.5032/jae.2012.01031

Lambert, M., Torres, R., & Tummons, J. (2012). The influence of time management practices on job stress level among beginning secondary agriculture teachers. *Journal of Agricultural Education, 53*(1), 45–56. https://doi.org/10.5032/jae.2012.01045

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

Martin, M. J., & Enns, K. (2017). The conflicts of agriculture: Exploring the agricultural ideologies of university agricultural education students. *Journal of Agricultural Education, 58*(1), 207–222. https://doi.org/10.5032/jae.2017.01207

Martin, M. J., Enns, K., & Hartmann, K. (2022). Agrarianism in agricultural education: A narrative study. *Journal of Agricultural Education, 63*(3), 135–148. https://doi.org/10.5032/jae.2022.03135

Martin, M. J., & Kitchel, T. (2013). Agrarianism: An ideology of the National FFA Organization. *Journal of Agricultural Education, 54*(3), 28–40. https://doi.org/10.5032/jae.2013.03028

McClusky, H. Y. (1963). The course of the adult life span. In W. C. Hallenback (Ed.), *Psychology of Adults* (pp. 10–20). Adult Education Association of the U.S.A.

Meadows, D. H. (2008). *Thinking in systems: A primer*. Chelsea Green Publishing.

Merriam, S. B., Caffarella, R. S., & Baumgartner, L. M. (2006). *Learning in adulthood: A comprehensive guide*. John Wiley & Sons, Incorporated. http://ebookcentral.proquest.com/lib/michstate-ebooks/detail.action?docID=792611

Pauley, C., McKim, A., & Hodbod, J. (2019). A social-ecological resilience perspective for the social sciences of agriculture, food, and natural resources. *Journal of Agricultural Education, 60*(4). https://doi.org/10.5032/jae.2019.04132

Ritz, R., Burris, S., & Brashears, T. (2013). The effects of a time management professional development seminar on stress and job satisfaction of beginning agriscience teachers in west Texas. *Journal of Agricultural Education, 54*(3), 1–14. https://doi.org/10.5032/jae.2013.03001

Ryan, S. V., von der Embse, N. P., Pendergast, L. L., Saeki, E., Segool, N., & Schwing, S. (2017). Leaving the teaching profession: The role of teacher stress and educational accountability policies on turnover intent. *Teaching and Teacher Education, 66*, 1–11. https://doi.org/10.1016/j.tate.2017.03.016

Solomonson, J., Korte, D., Thieman, E., Rettalick, M., & Keating, K. (2018). Factors contributing to Illinois school-based agriculture teachers' final decision to leave. *Journal of Agricultural Education, 59*(2), 321–342. https://doi.org/10.5032/jae.2018.02321

Sutcher, L., Darling-Hammond, L., & Carver-Thomas, D. (2016, September 16). *A coming crisis in teaching? Teacher supply, demand, and shortages in the U.S.* Learning Policy Institute. https://doi.org/10.54300/247.242

The National FFA Organization. (2022). *FFA statistics*. https://www.ffa.org/statistics/

Torres, R., Lawver, R., & Lambert, M. (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

Barriers Impeding the Ability of Agriculture Teachers to Achieve Positive Work-Life Integration During the School Year

Jay K. Solomonson, Illinois State University
Lucas D. Maxwell, Illinois State University
Michael J. Barrowclough, Illinois State University

Introduction / Theoretical Framework

The shortage of qualified teachers is not unique to School-Based Agricultural Education (SBAE) as it cuts across all disciplines in the nation (Hopkins et al., 2020). The SBAE teacher shortage is not only linked to a low number of graduates from teacher education programs (Foster et al., 2020), but also from the high turnover rate in the profession (Eck & Edwards, 2019). One specific reason SBAE teachers have chosen to leave the profession is their inability to find a balance between their professional and personal lives (Sorensen et al., 2016a). Given the long-standing national shortage of SBAE teachers, over the last decade a great deal of attention has been paid to the teacher attrition problem and 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., 2016a; Sorensen et al., 2016b; Traini et al., 2019; Traini et al., 2020).

More than a decade ago, it was noted SBAE teachers were working far more hours than they were being compensated for (Murray et al., 2011). Further confirming this assertion, a national study of SBAE teachers found that on average, teachers were working 55 hours per week and the stress from this workload interfered with family lives (Sorensen et al., 2016a; Sorensen et al., 2016b). This spillover has been shown to lead to teachers feeling guilty about spending time on activities not related to their work responsibilities (Traini et al., 2019). Teachers conceptualize their efforts at work as a *success trap* often leaving them feeling pressure to work even harder "to continue to 'meet expectation' and 'build on their success'" (Traini et al., 2020, p. 181). Further illustrating the relationship between work and home life, SBAE teachers' spouses have noted their dislike of the hours of work and amount of work brought home (Hopkins et al., 2020).

Specifically in the state of Illinois, a shortage of SBAE teachers has been an issue for decades. Recently, the Illinois Agriculture Education Annual Report (2022) indicated there were only 33 graduates from university agricultural education programs while 139 open SBAE teaching positions existed. Given this documented disparity, it is crucial current SBAE be retained in their positions. Unfortunately, data suggested Illinois SBAE teachers struggle with finding a work-life balance (Solomonson et al., 2022). Understanding factors that influence SBAE teachers perceived ability to integrate their personal and professional lives is an important component to address the states teacher shortage.

Our study was framed around the concept of spillover, a hypothesis that helps to describe the relationship between one's work and non-work life. Wilensky (1960) explained the impact of the cognitive strain and stress associated with work impacting non-work or leisure time with his "spillover leisure hypothesis" (p. 544). While he addressed the topic from the viewpoint of the spillover of work into the home, Voydanoff (1980) suggested the relationship was more complex

and noted issues impacting individuals at home can also influence their performance and satisfaction at work. Additionally, Crouter (1984) posited spillover between work and life could be further explained by categorizing them into both cognitive and behavioral impacts. Our study's purpose and objectives were framed with these concepts in mind.

Purpose & Objectives

The purpose of our study was to examine potential barriers impeding a SBAE teachers' 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 during the school year.
(2) Determine if differences existed in hours spent on specific SBAE work activities among various demographic groups.
(3) Identify specific work responsibilities and personality traits that may hinder a SBAE teachers' ability to achieve positive work-life integration.
(4) Determine if differences exist in the work-life integration barriers among various demographic groups.

It should be noted this project was part of a larger study examining work-life integration of SBAE teachers in Illinois.

Methodology

After we received IRB approval, we distributed an electronic questionnaire to all 519 full-time SBAE 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 integrate 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 in the fall of 2022. This approach yielded 165 usable responses and a 31.79% response rate. Data were analyzed using SPSS© version 26.0. Descriptive and inferential statistics including medians, modes, means, standard deviations, independent-level t-tests, and ANOVAs were used to analyze data.

Findings

Objective one sought to describe the hours SBAE 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 SBAE 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 those with 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 sought to identify specific work responsibilities and personality traits that may hinder a SBAE teachers' ability to achieve positive work-life integration. These data can be found below (see Table 2).

Table 2

Perceived Barriers Hindering SBAE Teachers from Achieving Positive Work-Life Integration (n = 165)

Variable	*Mdn*	*Md*	*M*	*SD*
Work Responsibilities				
Weekend FFA Activities	7	10	6.27	2.89
Night FFA Activities	6	7	6.01	2.51
Excessive Paperwork	6	7	5.75	2.61
Taking Work Home	5	5	5.38	2.76
Operating/Maintaining Ag Ed Facilities	5	3	4.89	2.46
Inability to Leave During the School Day	5	1	4.73	3.14
Personality Traits				
Fatigue from the Heavy Workload	7	10	6.67	2.67
My Inability to Say No	7	6	6.38	2.60
My Need to be a Perfectionist	6	7	5.61	2.82

Loving the Job too Much	5	5	5.35	2.81
Having to React to Everything Immediately	6	6	5.34	2.73
Lack of Work-Life Boundaries	5	2	5.16	2.82

Note. Ten-point Likert-type scale with 1 = Not a Barrier and 10 = Significant Barrier. *Mdn* = Median; *Md* = Mode; *M* = Mean; *SD* = Standard deviation.

Objective four was used to determine if differences exist in the barriers among various demographic groups, specifically sex, marital status, raising children, type of licensure, and professional career stage. When examining specific work responsibilities, we discovered two significant differences. Unmarried teachers reported significantly higher mean scores in taking work home compared to married teachers, $t(163) = 2.99$, $p = .00$. We also discovered mid-career teachers had more issues with weekend FFA activities as a barrier than both novice and late-career teachers, $F(163) = 4.98$, $p = .00$.

When examining personality traits, we found several significant differences in each of the five demographic groups. Females reported higher mean scores in their need to be a perfectionist ($t(163) = 4.28$, $p = .00$), inability to say no ($t(163) = 2.18$, $p = .03$), and loving their job too much ($t(163) = 1.98$, $p = .05$) compared to their male counterparts. Unmarried teachers revealed their need to be a perfectionist ($t(163) = 2.44$, $p = .01$) and loving their job too much ($t(163) = 2.05$, $p = .04$) as significantly higher than those currently married. SBAE teachers with no children indicated their need to be a perfectionist ($t(163) = 2.25$, $p = .02$), having to react to everything immediately ($t(163) = 3.67$, $p = .00$), and loving their job too much ($t(163) = 2.04$, $p = .04$), as higher barriers than those with children. Interestingly, teachers with an alternative licensure showed significantly higher mean scores than traditionally certified teachers in their inability to say no ($t(163) = 2.56$, $p = .01$) and loving their job too much ($t(163) = 2.05$, $p = .04$). Finally, a novice teachers need to be a perfectionist was significantly higher both mid-career and late-career teachers, $F(163) = 4.81$, $p = .00$.

Conclusions, Implications, & Recommendations

Illinois SBAE teachers, regardless of sex, are devoting excessive 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. It is recommended further research examine the nature of the FFA activities requiring so much time beyond the regular contract. Research should also look at ways to aid teachers in planning and preparation for classroom/laboratory instruction.

Illinois SBAE teachers also feel activities that happen outside of contracted school hours on nights and weekends, particularly those associated with FFA, inhibit their perceived ability to achieve positive work-life integration. It should stand out that regarding weekend FFA

activities, the modal response was 10. Traini et al. (2019) reported early career SBAE teachers struggle with notions of being a successful agriculture teacher and achieving a work-life balance. Specifically, teachers noted the pressure to have high FFA participation and award-winning members. Given the shortage of teachers and high attrition rates, the conclusion that teachers are fatigued from the heavy workload and expectations of being a successful SBAE teacher should be alarming.

The significant difference between mid-career teachers and both novice and late-career teachers also seem to suggest there may be factors outside the scope of this study impacting the amount of time these teachers feel they can spend outside of contractual hours working with FFA activities. Given that teachers at this point in their careers may well have children of their own participating in extracurricular activities, further study should examine ways to support teachers during this point in their career. We also conclude that both novice teachers and females feel additional pressure to be perfect in their role as a SBAE teacher. While several other differences were noted, further study should seek to determine why these groups seem to feel additional pressure that inhibits their ability to achieve positive work-life integration.

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

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.

Eck, C. J., & 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

Foster, D. D., Lawver, R. G., & Smith, A. R. (2020). National agricultural education supply and demand study, 2019 executive summary. https://aaaeonline.org/Resources/Documents/NSD2019 Summary.pdf

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

Illinois Ag Ed Annual Report. (2022). *2022 Illinois Agricultural Education Report*. https://www.ilaged.org/docs/Agricultural%20Education%20Annual%20Report%20(2022)_52058.pdf

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

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. (2016a). A national study of work-family balance and job satisfaction among agriculture teachers. *Journal of Agricultural Education*, *57*(4), 146-159. https://doi.org/10.5032/jae.2016.04146

Sorensen, T. J., McKim, A. J., & Velez, J. J. (2016b). 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. https://doi.org/10.1111/j.1471-6402.1980.tb00954.x

Wilensky, H. L. (1960). Work, careers, and social integration. *International Social Science Journal*, *12*, 543–560.