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NCLCT in Coordination with
Purdue University & Langston University

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Review Process for the NCLCT

This was the 6th National Conference on Learner-Centered and the 3rd year the NCLCT was co-hosted in collaboration with the North Central Region of the American Association for Agricultural Education. On behalf of the NCLCT and NC-AAAE Conference Planning Team, we offer sincere gratitude to the 8 colleagues who served as reviewers and evaluated this year's LCT submissions. A total of 15 LCT abstracts were submitted. Based on quality rankings and time allotted in the conference schedule, 11 abstracts were selected for presentations and two abstracts were accepted as posters at the 2021 North Central AAAE Conference. With a focus on building collaborative partnerships among 1890 and 1862 Land-Grant Universities, almost of the LCT presentations were authored or co-authored by faculty from 1890 Historically Black Colleges and Universities. We extend our sincere appreciation for Dr. Orlenthea McGowan and her colleagues at Langston University for providing leadership and support through the 1890 Capacity Building Grant (NIFA 2016-06658), "Building Future Faculty and Leaders through Culturally Responsive Learner-Centered Teaching Partnerships."

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Concurrent LCT Presentations Session 1

- An Interrogative Approach to Creating a Culture of Mentoring
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- Navigating Practica and Pre-Professional Experiences During COVID-19
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  - Sarah E. LaRose

- Learner Centered Strategies & Veterinary Surgery Using Small Group Teaching in College Undergraduates
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- Applying Learner Centered Approach in an Inquiry-Based Homemade Hydroponics Program with Master-Gardener Educators
  - Jean Paul Iyakaremye & Hui Hui Wang

An Interrogative Approach to Creating a Culture of Mentoring

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An Interrogative Approach to Creating a Culture of Mentoring

Introduction

Project Summary: The goal of this project is to increase underrepresented students' success in Food, Agricultural, Nature and Human Sciences by facilitating integrative and holistic mentoring activities that foster a culture of mentoring through peer-to-peer, formal, and informal mentor relationships.

Need for Research

It is evident that for the university to successfully transition students in and out, there has to be systems in place that allow students to thrive in an environment that they feel is supportive (Arroyo & Gasman, 2014). Student support services, such as mentoring programs, can be effective at enhancing the quality of students' learning experience, increasing graduate rates, and supporting students' identity development. Few collegiate experiences are more critical than having a consequential mentor relationship. Mentors can help students with goal setting and networking, offer post-graduate guidance, and be a listening ear.

Mentors especially play a significant role in the lives of students who are underrepresented in STEM (Rattan, Savani, Chugh, & Dweck, 2015). Women and students of color can sometime feel like they do not belong in STEM majors and careers. Whether it is because of the racist and sexist rhetoric circulating in those spaces or the students or instructors in the classrooms do not look like them, successfully navigating STEM for these students can be the difference between having or not having a mentor (Hurd, Sánchez, Zimmerman, & Caldwell, 2012).

Connection to Literature

Historically Black Colleges and Universities (HBCUs) are uniquely positioned to educate and graduate Black students. Compared to Black students at Predominantly White Institutions (PWIs), those who attend HBCUs have reported higher levels of engagement, support, and success (Palmer & Young, 2010). While HBCUs have made significant impact on Black college student success, many have substantial shortcomings. Black students, nationally, graduate at a lower rate than their counterparts (Strayhorn & Terrell, 2010). Tennessee State University (TSU) serves a population – students who are from economically disadvantaged backgrounds, first-generation, and members of underrepresented racial groups – who tend to face a litany of challenges when they transition from high school to college. TSU has a 58 percent first to second year retention rate, 10 points lower than the state and national average. While the four-year graduation rate is slightly below the national average at 29.5 percent, the overall six-year graduation rate is about 33 percent which is almost half the rate of public institutions in the country. Additionally, less than 50 percent of students graduate within eight years. These are staggering statistics that require holistic interventions that supplement the current efforts to increase the retention and graduation rates.

Implementation of Strategy

To ensure the success of the peer mentoring program, the project leads will explore recruiting at the end of each semester to ensure new students who begin their programs in the spring semesters are assigned a peer mentor. Workshops and trainings will be offered during the fall and spring semesters in years one and two. When it is safe for students to return to campus,

mentors and mentees will be invited to participate in team building and social events throughout the school year. The repository and PM/NM workshops will be ongoing activities.

The evaluation of the project will consist of quantitative and qualitative methods to assess the three objectives. The Project Team will be responsible for creating the proper protocols and instruments to measure the activities and outcomes. The summative assessment of the activities in year one will be used as a formative assessment for the second year, as the findings will influence the facilitation of the peer-to-peer program in year two.

The final report will be shared with faculty, and college and university leadership. At the college level, the project will utilize the Director of Communications to capture and share snapshots of success through social media, college website page, and newsletter. At the university level, information about the repository and workshops for faculty and staff will be advertised through the Office of Communications.

Results to Date/ Impact

Overall, the implementation plan for the program has gone well. All first-year students in the College Agriculture that were able to be contacted were matched with a peer mentor. Initially it was difficult to disseminate which undergraduate students were actively enrolled in classes in the college, as the list of students from the registrar's office did not update after the last day to register for classes for each semester. The jitters and anxiety that come with incoming freshman did not aid the connection of program mentors and staff with making a virtual first impression.

Recruitment for mentors and mentees in both the graduate and undergraduate programs went well. For the undergraduate program, there were 19 first year mentees and 68 mentors, while the graduate program had 20 graduate students and 53 mentees. Throughout both the Fall and Spring semester monthly trainings were held for undergraduate mentees to receive tips and best practices to enhance the mentee relationships and handle the responsibility of mentoring. During these trainings, the mentors were also given the opportunity to provide feedback about the program thus far. There was a general sense of gratification for the program and how they wished a similar program were in place for their freshman year. Many mentors addressed concern of not hearing back from mentees during the first year, as the response rate and overall communication was lower than anticipated. The last meeting of each semester hosted both mentors and mentees in an effort to have open discussion about the program. These meetings produced the highest participation, and the overall feeling was enthusiastic about the relationships built and the future of the program.

Future Plans

The program facilitators will analyze the data from the first year and incorporate key information going into the implementation of the program's second year. For the second year the staff plans to partner with the facilitators of the incoming freshman orientation to begin recruitment of the program. Starting a new mentoring program during the COVID 19 pandemic came with its own unique barriers and challenges but having a thorough plan helped mitigate the effects of the challenges. Plan to work closely with other campus organizations early, even possibly introducing the program during freshman orientation.

References

Arroyo, A. T., & Gasman, M. (2014). An HBCU-based educational approach for Black college student success: Toward a framework with implications for all institutions. *American Journal of Education,* 121(1), 57-85.

Dawson, P. (2014). Beyond a definition: Toward a framework for designing and specifying mentoring models. *Educational Researcher*, 43(3), 137-145.

Hagler, M. (2018). Processes of natural mentoring that promote underrepresented students' educational attainment: A theoretical model. *American journal of community psychology*, 62(1-2), 150-162.

Hurd, N. M., Sánchez, B., Zimmerman, M. A., & Caldwell, C. H. (2012). Natural mentors, racial identity, and educational attainment among African American adolescents: Exploring pathways to success. *Child development*, 83(4), 1196-1212.

Leidenfrost, B., Strassnig, B., Schütz, M., Carbon, C. C., & Schabmann, A. (2014). The impact of peer mentoring on mentee academic performance: Is any mentoring style better than no mentoring at all. *International Journal of Teaching and Learning in Higher Education*, 26(1), 102-111.

Palmer, R. T., & Young, E. (2010). The uniqueness of an HBCU environment: How a supportive campus climate promotes student success. *The evolving challenges facing Black college students: New insights for practice and research*, 138-161.

Seifert, T. A., Drummond, J., & Pascarella, E. T. (2006). African-American students' experiences of good practices: A comparison of institutional type. *Journal of College Student Development,* 47(2), 185-205.

Strayhorn, T. L., & Terrell, M. C. (2010). The Evolving Challenges of Black College Students: *New Insights for Policy, Practice, and Research*. Stylus Publishing, LLC.

Rattan, A., Savani, K., Chugh, D., & Dweck, C. S. (2015). Leveraging mindsets to promote academic achievement: Policy recommendations. *Perspectives on Psychological Science*, 10(6), 721-726.

Rhodes, J. E. (2005). A model of youth mentoring. In D. L. Dubois & M. J. Karcher (Eds.), *Handbook of Youth Mentoring* (pp. 30–43). Thousand Oaks, CA: Sage.

Zimmerman, M. A., Bingenheimer, J. B., & Behrendt, D. E. (2005). Natural mentoring relationships. In D. L. DuBois & M. J. Karcher (Eds.), *Handbook of youth mentoring* (pp. 143–157). Thousand Oaks, CA: Sage.

Culturally Responsive Mentorship for Colleges of Agriculture and Environmental Sciences

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Culturally Responsive Mentorship for Colleges of Agriculture and Environmental Sciences

Introduction & Need for Strategy

In the field of agriculture and natural resources, those in STEAM (STEM + Agriculture) careers have attributed its lack of success in diversifying its workforce on the "leaky pipeline", particularly for underrepresented minorities (Estrada, Hernandez, & Schultz, 2018). However, diverse college faculty can bring important perspectives to students as they advance equity in our society (Zambrana et al., 2015). In colleges of agriculture, BIPOC, Latinx, LGBTQ+, and women continue to find themselves in a system that lacks the structural changes needed to create the space for and support their success. Therefore, culturally responsive mentoring may be a means for retaining students from the aforementioned groups in academia to diversify faculty. For this project, we include BIPOC, Latinx, LGBTQ+, and women in our definition of underrepresented minorities (URMs) in order to reach students who have historically been marginalized in colleges of agriculture and life sciences. Preparing faculty mentors to support their URM doctoral students is crucial. Improving the preparation of URM PhD students can significantly help them acquire competitive faculty positions, be better prepared to navigate the tenure and promotion process, and to thrive in academia as URMs.

Connection to Literature

Mentorship has been shown to greatly increase the capacity for success (Montgomery & Page, 2018). Professional and personal growth through mentoring can have significant impact on the self-efficacy and belief in oneself that can ultimately lead to individual and career advancement (Montgomery & Page, 2018). However, many current approaches to preparing faculty to mentor are more observational than intentional and rely on the mentee to intrinsically learn mentoring skills from their own experience being mentored (Montgomery, Dodson & Johnson, 2014). Currently, [College of Agriculture] does not have a faculty mentor preparation program. Further, the college lacks diversity in its faculty with recent data reflecting 0.6% Black women, 2.4% Black men, 2.7% Latinx women, 3.9% Latinx men, and 34.9% women overall (LGBTQ+ data is not collected). Therefore, it is most likely the PhD student will have a cross-cultural mentoring relationship during their doctoral career, and it is imperative that the faculty mentor is better prepared to serve in that role. Culturally relevant mentoring requires the faculty mentor to "maintain a dual perspective, seeing the mentee as an individual, as well as part of a larger social context" (Crutcher, 2014). To do this, the mentor must be aware of the problems facing URMs at the academy and their respective fields and actively engage in mentorship to support the mentee in this reality (Montgomery & Page, 2018). This program aims to fill the gap in faculty mentor preparation while meeting the needs of and preparing future URM faculty.

How It Works & Implementation of Strategy

We implemented a cohort approach to mentorship by pairing faculty wishing to be better mentors for URMs in [the College] and 1 doctoral URM student seeking to become faculty. We developed programming that includes topics that are of interest to the faculty and the URMs individually as well as co-curricular trainings that support learning and growth between the two groups. The program has a total of 8 sessions: 4 with the mentors and URM PhD student cohorts individually and 4 as a group. Before we developed the program (outlined below), we solicited responses about graduate students' mentoring experiences via survey. Respondents represented both masters and doctoral graduate students from any demographic group to learn more about the general mentorship culture of [the College]. The data aided in the development of sessions topics related to intercultural mentoring during their program.

Results to Date

Overall, results from the survey indicated the majority of respondents strongly agreed/agreed that they felt supported by their faculty advisors: 87% felt academically supported and 68% felt emotionally supported. Sixty three percent strongly agreed/agreed that their faculty advisor understands cultural differences that may impact their professional development. Likewise, 75% of respondents strongly agreed/agreed that their faculty advisor recognizes gender differences and dynamics that may impact their professional development. The open-ended responses gave more insight into the different dynamics that occur in the mentoring relationships. Several students mentioned struggling how to communicate with their advisors: "*Although my advisor never does anything that makes me feel alienated, I struggle with social anxiety and asking for help. I struggle to communicate this to my advisor, and so they are often unaware that social tasks that are very easy for them are extremely difficult and uncomfortable for me*." Another respondent said "*If I do not keep up with communication with my advisor my relationship with them can suffer greatly. I can sometimes get in my own head and develop a bit of imposter syndrome. When this happens, I tend to isolate myself from my advisor*." Other students mentioned they felt a lack of guidance: "*I feel like I was kinda left to figure out everything by myself; and looking back as a new graduate student, not having guidance was hard and let to many false interpretations of what my performance should or shouldn't be*"; and "*We had very few conversations about what I would do after I graduated, the expectation seemed to be that I would figure it out on my own*".

Respondents also have examples of great mentorship. Many were as a result of their interpersonal relationship: "*I'm usually surprised when I ask a question for guidance how she responds deeper than I anticipate and more compassionately than expected. She not only answers the question academically but takes into consideration my personal situation and offers best advice overall*." Another respondent said "*I was really struggling to keep up with self-motivation and self-advocacy during fall 2020, mostly due to situations caused by the pandemic. My advisor could see how I was struggling and really helped me to navigate and find out about different university resources that are available to help grad students with these kinds of issues. I am doing much better now and feel extremely supported by my advisor*."

These results indicated a need for programming that addressed how to communicate across differences, develop a healthy mentor/mentee relationship, and how to empower advocacy. The resulting program hosts sessions on the following topics: understanding how implicit bias and values affect mentoring relationships; cultural competence and professional identity formation; challenges for URMs in academia; soliciting and receiving mentoring feedback; and how to protect oneself through university policies and grievance mechanisms. The aforementioned core concepts are integrated throughout each and every session. Facilitated by the team and an external collaborator, each session stresses a judgement free environment to further develop their culturally responsive mentorship. Faculty mentors have also been paired with their mentee and are scheduling informal meetings to discuss program and career-related topics.

Future Plans

At the time of writing the abstract, the team has conducted 3 of 8 sessions. We plan to have the remainder once per month in the fall semester. We have created feedback surveys that are administered after the sessions in order to adjust the focus and delivery of subsequent sessions. We will be developing online modules to be hosted on [the College's] website for others to learn about the importance of culturally responsive mentorship and provide a basic understanding of the topic.

References

Crutcher, B.N. (2014). Cross-cultural mentoring: A pathway to making excellence inclusive. *Liberal Education, 100*(2): https://www.aacu.org/liberaleducation/2014/spring/crutcher

Estrada, M., Hernandez, P. R., & Schultz, P. W. (2018). A longitudinal study of how quality mentorship and research experience integrate underrepresented minorities into stem careers. *CBE Life Sci Educ, 17*(1): ar9. doi: 10.1187/cbe.17-04-0066

Montgomery, B. L., Dodson, J. E., & Johnson, S. M. (2014). Guiding the way: Mentoring graduate students and junior faculty for sustainable academic careers. *SAGE Open*, *4*(4), 11p. https://doi-org.proxy.lib.ohio-state.edu/10.1177/2158244014558043

Montgomery, B. L. & Page, S. C. (2018). Mentoring beyond hierarchies: Multi-mentor systems and models. *Commissioned Paper for National Academies of Sciences, Engineering, and Medicine Committee on Effective Mentoring in STEMM*.

Zambrana, R. E., Ray, R., Espino, M. M., Castro, C., Cohen, B. E. & Eliason, J. (2015). *American Educational Research Journal, 52*(1), 40–72. doi: 10.3102/0002831214563063

Crisis Intervention & Resilience: The use of Learner Centered Teaching

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Crisis Intervention & Resilience: The use of Learner Centered Teaching

Introduction

Life history studies of epidemiological study found that 69% of a representative sample of 1,000 Americans. have had experienced at least one extremely traumatic event during their lifetime (Kanel, 2017).
In addition to some dangers, crisis also presents opportunities for personal growth if during the crises one receive immediate help and practical support. Resilience is the term for the ability to "Bounce Back" after significant adversity and risk. COVID-19 posed a crisis for many of us, in which if we are here to tell our story of survival during this pandemic, we have surely persevered through some of the most trying times of our lives. Ultimately, we have learned to be resilient and to thrive despite the crisis of over 500,000 people dying from this deadly virus. As educators, we are typically expected to maintain will power and offer reasonable accommodations to our students despite the crisis that we are facing as an institution or individually. In the same breath during any given semester, undoubtably a student may experience an event or life circumstances that may categorizes them as a victim of a crisis. You want to help a victim not only to survive the crisis experience, but to go on to being resilient, and thrive in life despite the setback.

Presentation Elements

This presentation shall offer a guide to CRISIS INTERVENTION, while using an LCT model to teach resiliency. In addition, presenters will uncover the fundamentals of surviving situational and developmental crises, how they occur and how you can manage them. Various traditional counseling models as they relate to crisis intervention, will illustrate how models of crisis intervention can be incorporated into the classroom, which can be used within an LCT setting with any student that may be experiencing a crisis. Various examples of resiliency will illuminate the psychological and behavioral dynamics associated with a crisis. Case scenarios may help one to learn what to say to students, whether the crisis is developmental; related to trauma, post-traumatic stress disorder (PTSD), substance abuse or other factors. Attendees shall also learn how to define the causes of stress, and student-centered coping strategies can be used to combat various stressors.

Introduction to Learner-Centered Teaching Strategies

This presentation is designed to offer some insight on ways to use LCT to help student's overcome adversity that they may face throughout their quest to conquer their academic endeavors. This presentation will introduce an understanding of a few theories and concepts of crisis intervention, proper approaches to safely and effectively resolve a crisis using LCT. We will help attendees to better understand the holistic concept of stress and how it may impact your daily lives. We will shed light on a few clinical tools to help educators work with a victim and/or perpetrator, as effective communication and/or calming techniques can be used to aid in successful resolutions surrounding a crisis as they happen and may offer long-term solutions.

Incorporating Learner Centered Teaching as a Strategy to Resiliency

There is a recognition that educators like mental health professionals must be prepared to be Resilient and to guide responsibly for those we serve, for the benefit of increased understanding between student/teacher and/or client/therapist, and to increase sensitivity to those diverse differences among them. In fact, it has been argued that educator's and counselors have a moral obligation to be curious about the differences present in their respected settings. All communications are often inherently and unavoidably a multicultural experience. Therefore, LCT is the best approach to allowing students to guide the teacher of their path and experiences of surviving their crisis and resiliency.

The development of multicultural teaching and counseling began with attention to diverse services provided by the teacher or counselor from predominantly majority cultural power groups to many oppressed ethnic minority clients. Many students first experiences of surviving a crisis may very well come from the way their culture or family handles those types of stressors. Therefore, multicultural competencies should be considered a user friendly LCT strategy to rapport building with students.

Assessment Strategies for Learner-Centered Teaching

Various LCT instructional assessment methods will be utilized to accomplish course objectives, which includes, but not limited to presentation, discussion, clinical feedback, and participant role-play. The purpose of this presentation is to assess a person's resiliency to life's challenges. We will review the positive and negative prospects of a person's ability to adapt to adversity. It is our intension to discuss factors which can help or hinder the recovery from adverse experiences. We also hope to shed light on the benefits of using a crisis intervention, which will often enhance one's ability to cope and recover from adversity.

Presentation Strategies and Expected Outcomes

The presentation is designed to introduce current Crisis Intervention theories, Resiliency, and a practical LCT model. It is designed to offer insight for faculty and other educators, to recognize if a student is having a mental health crisis and garner the skills to assist participants in obtaining general knowledge of crisis intervention training that can be applied to students that may be dealing with various forms of crisis and the sociocultural considerations that often comes along with varying crisis. Objectives: (1) Identify resiliency, (2) Review a few factors which hinder Resiliency, (3) Review factors that positively assist in Resilience, (4) Identify those who demonstrate Resilient responses, and (5) Identify Crisis Interventions which will help to promote positive outcomes to negative life experiences.

References

Kanel, K. (2017). *A Guide to Crisis* (6th edition). California State University, Fullerton. (ISBN- 978-1-337-56641-4, ISBN-978-1-337-61665-2).

Smeets, E., Neff, K., Alberts, H. & Peters, M. (2014). Meeting suffering with kindness: Effects of a brief self-compassion intervention for female college students. Journal of Clinical Psychology,70, 794-807.

Steinhardt, M. & Dolbier, C. (2008). Evaluation of a resilience intervention to enhance coping strategies and protective factors and decrease symptomatology. Journal of American College Health, 56, 445-453.

Stewart, D. E. & Yuen, T. (2011). A systematic review of resilience in the physically ill. Psychosomatics, 52(3), 199-209.

Suo, L., Zhao, L., Si, J., Liu, J., Zhu, W., Chai, B., ... & Lu, L. (2013). Predictable chronic mild stress in adolescence increases resilience in adulthood. Neuropsychopharmacology, 38(8), 1387-1400.

Tennant, C. (2002). Life events, stress, and depression: a review of recent findings. Australian and New Zealand Journal of Psychiatry,36(2), 173-182.

Tiet, Q.Q., Huizinga, D. & Byrnes, H.F. (2010). Predictors of resilience among inner city youths. Journal of Child and Family Studies, 19(3), 360-378.

Varese, F., Smeets, F., Drukker, M., Lieverse, R., Lataster, T., Viechtbauer, W. & Bentall, R. P. (2012). Childhood adversities increase the risk of psychosis: A meta-analysis of patient-control, prospective-and cross-sectional cohort studies. Schizophrenia Bulletin, 38(4), 661-671.

Wittchen, H.U., Nelson, C.B. & Lachner, G. (1998). Prevalence of mental disorders and psychosocial impairments in adolescents and young adults. Psychological Medicine, 28, 109-126.

Zolkoski, S. M. & Bullock, L. M. (2012). Resilience in children and youth: A review. Children and Youth Services Review, 34(12), 2295-2303. Psychology Teaching Review Vol. 22 No. 1, Spring 2016

Navigating Practica and Pre-Professional Experiences During COVID-19

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Navigating Practica and Pre-Professional Experiences During COVID-19

Introduction & Need for LCT Strategy

Practica provide college students with pre-professional experiences to help apply theoretical knowledge and best practices in a real-world context. Practical experiences (defined as practica) are commonly used in education and the human sciences disciplines to provide college students opportunities for explorations, skill development and reflection in real-world contexts (Cooper & Wieckowski, 2017). Specifically, vocational rehabilitation services and agricultural STEM education prepare people with 21st century skills to be successful members of the workforce.

This presentation will highlight how two pre-professional programs conducted practicums for college students to apply vocational preparedness skills during COVID-19. COVID-19 required the two programs to adapt and provide innovative pre-professional experiences for their college students. We will share the similarities and differences of how programs at two different land-grant universities navigated providing practicum experiences for their students during COVID-19, and summarize what the students shared about their experiences, including benefits and challenges.

Connection to Literature

The theoretical framework that will connect this study and understanding the navigation of practica during COVID-19 is Third Space Theory. On the face of it, oppositional first and second spaces work together to create a new third space for knowledge, discourses, and mastery forms. The first space is the student, community, and network. The second space is the institution of learning. The third space is reconceptualization of learning and success. This theory can be used to explore learning as a platform to move students through dynamic zones of proximal development (Pane, 2009). The lens of Third Space Theory is a great way to engage students in reflection during practica. Students can re-imagine structure, pedagogies, and behaviors during these learner-centered experiences (Weimer, 2013). There are two things that are important to draw from third space theory in relation to this study: the creation of new spaces for reflection and renewal but also understanding learning through various dimensions while traversing through a practicum during a pandemic.

How It Works / Implementation of LCT Strategy

The University of Arkansas at Pine Bluff (UAPB) Rehabilitation Services program centers around preparing students for work and advocacy with people with disabilities in the vocational rehabilitation field. During COVID-19, program practicum processes required adjustment due to strict site policies. Besides using Blackboard for discussion/reflective assignments, an innovative measure was to utilize Go React for end of experience case presentations and video reflective exercise. Go React is a video assessment software that helps student teachers demonstrate skills online through capturing video of students for critique of their skills. Additionally, Zoom was utilized for faculty/student monthly meetings and any supplementary conferences.

Students at Purdue University can enroll in a graduate-level course to learn how pedagogy and pedagogical content skills to teach STEM through Agriculture, Food and Natural Resources (National Council for Agricultural Education, 2015). Students prepare a set of lessons and they

engage in a practicum experience to teach youth using one of their lessons. Typically, these afterschool lessons were taught in real-world settings (e.g., 4-H clubs, Girls' Scouts, school enrichment). Because of COVID-19, students taught their lessons to K-12 students via a virtual Ag+STEM Camp. The virtual lessons were delivered using the Zoom platform. The lessons were 45 minutes in length and were conducted in the evenings (6:00 and 7:15 p.m. EDT. The virtual Ag+STEM Camp was part of a college-wide outreach event known as SpringFest, which is an open house for the community and alumni to visit campus and learn more about what faculty, staff and students are doing. A table in the appendix illustrates a comparison between the two courses.

Results to Date / Implications / Impact

The University of Arkansas at Pine Bluff Rehabilitation Services practicum during COVID-19 had 3 major outcomes. The first being the management of the virtual environment itself. A lot of the experience, normally, was a face-to-face, hands-on engagement to learn and get to understand clients in vocational rehabilitation. It was disconcerting for the students to, in a way, be in a position of a person with a disability, having to learn in an unchartered space. Second, learning and applying new technology during COVID-19. The rehabilitation services program was new to Go React. It was expected to be only used in the teacher education environment. However, the software offered a new aspect to the program and its continued usage. Lastly, the experience did create an environment where the students took more initiative in learning but understanding how people with disabilities deal with disruption in life daily, so it increased skills of flexibility and empathy.

There were five outcomes of the Virtual Ag+STEM Camp. First, hands-on activities, such as a live insect, Kahoot!, drawing a plan, and building a model, engaged students in the virtual environment. Second, the virtual environment was challenging to engage students because it was difficult to see the students and monitor what they were doing during the presentation and activity. Third, the limited number of participants made it challenging to promote discussion and share ideas. Fourth, the technology platform made it challenging to multi-task—making sure the technology was working, monitoring the chat, watching participants on the screen, presenting content, and facilitating the activities. Finally, the virtual youth engagement experience did provide preservice educators a real-world experience that will be useful in their future careers; however, they also desired having a face-to-face experience in addition to the virtual teaching experience.

Future Plans / Advice to Others

A major takeaway from the presentation was that during a pandemic, faculty and students can feel isolated, but it was encouraging to review similar challenges with engagement and experiences. A recommendation is to reach out to other programs, not necessarily similar to view practices employed. The UAPB practicum, though face-to-face and virtual, plans to be expand more virtual experiences; technology makes services more accessible for individuals with disabilities; The program has plans to create an assistive technology lab that would integrate practicum that would expand on the experience. The Purdue practicum will likely be face-to-face and virtual next year because students want to have a more personalized experience and they saw the value of learning how to engage youth virtually and how technology could broaden access to more students. Faculty adapted to integrating technology into practica, which was the direction they wanted to go but COVID-19 accelerated the adoption of new technology in facilitating pre-professional experiences.

References

Cooper, L. D., & Wieckowski, A. T. (2017). A structured approach to reflective practice training in a clinical practicum. *Training and Education in Professional Psychology*, *11*(4), 252–259. https://doi.org/10.1037/tep0000170

National Council for Agricultural Education. (2015). *National Agriculture, Food and Natural Resources Content Standards*. Indianapolis, IN: Author. https://thecouncil.ffa.org/afnr/

Pane, D. M. (2009). Third space: Blended teaching and learning. *Editor Managing Editor*, *5*(1), 64-92.

Weimer, M. (2013). Learner-centered teaching: Five key changes to practice (2nd edition). John Wiley & Sons.

APPENDIX 1

Table 1. Comparison of Two Community-Based Practicum Experiences		
Elements	**University of Arkansas – Pine Bluff**	**Purdue University**
Course	RHAB 4350 Practicum in Rehabilitation	ASEC 545: Teaching STEM through AFNR
College Students	Upper-level Undergraduate	Graduate & Upper-level Undergraduate
Foundational Knowledge	Vocational Rehabilitation Education Cooperative/Discovery Learning Awareness of Professional Ethics	Integrated STEM Education Meaningful Learning Learner-Centered Teaching Culturally Relevant Pedagogy
Educational Standards	Scope of Practice from Commission on Rehabilitation Counselor Certification (CRCC) Commission on Rehabilitation Counselor Certification (CRCC)	National Standards for Next Generation Science Standards Common Core Mathematics Standards National Educational Technology Standards National Agriculture, Food & Natural Resources Content Standards Indiana State Learning Standards
Planning, Designing & Organizing	Presentation of case information and experiences relevant to their practicum and the practicum of other students. Submission of a weekly log/session notes of activities/lessons with clients	Students design 3 lessons; or, co-design 5 lessons with a peer; each lesson is 45 minutes of instruction
Engagement with Audience (Service Delivery & Teaching)	Virtual supervised practicum in rehabilitation working with people with disabilities (casework, counseling) Utilization of Go-React	Virtual Afterschool Program, 45-min session with K-12 students and their parents
Reflection & Self-Assessment	Discussions and reflections throughout the course	Multiple reflections throughout the course and a self-reflection and self-assessment after microteaching experience
Peer Feedback	Peer feedback through discussion questions on site, counseling issues concerns, cases	One peer observes and provides written feedback
Professionalism	Site supervisor mid and final evaluation and virtual observations as allowed	Innovative Teaching Poster Ideation Discussion Roundtable Proposal

Book It! Using Popular Press Book to Enhance Post-Secondary Classrooms

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Book It! Using Popular Press Book to Enhance Post-Secondary Classrooms

Introduction & Need for Strategy

In the information era, journeys of thought, exercises of the mind, and empathy building activities are essential to navigate the complex and dynamic world we live in. With this in mind, we use popular press books to help frame the discussion of course topics, while giving students a chance to discuss and critique ideas and themes presented in them. Using a variety of sources and allowing them to select their own books, helps students break free of the mindset that only the limited highlighted on the course syllabus are the "right" ones. When students are encouraged to interact with a variety of perspectives, they can better begin to shape and refine their own personal opinions and beliefs. This approach has been used successfully in a variety of undergraduate and graduate settings and lead to enriched classrooms and student experiences.

Connection to Literature

Book clubs have been shown promote professional collaboration among preservice and practicing teachers (Burbank et al., 2010). Since the focus of book clubs is the exchange of ideas and interpretations, there are many opportunities to develop professional communities of practice (Kietzmann et al., 2013; Wenger, 1998). Reading fiction has been shown to help increase individual's empathy and understanding of the theory of mind (Mar et al., 2009) and prosocial behaviors (Johnson et al., 2013). Due to the role it can play in empathy development, utilizing fiction is also effective for counseling students. Asynchronous online classes do not always have a clear way to develop a community of practice among the students. One of the biggest challenges online education faces is feeling isolated from both instructors and students (Bolliger & Inan, 2012; Rovai, 2002; Shieh et al., 2008; Zembylas et al., 2008). By implementing book clubs with the help of video discussion boards, it was our goal to develop such communities. Using popular press books in teacher and counselor education courses has had positive impacts on our students.

How it Works & Implementation Strategy

One approach to using popular press books in through the book club approach, which has been utilized in face-to-face and online settings and with undergrad and graduate students.
At the start of the semester, students choose from three popular press books associated with course material. For example, the Advanced Pedagogy students selected from *Mindset* by Carol Dweck, *Make it Stick* by Peter Brown, and *The Teenage Brain* by Frances E. Jensen The students were then assigned to weekly discussion groups made up of those reading the same title. the groups had in-depth rich discussions about the material they were reading and how it applied to their personal and professional lives outside of class. Once the groups have finished the set of weekly prompts, each student is assigned to a jigsawed presentation group. These groups contain one person from each discussion group, so the resulting group has a representative from each book. One of the benefits of having presentation groups is it provide all students with brief overviews and key information from each title associated with class.

Another approach is book presentation groups. Each week three to four students were tasked with discussing the book that they had selected at the beginning of the semester. Unlike the discussion groups, whose purpose was a true book club style discussion and analysis, the presentation groups were focused on sharing important information and implications for their book. Everyone was given up to ten minutes to present their book. They were asked to provide a brief overview of their title and discuss the key ideas and topics that influenced their professional practice. This allowed students to compare and contrast the titles that they had selected for the assignment. Moreover, students were also asked brief questions after their presentation to aid analysis. After completing their presentation, individuals were required to complete a brief form which allowed them to provide a summary and 5 takeaways from the book as related to the course material.

Results & Advice to Others

When reflecting on the semester at the end of the class, many students discussed their enjoyment and professional benefits of book club and book presentations. Some common themes they discussed where having the ability to choose what book to read, being able to discuss the book, and the connection to their classmates. The freedom of choice allowed them to select a book that best fit their needs, interests, and desires. In online classes, the use of the video discussion board helped students feel like they were having authentic discussions with their classmates. Multiple students who participated in the book presentation activity also indicated that the assignment felt less like homework and more like self-care. Additionally, it allowed students to recognize appropriate modeling, think critically, and explore historical perspectives.

Getting connected to classmates was another important benefit of book club. Many students have commented on how they feel like they developed a professional community of practice within their discussion groups. The size of the class is an important aspect to monitor. With classes of less than 10, it was helpful to have students identify their first and second choice of books. Occasionally, it is necessary to ask students to read their second choice to ensure all title had at least two people reading them to prompt discussion. With larger classes, it may be necessary to have several discussion groups for the same title.

For book presentations, it is recommended that educators may have a list of recommendations for students who are not traditionally interested in reading fiction. Moreover, students should be given a list of options for accessing the books at no cost. Prior to engaging in the activity, a list of guidelines should be developed to ensure appropriateness of book selections. For example, after the first year of book presentations, the guidelines were updated to exclude non-fiction books that focused on specific topics which may not be able to be discussed sensitively in the required time frame. Additionally, the class size might impact the number of meetings that need to include book presentations as well as the length of presentations.

References

Bolliger, D. U., & Inan, F. A. (2012). Development and validation of the Online Student Connectedness Survey (OSCS). The International Review of Research in Open and Distance Learning, 13(3).

Burbank, M., Kauchak, D., & Bates, A. (2010). Book clubs as professional development opportunities for preservice teacher candidates and practicing teachers: An exploratory study. *The New Educator, 6,* 56-73.

Johnson, D. R., Cushman, G. K., Borden, L. A., & McCune, M. S. (2013). Potentiating empathic growth: Generating imagery while reading fiction increases empathy and prosocial behavior. *Psychology of Aesthetics, Creativity, and the Arts*, *7*(3), 306.

Mar, R. A., Oatley, K., & Peterson, J. B. (2009). Exploring the link between reading fiction and empathy: Ruling out individual differences and examining outcomes.

Kietzmann, J., Plangger, K., Eaton, B., Heilgenberg, K., Pitt, L., & Berthon, P. (2013). Mobility at work: A typology of mobile communities of practice and contextual ambidexterity. *Journal of Strategic Information Systems, 3*(4), 282-297.

Rovai, A. P. (2002). Development of an instrument to measure classroom community. Internet & Higher Education, 5(3), 197.

Shieh, R. S., Gummer, E., & Niess, M. (2008). The Quality of a Web-Based Course: Perspectives of the Instructor and the Students. TechTrends: Linking Research & Practice to Improve Learning, 52(6), 61-68.

Wenger, E. (1998). *Communities of Practice: Learning, Meaning, and Identity.* Cambridge, MA: Cambridge University Press.

Zembylas, M., Theodorou, M., & Pavlakis, A. (2008). The role of emotions in the experience of online learning: challenges and opportunities. Educational Media International, 45(2), 107-117.

Industry Driven Integrated STEM and Systems Approach to Innovative Incubation

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Industry Driven Integrated STEM and Systems Approach to Innovative Incubation

Introduction/Need for Strategy

Agricultural grand challenges are "intertwined with other disciplines in the natural and social science" (National Research Council, 2009a, p. 4); to solve the grand challenges facing agriculture, interdisciplinary collaboration is inevitable. The National Science and Technology Council (2018) states, "the best science, technology, engineering, and mathematics (STEM) education provides an interdisciplinary approach to learning, where rigorous academic concepts are coupled with real-world applications and students use STEM in contexts that make connections between school, community, work, and the wider world" (p. 1). Integrated STEM (iSTEM) teaching approaches attempt to mirror solving a real-world problem in a complex designed system and help students make sense out of the fragmented and departmentalized knowledge that is typically taught in disciplinary silos.

The **IN**dustry-dri**V**en **I**ntegrated STEM and **S**ystems Approach to **I**nnovative Incubati**ON** (IN-VISION) project, was uniquely positioned to advance knowledge about teaching and learning in iSTEM that uses agro-ecosystem thinking situated in agricultural design challenges to develop and practice data-based decision making. The IN-VISION project aimed to provide a meaningful and supportive context in which students can contextualize STEM in their own lives and the lives of others, see the interdisciplinary connections, navigate the deluge of scientific data that is available, and learn through authentic communication of their understandings. It was a direct response to calls for the demand for talents to fill the U.S. STEM and agriculture, food, and nature resources (AFNR) pipeline (USDA, 2015).

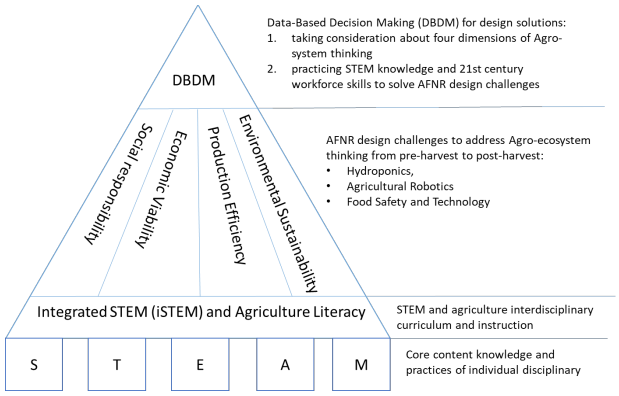
Connection to Literature

The project was guided by literature in K-12 STEM curriculum and instruction, citing it's urgent need for transformation (USDA, 2015; U.S. Department of Education, Office of Innovation and Improvement, 2016). This includes work in iSTEM education, or integrated STEM education, which works to bring real-world, authentic problems to the classroom to connect school learning with personal lives and future work (Bryan et al., 2016; Mahoney, 2010; NRC, 2014; Wang & Knobloch, 2018).

How It Works & Implementation of Strategy

The IN-VISION project used the conceptual model (Figure 1) to structure a year long Incubation Design Challenges (IDC). Through involving a holistic experience of IDCs, the participants, in-service high school STEM and agriculture teachers, participated in: (1) a one-week immersive learning experience and face-to-face summer professional development (PD); (2) small learning community (SLC) meetings to design iSTEM and AFNR educational materials that is solidly grounded in Agro-ecosystem thinking; (3) interaction with scientists; and, (4) the student award event, to provide students a comprehensive iSTEM through AFNR learning environment.

In each high school, 3-4 STEM and agriculture teachers, form a team to participate in the project for three years. IDCs are driven by solving a complex food system problem that is facilitated by scientists and industry partners to develop high school students' workforce STEM outcomes. For



example, the hydroponics IDC includes (1) Designing a hydroponics system, 2) Scientific experiment with the hydroponics system using sensors, 3) Sustainability challenge--food waste study with the school's cafeteria, and 4) Sustainability challenge--design sustainable and safe food product. Students worked in teams to complete the IDCs and present their project at the end of year IN-VISION project period.

Figure 1. Conceptual Model of IN-VISION project

To introduce teachers to general integrated STEM teaching approaches and the IDC's, a summer professional development was held. The focus was to provide teachers with the time and tools needed for their integrated lessons like STEM and AFNR integration, context in culture, community and careers, models of STEM integration and agroecosystem thinking, and assessment. In the summer PD, teachers also had the opportunity to interact with the scientists and ask them field specific questions, relevant to implementing their IDC.

Results to Date/Implications/Impact

There were six high schools and 15 teachers from the midwestern region of the United States that participated in the project in 2021. The participants taught a variety of subjects including science, agriculture, math, and technology. In response to the COVID-19 pandemic, the summer professional development events were transitioned to an at-home, online learning environment using recorded videos and Google Classroom. The event was divided into two parts, an asynchronous session and two synchronous sessions. Participants completed six modules, including videos and assignments, about general integrated STEM teaching approaches, and three modules from scientists to describe the food systems design challenges in June and July. The synchronous session was structured as two, half-day trainings that focused on helping teachers co-develop their integrated STEM through AFNR lessons and implement the lessons to help their students to complete the IDC and present their projects. Oval the post evaluation result showed that the teachers enjoyed the hybrid training format. Their comments included flexibility and opportunities to revisit the content if they did not understand the first time. They also mentioned short and separate day professional development program was better than intensive professional development program. They also enjoyed the teamwork time that was structured at the training.

Future Plans/Advice to Others

We will develop a IN-VISION website to upload all the online professional development materials in late summer 2021, and public will have access to them. Based on the data that we collected in 2021, we might consider both hybrid training in the future. COVID-19 created some challenges for our project, and we took a different approach to structure the professional development. Implications for future teacher professional development will be shared.

References

Bryan, L. A., Moore, T. J., Johnson, C. C., & Roehrig, G. H. (2016). Integrated STEM education. In C. C. Johnsion, E. E. Peters-Burton, & T. J. Moore (Ed.), *STEM road map: A framework for integrated STEM education* (pp. 23-37). New York: Routledge.

Mahoney, M. P. (2010). Students' attitudes toward STEM: Development of an instrument for high school STEM-based programs. In *Journal of Technology Studies*. Retrieved from http://scholar.lib.vt.edu/ejournals/JOTS/v36/v36n1/mahoney.html

National Science and Technology Council (NSTC), Committee on STEM Education. (2018). *Charting a course for success: America's strategy for STEM education*. Washington, DC: U.S. Government. Retrieved from: www.whitehouse.gov/wp-content/uploads/2018/12/STEM-Education-Strategic-Plan-2018.pdf

National Research Council. (2009). *Transforming Agricultural Education for a Changing World.* Washington, DC: National Academies.

National Research Council. (2014). *STEM integration in K-12 education: Status, prospects, and an agenda for research*. Washington, DC: National Academies Press.

United States Department of Agriculture. (2015). *Employment opportunities for college graduates in food, agriculture, renewable natural resources, and the environment*. Retrieved from: https://www.purdue.edu/usda/employment/wp-content/uploads/2015/04/2-Page-USDA-Employ.pdf?

U.S. Department of Education, Office of Innovation and Improvement. (2016). *STEM 2026: A Vision for Innovation in STEM Education*. Washington, DC: Author. Retrieved from: https://innovation.ed.gov/files/2016/09/AIR-STEM2026_Report_2016.pdf

Wang, H. H., & Knobloch, N. A. (2018). Levels of STEM integration through Agriculture, Food, and Natural Resources, *Journal of Agricultural Education*, *59*(3), 258-277. https://doi.org/10.5032/jae.2018.03258

Paper Presentation

Learner-Centered Engagement Approaches to Teaching and Learning: Reflections from Three Courses

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Learner-Centered Engagement Approaches to Teaching and Learning: Reflections from Three Courses

Introduction, Need and Connection to Literature: In recent years, especially with COVID-19 challenging the education mission of colleges and universities, the concept of learner centered teaching (LCT) has taken a new meaning and offered opportunities for instructors to redesign their approaches to teaching and learning. According to Weimer (2012), LCT embodies five characteristics:: 1) total engagement of students in the learning process, 2) acquisition of skill instruction that help students to think, solve problems, analyze arguments, debate, 3) encouragement of students to reflect on their learning, specifically telling what they are learning and how they are learning the concept, 4) give control of the learning processes to students thereby increasing motivation to learn, and 5) encourages collaboration, that is, students learn from each other. In the last decade or so, several scholars have documented the importance and effectiveness of the LCT. Consensus from these studies suggest that: 1) active learning strategies such as LCT engages students in the learning process which helps in knowledge retention (Handelsman, et al, 2004, 2) greater retention of knowledge, deeper understanding, and more positive attitudes towards the subject being taught (Collins & O'Brien, 2003), and 3) more advantageous outcomes compared to traditional teaching method (Weimer, 2012). McCombs and Whistler (1997) state that in an LCT environment, learners are treated as co-creators in the learning process, as individuals with ideas and issues that deserve attention and consideration. We used Weimer's (2012) characteristics of LCT as a framework for this abstract and presentation.

Purpose and Objectives: The purpose of this LCT presentation is to showcase the use of LCT in undergraduate and graduate level courses at three different universities. First, we share background information on the courses and the use of LCT. Second, we describe how the students were engaged in each of the three courses where they eventually became co-creators in the learning process, and third, we share the feedback from students who took these courses.

Implementation Strategy and Results: Description of Courses: Course 1: Morningside University is a small, residential, private university with a growing major agricultural department. In 2020, a new Agriculture Center on campus with outdoor classroom and a 130' by 30' greenhouse was funded. The spring 2021 AAFS Capstone course was comprised of nine graduating seniors and focused upon the development of enterprise plans for the new Ag Center through a Team-Based Learning approach (Michaelsen, Knight, & Fink, 2004). Students were given specifications related to the physical layout of the Ag Center and greenhouse and divided into committees and teams (McCubbins, Paulsen, & Anderson, 2016) to research and make business planning decisions related to their implementation in the ensuing academic year. Three team business plans were developed which each included a minimum of three enterprises. Individually, students completed and presented a peer-reviewed, strategic issue analysis (Paulsen, 2009) of nine exclusive enterprises. Anecdotally, students shared that they enjoyed the opportunity to work in committees to research their plans, they learned a lot about the importance of teamwork through the coursework and team development of their business plans, and they felt pride in leaving a legacy for future students in the program. They greatly appreciated the opportunity for the learner-centered engagement approach brought to the capstone course.

Course 2: In a LCT Reading Course (fall 2020) at Langston University, students participated in a virtual service- learning Readers Theater. The purpose of Readers Theater is not to increase students' reading speed, but rather to use repeated readings as a way for students to find deeper meaning of text while making significant gains in expressive reading (Rasinski, 2012). This type of repeated reading, "provides students with diverse learning needs an opportunity for authentic participation in rereading texts- in contrast to the traditional skill and drill approach of rereading text by teacher direction" (Garrett & Connor, 2010, p. 7). Today, and historically, stories remain an engaging way to learn important moral lessons. According to 2019 Teach Hub.com (Teaching Strategies: about Reader's Theater), Reader's Theatres have built-in instructional strategies to improve teaching and learning (to improve reading skills) for young readers. The dramatic interaction and engagement cause readers to look more closely to the book text to visually interpret meaning into the reading experience. Through the Reader's Theatre, students can improve fluency, vocabulary, and *comprehension skills.*

Course 3: This was a graduate level, one-credit course at Penn State designed as get familiar with and understand how agricultural extension is organized around the world. Students selected a country of their choice and adhered to the course requirements in preparing the final paper and presentation which included: 1) describe the social, economic, and political factors, 2) identify the chosen country's Extension system, describe its history; discuss how Extension programs are designed, delivered and evaluated; 3) identify strengths and weaknesses and suggest opportunities to improve them, and finally, 4) compare and contrast the U.S. Extension system with the chosen country. Students were engaged from the start till the completion of the 16-week semester. A set of eight initial questions were provided by the instructor to guide the final paper and presentations. Students modified these questions to meet their individual needs. Once the country was selected, students collected data through literature search, interviews with students from the countries selected, discussion with peers and the instructor. This experience was truly a learner-centered from the beginning to the end culminating in a paper/abstract worthy of presentation at research conferences. One student noted, "*the student-lead approach motivated my self-learning about the topics presented. through this course, I raised my knowledge about the Ag. Extension internationally and get a broad perspective of how the extension works around the world, the common aspects and challenges."*

Implications and Advice to Others: Collectively, these three courses have shown how learner-centered approaches can be used in the teaching-learning process. The concept of engagement, collaboration, teamwork, self-reflection, and learning is evident. Students indicated that with some guidance they can not only be learners but also co-creators of the teaching and learning process. Instructors thinking of using learner-centered approach will immensely benefit from the experiences achieved in these courses. Furthermore, for the three instructors, these experiences have expanded their repertoire of their teaching.

We will engage participants by using Kahoot, Role playing, and small group-discussions in this interactive presentation. Participants will have an opportunity to 1) participate in discussions and in a mock reader's theater experience, 2) learn from shared experiences of presenters, and 3) engage in innovative ways to create online tools to support their LCT instructional activities.

References

Collins, J. W., 3rd, & O'Brien, N. P. (Eds.). (2003). Greenwood Dictionary of Education. Westport, CT: Greenwood.

Handelsman, J., Ebert-May, D., Beichner, R., Bruns, P., Chang, A., DeHaan, R., et al. (2004). Scientific teaching. *Science* 304(5670), 521–522.

McCombs, B., & Whistler, J. S. (1997). *The Learner-Centered Classroom and School: Strategies for Increasing Student Motivation and Achievement*. San Francisco, CA: Jossey-Bass Publishers.

McCubbins, OP, Paulsen, T. H., & Anderson, R. G. (2016). Students' perceptions concerning their experience in a TBL formatted capstone course. *Journal of Agricultural Education*, *59*(1), 135-152. doi: 10.5032/jae.2016.03070

Michaelsen, L. K., Knight, A. B., & Fink, D. L. (Eds). (2004). *Team-based learning: A transformative use of small groups in college teaching.* Sterling, VA: Stylus Publishing.

Paulsen, T. H. (2009). Strategic issues: A critical component of a capstone farm management course. *North American Colleges and Teachers of Agriculture, 53*(Supplement 1), 72.

Rasinski, T. V. (2012). Why reading fluency should be hot. Reading Teacher, 65(8), 516-522.doi:10.1002/TRTR.01077

Teach Hub.Com. (2019). Teaching strategies: about reader's theater, k-12 Teacher Alliance; retrieved from http://www.teachhub.com/teaching-strategies-about-readers-theater

Weimer, M. (2012). *Learner-centered teaching and transformative learning.* In E. W. Taylor & P. Cranton (Eds.), Handbook of transformative learning: Theory, research, and practice (pp. 439-454). San Francisco: Jossey-Bass.

LCT Presentation

Incorporating Virtual Multi-University Collaboration and Human-Centered Design in an Agricultural Program Development Course

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Incorporating Virtual Multi-University Collaboration and Human-Centered Design in an Agricultural Program Development Course

Introduction and Need for Strategy

In order to provide new skills related to virtual teams and a unique experience for students during a time that travel was not authorized, the University of Illinois and University of Missouri developed an innovative approach to adding virtual teamwork through an agricultural education and training program development course taught during the pandemic. The two universities' instructors joint-taught their spring 2021 courses, bringing students together in virtual teams. Not only did the joint venture provide students with an opportunity to work virtually with individuals outside of their home university, but it also included applied learning through real world projects from stakeholder organizations. Additionally, the course content included human-centered design principles applied to traditional models of education and program planning.

Connection to Literature

The impact of integrating real-world experiences into the classroom has been well documented. Students given the opportunity to apply theories and concepts to practical problems are more likely to report higher academic motivation (Trolian & Jach, 2020). Actively engaging with course concepts leads to greater mastery of the material (Maskiwicz, et al., 2012) and skills in higher order thinking (Jensen & Lawson, 2011).

Human centered design (HCD), or design thinking, is a term for innovating or designing with the end user in mind. While there are many definitions for HCD (Brown, 2009, Krippendorff, 2006), this project uses the definition and model developed specifically for training and development (Boller & Fletcher, 2019). HCD is a problem-solving approach that involves working with target audiences to understand their needs/experience, synthesizing this information, ideating potential solutions, prototyping and implementing. HCD principles complement theories of teaching and learning that underlie university agricultural education programs. Research suggests that utilizing HCD principles should help students learn to shift their frame of reference becoming more empathetic, collaborating in meaningful ways and appreciating the need to adapt their point of view (Goldman & Zeilezinski, 2016).

How it Works/Implementation of Strategy

The goals for the agricultural education and training program development courses were to (1) expand the traditional vision of a classroom to include stakeholder projects with real world application, (2) connect students with neighboring institution peers through virtual collaboration, and (3) expand the frameworks for planning and training to incorporate HDC.

Before the courses began, instructors identified stakeholders interested in providing an opportunity for students to develop a training/educational program for their organization. Stakeholders from three states provided seven project opportunities. Topics included elementary and middle school agricultural education, customer service, public speaking, food sanitation and mentoring. The teams included 6-7 members representing both universities.

Teams were tasked to set up meetings with their stakeholders to gain more information about the project. Next, teams were asked to interview representatives of the target audience for their program to develop an understanding of the human experience central to the program. This information was recorded in an empathy map. Groups then used mind mapping to expand their thoughts and ideas before developing a lesson outline. The final project included a logic model, lesson outline and information to lead and evaluate the program. At the end of the semester, teams presented their programs and program resources to their stakeholders.

Over the course of the semester, students met with their own university class during regular class hours. The two universities met together in virtual, bi-weekly meetings on Zoom to connect as an entire group and to allow time to meet in their virtual teams. The joint time was used for teambuilding to assist in group formation, content learning related to aspects of the team projects and problem solving for team-related issues. The instructors also met individually with each team to discuss their individual challenges and questions.

Results to Date/Implications/Impact

This course produced seven training programs developed for five unique stakeholders. Feedback from stakeholders revealed that parts of all programs will be piloted or implemented by stakeholders, fulfilling the objective of providing students real world application.

Of the 40 students enrolled, 18 (45%) completed a retrospective pre-posttest survey about their experience in the course. The survey asked students to report their skills related to teamwork and communication concepts both *before* the course and *after* the course. The chosen skills came from the [university] human-centered design skill survey (citation, 2020).

Students reported a statistically significant ($p<.05$) increase in the following six skills, which all represent *intrapersonal* skills. These skills included: (1) managing time effectively; (2) thinking critically about problems and solutions; (3) being comfortable with what is unknown; (4) being comfortable finding new approaches to solve problems; (5) feeling comfortable making mistakes and learning from them; and (6) reflecting on their own thoughts and actions.

However, students did *not* show a significant increase ($p>.05$) in five skills on the survey, all of which are *interpersonal* skills. These skills included: (1) respecting the opinions of others; (2) collaborating with people from different backgrounds; (3) accepting the group's decision if it is different from your own; (4) sharing knowledge with teammates; and (5) being comfortable dealing with problems for which you cannot predict if they will be successfully solved.

These survey results refute previous research that suggests that when using human centered design principles, students learn to shift their frame of reference to be more empathetic, collaborate in more meaningful ways and appreciate the need to adapt and change their point of view when gaining more information (Goldman & Zeilezinski, 2016).

While it is important to value an *end product* that learners create, it is also critical for instructors to prioritize the *process* that is used to create the collaborative product. Instructors should continually consider designing learning experiences to improve both intrapersonal and interpersonal skills. Our experience reveals that just because students are working in teams does not mean that they perceive they are improving interpersonal skills. It is not known if students' intrapersonal skills did not actually improve, or if students simply did not perceive the improvement. Further research should explore this phenomenon.

Future Plans /Advice to Others

Future plans include exploring ways to help students improve intrapersonal skills when they are working as a team member. In an effort to address this concern, we plan to add a face-to-face weekend bringing together students from both universities, instructors, and stakeholders for in-person collaboration before initiating virtual teamwork.

Supporting virtual teams of students from two different universities proved to be a greater challenge than we originally anticipated. Some of the teams seemed to move to the performing stage quickly and create high quality programs, while other teams struggled. If virtual teams are a critical part of career expectations in the future, we need to explore ways to get over the hurdles of distance communication.

References

Boller, S., & Fletcher, R. (2020). *Design Thinking for Training and Development.* ATD Press.

Brown, T. (2009). *Change by design*. Harper Business.

Goldman, S. & Zielezinski, M. B. (2016). Teaching with design thinking: Developing new vision and approaches for twenty-first century learning. In S. Goldman & M. B. Zielezinski, eds. *Connecting science and engineering education practices in meaningful ways: Contemporary trends and issues in science education, 44.* Springer International Publishing. https://doi.org/10.1007/978-3-319-16399-4_10

Jensen, J. L. & Lawson, A. (2011). Effects of collaborative group composition and inquiry instruction on reasoning gains and achievement in undergraduate biology. C*BE Life Sciences Education, 10*(1), 64-73. https://doi.org/10.1187/cbe.10-07-0089

Krippendorff, K. (2006). *The semantic turn: A new foundation for design*. Taylor & Francis, CRC Press. https://doi.org/10.4324/978020329995

Maskiewicz, A. C., Griscom, H. P., & Welch, N. T. (2012). Using targeted active-learning exercises and diagnostic question clusters to improve students' understanding of carbon cycling in ecosystems. *CBE Life Sciences Education, 11*(1), 58-67. https://doi.org/10.1187/cbe.11-02-0011

Trolian, T. L. & Jach, E. A. (2020). Engagement in college and university applied learning experiences and students' academic motivation. *Journal of Experiential Education, 43*(2), 317-335. https://doi.org/10.1177/1053825920925100

Using a Choice Board Approach to Incorporate Personalized Professional Development within an Undergraduate Teaching Methods Course

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Introduction & Need for Strategy

During the 2020-2021 school year, it was necessary to revisit course design and expectations to ensure equity and accessibility in the context of a Hy-Flex instructional environment. In this approach, students had the choice to attend class face-to-face or virtually, so course assignments and instruction needed to be accessible from a distance and on campus. In addition to the COVID-19 pandemic, racial justice protests and a hotly contested Presidential election set the stage for an environment of uncertainty and change. In response to instructional design needs, and conversations about racial justice, a Personal Professional Development Plan assignment was integrated into Methods of Teaching Agricultural Education course at Purdue University.

As part of demonstrating how participation in a student organization like FFA can be integrated into instruction, pre-COVID course assignments included participation in various Agricultural Education club events. Since many of these club events were cancelled or limited in scope during the Fall 2020 semester, the course instructor revised this assignment to become the Personal Professional Development Plan. Through this new assignment, students explored elements of their own professional growth that they felt they needed to focus on as a future educator, selecting four different activities from an instructor-created choice board. The four different activities aligned with the Model for Agricultural Education at Purdue, which guides the implementation of the undergraduate Agricultural Education major. Within each of these four areas, the instructor suggested activities which specifically addressed issues of injustice, intercultural communication, or inequity to immerse students in contextualized learning in addition to classroom experiences.

Connection to Literature

Given that the Teaching Methods course is the final course that Agricultural Education majors take prior to their student teaching internship, the course instructor set out to help students practice the professional behaviors expected of educators. Building upon Self-Determination Theory (Deci & Ryan, 1985) and Self-Directed Learning Theory (Knowles, 1975), the design of the Personal Professional Development Plan assignment sought to increase student agency over their own learning. Agency is one of the three innate needs posited by Deci et al. (1991) as necessary to develop motivation, and contributes to self-directed learning. Agency is a clear component of Self-Directed Learning Theory. When adults feel a sense of agency, they feel more empowered and respected to make decisions that are meaningful for themselves. Shifting the balance of decision-making power from a primarily teacher-centered approach to a more learner-centered approach can increase student autonomy and help support their development as independent learners (Weimer, 2013). Thus, preservice teachers with a sense of agency may be more likely to willingly make decisions to purposively engage in professional development activities not just for the sake of the course assignment, but to meaningfully advance their own knowledge, skills, or attitudes.

How it Works & Implementation Strategy

The Personal Professional Development Plan Assignment was introduced to students at the beginning of the Fall 2020 semester and was described as a semester-long project that consisted of three major components: 1) Professional Development Plan Proposal, 2) Completion of each of the four activities, and 3) Creation of a final project in which students reflected upon their experiences and how they would influence their work as an educator. Students were provided an assignment prompt which included a choice board of options organized into the four areas present in the Model for Agricultural Education at Purdue University: General Education, Professional Education, Technical Agriculture, and Agricultural Education. Within each of these categories,

students were provided four sample activities to choose from, but were also given the option to design their own activity (with instructor approval) within the category. Students selected one activity from each of the four categories and submitted a Professional Development Plan Proposal by the end of September. Activities included on the choice board included virtual and face-to-face options, in both on and off-campus locations to allow for flexibility and equitable access.

In the proposal, students identified their overall professional development goal, an explanation of why they selected that goal, identified which four events they intended on participating in and described how involvement in those activities would help more them toward their overall goal. They also included a description of how they planned on presenting the final results of their professional development experiences (i.e. paper, PowerPoint, video, podcast, etc.) and developed an assessment plan for the course instructor to use when grading their final assignment. As students completed their activities, they uploaded some sort of evidence of their participation in the activity to the course LMS to document their progress. The final project was due shortly after Thanksgiving. In this final project, students needed to at minimum, address the following questions: 1) How has my involvement in this event affected my knowledge, skills, or attitudes? 2) How else do I need to continue to grow in these areas? 3) How has my experience in these events influenced my future endeavors as an educator?

Results to Date/ Implications/ Impact/ Future Plans

The final projects submitted by students varied in format, but all featured reflections that indicated students felt they experienced growth through their experiences. Final projects included narrated PowerPoints (n = 6), PowerPoint slides, (n = 4), YouTube videos (n = 4), written essays (n = 3), websites/blogs (n = 3), and narrated infographic (n = 1). One student did not submit a final project. Many students focused on development of skills related to creating inclusive classrooms that embrace the diverse lived experiences of their future students. One option on the choice board included listening to educational podcasts, which became a very popular selection. Students who selected listening to the suggested podcasts as one of their four activities enthusiastically recommended their experience to others, and some added the podcast to their regular rotation of podcasts. Some students experienced difficulty initially identifying a professional development goal; in the future, the instructor plans to integrate a tool such as the Globally Competent Learning Continuum (ASCD, 2021) into the course or overall curriculum to provide students a starting point from which to focus their professional growth. The depth of learning achieved by students in this assignment appeared to be much greater than the previously existing assignment, so the instructor plans on continuing to use this assignment in the Teaching Methods course beyond COVID.

Advice to Others

Provide students feedback on their proposal early in the semester to help ensure clarity and final projects that are of appropriate depth. Ensure that the options students have available to them are accessible in a variety of formats and times to allow for flexibility. Clearly connect the purpose of a project like this to tangible, long-term outcomes to illustrate the value of these learning activities, so that they are not viewed as an “add-on” assignment. While we ran out of time to conduct in-class presentations of the final projects, it would be powerful to include opportunities for students to share their learning with their peers as another reflection to reinforce their experiential learning.

References

ASCD. (2021, June 17). *The Globally Competent Learning Continuum.* ASCD. http://globallearning.ascd.org/lp/editions/global-continuum/continuum.html

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior.* New York: Plenum.

Deci, E. L., Vallerand, R. J., Pelletier, L. G., & Ryan, R. M. (1991). Motivation and education: The self-determination perspective. *Educational Psychologist, 26*(3 &4), 325-346. https://doi.org/10.1207/s15326985ep2603&4_6

Knowles, M. (1975). *Self-directed learning: A guide for learners and teachers*. New York, NY: Association Press.

Weimer, M. (2013). *Learner-centered teaching: Five key changes to practice (2nd ed.).* San Francisco, CA: John Wiley & Sons.

Learner Centered Teaching Strategies for Undergraduate Students in Multiple Disciplines at Alcorn State University

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Learner Centered Teaching Strategies for Undergraduate Students in Multiple Disciplines at Alcorn State University

Introduction

With constant change in the educational landscape and growing demands for multiple learning modalities, Learner Centered Teaching (LCT) seems a much-needed approach. The characteristics of LCT, of engaging students in the hard messy work of learning; skill instruction; reflection; allowing students to have control over their learning process and collaboration (Weimer,2012) are effective strategies yet are not implemented in most curricula. The thrust on delivery of content knowledge and less on application creates an imbalance in building student career competence. Ample research evidence demonstrates that LCT has proved effective in multiple disciplines. LCT is effective because students are engaged in the learning process, resulting in active construction of knowledge (Lattimer, 2015; Somani & Rizvi, 2018; Weimer, 2013). However, fewer than half of students' report being engaged in their education (Gallup Student Poll, 2017). This presentation will highlight LCT strategies implemented by a team of multidisciplinary professionals in the respective courses. Student engagement and outcomes will be highlighted.

Project/Presentation Objectives

Alcorn State University offers a variety of programs which include Human Sciences, Biology, Education and Veterinary science. The demands for students to gain competitive careers is challenging instructors to develop high impact learning strategies to provide students the competitive edge in the job market. Undergraduate research, field experiences and project based learning are some of the proven effective in these majors. This presentation will highlight these strategies, their implementation and student outcomes in the aforementioned majors. The overall goal of implementing these strategies are 1) To enhance student understanding of the current trends and issues pertaining to their respective fields. 2) To build student critical thinking and problem solving skills which are essential in their careers and 3) To guide students to design their learning in skills needed for career preparation.

Methodology

Instructors from various disciplines design their courses to incorporate a range of learning strategies such as research, problem-based learning, cooperative learning and field-based learning. Each presenter will showcase the methodologies adopted to implement each of these strategies as suited to their discipline. The student learning outcomes are measured for a period of a semester and the various objectives and outcomes for the respective courses are mapped to determine efficacy of these strategies. Efficacy of the strategies will also be correlated with student feedback from the courses. Additionally, the presenters will identify common strategies that prove effective across disciplines and share best practices for implementation in similar courses.

Results and Implications

As students engage in these high impact practices, it increases their confidence levels, and they will learn to adapt to the demands of their careers. The skills and knowledge accrued through experiential learning will position students at an advantage to qualify for advanced degrees or competitive careers.

Future Plans/Advice to Others

The Departments of Human Sciences, Agriculture, Biology and Education at Alcorn State is committed to providing students with enriching experiences to enhance their successful acceptance into professional programs and qualify for competitive careers. Usage of innovative programs, new course additions, restructuring old courses as well as constant review of the curriculum is encouraged to meet professional program requirements.

References

Gates, M., Odom T. F, Sawicki, R. (2018). Experience and Confidence of Final Year Veterinary Students in Performing Desexing Surgeries. *New Zealand Veterinary Journal, 66(4), 210-215.*

Gopinath, D., McGreevy, P., Zuber, R.., Baguley, J., Barrs, (2012). V. Developments in Undergraduate Teaching of Small Animal Soft-Tissue Surgical Skills at the University of Sydney. *Journal of Veterinary Medicine Education, 39(1), 21-29.*

Lattimer, H. (2015). Translating theory into practice: Making meaning of learner centered education frameworks for classroom-based practitioners. International Journal of Educational Development,45, 65-76. doi:10.1016/j.ijedudev.2015.09.012

Somani, R., & Rizvi, M. (2018). Project based learning over traditional method of language teaching: A quasi experiment design in EFL classrooms. Literacy Information and Computer Education Journal, 9(2), 2895 – 2906. doi:10.20533/licej.2040.2589.2018.0381

Weimer, M. (2013). Learner-centered teaching: Five key changes to practice. San Francisco, CA: Jossey Bass.

Gallop Student Poll. (2017). Engaged today – ready for tomorrow. Retrieved from https://news.gallup.com/topic/gallup_student_poll.aspx

Research Paper Presentation

Applying Learner Centered Approach in an Inquiry-Based Homemade Hydroponics Program with Master Gardener Educators

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Applying Learner Centered Approach in an Inquiry-Based Homemade Hydroponics Program with Master Gardener Educators

Introduction & Need for Strategy

As society changes, the needs of its people also change; this concept of change has been a key element in the design of adult education programs since the inception of the movement (Boone, 1973). Boone (1973) continues stating that from its formative years to the present, the adult education movement has placed much emphasis upon problem-solving by imparting knowledge and improved decision-making procedures.

The learning experience is mostly problem-centered and working adults are likely to be less enthralled by survey courses that are full-time as professional students. Adults tend to prefer single-concept, single-theory courses that focus on applying the concept to relevant problems (Boone, 1973). Therefore, an inquiry-based learning project growing vegetables in a homemade hydroponics system is being developed to promote scientific thinking among Masters-Gardener educators whereby an online module made of four lessons was delivered.

Connection to Literature

The lifelong learning experiences and education of adults become more complex due to intricate variables they must handle on the pursuit of success in life (Wlodkowski, 2008). The cognitive processes underlying scientific discovery and day-to-day scientific thinking have been a topic of intense scrutiny and speculation for almost 400 years (e.g., Bacon, 1620; Galilei, 1638; Klahr, 2000). Kirby, et al. (1999) describe creative thinking, organization, logical thinking, scientific thinking, persuasive thinking, and problem solving as all being part of critical thinking. Recognition of the need for critical thinking and decision-making processes is vital to meaningful adult learning. For the purpose of this program, scientific thinking refers to both "thinking about the content of science and the set of reasoning processes that permeate the field of science: induction, deduction, experimental design, causal reasoning, concept formation, hypothesis testing, and so on" (Dunbar & Klahr, 2012, p.611).

Inquiry learning can be used to train learners critical thinking skills. With inquiry learning, learners are actively involved in learning both physically and mentally (hands on activity) through experimenting activities, observing, asking, analyzing data, and making conclusions (Suryanti et al., 2018). Suryanti et al. (2018) continues stating that Learner centered inquiry learning has been shown to improve students' critical thinking skills and as critical thinking skills of the learner continue to develop, it should continuously be trained to adjust with the changing world. Adult education mirrors a society's current needs. Hence, current society's changing needs demand continuous and comprehensive education for adults throughout their lives. The rationale supporting the need for adult education relates to the nature of the various roles which responsible adults must perform in society. Adults bear constantly shifting roles which must be implemented throughout adulthood. A few such roles include those of worker, family member, citizen, and consumer. The implications for adult education relative to the performance of these roles are obvious (Boone, 1973).

How It Works & Implementation of Strategy

The concept used in this program aims at developing Master Gardener educators' scientific thinking as part of problem-solving skills by using online modules that focus on homemade hydroponics inquiry-based project. Key components that facilitate the learning includes fours lessons which are (1) What is hydroponics and why it is important; (2) Homemade Hydroponics Design (what factors to consider, different designs, maintenance); (3) Guided inquiry guidelines (4) A scenario to help participants work on it (Wrap-up with example).

The first lesson mainly focuses on hydroponics system definitions, types and history. It also details environmental, health and financial benefits of using a homemade hydroponics. The second lesson details technical skills needed to assemble a homemade hydroponics system. It mainly focuses on what plants need to grow and how a homemade hydroponics system can be designed to fulfil those needs. The third lesson is a guided inquiry made of what a scientific inquiry means, the role of scientific inquiry and learners are taught guided inquiry steps while also they are explained how to use data in decision making. Finally, the last lesson is a practical guidance visually showing learners how to design and assemble a homemade hydroponics system.

After the online learning experience, participants design and construct their homemade hydroponics systems. They then perform a guided inquiry growing vegetables as a way to apply skills learned during the homemade hydroponics online modules. Finally, during the implementation of the guided inquiry, participants implicate components of scientific thinking

Results to Date / Implications / Impact

A need assessment survey was conducted to assess the prospective participants willingness to participate in the research. About 166 non-formal/informal educators were recruited to participate in this study. The majority (81%) identified themselves as home growers, and 92.6% acknowledged that they have heard about hydroponics before. However, 92% of the participants identified themselves as having very limited knowledge about hydroponics, while 95% mentioned that using hydroponics to grow food indoors can be a great educational activity to do with both youth and adults. Learners followed their own pace while learning with online module. Google Classroom were used as a learning platform. Throughout the program, learners were given assignments to do as part of the learning process to help them develop their scientific thinking throughout the learning process.

Future Plans / Advice to Others

Educators who endeavor to direct learners in acquiring skill in scientific thinking must have a clear-cut of the elements that constitute such thinking; they must be on the alert to detect and correct the errors that learners are most likely to make in the process (Downing, 1928). Despite a volume of research, controversy continues regarding how this strategy develops and how educators can best support its development. Therefore, continuing investigation and program development are warranted.

References

Bacon, F. (1620/1854). Novum organum (B. Monatgue, Trans.). *P A: Parry & McMillan*.

Boone, E. J. (1973). Adult Education: A Quest for Life. *Community College Review*, 1(1), 6–13. https://doi.org/10.1177/009155217300100103

Downing, E. (1928). The Elements and Safeguards of Scientific Thinking. *The Scientific Monthly, 26*(3), 231-243. Retrieved June 23, 2021, from http://www.jstor.org/stable/8055

Dunbar, K. N., & Klahr, D. (2012). Scientific thinking and reasoning. In K. J. Holyoak & R. G. Morrison (Eds.), *Oxford library of psychology. The Oxford handbook of thinking and reasoning* (p. 701–718). Oxford University Press

Galilei, G. (1638/1991). Dialogues concerning two new sciences (A. de Salvio & H. Crew, Trans.). Prometheus Books.

Kirby, G. R., Goodpaster, J. R., & Levine, M. (1999). Critical thinking. *Pearson Custom Publishing*.

Klahr, D. (2000). Exploring science: The cognition and development of discovery processes. *MIT Press*.

Suryanti, Ibrahim, M, & Lede, N S. (2018). Process skills approach to develop primary students' scientific literacy: A case study with low achieving students on water cycle. IOP Conference Series. *Materials Science and Engineering*, 296(1), 12030.

Wlodkowski, R. J. (2008). Enhancing adult motivation to learn: A comprehensive guide for teaching all adults *(3rd ed.).* Jossey-Bass.