

Elevating Education with Agricultural Certifications

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Introduction

More than 2.5 million K-12 students nationwide are introduced to agriculture through Agriculture in the Classroom (AIC) activities annually (National Agriculture in the Classroom Organization, 2023). Yet, teachers involved in these interventions are most often not formally trained to teach agriculture (Gill et al., 2024). State and national organizations do provide AIC professional development; however, teachers continue to cite lack of confidence in or lack of contextual knowledge about agriculture as barriers to incorporating agricultural examples into their teaching (Burrows et al., 2020; Gill et al., 2024; Miller et al., 2022). Despite this, teachers, parents, and administrators indicate agricultural content should be taught in courses outside of agricultural Career and Technical Education (CTE) programs (Gill et al., 2024; Miller et al., 2025; Plunkert & Curry, Jr., 2024). To address this content knowledge gap, Utah State University's Agricultural Literacy Certification (ALC) course was developed. The ALC course is an 8-module online micocredential course providing an overview of agricultural sectors. Addressing topics from animal and plant science to conservation and nutrition, the modules detail the complexities of the farm-to-consumer journey. One module specifically addresses techniques for teaching agriculture in grades and courses outside of CTE.

Theoretical Framework/Purpose

This course evaluation research sought to understand what content knowledge teacher-participants gained from the ALC course and how these individuals intended to apply the information in their teaching. Pedagogical Content Knowledge (PCK) indicates teachers must have both a strong understanding of the subject matter they are teaching as well as teaching methods for teaching that subject (Magnusson et al., 1999). The ALC course was designed to provide both necessary pieces to teacher participants.

Research Questions

1. What was the most useful content participants learned during the ALC course?
2. How are participants planning to use the content and resources presented in the ALC in their teaching?

Methods

Utah State University researchers developed the ALC course, and pilot-tested all modules with the support of an external evaluator from the University of Florida. In August 2024, a soft launch opened the course to a limited number of participants providing an incentive for these educators to complete all the modules. Teachers were solicited through the National Agriculture in the Classroom network to participate in the pilot and soft launch. More than 3,600 K-12 teachers, non-formal, and volunteer educators applied. A randomly selected group of applicants (N = 408) were invited to participate in the soft launch. ALC course developers asked a series of questions, guided by PCK, in a course evaluation. The course developers and the evaluator drafted, distributed and analyzed this instrument within Qualtrics. Review of responses informed course modifications prior to the full public launch in October 2024, as well as informed researchers of teachers' thoughts about their own agricultural PCK after ALC participation. A limitation of this study was that the soft launch participants opted to participate in the course and, therefore, may be more motivated to teach about agriculture than others. Also, these completers received a small incentive for their participation and feedback to inform modifications before the public course launch. A USDA NIFA grant supported the development of the ALC.

Results

During the soft launch in August 2024, 408 people enrolled in the ALC course, with 279 (68%) participants completing the course to earn their agricultural literacy certificate. These completers also completed the post-course evaluation. Most (64%) completers felt the course increased their agricultural knowledge. The course increased their (63%) understanding of using agricultural literacy resources in their teaching and their willingness to participate in local agricultural literacy efforts (68%). Participants strongly (67%) or somewhat (25%) agreed that the course demonstrated how to use their newly gained knowledge with instructional resources to include agriculture as a context for academic content. Participants were asked a long-answer question: “What was the most useful content you learned during the ALC course?” Researchers summarized participant responses into six themes: Career opportunities explained in agriculture (beyond “just farmer”); Availability of standards-connected, free lessons (Agricultural Literacy Matrix database); Overall explanation of the interconnectedness of agriculture (within the industry); Agriculture connects to educational standards in many ways; Participants will more seriously consider their personal purchasing/grocery store shopping; and Personal use of agricultural knowledge (gardening, raising chickens, etc.). When asked: “How are you planning to use the content and resources presented in the ALC in their teaching?”

Participants identified ways the ALC content informed the content of their teaching:

This course provided more background information that I can incorporate into my AP course. We (myself and my students) are not in a farming community and these concepts are usually difficult for my students to relate to. I feel by completing this course, I will be better prepared to teach the required topics.—Texas High School Teacher

Participants also identified ways the ALC provided instructional strategies for their teaching:

The most useful thing I learned in the course was the importance of integrating hands-on, interactive activities to engage young learners effectively. These activities not only make the learning process fun but also help children grasp complex concepts through real-life experiences and sensory engagement. This approach enhances their understanding and retention, making abstract ideas like farming more concrete and relatable.—Oklahoma Elementary Teacher

Conclusions, Implications, and Recommendations

PCK indicates teachers need a functional understanding of teaching strategies as well as content topics to be effective (Magnusson et al., 1999). The ALC soft launch participants spoke to both of these factors due to the course. Some participants discussed their own increased confidence in teaching agricultural contexts as well as their willingness to participate in local agricultural literacy efforts. These comments support the need for both agricultural content knowledge development and pedagogical professional development for formal and non-formal educators.

Further research is needed to follow up with these course participants to learn how they translated their ALC learning into practice during the 2024-25 school year. Did ALC participants increase their agricultural lesson incorporation after having taken the course? Did they feel more confident in teaching these lessons as a result? Additional research could explore why this implementation was or was not successful. Further research could understand specifically what lessons or content areas were taught as a result of ALC participation. This research would inform agricultural literacy program developers’ creation of future professional development.

References

- Bellah, K. A., & Dyer, J. E. (2009). Attitudes and stages of concern of elementary teachers toward agriculture as a context for teaching across grade level content area standards. *Journal of Agricultural Education, 50*(2), 12–26.
- Burrows, M., Sorensen, T., & Spielmaker, D. (2020). Assessing the acceptance of incorporating agriculture into elementary school curriculum. *Journal of Agricultural Education, 61*(2), Article 2. <https://doi.org/10.5032/jae.2020.02358>
- Gill, K., Michel, M., & Leman, A. M. (2024, May). Teachers' motivations and barriers to integrating agricultural content into elementary school curricula. *Paper Presentation*. American Association for Agricultural Education, Manhattan, Kansas. <https://bit.ly/3F6eMIU>
- Magnusson, S., Krajcik, J., & Borko, H. (1999). (PDF) Nature, sources, and development of pedagogical content knowledge for science teaching. In *Examining Pedagogical Content Knowledge* (pp. 95–132). https://doi.org/10.1007/0-306-47217-1_4
- Miller, A. J., Warnick, B. K., Spielmaker, D. M., Pate, M. L., Judd-Murray, R., & Longhurst, M. L. (2025). Parents' value of their children learning about agriculture in school. *Journal of Agricultural Education, 66*(1), Article 1. <https://doi.org/10.5032/jae.v66i1.2773>
- Miller, A., Konakis, Z., Yoshikawa-Ruesch, E., Spielmaker, D., & Stewardson, D. (2022). Evaluating the Utah Agriculture in the Classroom preservice teacher seminar. *Outcomes and Impact Quarterly, 2*(4), 3. <https://doi.org/10.26077/b9b9-39a8>
- National Agriculture in the Classroom Organization. (2023). *Annual report*. <https://www.jotform.com/report/24169447908306418>
- Plunkert, M., & Curry, Jr., K. (2024, May). Implementing agricultural literacy in Pennsylvania elementary and middle schools: Perceptions of principals. *Paper Presentation*. American Association for Agricultural Education, Manhattan, Kansas. <https://bit.ly/3F6eMIU>