Agriculture in the Classroom: 2021 Virtual Connections Defined

Amelia J. Miller, M.S.
Graduate Student
Utah State University
amelia.miller@usu.edu

Jenny E. Bennett, M.Agr.
Graduate Student
Utah State University
a02376639@usu.edu

Michelle S. Burrows, Ph.D.
Assistant Professor
Utah State University
michelle.burrows@usu.edu

Applied Sciences, Technology & Education
Utah State University
6000 Old Main Hill
Logan, Utah 84322

Introduction

Agriculture in the Classroom (AITC) programs work to increase agricultural literacy in pre-kindergarten through twelfth-grade education (NAITCO, 2020a). Housed in 52 United States and territories, AITC programs' outreach is guided by the Agricultural Literacy Logic Model (Spielmaker et al., 2014). Programs use authentic, agricultural-based content to teach core curriculum standards across all subject areas. Each program submits an annual report to the national organization inventorying activity, including students and teachers reached, staffing, resources developed, new initiatives, average budgets, web analytics, and other relevant data. These reports are summarized at the organization's annual meeting and publicly shared on its website (NAITCO, 2020b). The COVID-19 global pandemic limited in-person interaction, particularly at schools across the United States, throughout 2020 and 2021. Previously, much of the AITC program outreach was conducted in-person (Spielmaker & Warnick, 2012; NAITCO, 2020c). Technology provided a way to connect through the shutdown period and will continue to drive societal change (Atske, 2021). This content analysis seeks to quantify virtual AITC interventions for students and teachers in 2021 and summarize the types of content virtually delivered to these audiences by state and territory AITC programs.

Theoretical Framework

The American Association of Agricultural Education's Research Values emphasize advancing public knowledge of agriculture, food, and natural resource systems through education at all grade levels (AAAE, 2023). Logic models are commonly used as a program planning and evaluation tool (Mertens & Wilson, 2019). The Agricultural Literacy Logic Model states pre-kindergarten through postsecondary teachers and students are main outputs of state AITC programs (Spielmaker, et al., 2014). The annual AITC program reports summarize interventions for these audiences. This conceptual content analysis seeks to understand virtual efforts offered by AITC programs in 2021.

Research Questions

1. How many AITC programs engaged virtually with students and teachers in 2021?

2. What types of interventions made up the virtual engagement for students?

3. What types of interventions made up the virtual engagement for teachers?

Methods

This conceptual content analysis reviewed existing data collected by the National Center for Agricultural Literacy (NCAL) summarizing AITC program outreach in 2021. The reports were submitted to NCAL via a JotForm survey with 51 state and territory AITC programs responding for this timeframe. Descriptive statistics were calculated. To address research questions two and three, long-answer responses were analyzed to count instances of selected terms. AITC program staff described virtually conducted student and teacher offerings in separate long answer questions. Three researchers grouped responses using open coding, then refined the codebook using axial coding to determine the final categories. Selective coding was used to sort the reported activities into final categories (Marshall et al., 2021). This selective reduction process narrowed virtual student outreach into nine categories and virtual teacher outreach into seven categories. Krippendorff's alpha (α) was calculated for both teacher and

student data to estimate intercoder reliability where $\alpha = 1$ is perfect reliability and $\alpha = 0$ is the absence of reliability (Hayes & Krippendorff, 2007).

Results

To address research question one, 45 of the 52 (88%) programs responded to the questions about virtual program offerings. Of the responding programs, 28 (62%) did provide virtual activities for students in the 2021 program year and 17 programs (38%) did not. Slightly more programs met virtually with teachers with 35 (78%) hosting virtual activities during this timeframe. To address research questions two and three, the types of student programs offered were coded into nine categories (Table 1). The most frequent types of programs were virtual field trips (14) with live presentations (11) and group activities (11) following. The Krippendorff's alpha for student virtual programming was high ($\alpha = 0.7196$), suggesting coders most often agreed on the categories of each program description. Teacher professional development (25) was the most frequent offering for this audience while presentations hosted with partnering organizations (4) and providing AITC resources (4) were next most popular (Table 2). The Krippendorff's alpha for teacher virtual programming was in the mid-range ($\alpha = 0.4858$) suggesting coders did not always agree.

Table 1

2021 Virtual AITC Student Programming

Virtual programming type	*f*
Field trips	14
Live presentations	11
Group activities	11
Live readings	6
Mailed lessons	3
Recorded presentations	3
Author visits	2
Readings recorded	2
Mailed activity	1

Note: Some AITC programs reported more than one type of program

Table 2

2021 Virtual AITC Teacher Programming

Virtual programming type	*f*
Teacher PD	25
Partner org. presentation	4
Resources provided	4
Coaching and mentoring	2
Farm tour	2
Seminar for college credit	2
After school/childcare providers workshop	2

Note: Some AITC groups reported more than one type of programming

Conclusions and Discussion

In 2021, most AITC programs (88%) did find ways to connect with teachers and students virtually during a year of limited in-person events. While these restrictions have lifted, virtual programming is not going away (Atske, 2021). It is recommended researchers evaluate the impacts of virtual programs to further understand the effectiveness of this AITC outreach modality. These impacts could be compared with those of in-person programming. Data should continue to be collected to understand which programs transitioned back to in-person and which remained virtual. Low coder reliability for teacher programming could be attributed to fewer category options and the high subjectivity of freeform long-answer responses (Hayes & Krippendorff, 2007). Researchers recommend the categories used in this study be used in future data collection, asking AITC program leaders to label each instance of outreach to increase consistency of reporting and ease of future analysis.

References

American Association for Agricultural Education (AAAE). (2023). *AAAE Research Values.*

Atske, S. (2021, February 18). Experts Say the 'New Normal' in 2025 Will Be Far More Tech-Driven, Presenting More Big Challenges. *Pew Research Center: Internet, Science & Tech*. https://www.pewresearch.org/internet/2021/02/18/experts-say-the-new-normal-in-2025-will-be-far-more-tech-driven-presenting-more-big-challenges/

Hayes, A. F., & Krippendorff, K. (2007). Answering the call for a standard reliability measure for coding data. *Communication Methods and Measures*, *1*(1), 77–89.

Marshall, C., Rossman, G. B., & Blanco, G. L. (2021). Designing qualitative research (7th ed.). SAGE Publications, Inc. (US). https://online.vitalsource.com/books/9781071817384

Mertens, D. M., & Wilson, A. T. (2019). *Program evaluation theory and practice* (2nd ed.). Guilford Press.

National Agriculture in the Classroom Organization (NAITCO). (2020a). *About Agriculture in the Classroom.* National Agriculture in the Classroom. https://www.agclassroom.org/get/about/

National Agriculture in the Classroom Organization (NAITCO). (2020b). *Affiliates.* National Agriculture in the Classroom. https://www.agclassroom.org/get/affiliates/programs

National Agriculture in the Classroom Organization (NAITCO). (2020c). *2020 Annual Report.* National Agriculture in the Classroom. https://cdn.agclassroom.org/nat/data/affiliates/report_annual.pdf

Spielmaker, D.M, Pastor, M., & Stewardson, D.M. (2014). A logic model for agricultural literacy programming. *Proceedings of the 41st annual meeting of the American Association for Agricultural Education*, Snowbird, UT. Retrieved from http://aaaeonline.org/Resources/Documents/National/Poster%20and%20Research%20Schedule,%20National2014.pdf

Spielmaker, D. M., & Warnick, B. K. (2012). *A trend analysis of National Agriculture in the Classroom Program Data: 2006-2010*. National Agriculture in the Classroom Organization. https://cdn.agclassroom.org/nat/data/get/trend_analysis_paper.pdf