

United States Department of Agriculture
Project Initiation

Project Data for Accession Number 1033908

Project Title

STEM into Ag Literacy: Professional Development for Teachers to Foster Future Agricultural Professionals

Project Details

Sponsoring Institution National Institute of Food and Agriculture	Project Status ACTIVE
Funding Source NIFA Non Formula	Grant Year 2025
Grant No. 2025-67037-45074	Cumulative Award Amt. \$500,000.00
Proposal No. 2024-11034	Multistate No. (N/A)
Project Start Date Sep 01, 2025	Project End Date Aug 31, 2028
Program Code [A7501] Professional Development for Agricultural Literacy	

Project Director

Spence, P.

Recipient Organization

NORTH CAROLINA AGRICULTURAL AND TECHNICAL STATE UNIVERSITY
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Performing Department

(N/A)

Non Technical Summary

"STEM into Ag Literacy (SAL): Professional Development for Teachers to Foster Future Agricultural Professionals" hosted at North Carolina A&T State University in partnership with Alabama A&M University will develop a curriculum (modules) supporting AFRI's professional development for Agricultural Literacy for K-14 educational professionals. The multi-disciplinary, institutional team will provide 20 secondary teachers (grades 6-12) per year for a total of 60 teachers over a three-year period with professional development to enhance their agriculture literacy and STEM knowledge to be practiced in their classrooms and laboratories. Eight high-quality training modules will be created and scaffolded using the Understanding by Design (UbD) framework to allow teachers to learn, practice, and then integrate FANH Sciences and STEM into their classrooms and laboratories while also enhancing their agriculture literacy with the use of digital tools. Teachers will complete the modules synchronously via a learning management system (Google Classroom), following the Association of College and University Educators (ACUE) Framework.

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These three objectives will guide the SAL program: (1) provide high-quality educational content to empower Teachers grade 6-12 with knowledge of water quality, soil science, food science, and animal science while enhancing their skills in data management, research, communication, and digital technology; (2) inspire Teachers grades 6-12 through engaging activities and hands-on experiences, helping them to acquire a greater interest in developing their teaching competencies in the Food, Agriculture, Natural Resources and Human (FANH) Sciences and Science, Technology, Engineering and Mathematics (STEM); and (3) offer participants a mentoring program, while introducing them to the vast degree programs and careers in the FANH sciences and STEM fields. Twenty-secondary teachers per year will engage in a hybrid two-week summer program and receive mentorship from the program team, university and industry professionals during the academic year. This program will address five AFRI priority areas, 1-plant health and production and plant products; 2-animal health and production and animal products; 3-food safety, nutrition, and health; 4-bioenergy, natural resources, and environment; and 5-Agriculture systems and technology. The main outcome is to increase secondary teachers' knowledge of FANH Sciences and STEM fields while developing a database of resources produced by teachers who participate in the program to share with non-participating teachers with secondary students as end beneficiaries. Integrating innovative systems (i.e., synchronous and asynchronous technologies) provides teachers with technological resources to build a skilled workforce.

Animal Health Component

Animal Health Component: 0%

Research Effort Categories

Basic	0%
Applied	0%
Developmental	0%

Classification

Knowledge Area (KA)	Subject of Investigation (SOI)	Field of Science (FOS)	Percent
903	6010	3020	50%
903	6099	3020	50%

Knowledge Area

[903] Communication, Education, and Information Delivery

Subject Of Investigation

[6010] Individuals (as workers, consumers, members of society)

[6099] People and communities, general/other

Field Of Science

[3020] Education

Keywords

Mentoring, Professional Development, STEM, Training, Agriculture Literacy, K-12 Professionals

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Goals / Objectives

The "STEM into Ag Literacy" (SAL) program will offer a hybrid two-week summer professional development program that will provide hands-on, experiential learning experiences at North Carolina Agricultural and Technical State University (NC A&T) and Alabama A&M University (AAMU). The goal of the "STEM into Ag Literacy"(SAL) program is to deliver a curriculum (modules) to provide professional development focused on Agricultural Literacy/STEM for 6-12 grade teachers. The program consists of three objectives, which are to: Provide high-quality educational content to empower 6-12 grade teachers with knowledge of water quality, soil science, food science, and animal science while enhancing their skills in data management, research, communication, and digital technology; Inspire 6-12 grade teachers through engaging activities and hands-on experiences, helping them to acquire a greater interest in developing their teaching competencies in Food, Agriculture, Natural Resources and Human Sciences (FANH) Sciences and Science, Technology, Engineering and Mathematics (STEM); Offer 6-12 grade teachers a mentoring program while introducing them to the vast degree programs and careers in the FANH Sciences and STEM.

Project Methods

Objective 1. Provide high-quality educational content to empower Teachers grade 6-12 with knowledge of water quality, soil science, food science, and animal science while enhancing their skills in data management, research, communication, and digital technology. "STEM into Ag Literacy" (SAL) program will offer a hybrid two-week summer professional development program that will provide hands-on, experiential learning experiences at North Carolina Agricultural and Technical State University (NC A&T) and Alabama A&M University (AAMU). Eight high-quality training modules will be created and scaffolded using the Understanding (UbD) Framework to allow teachers to learn, practice, and then integrate FANH Sciences and STEM fields into their classrooms and laboratories while also enhancing their agriculture literacy with the use of digital tools. The first week will include educating and mentoring the teachers. Hybrid, synchronous workshops will be held from 9 am to 4pm EST Monday-Friday. A Pre-Test Survey (Qualtrics) will be administered prior to completing each module. Each day will start with a check-in activity to help teachers ground themselves and prepare to engage with the tasks ahead. A post-survey will be administered at the end of each module. Each day will conclude with a check out activity that will prepare teachers for a smooth transition to complete the self-reflection homework assignment designed to allow teachers to reflect on the concepts discussed, skills learned, implementation to enhance in their existing curriculum. Objective 2. Inspire Teachers grade 6-12 through engaging activities and hands-on experiences, helping them to acquire a greater interest in developing their teaching competencies in Food, Agriculture, Natural Resources and Human Sciences (FANH) Sciences and Science, Technology, Engineering and Mathematics (STEM). Prior to attending the program, each teacher will receive a kit with digital tools, environmental sampling tools, books, and lesson-focused resources to complete SAL activities. Teachers who opt to participate virtually will receive their kits in the mail before the program starts. Teachers will be exposed to a diverse set of digital tools to enhance their agriculture literacy to foster future agricultural professionals. Modules will be administered synchronously via a learning management system (Google Classroom) using the Association of College and University Educators (ACUE) Framework. Teachers will immerse themselves in experiential learning activities focused on water quality, soil science, food science, and animal science while enhancing their skills in data management, research, communication, and digital technology. The second week will be asynchronous and with self-paced instruction to give teachers the opportunity to complete their final project with the support of a mentor and to deliver their project (infographic lesson plan) to their peers, mentors, and program team. Each teacher will be required to search for sound science evidence on an agriscience topic of their choice and use Canva to create an infographic lesson plan discussing their topic and how it can be implemented in their existing curriculum. Infographics will be uploaded to the portal and shared via Padlet near the end of the second week. Each teacher engaged in a double-blind peer-review process to evaluate the infographics and provide feedback using a scoring rubric. The feedback will be shared with each teacher so they can use the suggestions to improve their infographic lesson plans. A Show-and-Tell session on the last two days of the program. Virtual presentations will be delivered synchronously via zoom or google meet. Each teacher will deliver a 10-15-minute presentation of their infographic lesson to the group, during

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which they will share what they learned during the summer program during Week 1, exhibiting skills learned during the communication, technology, and research modules. Teachers will earn "digital certification" (SAL badge) and a stipend upon full SAL completion. The digital certification will provide continuing education credits (CEUs) and allow participants to broaden avenues to acquire and demonstrate, document, and display the skills learned. Offer Teachers grade 6-12 a mentoring program while introducing them to the vast degree programs and careers in the FANH Sciences and STEM. Teachers will continue to receive support beyond the summer program and access to resources on Google Classroom. The infographics developed by teachers will be available for download to share with their colleagues and students as a handout. A Google Groups listserv and GroupMe will be created to serve as a community among teachers, mentors, the program team, and faculty, as well as to share resources in their classrooms and laboratories for professional development opportunities and mentorship. Teachers will be given the opportunity to attend a follow-up meeting with the program team, mentors, and their peers (cohort) 1-3 times to share their experiences with implementing the practices in their classrooms and laboratories learned during the program. During these virtual sessions, teachers will be able to ask questions, voice concerns, and share successes and failures while implementing their new skills in their classrooms and laboratories. Teachers will complete a follow-up survey to provide feedback from colleagues and program facilitators.