Integrating Service-Learning SAEs into Teacher Preparation Through Hydroponic Food Production

Introduction/Need for Innovation or Idea

Within the implementation of SAE for All in 2019, service-learning programs were highlighted as key immersion opportunities where "one or more students plan, conduct, and evaluate a project designed to provide a service to the school, public entities, or the community" (National Council for Agricultural Education [NCAE], n.d., p. 22). Service-learning SAEs have become increasingly popular among school-based agricultural education (SBAE) teachers because they offer flexibility, align easily with course content, and allow teachers to supervise multiple students through SAEs simultaneously (Ford et al., 2025). Models of service-learning that include immediate reflection have been shown to enhance students' self-perceived leadership abilities and their sense of contribution to their communities (Stafford et al., 2003). Toombs et al. (2022) found that engaging pre-service teachers in active projects strengthened their confidence in designing and implementing SAE programs within the SBAE classroom. Furthermore, anecdotal evidence from agriculture teachers in Georgia suggests that a lack of knowledge exists regarding service-learning SAE projects and how to engage students in these immersion SAE categories. Therefore, providing pre-service agriculture teachers with the opportunity to participate in a service-learning project during their teacher preparation program is essential for supporting the effective implementation of this SAE category in their future classrooms.

How It Works/Methodology/Program Phases/Steps

In Spring 2025, the Department of Agricultural Leadership, Education and Communication at the University of Georgia received a grant from the Office of Sustainability to enhance food security and promote sustainable agriculture through education and efficient urban food production. Using these funds, 15 hydroponic towers were purchased as instructional tools for use in courses within the agriculture teacher preparation program. Pre-service teachers participated in setting up, planting, and harvesting crops from the hydroponic systems while engaging in lessons on sustainable and urban agriculture as a means to address food security.

Continuing into Fall 2025, students enrolled in AGED 4340: Developing Community Programs in Agricultural Education began to learn about implementing the Agricultural Education Model, including FFA and SAE components. During the preceding summer, faculty established a partnership with the Food Bank of Northeast Georgiato create a collaborative service-learning opportunity. Under this agreement, students supported the Food Bank by donating lettuce grown in the classroom hydroponic systems and completing a minimum of 10 volunteer hours with the organization over the semester. This project serves as a model service-learning SAE for pre-service teachers, allowing them to experience the same process their future students would—planning a program, committing to intentional service learning, and maintaining records using systems such as the Agricultural Experience Tracker (AET). At the end of the semester, each pre-service teacher presents a 5–10 minute reflection on their

experience, the competencies they developed, and their meaningful contributions to the Food Bank through their service.

Results to Date/Implications

The service-learning SAE project is currently in its initial implementation phase. As of mid-semester, seven pre-service teachers have collectively documented 41 hours of service in AET. The first harvest from the classroom hydroponic systems yielded 15 gallon-sized bags of lettuce, all of which were donated to the Food Bank of Northeast Georgia. These early results demonstrate both the feasibility and immediate community impact of integrating hydroponic systems into pre-service agricultural education coursework. The hands-on nature of the project has provided students with authentic opportunities to engage in experiential learning and community service while reinforcing key components of the Agricultural Education Model. Continued monitoring of student engagement, reflection, and community partnerships will help refine the project model and inform how service-learning SAEs can be sustainably embedded into teacher preparation programs. Initial feedback indicates strong potential for this initiative to enhance students' understanding of program planning, record-keeping, and the broader social responsibility of agricultural educators.

Future Plans/Advice to Others

Looking ahead, we plan to continue strengthening the partnership with the Food Bank of Northeast Georgia while expanding the hydroponic systems to include additional crop varieties and instructional applications. In future semesters, pre-service teachers will have the opportunity to take the hydroponic systems with them to their student teaching placements, allowing them to extend the service-learning project into their own classrooms and communities. This will provide valuable experience in managing classroom-based agricultural projects, facilitating student engagement, and promoting community partnerships. For other programs interested in implementing a similar model, it is helpful to start small, build strong local partnerships, and intentionally connect the project to existing coursework and program outcomes. Encouraging reflection and emphasizing both the educational and community impact of the work can help ensure the project is meaningful, sustainable, and scalable to meet the needs of individual pre-service teachers as they enter the classroom. Beyond this project, plans are in place to continue it through a grant project that would enhance a food-to-table program in local K-12 public schools.

Costs/Resources Needed

This project required approximately $5,000 to purchase the hydroponic towers and the materials needed for their maintenance and operation. However, similar models can be implemented at a lower cost depending on available resources and program goals. Many hydroponic systems can be built using inexpensive or recycled household materials, making them accessible for teacher preparation programs with limited funding. Incorporating a system-building component can also serve as a valuable learning opportunity for pre-service teachers, allowing them to apply problem-solving and resource management skills while designing a mock SAE project. Programs may also seek support through local grants, school partnerships, or community sponsors to offset costs and ensure the project's long-term sustainability.

References

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