

**Cultivating The Pipeline: Addressing Agricultural Education Gaps within Scotland's
STEM Career Learning Pathways**

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Need for Idea

The national FFA organization defines agricultural education as a pathway providing students with learning opportunities to expand their knowledge on topics like business, environmental and natural resources, science, as well as plant and animal production (Aarup, 2025). Such a learning pathway is commonly known to impact consumer and youth agricultural literacy (Aarup, 2025). Thus, the United States has provided a plethora of opportunities for agricultural integration in the classroom, formally and informally (Aarup, 2025).

These opportunities, however, are not widely available globally. According to Brett (2022), the Curriculum for Excellence (CFE) in Scotland presents agriculture through an “anti-rural” lens, which only highlights the industry as a negative occupation impacting the environment. Presenting a biased outlook does future consumers and the Scottish job market a disservice. Scotland STEM education has an opportunity to evolve and uphold the country’s agricultural career pipeline to maintain food systems infrastructure. As of 2025, Scotland’s agricultural sector includes 66,800 citizens, a 0.9% decrease from 2024 and a 0.5% decrease from the five-year average (Scottish Census, 2025). This program intends to develop an international agricultural education experience through career trajectory integration. If we hope to see a higher number of students with a well-developed individual interest in agriculture, we should employ tools in STEM classrooms of all disciplines where they can first have a triggered situational interest to grow from (Hidi, 2006).

How it Works

University of Kentucky, in conjunction with Scotland's Rural College, compiled curriculum supplements with an agricultural context to coincide with STEM career learning sectors in Scotland. To be considered for curriculum supplements, the resources must have an international appeal or an appeal to Scotland’s educational initiatives. Specifically, these resources must fit at least one of the 12 career sectors, as highlighted by the “Grow Scotland” campaign (STEM Nation, n.d.). Materials gathered consist of complete lesson plans along with multimodal resources to implement into the classroom, with the opportunity to make cross-curricular connections. Resources were gathered from a variety of organizations including National Agriculture in the Classroom and American Farm Bureau Foundation for Agriculture. Following implementation, STEM educators will be equipped with a binder to assist in the application of the agricultural context to their topics of study.

Additionally, A team of undergraduate and graduate students from University of Kentucky with a background in agriculture education or the National FFA organization were assembled to help gather evidence in support of the initiative. With the incorporation of college scholars, it provides an opportunity for future educators to gain an international perspective of agricultural education which can strengthen their teaching pedagogy skills and stories. Once resources are compiled, they will be presented to Scotland educators and officials for feedback and approval.

Results and Implications

While this project is still relatively new, results thus far prove robust potential for growth and international establishment. To date, over 25 scholarly articles and curricula have been collected over the 12 established STEM pathways between two graduate and one undergraduate

students in community leadership development at the University of Kentucky. An additional and vital aspect of this initiative is international collaboration and partnerships. Currently, the PI is in association with an established partner from Scotland's Rural College and has collected preliminary research regarding Scotland's STEM educators' adherence to national performance standards, agricultural science production standards, and real-world connections for students. This collaborative effort not only provides research opportunities in other countries but also provides international context and development opportunities for the University of Kentucky.

Future Plans

While still in development, this project's impact is projected to be vast and profound for national and international agricultural education initiatives. Specifically, in the realm of agricultural education, this sets out a framework for education systems to integrate agriscience in multiple career pathways as opposed to marginalizing an industry as robust as agriculture. Direct future plans include the continuation of graduate and undergraduate students completing national and international databases for STEM and agricultural curricula, as well as national and international grant applications.

Cost and Resources Needed

This project aims to utilize United States Department of Agriculture grant funding, specifically their "Education and Workforce Development" funding opportunity. This research initiative readily aligns with the following program priorities (a) Professional Development for Agricultural Literacy (b) Agricultural Workforce Training at Community Colleges (c) Food and Agricultural Non-formal Education, and (d) Research and Extension Experiences for Undergraduates. These priorities aim to develop agricultural and food literacy, develop workforce readiness, improve prosperity in rural and urban populations, and promote research and extension experiences for undergraduate students. This proposed research initiative will be submitted with the March 16th grant cycle. Costs associated with this project include travel for students and PI, as well as supplemental materials.

Resources

- Aarup, S. (2025). *The importance of agricultural education*. The National FFA Organization. <https://www.ffa.org/ffa-in-the-usa/the-importance-of-agricultural-education/>
- Brett, S. N. (2022). *Examining the opportunities for agricultural experiences as part of Scottish secondary school pupils' learning under Curriculum for Excellence* [Doctoral dissertation, University of Glasgow]. University of Glasgow Enlighten Theses. <https://theses.gla.ac.uk/82734/>
- Hidi, S., & Renninger, K. A. (2006). The Four-Phase Model of Interest Development. *Educational Psychologist*, 41(2), 111–127. https://doi.org/10.1207/s15326985ep4102_4
- Scotland Census. (2025, June). Results from the Scottish Agricultural Census. <https://www.gov.scot/publications/results-from-the-scottish-agricultural-census-june-2025/pages/key-points/>
- STEM Nation. (n.d.). *STEM careers*. Glow Blogs. <https://blogs.glowscotland.org.uk/glowblogs/stemnation/stem-careers/>