

Available and Desired Agricultural Laboratories in Indiana SBAE Programs

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Introduction/Need for Research

SBAE teachers use a variety of instructional spaces for laboratory-based instruction. Availability of laboratory teaching spaces can vary based on location and school program. Prior research indicates that the majority of available agricultural teaching laboratories include agricultural mechanics facilities and greenhouses (Shoulders & Myers, 2012), and that while the focus of SBAE may have evolved over time, program teaching facilities have remained somewhat static (Twenter & Edwards, 2017). As faculty at Purdue University prepared to offer a new course in Laboratory Teaching Practices in Agricultural Education for preservice SBAE teachers, it was necessary to take inventory of the availability of agricultural teaching laboratory spaces in Indiana SBAE programs.

Conceptual Framework

To appropriately align the new Laboratory Teaching Practices course with present needs of the Indiana Agricultural Education workforce, it was necessary to first identify desired learning outcomes, following a backwards design curricular model (Wiggins & McTighe, 2005). To develop these learning outcomes, we first needed to determine the current status of teaching laboratory spaces in Indiana Agricultural Education programs. To do so, we conducted a needs assessment aligned with the Lee Educational Needs Assessment Model (1973). In this model, Lee described educational needs as being the difference between the desired learning outcomes and current accomplishments of a program. Lee described three major phases: 1) Identify desired results, 2) Assess how well students are achieving the desired results, and 3) Begin problem-solving to address gap in performance.

Methods

This study used a non-experimental descriptive survey design to identify agricultural laboratory teaching spaces available to Indiana SBAE teachers. Data reported in the current study are part of a larger research project exploring how Indiana SBAE teachers utilize laboratory teaching spaces. All Indiana SBAE teachers for the spring 2021 semester were considered as the population of this study (N = 316). Contact information for all Indiana SBAE teachers was obtained from the Indiana Agricultural Education email Listserv, which is maintained by [UNIVERSITY] faculty members. The survey instrument consisted of four sections: 1) Classes Taught, 2) Laboratory Spaces, 3) Supports and Barriers, and 4) Demographics. This abstract focuses on data derived from sections 1, 2, and 4. The survey instrument was pilot tested in February 2021 among 14 student teachers at Purdue University. Results of the pilot test suggested that the survey constructs were reliable with Cronbach's alpha ranging from .88 to .90. Survey responses were collected via an email-based survey utilizing Dillman's (2014) Tailored Design Method. Participants received individualized emails inviting them to participate in the survey instead of a generalized message broadcast on the statewide Ag Ed listserv. Participation in the survey was incentivized through the use of an opt-in at-random drawing for up to five participants to have the cost of their individual conference registration paid for the statewide summer Ag teacher conference.

The purpose of this study was to explore the availability of agricultural teaching laboratory spaces in Indiana SBAE programs. This study was guided by the following objectives:

1. Identify courses currently taught by Indiana SBAE teachers.
2. Describe agricultural laboratory teaching spaces regularly used by Indiana SBAE teachers.
3. Identify agricultural laboratory teaching spaces desired by Indiana SBAE teachers.

Results/Findings

For the purposes of data analysis for this study, a completed response was one in which 80% of the survey had been completed. One hundred six participants consented to participate in the study. After removing responses that had completed anywhere between 5% and 78% of the study, there were 79 usable completed responses for a final response rate of 25%. Frequencies and descriptive statistics were run using SPSS © version 24. According to the results of this survey, the top five courses most regularly taught by participants included Animal Science (78.5%); Introduction to Agriculture, Food, and Natural Resources (78.5%); Agribusiness Management (58.2%); Advanced Life Sciences: Animals (54.4%); and Agriculture Power, Structure, and Technology (51.9%). This is unsurprising given typical student interest in Animal Science, the state Career and Technical Education funding structure, and new Programs of Study requirements. Programs enrolling students in ALS Animals, Animal Science, and Agribusiness Management are all deemed to be moderate value courses based on workforce projection needs, so schools are awarded \$400 per student enrolled. Ag Power courses earn schools \$680 per student enrolled as it is deemed to be a high value workforce area (Indiana Workforce Development, 2020).

The top five most regularly accessible laboratory teaching spaces for Indiana SBAE teachers included 1) Ag Mechanics Shop Facility (64.6%), 2) Greenhouse (60.8%), 3) Test Plot/Field Crops (35.4%), 4) Landscaping Area (27.8%), and 5) Aquaculture Tank/Pond (26.6%). It appears that the majority of respondents in this study work at programs which have Ag Mechanics facilities or Greenhouses supporting previous work by Shoulders and Myers (2012) and Twenter and Edwards (2017). As Twenter and Edwards (2017) noted, facilities such as these reflected the historical roots of vocational agriculture programs but may need to be updated to meet the needs of future agricultural education efforts. Although the top two courses taught by a majority (78.5%) of respondents (Animal Science and Intro to AFNR), animal science related facilities were not readily accessible to participants.

When asked to articulate which facilities would be desirable to add to existing program infrastructure, participants responses reflected this discrepancy, with 40.5% of respondents desiring to add an equine or livestock facility, and 34.2% requesting a small animal or veterinary facility. Other highly desirable facilities included a food science laboratory (35.4%), a greenhouse (25.3%), garden (25.3%), and aquaculture tank/pond (20.3%).

Conclusions, Recommendations, & Impact on Profession

Based on the results of this survey, it will be necessary for Purdue Agricultural Education faculty to design instructional experiences for preservice teachers that prepares them to meet the instructional and management needs of existing Ag Mechanics and Greenhouse facilities. They will also need to focus on how to incorporate how to teach in hands-on ways without necessarily having access to animal facilities. Additional considerations include preparation of future educators to utilize existing facilities within their local communities if the school does not have suitable laboratory facilities. Continued research on how in-service agriculture teachers are able to navigate these pedagogical and programmatic demands will be necessary to conceptualize how SBAE can continue to provide contextualized learning that meets the needs of the local community, while also preparing students to enter the 21st century workforce.

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