Research Poster

Experimental Studies in School-based Agricultural Education from 2006-2016: A Synthesis of Literature in the Journal of Agricultural Education

Blake C. Colclasure & Andrew C. Thoron
University of Florida

310 Rolfs Hall
PO Box 110540
Gainesville, FL 32611
(217-898-2036)
bcolclasure@ufl.edu

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Introduction

Experimental and quasi-experimental research on the effectiveness of curriculum design and teaching methodology in school-based agricultural education programs (SBAE) is vital to establish a wide-body of empirical evidence that can support best practices in modern SBAE. The AAAE National Research Agenda proclaimed "utilizing research to draw a connection between the impacts of our academic programs and student preparedness and success is essential for survival and sustainability of agriculture [education]" (Roberts, Harder, & Brashears, 2016, p. 32). In an era of standards-based and data-driven education, academic programs must demonstrate educational merit. Agricultural education must be well positioned to justify their worth through empirical data, by using experimental research to authenticate measurable student outcomes (Thoron & Myers, 2011). Due to the well pronounced need for experimental and quasi-experimental research in SBAE, this study attempted to investigate the quantity, quality, and recommendations of recent research of such designs that were published in the *Journal of Agricultural Education (JAE)* from the years 2006 through 2016. The following research questions guided the investigation of literature for this study: (1) How many studies involving experimental or quasi-experimental research in school-based agricultural education were conducted and published? (2) What was the duration of treatment methods implemented in the experimental or quasi-experimental research designs? (3) How many participants were sampled in the experimental or quasi-experimental research designs? (4) What trends in research foci and results were common in the experimental or quasi-experimental designs? (5) What trends in research recommendations were suggested by authors of these studies?

Methodology

This study used a research synthesis as its design. The researcher examined studies in school-based agricultural education and included all research that could be described as either experimental or quasi-experimental and published in the premier journal for agricultural education – *Journal of Agricultural Education*. Furthermore, the researcher included only literature published from 2006-2016 (volumes 47 through 57). Each publication that met the parameters of this study was investigated and content for each study was organized in a matrix. *Microsoft Excel*® was used as recording software to complete a matrix for each study that included: (a) the title of the study; (b) the authors of the study; (c) the year of the study; (d) the length of treatment in the study; (e) the number of participants involved in the study; (f) the treatment construct; and (g) the results of the study. The researcher investigated question one by analyzing the total number of studies that met the research parameters by year. Question two was investigated by determining the lengths of the treatments used in the studies. Research question three was investigated by comparing the number of participants which data was obtained for in each study. Research question four was investigated by coding the research and categorizing the purpose of each study into consistent themes. Research themes such as testing the effect of teaching methods, testing the effect of laboratory design, testing the effect of technology, and testing the effect of new or enhanced curriculum were used. Lastly, research question five was investigated by coding researcher recommendations found in concluding sections into consistent themes.

Results

Six hundred and seventy-six articles were published in the *Journal of Agricultural Education* from 2006 through 2016. Of these articles, 35 met the parameters considered to be an experimental design (Ary, Jacobs, Sorenson, & Walker, 2014), resulting in approximately five percent of published articles in *JAE*. An average of slightly more than three articles per year were published. The number of publications per year ranged from a low of two in the years 2007, 2008, 2009, and 2010 to a high of six in the year 2014. Thirty-two of 35 articles included a specific duration for the length of treatment that was used in the study. Nine of the 32 studies had a treatment duration of five instructional days or less, followed by six studies that had a duration between six and ten days. Four studies had a treatment duration that ranged from 56 to 60 instructional days. Three studies used a semester as a unit for treatment duration which was converted to 90 instructional days and three studies used a year-long treatment duration which was converted to 180 instructional days. The average study was slightly longer than 40 instructional days. Thirty-four of the 35 studies analyzed in this review include the number of student participants in which data was collected. The number of participants in the studies ranged from 33 to 672. Nine studies had a range of participants from 51-100. Ten studies had a range of participants from 101-200 and six studies included between 401 and 450 participants. The mean number of participants was roughly 223 students.

Research question four sought to establish trends within areas of investigation for the research areas published. Through coding each study's primary area of investigation, several trends in research emphasis were revealed: (a) studies that investigated curriculum (n=14); (b) studies the investigated the use of technology (n=3); (c) studies that investigated laboratory approaches (n=3); and (d) studies that investigated a method of active learning (n=11). Research question five sought to synthesize researcher recommendation involving future studies. Through coding each publication's recommendations section, five common themes in research recommendations were found: (a) future experimental studies should extend treatment duration; (b) future experimental studies should include larger sample sizes; (c) future experimental studies should address students' long-term outcomes; (d) professional development should be utilized to ensure that instructors deliver treatment appropriately; and (e) future studies in teaching methodologies and curriculum design should investigate student motivation, interest, and self-efficacy.

Conclusions & Implications

It is recommended that further investigation on experimental studies in school-based agricultural education continue beyond the *Journal of Agricultural Education*. This report did not analyze the statistical significance of findings found within studies nor if studies followed proper research design and reliable instrumentation. Measures such as comparing effect size could increase the rigor of future syntheses of literature in experimental education (Abrami & Bernard, 2007). Future experimental research in SBAE education should include random selection and true experimental design whenever possible (Blackburn & Robinson, 2016; Pearson, Young, & Richardson, 2013; Haynes, Robinson, & Key, 2012). Future quasi-experimental research should also make every effort to use best practices in education research. This synthesis calls to question if the quality and quantity of published experimental or quasi-experimental research studies in school-based agriculture education are adequate in meeting the needs of the profession as discussed in the National Research Agenda. If not, why are we falling short and how can researchers meet these needs?

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