Research Poster

Understanding Inquiry-Based Learning from an Instructor Perspective

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Introduction

The way instructors disseminate and implement inquiry-based learning activities has an impact on students' learning (Maab & Artigue, 2013). The inquiry-based approach to instruction is accompanied with challenges (Edelson, Gordin, & Pea, 1999). Teachers' perceptions of inquiry-based learning will influence their implementation of inquiry-based activities. Only limited research has been conducted examining agricultural instructors' perceptions of how inquiry-based learning is defined. With numerous different definitions of inquiry-based learning, it is important to understand how agricultural instructors define inquiry so that appropriate terminology can be used when conducting related studies. This study addressed the need for research related to meaningful, engaged learning in all environments, Research Priority Four of the American Association for Agricultural Education National Research Agenda 2016-2020 (Roberts, Harder, & Brashears, 2016). The purpose was to describe how agricultural instructors define inquiry-based learning. The objectives were: (a) describe agricultural instructors' definition of inquiry-based learning; and (b) determine how agricultural instructors believe inquiry-based learning differs from problem-based and experiential-based learning.

Theoretical Framework

Based on the current inquiry-based learning literature, the theoretical framework of this study is rooted in the theory of constructivism. Piaget's Theory of Cognitive Development and Vygotsky's Sociocultural Theory form the foundation of constructivism. These two theories indicate students' knowledge schemes are modified through activities, problem solving, and discussion (Schunk, 2004; Driver, Asoko, Leach, Mortimer, & Scott, 1994). Students use constructivism in science classrooms to interpret their experiences, which leads to the discovery of the meaning and development of understanding (Palmer, 2005). Teaching environments based on constructivism give students autonomy in learning which motivates them to learn (Sckunk, 2004). Teaching strategies based on constructivism provide students with experiences, which allow them to develop their own knowledge schemes. Discovery learning, inquiry-based learning, and peer-assisted learning are just a few examples of teaching strategies rooted in constructivism (Sckunk, 2004). Autonomy in inquiry-based learning allows learners to construct their own representation of material, select what information is relevant, and interpret their findings based on their existing knowledge of the subject (Shuell, 1993). Understanding how teachers perceive teaching approaches, such as inquiry-based learning, will allow the development of strategies to encourage increased use of these methods in the classroom.

Methodology

This study used an online survey to collect information regarding how secondary and post-secondary educators define inquiry-based learning. The participants of the study were secondary and post-secondary educators known to the researcher who had expressed interest in inquiry-based learning. A recruitment letter explaining the purpose of the study was sent out to 30 secondary and 30 post-secondary educators, with 31 volunteering to participate. The 31 who volunteered consisted of 19 post-secondary educators and 12 secondary educators. A link to the questionnaire, hosted by Qualtrics, was emailed to participants. A five-contact e-mail strategy, as suggested by Dillman, Smyth, and Christian (2014), was utilized. The six-question survey allowed the researcher to gain a description of the respondents experience with inquiry-based learning and obtain textual responses from each respondent describing how they defined inquiry-based and how they perceived the inquiry-based approach differed from other approaches. The

open-ended responses were analyzed using the constant comparative method (Glaser, 1965). Trustworthiness was ensured by having a second researcher analyze the data for emerging themes in consultation with the lead researcher.

Results

Participants reported a wide range of experience with the inquiry-based approach, four participants reported less than five years experience, 11 participants reported between years six and 15 years of experience, while 16 participants reported over 16 years experience. Courses taught by post-secondary instructors included agricultural education, agricultural leadership, teaching methods, and curriculum design. Secondary instructors reported teaching courses such as introduction to agriculture, agriscience, animal science, veterinary topics, horticulture, and agricultural mechanics. Twenty-nine of the participants reported some type of professional development related to inquiry-based teaching.

The first objective was to determine how agricultural instructors define inquiry-based learning. In examining the responses from secondary and post-secondary instructors the following themes emerged: student-driven, question guided lesson, problem solving, no expected outcomes, and hands-on. Within the responses related to inquiry-based learning being a question-guided lesson, there were discrepancies on whether the questions were teacher created or student created. Responses indicated that inquiry-based learning is student-centered, allowing students' interests to guide their learning. The second objective of this study was to determine how agricultural instructors perceive inquiry-based learning to differ from problem-based and experiential learning. Responses to this question revealed respondents perceived the theme of inquiry-based learning and problem-based learning to be similar. However, inquiry-based learning was expressed as involving students posing the questions while problem-based learning was expressed as involving a teacher posed question. Themes attributed directly to experiential based learning included hands-on learning, which could be used to solve problems or develop skills, and utilizing concrete and abstract experiences along with reflections to develop understanding. Inquiry-based learning was attributed more to the ability of the student to determine what problem to solve, instead of being given the problem.

Conclusions and Discussion

Inquiry-based learning can be misunderstood; it is possible for instructors to perceive they are utilizing this approach when in fact they are not. Understanding how instructors define inquiry-based learning, especially those who are familiar with the approach as in this study, is essential for the benefits of inquiry-based learning to be studied. Descriptions of inquiry-based learning by respondents were in agreement with the "Essential Features of Classroom Inquiry and their Variations" chart from the National Research Council (2000) which postulates that inquiry-based lessons can be teacher driven where the teacher poses the question, or student driven allowing the student to create the question. According to the National Research Council (1996), inquiry-based learning involves making observations and posing questions then using tools to gather, analyze, and interpret data. Inquiry-based learning allows students to discover different possibilities. Some educators described inquiry-based learning as hands-on; however, there can be hands-on activities that do not require students to pose any questions or discover any information on their own. Findings from this study reveal that individuals with experience in using this approach associate the approach with problem-based, project-based, and experiential approaches. Thus, in studies that strive to identify benefits of inquiry-based approaches it is critical to use these terms as a means of verifying the teaching methods used. Strategies to encourage instructors to utilize the inquiry-based approach should also use these terms.

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