Research Poster

Students' Perceptions of Inquiry-based Learning in the High School Agriculture Classroom

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Introduction

Inquiry-based learning opportunities are those activities allowing students to pose questions, make observations, and formulate explanations for their findings (National Research Council, 2000). The inquiry-based approach to instruction has been reported as valuable but accompanied with challenges (Edelson, Gordin, & Pea, 1999). In fact, the way in which inquiry-based learning is disseminated and implemented impacts learning (Maab & Artigue, 2013). Minner, Levy, and Century (2009) found inquiry-based learning had a positive effect on the learning of content, retention of content, and the conceptual understanding of students. Numerous studies examine teachers' perceptions of inquiry-based instruction and its benefits. However, only limited research has investigated perceptions of agricultural students regarding impact of inquiry-based methods on educational growth. 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 of this study was to determine perceptions of high school students transitioning to and using inquiry-based instruction in their agriculture classes. The objectives were as follows: (a) describe students' perceptions of the effectiveness of inquiry-based learning; and (b) describe students' perceptions of the impact of inquiry-based learning on critical thinking.

Theoretical Framework

The theoretical framework was drawn from literature on the inquiry-based learning approach. Inquiry-based learning is rooted in the theory of constructivism. Constructivism is rooted in the works of Piaget and Vygotsky's theories that students' knowledge schemes are modified through activities, problem solving, and discussion (Driver, Asoko, Leach, Mortimer, & Scott, 1994; Schunk, 2012). Learners involved in inquiry-based learning construct their own mental representation of material, selecting relevant information, and interpreting all the gathered information based on existing knowledge; according to Shuell (1993), this is the basis of constructivism.

Methodology

This study utilized qualitative methods following a standardized, open-interview format (Patton, 2002). Initial sampling consisted of a purposive sample of 67 high school students enrolled in agricultural classes utilizing inquiry-based learning. The teacher of the classes was trained in inquiry-based learning through the National Agriscience Teachers Ambassador program. The agricultural classes included animal science, horticulture, and career development. Out of the 67 students, 24 students returned parental consent and minor consent forms, which qualified them to participate in an interview per institutional review board guidelines. Each student was interviewed individually during the school day at a time convenient for the student and lasted approximately four to ten minutes depending on how much information the student selected to share. There were six questions included in the interview protocol. Each question sought to understand the student perspective of inquiry-based learning. Member checking was accomplished through student review of information transcribed to ensure accurate communication of thoughts. Codes were used within interview notes and a reflection log allowed

triangulation of data. The inquiry-based learning opportunities utilized the "Essential Features of Classroom Inquiry and their Variations" guidelines provided by the National Research Council (2000).

Results

Students in the sample had been involved in inquiry-based learning opportunities over eight-months leading up to the study. Twenty-four students were interviewed as a part of the study: 13 females and 11 males. Student classifications were 14 sophomores, 9 juniors, and one senior.

Students' Perceptions of the Effectiveness of Inquiry-Based Methods

Students' answers as to what was most beneficial about inquiry-based learning opportunities emerged as six themes: learn by yourself, gain knowledge, different, an experience, use prior knowledge, and entertaining. Most of the students interviewed chose to explain what they liked most about inquiry-based learning. Themes related to what they like most included: learn by yourself, variation, hands on, makes you think harder, learn new things, research, discussion, quicker, and challenge. Students were asked their opinion regarding how background information should be provided in the context of inquiry-based learning. The interviews revealed that half of the students preferred to receive background information before the inquiry-based learning opportunity, while half of the students preferred that they receive the information after they had completed the inquiry-based learning opportunity. Students were asked if there were any technologies that could be used to make the inquiry-based method more enjoyable. Those students who thought adding computers or cell phones would make the inquiry more engaging/fun wanted the technologies to be used to incorporate some type of game into the inquiry-based learning opportunity.

Students' Perceptions of Impact on Critical Thinking Skills

When asked if students felt that inquiry-based learning opportunities improved their critical thinking skills, all students answered yes. The ways in which students felt it improved their critical thinking skills varied. Themes included: learn by yourself, think harder, because you are doing, problem solving, remember better, and learn more. Most of the students felt that inquiry-based learning opportunities improved their critical thinking skills because they were required to find the answers on their own. Students also felt that their critical thinking improved because they were able to problem solve, remember the material better, and learn more.

Discussion and Recommendations

These findings suggest that students who have been exposed to inquiry-based learning opportunities recognize the benefits. Akpullukcu and Gunay (2015) found that students' favorite parts of inquiry-based learning were related to designing, application, and decision process. Similarly, all students in this study expressed that inquiry-based learning opportunities improved their critical thinking skills. Adding inquiry-based learning opportunities to agricultural classrooms might benefit students by improving their critical thinking skills and their ability to work autonomously. If we can capture the essence of how students are reacting to the use of inquiry-based learning, we can develop more effective strategies for agriculture teachers to implement inquiry-based learning. Experimental studies are recommended to examine the impact related to learning, engagement, and retention when inquiry-based learning opportunities are implemented as well as measure improvement in critical thinking.

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