Science Teachers' Perceptions of Science Integration In Agricultural Education

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Introduction

Integration of core subject matter (including science) in agricultural education has been emphasized by Career and Technical Education (CTE) legislation (Threeton, 2007) and by the push to improve Science, Technology, Engineering, and Math (STEM) education (Sanders 2009). Some states, including Texas, are awarding science credit for some agriculture classes. In a state with over 1,500 agricultural education programs, a lot of potential exists in Texas for teaching science concepts through agriculture (R. Whitson, personal communication). Studies show that agriculture students perform similarly or better than students who did not receive agriculture instruction integrated with science (Chiasson & Burnett, 2001; Haynes, Robinson, Edwards, & Key, 2012; Myers & Dyer, 2006; Pearson, Young, & Richardson, 2013; Ricketts, Duncan & Peake, 2006; Shoulders & Myers, 2013). Research in other states indicates science teachers support the integration of science in agricultural education and collaboration between agricultural education teachers and science teachers is important (Thompson & Warnick, 2007; Warnick, Thompson, & Gummer, 2004). Since no research has focused on the perceptions of Texas teachers towards the integration of science in agricultural education, this study sought to determine Texas science teachers' perceptions of science integration in agricultural education.

This study addressed Priority Five, Efficient and Effective Agricultural Education Programs, of the National Research Agenda for the American Association for Agricultural Education (Doerfert, 2011).

Theoretical/Conceptual Framework

The Theory of Planned Behavior (Ajzen, 1991) was used as a framework for this study. This theory suggests a person's behavior is influenced by their attitudes, subjective norms, and perceived behavioral control. This study focuses on the attitudes of science teachers by determining their perceptions of the integration of science in agricultural education. The target behavior of science teachers in this study is their collaboration with agriculture teachers who are integrating science into their agriculture curriculum. The collaboration between agriculture teachers and science teachers aids in the successful integration of science in agricultural education (Johnson & Newman, 1993).

Methodology

This study used a descriptive survey design using the first section of the Integrating Science Survey Instrument developed by Thompson (1996). Demographic questions were added to the instrument. In total there were 28 instrument items and 14 demographic questions. The 28 items were provided in a five-point Likert scale format (1 = strongly agree, 5 = strongly disagree). For the purpose of reporting, it was decided a priori that aggregate mean responses for the items would be interpreted as strongly disagree for means of 4.50 or higher, disagree for means of 3.50 to 4.49, neutral for means of 2.50 to 3.59, agree for means of 1.50 to 2.59, and strongly agree for means below 1.50.

To administer the survey, researchers attended the Conference for the Advancement of Science Teaching (CAST). The researchers had a booth in the conference trade show and asked science teachers in attendance to participate in the study. Teachers who participated were entered into a prize drawing for one of three $100 gift cards. Teachers who volunteered to participate were asked to complete the instrument in the booth and were provided with an iPad with a Qualtrics app. To maintain confidentiality, participants did not provide their name or other identifying information as a part of the instrument. After they completed the instrument they were given a prize drawing slip to complete and place in the prize drawing box.

The population of this study was Texas science teachers attending the CAST, which is hosted by the Science Teachers Association of Texas. A convenience sample of 116 science teachers was obtained. The participants had taught for an average of 10 years. Eighty-two percent of the participants were female, and were on average 37 years of age. Thirty-seven participants (32%) claimed their school offered science credit for at least one agriculture course.

Results/Conclusions

The purpose of this study was to determine science teachers' perceptions of integrating science in agricultural education. Of the 28 items the participants strongly agreed with four of them. Those items were "Agriculture is an applied science," People pursuing a career in agriculture must have a greater understanding of science than ten years ago," Agriculture students learn more about agriculture when science concepts are an integral part of their instruction, and "Agriculture students are more motivated to learn scientific concepts when they are integrated into the agriculture curriculum." The participants agreed with 23 of the items. Participants were neutral on one item, "The agriculture teacher in my school is competent enough in science to teach integrated science concepts." The participants did not disagree or strongly disagree with any of the items.

Since the participants agreed or strongly agreed with all but one item in the instrument it suggests that science teachers have a positive perception of integrating science in agricultural education. These results show the participants in this study overall had a more positive perception of science integration in agricultural educations than previous studies that gauged perceptions of science teachers, agriculture teachers, and administrators (Balschweid & Thompson, 2002; Thompson, 1996; Thompson, 2001; Warnick, Thompson, & Gummer, 2004),

Implications/Recommendations

Implications of this study suggest 1) as time progresses science teachers (and perhaps other stakeholders) have more positive perceptions of the integration of science in agricultural education, or 2) the differences are based on the location of the study. It is recommended the same study be conducted in states where a similar study has been previously conducted to determine if there is a change in perceptions. If a change is indicated, it could imply that the more positive perceptions are due to time. If no major changes are seen in those states it would imply the location of the study was the factor that impacted the differences in perceptions.

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