

Determining Factors That Motivate High School Agriculture Science Students

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Introduction/ Literature Review

As the individual progresses towards achievement of their own goals, their level of motivation is named the driving force that enables and challenges them to achieve their goals (Mubeen & Reid, 2014). Today, agricultural science educators offer courses that enable their students to utilize hands-on methodologies in motivating students studying the discipline of agriculture and other STEM concepts (Chumbley et al., 2015; Ricketts et al. 2006). Through this, it helps increase the number of students involved in STEM. The purpose of this study is to determine what are the outstanding factors which motivate high school agriculture science students to learn science. Through a better understanding of these motivations, we will be better able to act in the better interest of the student to become upstanding, contributing members of society.

Theoretical Framework

Our study on how students conceptualized their motivation to learn contextualized science is viewed through the lens of Azjen's theory of planned behavior (1991). The theory of planned behavior (Azjen, 1991) extends from Fishbein and Azjen's theory of reasoned action (1975). When the data for our study is holistically analyzed through this theory, the value and benefit of learning contextualized science by students is evident.

Methods

This descriptive study focused on high school students in the state of Texas enrolled in agricultural education courses and members who are also part of the National FFA Organization. High School students that competed and participated in the state agricultural mechanics CDE were the sample population used in this study. In total there were 88 students that participated in this study with 73 participants submitting useable surveys. There were six participants who identified as female and 67 who identified as male. Many of the participants identified as White ($n = 59, 67\%$), while three identified as Hispanic, and nine (10%) as Biracial. There was a total of 31 seniors, 24 juniors, 14 sophomores, and four freshmen.

This study utilized the Science Motivation Questionnaire II (SMQ-II), a 25-item instrument. This instrument included five constructs: intrinsic motivation, self-determination, self-efficacy, career motivation, and grade motivation. Each question is answered on a five-point Likert-type scale: never (1), rarely (2), sometimes (3), often (4), or always (5). Analyzing Likert-type and Likert-scale are different and should be reported accordingly (Boone and Boone, 2012). Test for reliability resulted in a Cronbach's Alpha Coefficient of 0.84.

Findings

The objective of this study sought to identify the factors that motivated students to learn science who participated in the Texas State FFA Agriculture Mechanics CDE. As shown in Table 1, the highest mean scores were found related to *Grade Motivation* ($M = 3.74, SD = 0.99$) and *Career Motivation* ($M = 3.74, SD = 0.94$). The lowest scores were found related to *Intrinsic Motivation* ($M = 3.48, SD = 0.78$) and *Self-Determination* ($M = 3.18, SD = 0.94$). Construct scores are provided within table one.

Table 1
Construct Scores

| | <i>M</i> | <i>Mode</i> | <i>SD</i> |
|----------------------|----------|-------------|-----------|
| Grade Motivation | 3.74 | 5 | 0.99 |
| Career Motivation | 3.74 | 5 | 0.94 |
| Self-Efficacy | 3.72 | 3 | 0.83 |
| Intrinsic Motivation | 3.48 | 3 | 0.78 |
| Self-Determination | 3.18 | 3 | 0.94 |

Note. Response options ranged from 1 (*Never*) to 5 (*Always*)

Conclusions

The researchers found the highest construct scores to be related to *grade motivation*, which can be described as the characteristics and factors influencing students to obtain a diploma, degree, or certification (Hakan & Munire, 2014). It can be suggested that these participants have a stronger level of agreement to the items that pertain to *Grade Motivation*. Grades are crucial to many students because they measure education success and are a part of the entry for many careers (Glynn et al., 2011). The researchers believe these findings are associated with the number of Junior and Senior students due to their determination to graduate and enter post-secondary education or start a career related to sciences. The lowest mean score was found related to *self-determination*. Self-determination is defined as the control students believe they have over their learning environment (Black & Deci, 2000). Upon holistic review it has been found that the students who participated in this study possess a moderate level of agreement with the items associated with the construct of *self-determination*. The researchers believe this could be due to the level and strength of their student autonomy. We have seen over the last year students becoming more autonomous and stronger in this area, having a large portion of their learning moved to the online environment.

Recommendations

Additional research could be conducted to find differences between other disciplines in the field of agriculture, i.e., using the SMQ at the state level Livestock Evaluation or Dairy Cattle Evaluation contest. Replication of this study would also be strengthened through targeting a larger sample population or even comparison between other regions or states.

The strengthening of the classroom learning environment through more contextualized learning would enhance student learning boosting the individual students' morals and philosophies to learn science. This is accomplished through content teaching that inspires students to connect the knowledge they learn in the classroom with the experiences that encompasses their lives (Ricketts et al., 2006). Self-efficacy directly correlates with the academic successes of students, it is firmly reasoned that educators are implored to discover and incorporate the content of their lectures that yields real world application of science skills in the agricultural education classroom.

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