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An Exploration of Relationships between Teaching Practices in Secondary Agricultural Education Programs and Student Engagement

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Abstract

This study was designed to explore the relationship between teacher practices and levels of student engagement in secondary agricultural education programs. Most researchers have agreed that student engagement at the secondary level may be measured through three constructs: cognitive engagement, behavioral engagement, and emotional engagement. The intra-curricular components, namely the FFA organization and Supervised Agricultural Experience Program, make secondary agricultural education unique when compared to the foundational classes of math, science, and English. Respondents included a total of 152 agricultural education programs, which were randomly selected within 11 states to participate in the study. One class in each program was surveyed, which totaled 2,106 student respondents. Relationships were identified between specific teaching and advising practices performed by the secondary agricultural educator and their students' level of engagement in classroom, FFA, and SAE activities. Each state is encouraged to replicate this study to determine student engagement levels in classroom, FFA and SAE activities, and then identify the causes and conditions leading to higher and lower levels of student engagement.

Keywords: Student Engagement, Teaching Practices, FFA, SAE

Introduction

Student engagement as a factor for improved performance and increased student success has been a major focus in the discourse among experts in school reform over the past several decades (Anderson, 2013Fredricks, Blumenfeld, & Paris, 2004; Wang & Fredricks, 2013). It is believed that student engagement in school and academic tasks not only leads to academic achievement, but also contributes to the cognitive and social development of students (Anderson, 2013). However, engaging students in learning has been a challenge for educators globally (Lee, 2012). Previous studies show that up to 25-60% of high school students become disengaged from school (Lee, 2012). Experts attribute the lack of student engagement to boredom, curriculum that is perceived irrelevant, and social and institutional barriers (Anderson, 2013).

A growing consensus among educational reformists is that in order to address the issue with student engagement, educators must set high standards for academic learning and conduct, develop meaningful and engaging curriculum, establish collaboration among school faculty, and provide personalized learning environments (Anderson, 2013; Archambault, Janosz, Fallu, & Pagini, 2009; Lee, 2012). Although educators have progressed in setting high academic standards

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and developing strategies for working together to ensure students success through relevant curriculum, providing personalized learning environments for students that increase engagement has remained a challenge – particularly in those schools that already struggle with maintaining the most basic educational resources.

Student Engagement

There are many definitions and ways to measure engagement. Some definitions depict it as a behavioral construct, while others take a more affective stance (Fredricks, 2013). For the purpose of this study, student engagement is described as the attention, interest, investment, and effort students direct toward academic tasks and is the outward manifestation of motivation (Skinner, Kindermann, Connell, & Wellborn, 2009; Wang & Degol, 2014). This definition takes into account the complexity of engagement and its relationship to theories of students' motivation to learn. Simply stated, student engagement is a multidimensional process where cognitive, emotional and behavioral participation in the learning experience is exhibited (Archambault et al., 2009; Fredricks, 2013).

Cognitive engagement refers to the degree to which students are able to self-regulate and invest in learning (Archambault et al., 2009). It is believed that students who are cognitively engaged are psychologically invested in and make an effort to learn, understand, and master the learning objectives (Archambault, Pagani, & Fitzpatrick, 2013; Chi & Wylie, 2014; van Uden, Ritzen, & Pieters, 2014). These students are able to employ various problem-solving skills, prefer to be challenged during academic tasks, and are able to utilize coping mechanisms when faced with failure (Wang & Degol, 2014). A cognitively engaged student is believed by some to demonstrate similar characteristics to that of an intrinsically motivated student (Wang & Fredricks, 2013). It should be noted that when effort is used in this context, it differs from behavioral effort in that it refers to the psychological control processes that aid in concentration, learning, and performance in spite of the environmental and/or personal distractions that may exist (Fredricks et al., 2004; Wang & Fredricks, 2013).

Emotional engagement refers to the affective component of learning (van Uden et al., 2014; Wang & Fredricks, 2013). More specifically, how students feel about the school and teacher in terms of expressing interests, boredom, anxiety, and happiness (Archambault et al., 2009; van Uden et al., 2014). Some researchers also liken this type of engagement to constructs in motivational research in that students' emotional engagement is similar to their identification with the school (National Research Council & Institute of Medicine, 2004). Students who are emotionally engaged feel a sense of belonging and value school related outcomes (Archambault et al., 2009). Although some researchers use motivation and engagement interchangeably, descriptions in engagement studies are more general in that they only define the student's emotion toward the school environment, which does not clearly identify the source of the emotion or attribute it to a specific activity or individual (Fredricks et al., 2004; Wang & Degol, 2014; Wang & Fredricks, 2013).

Finally, behavioral engagement is commonly defined in three ways (Wang & Fredricks, 2013). The definitions include students adhering to rules and environmental norms, involvement in learning through effort and persistence, and participating in school-related activities (Archambault et al., 2009; van Uden et al., 2014; Wang & Degol, 2014). Some researchers have expanded the definitions of behavioral engagement to delineate levels of participation that range from extrinsically motivated behaviors, where the student is cooperating with the learning environment, to more self-directed or student-initiated behaviors (Clark & Schroth, 2010; Zimmerman, 2013). These delineations overlap with the constructs of motivation in that students

who are self-directed are likely to be intrinsically motivated to learn and those who cooperate with learning do so in the presence of some form of extrinsic inducement.

Engagement and Student Background

Student engagement is a strong predictor of student academic success (Anderson, 2013; Lee, 2012). Research has shown that individual and familial factors impact student engagement (Lee, 2012; Wang & Eccles, 2013). These factors include gender, grade level, race, and socioeconomic status to name a few. Related to gender, studies have found that females are consistently more academically engaged than males from elementary school through high school (Lee, 2012). Similarly, students with higher levels of SES also demonstrate high levels of engagement (Lee, 2012). Also, middle and high school students who are academically successful report greater engagement with school and academic tasks (Lee, 2012). Conversely, high school students were less engaged if they were enrolled in special education courses or started attending their current high school as an upperclassman (Yazzie-Mintz, 2007).

However, the relationship between race, school climate, and student engagement has varied (Wang & Eccles, 2013). Some studies reported that African American students are less likely to engage in school compare to their European American counterparts, while others reported no ethnic differences (Wang & Eccles, 2013). Additionally, some researchers have found the impact of positive relationships with teachers to be stronger with students of color than their White counterparts (Wang & Eccles, 2013).

Engagement and Classroom Context

In addition to personal factors, previous studies have provided empirical evidence that classroom context impacts student engagement (Gillet, Vallerand, & Lafreniere, 2012; van Uden et al., 2014). Classroom context includes teacher support, peer interaction, classroom structure, autonomy support, and task characteristics (Fredricks et al., 2004; van Uden et al., 2014). The majority of the evidence on classroom context indicates that teacher support has a strong influence on engagement (Gillet et al., 2012; van Uden et al., 2014). Therefore, this study focused on teacher support as conceptualized by the presence of involvement, autonomy support, and structure.

In schools where teachers were supported with the availability of the instructional resources they need, relevant professional development, and a work environment of collegiality, the teachers were more likely to be caring and supportive (Jennings, Frank, Snowberg, Coccia, & Greenburg, 2013). As a result of the perceived teacher care and support, students reported more positive academic attitudes and values, and more satisfaction with tasks related to school (van Uden et al., 2014). Students need to feel they are important, they are able to make decisions concerning their education, they are supported in those decisions – autonomy support, and the tasks they are assigned are not only attainable, but have relevance to their present and future lives (Gillet et al., 2012). In addition, it is important that students have a clear sense of structure in the educational environment, and the consequences for their actions are consistent and predictable (van Uden et al., 2014).

Engagement in Agricultural Education

The importance of the agricultural educator cannot be denied in contributing to student engagement in classroom, FFA organization, and SAE activities; therefore, facilitating academic success (Anderson, 2013; Talbert & Edwin, 2008). Student organization membership was linked to student engagement as it directly increased student-teacher interaction and a sense of belonging

(Anderson & Kim, 2009; Fredericks et al., 2004; Lizzio, Dempater, & Newmann, 2011). These authors also agreed that students have a need for competence that impelled students to participate in extracurricular activities, thus becoming more engaged in learning. Without going into more detail, one can begin to see how FFA activities (meetings, leadership development, Career Development Events, etc.) may be related to a sense of belonging and a need for competence that facilitates cognitive, social, and emotional engagement. With respect to SAEs, the most influential person for implementing successful SAE projects is the agriculture teacher (Retallick, 2010). Moreover, several studies have found a positive relationship with either the scope or the quality of an SAE project with student achievement in agricultural education (Retallick, 2010). Nonetheless, SAE programs continue to be the weakest component of agricultural education due to the various barriers to conducting quality SAE programs, including student motivation, teacher training, and limited resources (Wilson & Moore, 2007).

Conceptual Framework

Family, community, and culture play a role in student engagement; however, the scope of this study is on the influence of the educational context on student engagement. The theoretical framework for this study is based on a multidimensional approach to student engagement (Fredricks et al., 2004; Vallerand & Bissonette, 1992; Wang & Fredricks, 2013). There is substantial empirical evidence supporting that students who meet the high academic expectations and take advantage of the curriculum need support from those with whom they interact, specifically the educator (Jeynes, 2007). The evidence suggests that the educational context impact on engagement is partially mediated by the student's beliefs about competence and control, their values and goals toward academic tasks, and their social connectedness (Anderson, 2013; Ryan & Deci, 2000). Figure 1 is a conceptual model for educational conditions that promote student engagement. The model demonstrates how the effect of the educational environment on engagement is partially mediated by psychological variables within the student.

According to this framework, the teacher's ability to provided classroom structure and autonomy support, and demonstrate a sincere investment in the students and the learning process promotes the students' belief in their academic ability (competence), autonomy over academic outcomes (control), sense of belonging (connectedness), and motivation to learn (values and goals). Therefore, high levels of these psychological mediators lead to high levels of cognitive, emotional, and behavioral engagement (Wang & Fredricks, 2013).

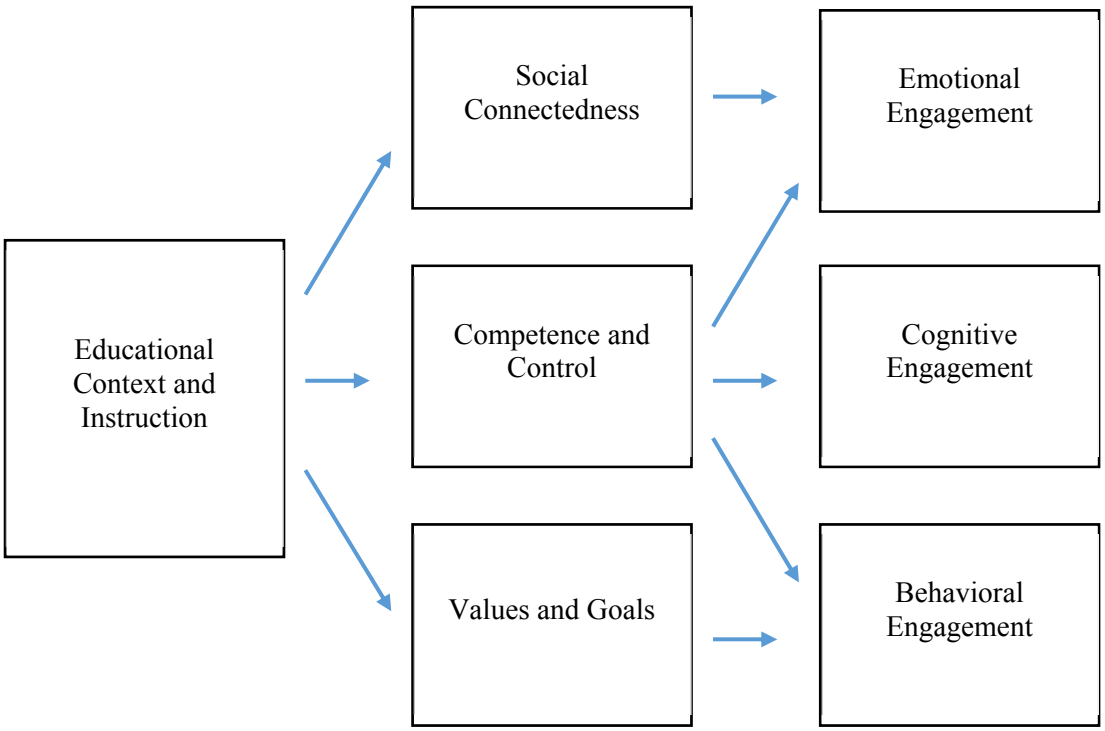

Figure 1. Conceptual model for educational conditions that promote student engagement

It is believed that the structure of agricultural education, when fully employed, provides the education context that increases student engagement and thus improve student learning (Anderson & Kim, 2009; Kelly & Price, 2009). The role of the agricultural educator is not only to instruct, but to also advise. Teachers who employ classroom instruction, FFA, and SAE projects increase the student-teacher interaction, which is instrumental in contributing to student engagement in the agriculture program (Talbert & Edwin, 2008). In addition, student organization membership provides students with a sense of belonging (Fredericks et al., 2004). Furthermore, motivational theory asserts that students have an innate need for competence that when encouraged compels them to participate in extracurricular [and intra-curricular] activities, thus becoming more engaged in learning (Fredricks et al., 2004; Ryan & Deci, 2000). To this end, the most influential person for implementing a comprehensive agricultural program, consisting of classroom instruction, FFA, and SAE projects, is the agricultural educator (Retallick, 2010; Wilson & Moore, 2007). However, what teaching practices have a positive association on student engagement in secondary agricultural education programs?

The study of student engagement involves identifying the practices used by teachers to increase learning and personal development and then surveying students to determine if those practices were effective. The literature encompassing student engagement has been more extensive in undergraduate education (Kuh, 2001), but researchers have begun to realize the potential of identifying student engagement in the high school setting (Wang & Fredericks, 2014). Some researchers have agreed that student engagement at the secondary level may be measured through three constructs: cognitive engagement, behavioral engagement, and emotional engagement (Fredericks et al., 2004; Yazzie-Mintz, 2007). The High School Survey of Student Engagement (HSSSE; Yazzie-Mintz, 2007) provided a rigorous measure of student engagement at the secondary

level, and is the largest database of secondary classroom engagement scores. However, the intra-curricular FFA and SAE components of agricultural education programs were considered unique when compared to foundational courses such as math, science and social studies, thus requiring additional instrumentation to identify how to measure student engagement in FFA and SAEs. This study was designed to identify the level of engagement in learning held by students enrolled in secondary agricultural education courses, and determine if specific teaching and advising practices performed by the agricultural educator related to student engagement in classroom, FFA and SAE activities.

Purpose and Objectives

In light of the National Research Agenda for the American Association for Agricultural Education (Roberts, Harder, & Brashears, 2016) call for research on meaningful and engaged learning in all environments, the purpose of this study was to explore the relationship between teaching practices in secondary agricultural education programs and levels of student cognitive, behavioral, and emotional engagement. The objectives guiding this study are:

1. Describe agricultural education programs in selected states;
2. Describe student background information and engagement in agricultural classes, FFA, and SAE;
3. Describe secondary agricultural educators' teaching practices; and
4. Explore relationships between teaching practices and student engagement in classroom, FFA and SAE activities.

Methods and Procedures

Convenience sampling was used to select eleven states to participate in the study, based on colleagues of the researchers who agreed to complete the methods of the study as assigned, and were in geographical regions of interest for the study (Ary, Jacobs, & Sorensen, 2010). These states included: California, Florida, Georgia, Idaho, Iowa, Louisiana, New York, North Carolina, Ohio, Texas, and Virginia; with data being collected in the spring of 2009. High school agricultural education programs within the eleven states were selected from a numbered list using a random number generator. Agricultural educators were contacted by phone or email and asked to participate in the study. If the agricultural educator declined to participate, the next randomly selected program was contacted until 20 programs were selected for each state. If there was more than one educator in the program, the most senior teacher was preferred. If an educator was newly hired at the school within the year, the program was not asked to participate in order to provide some credence to the assertion that selected agricultural education programs were stable. One class period of agricultural education students was surveyed in each agricultural education program. To ensure variance in class rank of the students, and to ensure that agricultural educators wouldn't offer their best class to participate in the study, classes were randomly assigned the class used in the study based on the number of freshmen, sophomores, juniors, and seniors found in the classes. For example, the first agricultural educator was assigned to administer the surveys in a class with the most freshman students; the second agricultural educator was assigned a class with the most sophomores, and so forth.

The participating agricultural educators were mailed a packet of instructions, an instructor's questionnaire, and a set of student questionnaires. The 45-minute student questionnaire consisted of the HSSSE (measuring classroom engagement) and the Agricultural Student

Engagement Survey (ASES; measuring student engagement in FFA and SAE activities). The instructor questionnaire was the Agricultural Instructor Survey of Teaching and Advising Practices (AISTAP), which took 30 minutes to complete.

The HSSSE is an annual survey measuring behavioral engagement, cognitive engagement, and emotional engagement of high school students (Yazzie-Mintz, 2007); and was used to measure level of classroom engagement in this study. Each of these three types of engagement has been labeled as a dimension of student engagement. HSSSE has the largest national database for high school student engagement allowing investigators to compare data with national norms. The HSSSE does not offer scale interpretation (e.g. disengaged, somewhat engaged, and highly engaged), rather, national averages are provided for comparison purposes. If scores are significantly below national averages, then efforts are made to reform the teaching and learning environment. The HSSSE has not yet reported established validity and reliability estimates, but was considered one of the best measures of high school student engagement (Yazzie-Mintz, 2009). Scale ranges for classroom student engagement dimensions include: classroom total engagement (0 to 121), classroom behavioral engagement (0 to 17), classroom cognitive engagement (0 to 65), and classroom emotional engagement (0 to 39).

Because agricultural education programs are unique with integrated FFA and SAE components, the 34-item Agricultural Student Engagement Survey (ASES), which used a 5-point Likert-type scale, was attached to the HSSSE for the purpose of measuring engagement in FFA and SAE activities. The ASES was developed by Friedel, Ricketts, Irani, and Stedman (2009) through a review of literature and similar to the dimensions of the HSSSE. In addition, the instrument was pilot tested prior to this study. The total summated scale for FFA engagement (19 items) and SAE engagement (15 items) both had a Cronbach's alpha of .93. Constructs of the ASES for FFA and SAE engagement included behavioral engagement (α = .83, .82), cognitive engagement (α = .93, .89), and emotional engagement (α = .91, .92), respectively.

Agricultural educators were administered the 125-item Agricultural Instructor Survey of Teaching and Advising Practices (AISTAP) to determine their teaching and advising practices related to the classroom, FFA, and SAE activities Friedel et al. (2009). Friedel et al. (2009) wrote the instrument as a list of activities performed by agricultural educators while teaching classroom, FFA and SAE activities. Items were treated independently, but were grouped by classroom instruction (50 items), FFA activities (39 items), and SAE activities (36 items) for the purpose of estimating reliability. Cronbach's alpha for the instrument was .94.

Descriptive statistics were used to analyze demographic information, level of student engagement in classroom, FFA, and SAE activities, and teaching and advising practices. Students completing the HSSSE in this study were compared to 66,062 non-agricultural education students who had completed the HSSSE during the same semester. Finally, Pearson's Correlation was used to determine relationships between teacher-related variables and levels of student engagement.

Findings

Agricultural Education Programs Information

Ten of the eleven states selected for this study provided data for the selected 20 agricultural education programs; however, the eleventh state provided data for only 12 schools. Of the 212 programs, the mode number of educators per program was one educator (n = 86, 57%). There were 33 (23%) two-educator programs, 17 (12%) three-educator programs, and 9 (6%) four-educator programs. For student-educator ratio, the mode response was one teacher to 76 or more students

(*n* = 68, 46%). Thirty-eight (26%) agricultural educators reported their program was one teacher for every 51 to 75 students in their agricultural education program. A total of 23 (16%) agricultural educators indicated there was one teacher for every 10 to 25 students, while seventeen (12%) indicated there was one agricultural educator for 26 to 50 students in their agricultural education program.

Almost half (*n* = 71, 49%) of the agricultural education programs were housed in a school with a community population of 2,501 to 25,000 people, while 38 (26%) agricultural education programs resided in communities of less than 2,500 people. A total of 17 (12%) agricultural education programs were in cities of 25,001 to 100,000 people, and 15 (10%) of the agricultural education programs were located in cities of over 100,000 people. Note that five agricultural educators did not indicate the size of the community in which the agricultural education program resided.

Of the agricultural educators participating in this study, 80 (55%) were male. The average agricultural educator was 39.6 years old and had taught agriculture for 13.5 years. Of these educators, 71 (48%) held a 12-month contract, while 35 (24%) held an 11-month contract, 26 (18%) held a 10-month contract, 10 (7%) held a 9-month contract, and 4 (3%) stated some other form of extended contract to perform summer responsibilities related to the agricultural education program.

Regarding the level of education obtained by agricultural educators, 70 (48%) responded that the highest degree achieved was a bachelor of science, 52 (36%) obtained a master of science, 21 (14%) obtained a master of science plus 30 hours of college credit, 2 (1%) obtained a doctorate in education, and 1 (1%) obtained a doctorate in philosophy. Eighty-six percent (*n* = 124) of agricultural educators went through a university preparation program to obtain traditional licensure.

Fifty-seven (39%) agricultural educators indicated that they had an advisory group which met once a semester, while 56 (38%) indicated that their advisory group met once a year or less. Twenty-one (14%) agricultural educators responded that their advisory group never met. However, 11 (8%) stated that their advisory group met once a month.

Regarding the FFA Alumni sponsoring local FFA activities that benefit the FFA chapter, 63 (43%) agricultural educators reported never. However, 32 (22%) agricultural educators indicated the local FFA Alumni sponsored an activity benefiting the FFA chapter once a year or less, 30 (21%) that there was an FFA Alumni activity supporting the local FFA chapter once a semester, and 21(14%) indicated that the FFA Alumni supported the local chapter once a month.

Student Background Information and Engagement

The 212 programs selected for this study consisted of 2,770 students enrolled in an agricultural education course that semester. A total of 2,112 (76%) completed the survey questions; however, six students were removed from the data set, because the construct scores for classroom, FFA, and SAE student engagement equaled zero in all three areas, and therefore not counted in subsequent analysis. For the remaining 2,106 students responding to the questionnaires, 55% were male with 1546 (73%) between the ages of 15 and 17 years old. Grade level distribution was relatively equal with 497 freshmen (24%), 521 sophomores (25%), 557 juniors (26%), and 456 seniors (22%). Almost 70% (*n* = 1,464) of students indicated that they currently do not live on a farm. In addition, 1,464 (72%) of these students perceived that their parents were not employed in the agricultural industry.

One third (n = 716) reported that they had been in the agricultural education program for a year, while 523 (25%) reported they had been enrolled for two consecutive years. In addition, 81% (n = 1,713) of the respondents reported they were members of the FFA organization. It should be considered that the reported membership in agricultural education programs was conceivably high given that two states participating in this study had nearly 100% membership.

A total of 1,527 (73%) students reported having an SAE project. When asked to specify the type of SAE project, 598 (28%) students classified their SAE as entrepreneurship, 448 (21%) students classified their SAE as placement, 156 (7%) students classified their SAE as research, 310 (15%) students classified their SAE as exploratory, and 195 (9%) classified their SAE as "other" with the most common response being "home improvement".

Classroom engagement mean scores for students enrolled in agricultural education programs included: behavioral engagement (M = 2.30, SD = 0.92), cognitive engagement (M = 2.68, SD = 0.84), emotional engagement (M = 3.24, SD = 0.82), and a summed total engagement score (M = 8.22, SD = 2.41). Students participating in this study, on average, were significantly higher in both behavioral engagement and emotional engagement than the national average of non-agricultural-education students completing the HSSE the same semester, reported as the dimensional norm, but with little effect size (see Table 1).

Table 1

Classroom Student Engagement Mean Scores (n = 2,106 agricultural education students compared with 66,062 non-agricultural education students as Dimension Norm)

Construct	*M*	*Dimension Norm*	*p*	*Effect Size*
Total Engagement	8.22	8.10	-	-
Behavioral	2.30	2.26	.02*	.05
Cognitive	2.68	2.67	.85	.00
Emotional	3.24	3.17	.00*	.10

Note. * $p < .05$. Analysis conducted by the Center for Evaluation & Educational Policy at Indiana University. Higher scores equal higher levels of engagement. Sub-scores indexed on a five-point scale for comparison purposes. Total Engagements was summed to a 15-point scale.

Using the ASES inventory to measure student engagement in learning with respect to FFA and SAE activities, the mean scores were 8.63 (SD = 1.36) and 7.71 (SD = 2.17) for SAE and FFA total engagement respectively; with each total engagement score being a summated score of the three constructs to develop a 15-point scale (see Table 2). The mean score for FFA emotional engagement (M = 4.10, SD = 0.73) was closer to the higher end of the scale than the other two constructs of student engagement, indexed to a five-point scale. Conversely, the mean score for SAE behavioral engagement (M = 1.66, SD = 0.79) was low considering the scale range and standard deviation, also indexed to a five-point scale. Sample sizes are reported with each construct to show responses, as incomplete responses from students were removed from the data.

Table 2

FFA and SAE Student Engagement Mean Scores

Construct	*M*	*SD*	*n*
FFA Total Engagement	8.63	1.36	1,690
Behavioral	1.88	0.76	1,702
Cognitive	2.65	1.07	1,694
Emotional	4.10	0.73	1,701
SAE Total Engagement	7.71	2.17	1,498
Behavioral	1.66	0.79	1,507
Cognitive	2.37	1.05	1,515
Emotional	3.68	0.87	1,504

Note. Higher scores equal higher levels of engagement. Sub-scores indexed on a five-point scale for comparison purposes. Total Engagement was summed to a 15-point scale.

Secondary Agricultural Educators' Teaching Practices

Classroom instruction. Agricultural educators were asked how often they used specific instructional practices in the class as asked on the AISTAP. The most often used practices were to *ask students to reflect on previous learning* (*M* = 4.14, *SD* = 0.83) followed by *facilitated class discussions that require higher level thinking skills* (*M* = 4.01, *SD* = 0.73). This evidence supports that, on average, agricultural educators facilitate class discussions that require higher level thinking skills and ask students to reflect on previous learning on a weekly basis. The least used instructional practice identified with the AISTAP was to *use FFA LifeKnowledge lesson plans* (*M* = 1.51, *SD* = 0.93). This finding suggests that agricultural educators, on average, use LifeKnowledge lesson plans once a semester.

Examining the practices of agricultural educators in giving students assignments, the most often used practices were *encourage students to think "deeper" about a topic* (*M* = 3.79, *SD* = 0.68) and r*equire students to provide a logical explanation for their beliefs* (*M* = 3.54, *SD* = 0.80). The finding indicates that agricultural educators, on average, often encourage students to provide depth of thought and explanation of their beliefs when discussing a topic. The least likely practice from this list for agricultural educators to use when giving students assignments was to *require that students submit two or more drafts of an assignment* (*M* = 2.30, *SD* = 0.84). This evidence suggests that agricultural educators rarely ask students to submit two or more rough drafts of an assignment.

Agricultural educators were also asked how instructional time was used. Responses were given by choosing the percentage of classroom time typically used to complete the specific strategy/method during instructional time. The instructional strategy/methods with the highest mean score were *applying learned skills in the laboratory* (*M* = 3.16, *SD* = 1.08), *used problem*

solving instruction (*M* = 2.83, *SD* = 0.81)*,* and *used lecture-discussion instruction* (*M* = 2.78, *SD* = 0.88), suggesting that agricultural educators, on average, had students engaged in teacher-guided instruction of applying learned skills in the laboratory between 26% and 50% of the instructional time. The instructional strategy/method with the lowest mean score was, *assigned a service-learning project* (*M* = 1.88, *SD* = 0.72). This suggests that agricultural educators, on average, use service-learning less than 25% of the instructional time for the classes identified in this study.

FFA advising. Agricultural educators were asked, utilizing the AISTAP, a series of questions regarding the percentage of involvement of FFA members participating in specific FFA activities as a result of their advising practices. The activities with the highest percentage of involvement, as reported by the agricultural educators, were FFA members planning the chapter meetings (*M* = 4.21, *SD* = 1.07), program of activities (*M* = 4.07, *SD* = 1.13), and chapter banquet (*M* = 4.01, *SD* = 1.17). The finding provided evidence that agricultural educators, on average, allow FFA members to plan approximately 51% to 75% of the aforementioned activities. The practice with the lowest percentage of use was including FFA involvement as part of a student's final grade (*M* = 1.61, *SD* = 0.76). The finding suggested that agricultural educators, on average, include FFA activities as part of the final course grade less than 25% of the time.

Techniques used to improve involvement of FFA members in FFA activities vary from educator to educator. The most often used techniques, as determined in this study was, *gave advise to FFA members on future career decisions* (*M* = 4.18, *SD* = 0.65), *worked with FFA members after school* (*M* = 4.12, *SD* = 0.81), and *gave additional awards to recognize students' FFA accomplishments* (*M* = 4.07, *SD* = 0.82). The least often used technique to involve students in FFA activities was *completing FFA proficiency awards during class time* (*M* = 2.15, *SD* = 0.95), indicating that the educators rarely use this practice.

SAE. Agricultural educators were asked, *how much time do you spend teaching record book entry to your new students?* The mode response (*n* = 62, 41%) was that they taught record book entry to new students for less than one week during the academic year. Additionally, 49 (32%) responded that they taught record book entry for one to two weeks, 23 (15%) stated they taught record book entry for two to three weeks, 6 (4%) responded three to four weeks, and 4 (3%) responded four or more weeks.

Agricultural educators were also asked to respond to, *SAE activities make up what percentage of students' final course grade?* Of the 146 responding agricultural educators, the mode response (*n* = 91, 60%) was 1% to 25% of the final course grade. Forty (26%) of the agricultural educators indicated that they did not count the SAE as part of the students' final course grades. However, 11 (7%) of the agricultural educators claimed that SAE contributed 26% to 50% of the students' final course grade, and three (3%) indicated that the SAE contributed 51% to 75% of the final course grade.

Regarding the agricultural educator practices used for incorporating SAE activities into the classroom, agricultural educators, on average, indicated that they *made an off-school site SAE visit for each student* (*M* = 2.72, *SD* = 1.29) and *discussed each student's SAE program with his/her parents* one to two times per year (*M* = 2.80, *SD* = 1.27). The practice with the lowest occurrence used to incorporate SAE activities was to *showcase their SAE program to fellow students* (*M* = 1.74, *SD* = 0.86). The finding suggests that agricultural educators, on average, ask students to showcase their SAE programs to fellow students less than once a week, per year.

The most common practices to motivate students to get involved in SAE activities identified in this study were *recognized students for their SAE accomplishment* (*M* = 3.95, *SD* =

0.90) and *advise student on career choices* (*M* = 3.64, *SD* = 0.87). The finding suggested that agricultural educators, on average, use these practices often. The least common practice to motivate students, as identified in this study was, *held an SAE orientation for parents of new agricultural education students* (*M* = 1.94, *SD* = 1.25). This finding provides evidence that agricultural educators rarely have SAE orientation meetings for parents of new agricultural education students.

The most used practice during an SAE visit was, *have students apply problem-solving skills to develop a solution* (*M* = 3.67, *SD* = 2.75). The finding suggests that agricultural educators use this practice often when making an SAE visit. The least used practice identified in this study was, *visit with employer or manager about his/her wishes for student's SAE* (M = 2.74, *SD* = 1.02). To interpret this finding, agricultural educators tend to sometimes visit with the student's employer or manager about their wishes for the student's SAE project.

Teaching Practices and Student Engagement

Correlations were used to examine relationships between agricultural educators' practices for classroom instruction and average classroom student engagement scores of their respective class (see Table 3). Positive relationships provided evidence of an association between the increased use of a specific teaching practice and increased levels of student engagement. The teaching practice with the highest correlation with levels of classroom total engagement was, *organizing a field trip that enhanced student learning* (*r* = .25, *p* < .05). Conversely, the teaching practice, *applying learned skills in the laboratory* was negatively correlated with classroom total engagement (*r* = -.21, *p* < .05).

Table 3

Correlations between Practices for Classroom Instruction and Student Engagement in the Classroom

Item	*M*	*SD*	Behavioral	Cognitive	Emotional	Total
Organize a class field trip	2.14	0.77	.25*	.24*	.24*	.25*
Assign homework for next day	2.73	1.23	.25*	.20*	.14	.20*
Encourage students to contact experts	2.91	0.87	.24*	.19*	.16	.20*
Written assignments using multiple sources	3.32	2.30	.18	.23*	.14	.20*
Applying skills in the laboratory	3.16	1.08	-.26*	-.19*	-.21*	-.21*

Note. * p < .05.

Correlations were used to examine relationships between agricultural educators' practices for advising the local FFA chapter and average FFA student engagement scores of their respective class (see Table 4). Positive relationships provided evidence of an association between the

increased use of a specific advising practice and increased levels of student engagement. The advising practice with the highest correlation with levels of FFA total engagement was, the percentage of the chapter banquet planned by the FFA members ($r = .28$, $p < .05$). However, the advising practice of awarding extra credit to students to participate in FFA activities was negatively correlated with FFA total engagement ($r = -.26$, $p < .05$).

Table 4

Correlations between Practices for Advising FFA and Student Engagement in FFA

Item	*M*	*SD*	Behavioral	Cognitive	Emotional	Total
Chapter banquet planned by members	4.01	1.17	.32*	.21*	.22*	.28*
Fundraisers planned by members	3.72	1.13	.28*	.15	.25*	.24*
Chapter POA planned by members	4.07	1.13	.25*	.14	.25*	.23*
Community-service planned by members	3.96	1.13	.24*	.11	.26*	.22*
Chapter meetings planned by members	4.21	1.07	.26*	.11	.18	.20*
Members assigned to committees	3.60	0.94	.20*	.10	.23*	.19*
Students attended the National Convention	1.66	0.58	.25*	.08	.16	.18
Students attended the State FFA Convention	2.14	0.59	.23*	.10	.11	.16
Times participating in CDEs	4.57	0.83	-.08	-.24*	-.04	-.15
Gave extra credit for FFA activities	3.34	1.45	-.22*	-.25*	-.25*	-.26*

Note. * $p < .05$.

Correlations were used to examine relationships between student engagement and SAE instruction used by agricultural educators (see Table 5). Positive relationships provided evidence of an association between the increased use of a specific SAE instructional practice and increased levels of student engagement. The SAE instructional practice with the highest correlation with levels of SAE total engagement was the practice of using SAE projects as part of students' final grade ($r = .21$, $p < .05$). The SAE instructional practice with the lowest correlation with SAE

behavioral engagement identified in this study was the number of times students enter information in their record book per week ($r = .19$, $p < .05$).

Table 5

Correlations between SAE Instruction and Student Engagement in the SAE

Item	*M*	*SD*	Behavioral	Cognitive	Emotional	Total
SAE activities make up % of students' final course grade	1.85	0.67	.07	.19*	.24*	.21*
Teach record book entry to new students	1.89	1.00	.11	.19*	.25*	.16
Evaluate progress of previously set goals	3.08	1.11	.05	.10	.21*	.15
Assess the scope of the SAE project	3.37	1.10	.06	.15	.19*	.14
Times/week students fill out SAE record book	1.89	0.99	.06	.19*	.08	.13

Note. * $p < .05$.

Conclusions and Recommendations

This study provides a snapshot of agricultural education programs across the United States with respect to demographic variables of agricultural educators, students enrolled in their agricultural education programs at the secondary level, and students' engagement in classroom, FFA and SAE activities, with respect to spring of 2009. While educational policy varies from state to state, so does variance in agricultural education programs in each state. Not every state was represented in this study, but states' different geographical locations were considered when selecting states for data collection. Researchers are encouraged to replicate this study in their respective states and compare to the mean scores identified collectively among these eleven states. The student engagement levels presented in this study may serve as a benchmark for the purpose of examining other teaching practices that may increase behavioral, cognitive, and emotional student engagement (Fredericks, et al., 2004) in learning in agricultural education classroom, FFA, and SAE activities; as well as a benchmark to compare to determine how agricultural education may improve student engagement in future years. Further, in the interest of utilizing large data sets to improve the educational outcomes of local agricultural education programs, this study offers researchers data needed for higher level inferential statistics, such as propensity score matching (Lane et al., 2012), which requires large data sets to compare baseline characteristics between groups.

Considering the demographic information of agricultural education students participating in this study, the evidence suggests that these students were typical to what was known anecdotally about students enrolled in agricultural education programs across the nation. Further, there was no indication from the evidence that these agricultural educators, and the programs they represent, were different from agricultural education programs across the nation.

Students enrolled in these agricultural education programs, on average, had higher levels of behavioral engagement and emotional engagement than other high school students surveyed with the HSSSE. Although the effect size to this difference was low, the agricultural education profession should spend additional time and resources to identify the specific instructional strategies, methods, and approaches that contribute to these higher levels. However, there was no significant difference in cognitive engagement levels between agricultural education students and other high school students surveyed, as measured by the HSSSE. One may not expect a significant difference; however, the purpose of examining student engagement was to improve student engagement (Kuh, 2001). The agricultural education profession should spend additional time and resources to identify how to improve cognitive engagement in learning. Much can be learned by examining each item of the HSSSE related to cognitive engagement and focus improvement on items in which agricultural education students scored lower.

Mean scores of FFA student engagement were identified for FFA members enrolled in secondary agricultural education programs. Although the ASES questions measuring behavioral engagement, cognitive engagement, and emotional engagement in FFA activities were estimated as reliable and possess content validity, the instrument will continue to be honed to better measure behavioral and emotional engagement in FFA activities. This effort will be challenging as anecdotal evidence suggests that students participating in FFA activities are often emotionally connected to the organization, but each local program may widely vary on the types of activities students may behaviorally participate as a member of the organization.

The ASES also measured SAE student engagement of students with SAE projects, with constructs consisting of behavioral engagement, cognitive engagement, and emotional engagement. While these measures were determined to be reliable and possess content validity, items will continue to require development to enhance the measurement of student engagement in SAE activities. In particular, the measure of SAE behavioral engagement may require improvement as students tended to score lower on this scale when considering the scale range and standard deviation. However, anecdotal evidence suggests that behavioral engagement in SAEs may actually be low given the recent efforts of the National FFA Organization, and teacher educators working to improve participation in SAE projects (Rubenstein & Thoron, 2015). Given the value of the SAE for providing opportunities to teach life skills for agricultural education programs, more research is warranted to better understand how to increase behavioral engagement in SAE programs, and improve its measure.

Small, but significant correlations were found between specific practices used by agricultural educators to teach and advise students, and student levels of engagement in classroom, FFA and SAE activities. Agricultural educators should be made aware of the teaching and advising practices that positively and negatively associate with higher levels of student engagement so that they can reflect and improve the teaching and learning process occurring in secondary agricultural education programs across the country. It should be noted that this study found a negative correlation between levels of classroom student engagement and applying learned skills in the laboratory. However, the instrumentation used in this study does not include questions related to the learning of psychomotor skills, which is the hallmark of agricultural education. More research is warranted to determine the link between learning psychomotor skills and student engagement.

It is the hope of the authors that continued assessment of student engagement in agricultural education programs will inform the agricultural education profession about good teaching and advising practices that lead to improved student engagement in the classroom and intra-curricular components of agricultural education programs. More effort should be made to educate the agricultural education community about the facets of student engagement, and how to improve

student engagement, so that students enrolled in agricultural education programs may consider all the possibilities and challenges the future may bring to individuals seeking a career in agriculture.

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