Advancements in Middle School Agricultural Education: An Examination of Emerging Trends and Exemplary Programs

Jacob P. Englin

Louisiana State University and Agricultural and Mechanical College

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ADVANCEMENTS IN MIDDLE SCHOOL AGRICULTURAL EDUCATION: AN EXAMINATION OF EMERGING TRENDS AND EXEMPLARY PROGRAMS

A Thesis

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Master of Science

in

The Department of Agricultural and Extension Education and Evaluation

by

Jacob Peter Englin
B.S., South Dakota State University, 2014
August 2023
This thesis is dedicated to the late Dr. Kristie Lea Storms. A sounding board of my early years in career and technical education, you were a major contributor to my pursuits in higher education. You gave me permission to pursue a life I didn’t know I could. Your influence has been constant.
ACKNOWLEDGEMENTS

I would like to thank my parents, Keith and Tamera Englin, for fostering a hunger for knowledge within me. I know that the gravel roads will always lead me home. To my siblings Hannah, Caleb, and Abigail, thank you for providing advice as I navigated my way through this experience. To Emma and Josie, thank you for providing listening ears when I needed them most, especially when asking “does this make sense?” To Teddy, you’ve been wagging by my side through it all and were my biggest cheerleader. To my office mates Jennifer, Whitney, Santiago, Benita, Abbi, and Saralyn, thank you for listening to my incessant questions, obnoxious ideas, and Taylor Swift playlists. You’ve been academic confidants and reliable friends. To Beth, Matti, and Andy, you’ve always been there for quick celebrations and helped push me through. To many other friends and family members, thank you for the support and encouragement. It has not gone unnoticed.

I would also like to thank my committee chair, Dr. Richie Roberts, and committee members, Dr. Kristin Stair and Dr. Michael Burnett. You’ve planted a seed for academic research and enhanced my love of teaching and learning. You are all dedicated to your students and this thesis is a small reflection of that dedication. Finally, a special thank you to Dr. Richie Roberts, my committee chair, without whom I would not have completed this research. You set high expectations for me, challenged my thinking, and allowed me to explore new insights into agricultural education. Your investment in my success is appreciated.
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ABSTRACT

Recent trends in agricultural education have demonstrated that the number of middle school programs and students has been increasing. Despite this, middle school agricultural education students, teachers, and programs often have been considered to be underserved. For example, teachers at this level have expressed that they often lacked the training and resources to meet the needs of this diverse learning population. Even so, middle school agricultural education teachers have continued to provide quality learning experiences for their students. In response, this investigation’s purpose was to examine current trends of middle school agricultural education and the quality of learning conducted by exemplary middle school agricultural education teachers. To achieve this, I examined the deficiencies regarding middle school agricultural education through two articles. In the first article, I conducted a scoping review that revealed limited peer-reviewed publications on middle school agricultural education. In the second article, I used self-regulated learning as a lens by which to examine the facilitation of learning through SAEs. In particular, I used an interpretive study design to collect qualitative data through participant interviews. The findings from this study provided a better understanding of current trends in middle school agricultural education and illustrated how the exemplary teachers navigated various contextual and structural challenges to facilitate high-quality learning for middle school students through SAEs. Documenting these trends and practices was vital to reinforcing the importance of middle school agricultural education. Moving forward, I recommend that future research explore the issues impacting middle school agricultural education students, teachers, and programs and develop strategies to eliminate the deficiencies impacting these populations.
CHAPTER 1. BACKGROUND AND SIGNIFICANCE OF THE STUDY

Middle school has been described as a time in which a young person between ages 10 to 14 undergoes rapid and profound cognitive, emotional, physical, and social changes (National FFA Organization, 2009; National Middle School Association, 2010; Talbert et al., 2007). During this time, young people begin making sense of the world by asking questions to adults, reflecting on previous experiences, examining their morals and values, and seeking peer acceptance and belonging (National Middle School Association, 2010). Further, middle school students begin to ponder about their future careers (National FFA Organization, 2009). A middle school is a place of discovery; therefore, everything at this level of education should be exploratory, even though students’ school-based explorations may not lead them to a future career (National Middle School Association, 2010). Nevertheless, “involvement in an agricultural science program can help middle school students through the maze of occupational, school, physical, emotional, and social demands” (National FFA Organization, 2009, p. 11).

To increase their literacy of agriculture, middle school students are often instructed in a variety of subject areas in agriculture, food, and natural resources (AFNR) and participated in FFA-related youth leadership activities (Jones et al., 2020). Often, agricultural education at the middle school level focuses on hands-on subject matter that interests students by enhancing their interdisciplinary learning, personal skill development, teamwork, leadership, and professional development (National FFA Organization, 2009). In 1988, middle school agricultural education students were granted national FFA membership (Golden et al., 2014). Since then, middle school agricultural education has continued to grow. In fact, in the 2021-2022 school year, there were 196,556 7th and 8th grade students enrolled in agricultural education courses in the U.S, with 108,853 of these students having membership in the National FFA Organization (National FFA...
However, middle school programs continued to struggle (Tucker & McHugh, 2022). In particular, Jones et al. (2020) reported that teachers were unprepared to teach middle school agricultural education students. Further, Rayfield and Croom (2010) illuminated a need for a middle school curriculum and professional development for teachers regarding facilitating FFA and SAE programs at the middle school level. Similarly, Golden et al. (2014) found that middle school teachers required more knowledge about assisting students with completing FFA award applications, data management for Supervised Agricultural Experience (SAEs), improving student motivation, and community relations. In addition to middle school teachers’ needs, Rayfield and Croom (2010) also called for greater recognition of middle school FFA and SAE award programs. Despite such work, there has been sparse peer-refereed knowledge advanced on middle school agricultural education, especially regarding students’ opportunities for career exploration through SAEs.

**Statement of the Problem**

Agricultural education teachers provide instruction at approximately 2,000 middle schools across the U.S. annually (Jones et al., 2020; Talbert et al., 2007). Students who participate at the middle school level have been shown to be more likely to pursue agricultural education in high school (Rayfield & Croom, 2010). However, little research has been conducted regarding middle school agricultural education within the *Journal of Agricultural Education* and other related journals. Because of this, it has become critical to better demonstrate the impacts of middle school agricultural education.

Agricultural education teachers have espoused deep-seated beliefs about the importance of SAE programs on students’ career and personal development (Wilson & Moore, 2007).
Perhaps this belief has been grounded in existing evidence that has shown that participation in SAE programs can improve students’ employability and 21st Century skills (Haddad & Marx, 2018; Ramsey & Edwards, 2012; Thiel & Marx, 2019). Despite this, empirical evidence on best practices for implementing SAEs at the middle school level has been lacking. A need emerged to understand the practices that exemplary agricultural education teachers use to successfully facilitate learning through the delivery of SAE into their middle school programs.

**Overview of the Study**

**Population and Data Collection**

To better understand this phenomenon, I examined middle school agricultural education using a two-article format for my thesis. The first article used a scoping review approach in which I analyzed peer-refereed journal articles to report emergent trends published on middle school agricultural education. Additional details regarding data collection of this scoping review can be found in Chapter Two.

I conducted the second article with 10 middle school agricultural education teachers from five leading states regarding middle school students and FFA enrollment in the U.S. I contacted state leaders of agricultural education in each state to identify participants. I asked them to recommend at least two teachers they considered exemplary in facilitating middle school SAE programs in their respective states. To accomplish this, I developed a semi-structured interview protocol and facilitated virtual interviews with each teacher. In addition, I asked each teacher to supply documentation that displayed exemplary methods of instruction or assessment regarding SAE programming to triangulate the study’s findings. Before initial contact with teachers, I received approval from LSU AgCenter Institutional Review Board (IRB) (IRBAG-23-009, see Appendix A). As required by the LSU Ag Center IRB, before data collection, I attached a
description of the study, a confidentiality statement, informed consent, and contact information.

**Organization of Thesis Articles**

This thesis was organized into a series of two articles that aimed to contribute to the body of knowledge on middle school agricultural education. This chapter provided a background of the thesis and an overview of the issues related to middle school agricultural education, particularly SAE programs. Chapters two and three included a targeted background, purpose, methodology, findings, and conclusions for each separate article. Chapter two investigated trends published on middle school agricultural education. Chapter three addressed a gap discovered in article one – the lack of knowledge on facilitation of learning through middle school SAE programs. The final chapter provided meta-conclusions and recommendations by synthesizing each article’s findings. Finally, the remaining sections of this chapter provided a brief overview of each article, and key terminology relevant to this thesis.

**Article One.** I conducted a scoping review in article one to identify the emergent trends of middle school agricultural education in the U S. Additionally, gaps of knowledge concerning middle school school-based agricultural education (SBAE) were identified. The major guiding questions for this scoping review were: (1) *What opportunities and challenges have been reported for middle school agricultural education students,* and (2) *What opportunities and challenges have been reported for middle school agricultural education teachers?* The analysis of these articles was achieved through careful examination of the reported trends and themes, and thoughtful categorization of the data reported.

**Article Two.** The second article examined the facilitation of learning using SAE programs in middle school agricultural education. To investigate such, I used a qualitative approach to examine emergent themes from agricultural education teachers who were considered
exemplary at delivering middle school SAEs in five states. The two guiding questions were:  

What SAE delivery and supervision approaches have been utilized by middle school agricultural education teachers to facilitate student learning? and (2) What factors indicate high quality-middle school SAE programs? Data collection involved in-depth, semi-structured interviews through virtual meeting platforms. Data analysis was conducted to reduce the information gathered from the interviews through coding methods outlined by Saldaña (2021). This process allowed me to determine patterns, themes, and trends to assign meaning to the data.

Assumptions

The following assumptions were made regarding this study:

1. The articles analyzed for the scoping review were complete and honest in reporting.

2. The responses provided through data collection with middle school agricultural education teachers were honest and representative of the practices used to facilitate learning through SAEs for students in 6th through 8th Grade.

Delimitations

The were three delimitations for this study:

1. Careful restrictions were set to garner articles that met the search criteria for the scoping review. Those restrictions can be found within the text of article one.

2. The second article required interviews with middle school SBAE teachers. State leaders of agricultural education were asked to recommend middle school teachers to ensure interviews were completed with teachers who met the criteria of the study.

3. Teachers were selected from the seven states with the highest enrollment of middle school students and/or highest membership of middle school FFA members (Jones et al., 2020).
**Limitations**

The limitations associated with this study included:

1. There was little information published regarding middle school agricultural education, so the findings reported in the scoping review covered limited information.

2. Because the findings of the second article only focused on five states with the highest levels of middle school SBAE enrollment and FFA membership (Jones et al., 2020), results may not be generalizable to middle school agricultural education throughout the U.S.

**Key Terminology**

The following terms were used throughout this study and definitions have been provided in accordance with their use in the study.

- **Middle school** – the educational unit between elementary school and high school – grades six through eight (Talbert et al., 2007)

- **School-based agricultural education (SBAE)** – programs of instruction related to agricultural education within a school system (Talbert et al., 2007)

- **Scoping review** – a literature review used to determine the coverage of a body of literature; they have been useful in examining emerging evidence in a given field of practice (Munn et al., 2018)

- **Supervised Agricultural Experience (SAE)** – planned, sequential, and educational agricultural activities completed by students outside of the classroom setting with supervision provided by the local agricultural education teacher, parent, employer, or other key individuals (Phipps et al., 2008)
CHAPTER 2. EMERGING TRENDS FOR MIDDLE SCHOOL AGRICULTURAL EDUCATION IN THE UNITED STATES: A SCOPING REVIEW

Introduction and Review of Literature

President Abraham Lincoln signed the Morrill Act into law at the beginning of the U.S. Civil War in 1862 (Herren & Edwards, 2002). This act authorized states to create universities on granted land that focused on agriculture, mechanical arts, and military science (Gordon & Schultz, 2020). The adoption of this law allowed young men who desired a vocational and practical education the opportunity to gain skills rather than focus on careers such as (a) law, (b) medicine, (c) ministry, and (d) teaching (Gordon & Schultz, 2020). However, Phipps et al. (2008) explained that agricultural instruction for students in college did not start until junior or senior year. To remedy this, providing agricultural coursework to students at the secondary level was necessary. And as a result, the Smith-Hughes Act (1917) was adopted.

The Smith-Hughes Act changed the U.S. educational landscape, especially for school-based agricultural education (SBAE) (Herren & Edwards, 2002). With the adoption of this law, high schools were allotted finances from the government to provide education and training in agriculture, home economics, and other industrial trades (Gordon & Schultz, 2020). One year after adopting the Smith-Hughes Act (1917), 15,453 high school students were enrolled in agricultural education courses (Gordon & Schultz, 2020). Further, agricultural education was offered in all contiguous states by 1922 (Phipps et al., 2008). According to the most recent data gathered from 2020-2021, 946,538 students were enrolled in agricultural education courses in the U.S. (United States Department of Education, 2022). As such, there were 196,556 7th and 8th grade students enrolled in agricultural education courses in the 2021-2022 school year (National FFA Organization, 2023a).
At its creation, agricultural education was limited to males aged 14 and older to align with the requirements established through the Smith-Hughes Act (1917). However, some states began to expand opportunities in agricultural education for middle school students with the first reported middle school agricultural education program established in 1926 for 8th Grade students in Virginia, where in the same year, 8th Graders were granted Virginia FFA membership. (Rossetti & McCaslin, 1994). It should be noted, however, that FFA membership nationally was not opened to middle school students until 1988 (National FFA Organization, 2022b). In 2022, there were 850,823 members (National FFA Organization, 2022c) with 108,853 being 7th and 8th grade students (National FFA Organization, 2023b).

Few award programs have been available to middle school students. Within the agriscience fair, middle school students may compete in divisions one or two, depending on project requirements (National FFA Organization, 2018). Meanwhile, of the 26 nationally recognized career and leadership development events, only two have been offered to middle school members: (1) creed speaking and (2) conduct of chapter meetings (National FFA Organization, 2022a). The FFA Discovery Degree can be awarded to a middle school student at the local level. Meanwhile, middle school programs can be recognized at the state and national level through the National Middle School Model of Excellence Award. This award program recognizes middle school agricultural education programs that exhibit excellence in the three areas of the program of activities: (1) building leaders, (2) growing communities, and (3) strengthening agriculture (National FFA Organization, 2022c).

Tucker and McHugh (2022) stated that middle school agricultural programs “serve as a recruitment pipeline, contributing to high school program growth. As students transition into secondary programs, they take their experience with them” (p. 25). These experiences included
agricultural interest, career development, and agricultural literacy (Rossetti, 1992). Even so, the students in middle school programs have different experiences than high school students, especially regarding the length of instructional time, student maturity levels, and duplication of instructional topics (Rossetti, 1992). From the teacher’s perspective, instructional time, varying from six weeks to a full year, can prove difficult for a middle school agricultural education teacher (McLean, 2022). Identifying effective teaching strategies and content to cover due to the lack of middle school educational standards (Jones et al., 2020), and the lack of attention to teacher preparation programs and professional development opportunities have posed challenges for middle school teachers (Golden et al., 2014).

Since agricultural education was introduced into the U.S. educational system, middle school students, teachers, and programs have been underserved (Tucker & McHugh, 2022). This has been evident in the lack of opportunities available to middle school agricultural students. Further, middle school teachers lack the training and resources to meet the needs of this diverse learning population (Golden et al., 2014). Because of this, middle school agricultural education programs appear to have not met their full potential. Consequently, the following questions have persisted: (a) What gaps in the literature exist concerning middle school agricultural education programs? and (b) What changes need to be addressed to advance middle school agricultural education in the 21st Century and beyond?

**Conceptual Frameworks**

After the Smith-Hughes Act (1917) funded teaching and learning of agriculture courses in public schools, agricultural-based clubs for youth eventually evolved into what has become to be known as the National FFA Organization (Croom, 2008). Meanwhile, Stimson’s farm project concept eventually evolved into what has become known as SAE, by which students learn
through individualized agricultural projects supervised by SBAE teachers (Croom, 2008). These three components – classroom/laboratory, FFA, and SAE – have historically provided a conceptual basis for delivering student learning in SBAE. Further, agricultural literacy, leadership, and career skill development have all been espoused to be embedded in the model (Croom, 2008). Figure 2.1 provides a visual representation of agricultural education’s comprehensive three-circle model.

![Diagram of Agricultural Education's Comprehensive Three-Circle Model]

Figure 2.1. Agricultural Education’s Comprehensive Three-Circle Model

Despite agricultural education’s three-circle model’s widespread adoption, it has been criticized for not accurately demonstrating the outcomes and context by which students achieve learning in SBAE (Hughes & Barrick, 1993). More recently, Roberts and Ball (2009) offered an alternative model for SBAE that sought to explain how agriculture can be used as content and context for teaching and learning. In particular, Roberts’ and Ball’s (2009) model depicted that student knowledge could be achieved across learning domains by using industry-validated agricultural curriculum. Further, Roberts and Ball (2009) opined that student learning resulted
from teacher-to-learner, as well as learner-to-learner interactions. The model also depicted the role of the agricultural education teacher as a facilitator of agricultural content and other interrelated educational domains (Roberts & Ball, 2009).

Roberts and Ball (2009) postulated that the merger of these concepts yielded two key outcomes: (1) a skilled agricultural workforce and (2) successful lifelong learners that are agriculturally literate citizens (Roberts & Ball, 2009); see Figure 2.2. By viewing middle school agricultural education through this framework, I was positioned to examine the trends that emerged from this scoping review and explore how the knowledge of middle school agricultural education has been limited in the literature. I also was able to cast a speculative eye toward the future regarding the appropriateness of organizing and delivering middle school programs from conceptual lenses designed to understand high school students’ experiences in SBAE.

Figure 2.2. Roberts’ and Ball’s (2009) Conceptual Model for Agricultural Subject Matter as a Content and Context for Teaching
Purpose, Significance, and Research Questions

The purpose of this study was to conduct a scoping review of peer-reviewed journal articles that have been published on middle school agricultural education in the U.S. In the future, this knowledge could inform research and provide additional opportunities for middle school agricultural education students. To meet the study’s purpose, the following research questions guided the investigation:

1. What opportunities and challenges have been reported for middle school agricultural education students?
2. What opportunities and challenges have been reported for middle school agricultural education teachers?

Methods and Procedures

I conducted a scoping review to synthesize the peer-refereed journal articles that have been published on middle school agricultural education in the U.S. Munn et al. (2018) stated that “scoping reviews are an ideal tool to determine the scope or coverage of a body of literature on a given topic” (para. 5). Further, “scoping reviews are useful for examining emerging evidence when it is still unclear what other, more specific questions can be posed and valuably addressed by a more precise systematic review” (para 5). To accomplish this, I analyzed each journal article as outlined by the guiding research questions to identify emerging themes, opportunities, and challenges.

Search Strategy and Inclusion Criteria

I utilized the EBSCO search engine provided through the Louisiana State University Library Portal. This search engine was limited to the ERIC and AGRIS databases. The search was also limited to scholarly (peer-refereed) journals with dates set from 1908-2021 in order to
gather as many articles as possible. A Boolean search string was used to search for the occurrence of these terms (“agricultur* education” AND “middle school” OR “junior high” OR “intermediate school”). This search yielded 63 unique publications. Additionally, a search using the phrase “middle school” was conducted through the database for the Journal of Agricultural Education and the Journal of Southern Agricultural Education Research. This search yielded 33 additional articles. Five duplicates were removed. I reviewed the titles and abstracts of the 91 publications to determine if they met the following criteria for the study: (a) a description of the scope of SBAE middle school students or SBAE middle school teachers, (b) identified needs for SBAE middle school students or SBAE middle school teachers, and (c) mentioned middle school agricultural programs. As a result of this process, 79 publications were excluded from the analysis. In total, 12 peer-refereed journal articles met the criteria for inclusion in this study.

Analysis Techniques and Trustworthiness of the Study

The 12 articles were then analyzed and coded by the lead researcher. To identify the emergent trends regarding middle school agriculture education, the following were identified: (a) type of article, (b) target participants, and (c) article context. The codes were developed following a classification system outlined by St. John and McNeal (2015). This framework was based on a five-level pyramid with each level increasing in the strength of evidence. The framework included the following unfiltered information: (a) practitioner wisdom/expert opinion, (b) qualitative and quantitative case studies, (c) qualitative and quantitative cohort studies, and (d) filtered information: meta-analyses and systematic reviews. Through the use of this framework, the following trends emerged regarding middle school agricultural education: (a) classroom/laboratory and program characteristics, (b) FFA, (c) SAE, and (d) teacher characteristics and needs.
**Findings**

My analysis of the published articles in peer-refereed journals for middle school agricultural education revealed important emerging commonalities, gaps, and trends. In total, 12 articles were included in the scoping review (see Table 2.1). Based on the analysis of the articles, I found that middle school agricultural education has been researched in a variety of settings. For example, more than half of the articles analyzed in this review were conducted using survey methods ($f = 6; 50\%$). Additional article characteristics were as follows: expert opinion ($f = 2; 16.6\%$), practitioner wisdom ($f = 2; 16.6\%$), and case-study ($f = 1; 08.3\%$). Eight articles were state specific ($f = 8; 66.6\%$) while four were completed nationally ($f = 4; 33.3\%$) and one (0.3\%) was local in scope.

Table 2.1. Summary of the Characteristics of Middle School Agricultural Education Reported in Peer-Refereed Literature

<table>
<thead>
<tr>
<th>Article</th>
<th>Article Type</th>
<th>Participants</th>
<th>Scope</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown and Stewart (1993)</td>
<td>Practitioner Wisdom/Students Experimental Design</td>
<td>Students</td>
<td>State</td>
<td>Knowledge change based on length of instruction</td>
</tr>
<tr>
<td>Duncan et al. (2016)</td>
<td>Case Study</td>
<td>Students</td>
<td>Local</td>
<td>Impact of a school garden on middle school students</td>
</tr>
<tr>
<td>Fritz and Moody (1997)</td>
<td>Survey</td>
<td>Teachers</td>
<td>State</td>
<td>The state of middle school programs</td>
</tr>
<tr>
<td>Golden et al. (2014)</td>
<td>Survey</td>
<td>Teachers</td>
<td>State</td>
<td>Needs of teachers</td>
</tr>
<tr>
<td>Jones et al. (2020)</td>
<td>Survey</td>
<td>State FFA Leaders</td>
<td>National</td>
<td>Status of middle school programs</td>
</tr>
</tbody>
</table>

(table cont’d)
<table>
<thead>
<tr>
<th>Article</th>
<th>Article Type</th>
<th>Participants</th>
<th>Scope</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rohs and Anderson (2001)</td>
<td>Survey</td>
<td>Students</td>
<td>State</td>
<td>Motivational of students</td>
</tr>
<tr>
<td>Rossetti and McCaslin (1994)</td>
<td>Survey</td>
<td>FFA Executive Secretaries</td>
<td>National</td>
<td>The state of middle school programs</td>
</tr>
<tr>
<td>Rudd and Hillison (1995)</td>
<td>Survey</td>
<td>Teachers</td>
<td>State</td>
<td>Teacher characteristics and the adoption of agriscience curriculum</td>
</tr>
<tr>
<td>Skelton et al. (2018)</td>
<td>Practitioner Wisdom/Pre- Post Test</td>
<td>Students</td>
<td>State</td>
<td>Science competence of students</td>
</tr>
</tbody>
</table>

The first question guiding this study focused on trends published in peer-refereed journals regarding middle school students. The emergent trends were divided into three sections: (a) classroom/laboratory and program characteristics, (b) FFA, and (c) SAE to align agricultural education’s comprehensive three-circle model (Croom, 2008).

In a study examining the status of middle school agricultural education, Jones et al. (2020) surveyed 32 state FFA leaders to determine the common subject areas taught in middle school agricultural education programs. Meanwhile, in a Delphi study, Frick (1993) gathered information regarding subject areas commonly taught in middle schools from the presidents of state associations of agricultural education. After analyzing the 12 articles in this review, the most frequently reported subject areas for middle school programs were career exploration ($f = 4; 33.3\%$), environmental/natural resources ($f = 3; 25\%$), international agriculture ($f = 3; 25\%$) and leadership/human relations ($f = 3; 25\%$). For this study, all FFA-related topics were included in the leadership subject area (e.g., parliamentary procedure, public speaking, and employability skills).
Additional information regarding middle school agricultural education programs included the common grade level of students and the length of programs. On this point, Brown and Stewart (1993) reported that there were no statistically significant differences regarding middle schoolers’ change in attitude or agricultural knowledge who received agricultural instruction between six and 18 weeks. Meanwhile, Jones et al. (2020) and Rossetti and McCaslin (1994) examined various program lengths of middle school agricultural education programs. The most commonly reported length of instruction included nine weeks \((f = 3; 25\%)\), six weeks \((f = 2; 16.6\%)\), and one semester (18 weeks) \((f = 2; 16.6\%)\). Finally, the grade levels described included 6th \((f = 8; 66.6\%)\), 7th \((f = 9; 75\%)\) and 8th grades \((f = 11; 91.6\%)\).

The impact of middle school programs has also been reported. One such impact was reported by Fritz and Moody (1997) who found that middle school programs promoted agricultural awareness and exposed students to agricultural careers. In this analysis, advantages and disadvantages \((f = 3; 25\%)\), knowledge retention and comprehension \((f = 2; 16.6\%)\), barriers \((f = 2; 16.6\%)\), student motivation \((f = 1; 8.3\%)\), school gardens \((f = 1; 8.3\%)\), and occupational education \((f = 1; 8.3\%)\) were found in the literature. Table 2.2 provides a summary of the emergent trends regarding classroom and laboratory for middle school agricultural education in peer-refereed journal articles.

Table 2.2. Summary of Emergent Trends regarding Classroom, Laboratory and Program Characteristics in the Middle School Agricultural Education Literature

<table>
<thead>
<tr>
<th>Emergent Trend</th>
<th>(f)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Classroom/Laboratory</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Subject Areas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career Exploration</td>
<td>4</td>
<td>33.3</td>
</tr>
<tr>
<td>Environmental/Natural Resources</td>
<td>3</td>
<td>25.0</td>
</tr>
<tr>
<td>International Agricultural</td>
<td>3</td>
<td>25.0</td>
</tr>
<tr>
<td>Leadership/Human Relations</td>
<td>3</td>
<td>25.0</td>
</tr>
<tr>
<td>Agricultural Literacy</td>
<td>2</td>
<td>16.6</td>
</tr>
</tbody>
</table>

(table cont’d)
Trends also emerged regarding middle school students’ FFA involvement. For example, FFA chapter organization was discussed. It was reported that some middle school chapters were separate from the high school chapters ($f=2$; 16.6%) and that some middle school and high school chapters were combined ($f=2$; 16.6%). Further, FFA dues were discussed in two articles ($f=2$; 16.6%). Jones et al. (2020) reported that 25 state leaders collected dues from middle
school FFA members, while seven states did not collect dues. In a study on the status of middle school programs, Rossetti and McCaslin (1994) reported that state-level competitions for middle school students were provided in 17 states, 14 states held their competitions with high school FFA events, and six states held their competitions separately from high school FFA events. In a more recent study, Jones et al. (2020) reported that five states held career development events (CDEs) separate from high school while 21 states held CDEs in conjunction with high school agricultural education programs.

Trends also emerged from the literature regarding FFA opportunities for middle school students. The most frequent opportunities reported for middle school students included a combination of Leadership Development Events (LDEs) and CDEs, including FFA creed speaking \((f = 2; 16.6\%)\), dairy foods \((f = 2; 16.6\%)\), livestock evaluation \((f = 2; 16.6\%)\), and public speaking \((f = 2; 16.6\%)\). A complete list of the reported FFA-related trends that emerged from the literature was provided in Table 2.3.

Table 2.3. Summary of Emergent Trends regarding FFA in the Middle School Agricultural Education Literature

<table>
<thead>
<tr>
<th>Emergent Trends</th>
<th>(f)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FFA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Chapter Organization</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separate chapter apart from high school</td>
<td>2</td>
<td>16.6</td>
</tr>
<tr>
<td>Joint chapter with high school</td>
<td>2</td>
<td>16.6</td>
</tr>
<tr>
<td>Dues</td>
<td>2</td>
<td>16.6</td>
</tr>
<tr>
<td><strong>CDE Organization</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CDE in-conjunction with high school</td>
<td>2</td>
<td>16.6</td>
</tr>
<tr>
<td>CDE separate from high school</td>
<td>2</td>
<td>16.6</td>
</tr>
<tr>
<td><strong>Opportunities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FFA Creed Speaking</td>
<td>2</td>
<td>16.6</td>
</tr>
<tr>
<td>Dairy Foods</td>
<td>2</td>
<td>16.6</td>
</tr>
<tr>
<td>Livestock Evaluation</td>
<td>2</td>
<td>16.6</td>
</tr>
<tr>
<td>Public Speaking</td>
<td>2</td>
<td>16.6</td>
</tr>
<tr>
<td>Agricultural Mechanics</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Agriscience Fair</td>
<td>1</td>
<td>08.3</td>
</tr>
</tbody>
</table>

(table cont’d)
Emergent Trends

<table>
<thead>
<tr>
<th></th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Contests</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Broiler Contest</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Conduct of Chapter Meetings</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Conventions &amp; Conferences</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Crops (Agronomy)</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Discovery Degree</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Environmental Skills Contest</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>FFA Officer Team</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>FFA Quiz</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Floriculture</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Horse Judging</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Livestock Showing</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Meats</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>National FFA Awards</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Poultry</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Proficiency Awards</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Record Books</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Soils</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>State FFA Awards</td>
<td>1</td>
<td>08.3</td>
</tr>
</tbody>
</table>

Trends also emerged regarding supervised agricultural experience (SAE) programs in the literature on middle school agricultural education (see Table 2.4). Of the 12 articles included in this review, three articles (25.0%) addressed this topic. In particular, Jones et al. (2020) reported that “of the 32 participating states, 24 (75%) reported that middle school agricultural science students participate in SAEs, while eight states (25%) reported the students did not participate in SAE projects” (pp. 48-49). In a study conducted by Rayfield and Croom (2010), teachers in North Carolina stated that SAE programs should be scaled-back because many of the middle school programs had varying program lengths.

Table 2.4. Summary of Emergent Trends regarding SAE in the Middle School Agricultural Education Literature

<table>
<thead>
<tr>
<th></th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAE Student Participation</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>SAE Teacher Preparation</td>
<td>2</td>
<td>16.6</td>
</tr>
</tbody>
</table>
The second research question for this study focused on the opportunities and challenges facing middle school agricultural education teachers. Golden et al. (2014) described the professional development needs of middle school agricultural education teachers. Meanwhile, Rayfield and Croom (2010) reported that improvements must be made in the middle school agricultural education curriculum to alleviate challenges for teachers. Curriculum development \( f = 2; 16.6\% \) was the most frequently reported need for middle school teachers. Other needs were reported once \( f = 1; 8.3\% \) and included: (a) community relations, (b) FFA, (c) SAE, (d) classroom activities, (e) instructional delivery methods, (f) curricular standards, and (g) personal management. It should be noted that Golden et al. (2014) reported on the professional development needs of middle school agricultural education teachers; however, not all specific topics reported by Golden et al., (2014) emerged among multiple articles; therefore, some of the professional development needs were not included in this study. Additionally, the most frequently reported middle school teacher frustrations included were facilities \( f = 2; 16.6\% \) and scheduling issues \( f = 2; 16.6\% \). A summary of emergent trends regarding the opportunities and challenges facing middle school agricultural education teachers can be found in Table 2.5.

Table 2.5. Summary of Emergent Trends regarding Opportunities and Challenges Facing Middle School Agricultural Education Teachers related topics in the Literature

<table>
<thead>
<tr>
<th>Emergent Trends</th>
<th>f</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Teacher Related Topics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher demographics</td>
<td>2</td>
<td>16.6</td>
</tr>
<tr>
<td>Amount of agriscience taught</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Willingness to teach agriscience</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td><strong>Professional Development Needs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curriculum</td>
<td>2</td>
<td>16.6</td>
</tr>
<tr>
<td>Community relations</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>FFA, SAE, and classroom Activities</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>In-service delivery methods</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Standards</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Personal management</td>
<td>1</td>
<td>08.3</td>
</tr>
</tbody>
</table>

(table cont’d)
### Emergent Trends

<table>
<thead>
<tr>
<th>Frustrations</th>
<th>( f )</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilities</td>
<td>2</td>
<td>16.6</td>
</tr>
<tr>
<td>Scheduling issues</td>
<td>2</td>
<td>16.6</td>
</tr>
<tr>
<td>Administrative support</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Curriculum</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Demands of teacher</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Student motivation and accountability</td>
<td>1</td>
<td>08.3</td>
</tr>
<tr>
<td>Youth development and recognition</td>
<td>1</td>
<td>08.3</td>
</tr>
</tbody>
</table>

### Conclusions

I conducted a scoping review of middle school agricultural education in the peer-refereed literature and identified existing trends and themes. Only peer-refereed articles that met the search criteria for this investigation were mobilized for analysis. The 12 articles meeting the search criteria were systematically analyzed following St. John’s and McNeal’s (2015) recommendations. This analysis provided an informative review of middle school agricultural education research in peer-refereed journal publications.

My analysis revealed that there has been limited research conducted on middle school agricultural education programs. However, of the articles analyzed, major trends emerged regarding (a) classroom/laboratory and program characteristics, (b) FFA, (c) SAE, and (d) teacher characteristics and needs. As a result, I concluded that the most commonly reported subject areas taught at the middle school level were career exploration, environmental/natural resources, international agriculture, and leadership/human relations, which included FFA-related topics. This conclusion was similar to Rossetti (1994) who reported that the most common topics taught in middle school programs were plant science and career exploration. I also conclude that middle school SBAE program lengths have varied considerably, in which nine weeks emerged as the most frequently reported program length in middle school agricultural education (Brown, 1993; Jones et al., 2020; Rossetti & McCaslin, 1994).
Regarding appropriate grade levels to be taught, recommendations from the literature ranged from 6th to 8th Grade. For example, Jones et al. (2020) reported that eight states had students beginning in 6th Grade, 23 reported enrollment beginning in 7th Grade, and 24 reported enrollment beginning in 8th Grade. Consequently, I conclude that practitioners have used various instructional strategies to positively impact middle school students’ learning about agriculture. As an illustration, my analysis revealed that innovative approaches included the use of middle school gardens (Duncan et al., 2016) and inquiry-based instruction (Skelton et al., 2018) to engage students in agricultural content, which yielded statistically significant and positive changes on their academic learning of agricultural topics.

I further concluded that the literature on FFA chapters at the middle school level had reported diverse program characteristics. For instance, in my review, I found that some agricultural education programs had separate chapters and some programs had combined the middle school FFA chapters at the high school and middle school levels while other programs combined middle school and high school FFA chapters. Further, Jones et al. (2020) reported that some states did not allow middle school FFA chapters. I also concluded that some states have combined CDEs for high school FFA chapters and middle school FFA chapters, whereas other states have separate contests for middle school FFA members. It was also concluded that the most frequently reported middle school FFA opportunities were (a) creed speaking, (b) dairy foods, (c) livestock evaluation, and (d) public speaking.

Finally, research conducted on SAE programs at the middle school level has been limited. However, of the published literature on middle school SAEs, student participation and teacher preparedness were the primary issues explored. For example, Jones et al. (2020) reported on middle school students’ participation level in SAEs. Meanwhile, both Rayfield and Croom
(2010) and Golden et al. (2014) reported that middle school teachers desired professional development opportunities regarding how to facilitate quality SAE programs effectively. As such, I concluded that a need has emerged for the creation of targeted professional development opportunities for middle school agricultural education teachers. In particular, the most reported needs for professional development in the literature included curriculum, community relations, and facilitating learning opportunities with FFA, SAE, and the middle school agricultural education classroom (Golden et al., 2014; Rayfield & Croom, 2010).

Discussion, Implications, and Recommendations

Limited knowledge has been disseminated in peer-reviewed journal publications on middle school agricultural education. Nevertheless, enrollment trends for middle school agricultural education programs have demonstrated a significant increase and diversity in students and programs (Jones et al., 2020). On this point, Rayfield and Croom (2010) argued that middle school agricultural education programs were a critical starting point for many high school agricultural education students. To continue to grow high school agricultural education programs, while also leading middle school students toward a skilled agricultural workforce and agricultural literacy (Roberts & Ball, 2009), I recommend that more attention be dedicated to advancing knowledge on middle school agricultural education students, teachers, and programs.

Regarding future research, I recommend that further investigations aim to describe middle school agricultural education program characteristics more intimately. This scoping review explored the characteristics regarding the length of instruction, subjects taught, and grade levels, but the findings were limited. Therefore, future studies should build upon Brown’s and Stewart’s (1993) work to analyze the role of the length of instructional time and the knowledge retention of middle school students in agricultural education programs. In addition, further
research should be conducted to assess individual middle school programs concerning how teachers incorporate all students into the total agricultural education program (Croom, 2008).

There has been little research on the subjects and topic areas that should be taught at the middle school level. For example, only four ($n = 4$) articles reported on appropriate subject areas for middle school agricultural education programs. However, it should be noted that three of the articles were published more than 10 years ago. Therefore, future studies should seek to provide an update on the appropriate subjects and topics to be taught. Further research should also be conducted to understand the variability of subject areas for middle school agricultural education programs from state to state. In particular, limited studies have reported middle school programs using industry-validated agricultural curricula (Roberts & Ball, 2009). Therefore, I recommend that future research examine the effectiveness of using curricular resources such as CASE’s AgXplore and Introduction to Agriculture, Food, and Natural Resources for middle school students. Future research should also be conducted on expanding curricular materials and their efficacy in promoting agricultural literacy for middle school students (Roberts & Ball, 2009).

Key findings from this scoping review revealed that middle school students were involved in FFA at the local, state, and national levels. However, the experiences of middle school FFA students have varied considerably across contexts. The organization of local FFA chapters has also been reported to be diverse in delivery and scope. Further research should explore the benefits of independent middle school FFA chapters versus combining them with the local high school FFA chapters. Data should also be collected and synthesized from each state to evaluate how state FFA associations have included and recognized middle school FFA members in leadership and career development events, proficiency award areas, agriscience fair, and leadership camps and conferences. With this data, best practices can be advanced to serve middle
school FFA members better.

I also recommend that future research examine the role of SAE programs at the middle school level. The farm project, as conceptualized by Rufus Stimson in 1908, now known as SAE, allowed students to learn more about agricultural concepts through project-based learning in an area of a student’s interest (Croom, 2008). However, at its creation, agricultural education was limited to high school students (Croom, 2008). As such, an important question emerged from this investigation that warranted future study: _should the outcome of middle school agricultural education be to develop skilled workers and/or agriculturally literate citizens as espoused by Roberts and Ball (2009)?_ On this point, many middle school students are just becoming aware of the variety of career options available. Therefore, students at this level may lack career goals (Roberts, 2003). Because of this, should SAEs for middle school students be revised and/or rethought?

Moving forward, data should be collected to understand the current state of middle school SAE programs and describe best practices implemented by teachers. Further, quality indicators for exceptional middle school SAE programs should be identified. The _SAE For All_ initiative aligns middle school students at the awareness level (National Council for Agricultural Education, 2017). Further, it describes Foundational SAE programs with five parts: (a) career exploration and planning, (b) employability skills for college and career readiness, (c) personal financial management and planning, (d) workplace safety, and (e) agricultural literacy, which eventually develops into an immersion SAE (National Council for Agricultural Education, 2017). However, limited empirical evidence has been reported that supports such outcomes for middle school agricultural students. Therefore, researchers should examine whether middle school students experience these reported outcomes. Research should also be conducted to
evaluate if the *SAE For All* initiative is relevant for middle school agricultural education.

A key implication of this study was that middle school agricultural education teachers have unique needs. Therefore, I recommend that teacher preparation programs consider adapting their curricular resources to prepare teachers to lead middle school agricultural education programs. Perhaps by partnering with colleges of education, new pedagogical approaches and curricular resources could be created to address this need. Additional research should also be conducted to evaluate the existing curriculum resources available to middle school teachers. Future researchers should also assess whether the agriculture, food, and natural resources (AFNR) standards are relevant and if they reflect the learning outcomes that middle school students should attain. If they do not reflect the appropriate learning standards, I recommend creating new curricular standards appropriate to middle school students.

Multiple studies in this scoping review reported that students developed an increased awareness of agricultural literacy due to their engagement in middle school agricultural education programs. However, when evaluated through the lens of Roberts’ and Ball’s (2009) model, I question whether the aims and purpose of middle school agricultural education have been adequately advanced. For instance, agricultural education’s comprehensive three-circle model demonstrated that student learning occurs at the intersection of (1) classroom/laboratory, (2) FFA, and (3) SAE (Croom, 2008). However, empirical evidence on middle school agricultural education has not necessarily supported such a notion. For example, due to limited instructional time of some middle school programs, students often do not have in-depth experiences in each of the model’s three components. Therefore, alternative models that seek to reflect a more accurate representation of middle school agricultural education’s unique activities, context, and outcomes of student learning should be explored.
CHAPTER 3. SELF-REGULATED LEARNING IN MIDDLE SCHOOL AGRICULTURAL EDUCATION: TEACHERS’ PERSPECTIVES ON FACILITATING QUALITY STUDENT LEARNING IN SUPERVISED AGRICULTURAL EXPERIENCES

Introduction and Review of Literature

Since its early foundation, project-based learning (PBL) has been a core tenet of school-based agricultural education (SBAE). For example, Rufus Stimson, an early leader of SBAE, introduced the home project method for SBAE students to complete agricultural improvement projects at their farms to gain more profound knowledge of the agricultural industry (Stimson, 1919). The home project method eventually evolved into what has become known as supervised agricultural experiences (SAEs) in SBAE and was likely the first component of agricultural education’s comprehensive, three-circle model (Croom, 2008).

SBAE was formalized after the adoption of The Smith-Hughes Act (1917). However, participation in SBAE programs was limited to males aged 14 years or older. It was not until years later that middle school agricultural education programs emerged. Agricultural education courses and state FFA membership were first reported for 8th Grade students in Virginia in 1926 (Rossetti & McCaslin, 1994). Over time, middle school agricultural education programs continued to emerge across the U.S., including 7th Grade programs in Vermont in 1930 and 6th Grade programs in Mississippi in 1974 (Rossetti & McCaslin, 1994).

Further, the National FFA Organization experienced a major demographic shift in 1988 when FFA membership was granted to middle school students (National FFA Organization, 2022). The adoption of middle school agricultural programs and membership in the National FFA Organization created a need for a middle school agricultural education curriculum, middle school FFA award programs, and middle school SAEs.

One recent initiative that has provided a guiding framework for this practice was SAE for
The goal of *SAE for All* was 100% engagement in SAEs for all students – from middle to high school (The National Council for Agricultural Education, 2012). Many students, especially at the middle school level, begin with a Foundational SAE. Foundational SAEs provide an entry point for students by which they can (a) explore careers, (b) gain critical employability skills, (c) engage in personal financial management, (d) research the importance of workplace safety, and (e) enhance their agricultural literacy (The National Council for Agricultural Education, 2017). Eventually, as students advance in SBAE, they can engage in Immersion SAEs to “enrich their agricultural education” (The National Council for Agricultural Education, 2017, p. 5).

Historically, Immersion SAEs have been rooted in placement projects by which students have been employed in the agricultural industry, or entrepreneurial projects, that allow them to own an agricultural enterprise (Phipps et al., 2008). However, Immersion SAE programs have expanded to include (a) research, by which students employ the scientific method to solve a problem, (b) school-based enterprise, an SAE program that allows students to utilize school facilities to create agricultural businesses, and (c) service-learning, a project-based learning experience that promotes students to develop a self-directed, agriculturally-themed service project tied to curriculum-based standards (The National Council for Agricultural Education, 2017).

SBAE teachers have agreed that SAE programs were a vital component of agricultural education’s comprehensive three-circle model; however, implementation of quality SAE programs has been reported to be lacking (Lewis et al., 2012; Wilson & Moore, 2007). For example, Lewis et al. (2012) reported that many SBAE students were unaware of the major SAE categories. Further, some previous research (Retallick, 2010; Wilson & Moore, 2007) has
suggested that SBAE teachers experienced challenges regarding integrating SAEs into their programs due to (a) lack of rewards, (b) barriers to successful integration, and (c) inconsistencies across student dynamics. Retallick (2010) also suggested that an incongruence existed between the theory of SAE programs and the practices teachers used to incorporate SAEs into their programs.

To this point, the National Council of Agricultural Education (2015) argued that supervision by teachers and other adult mentors was essential to SAE program quality. Teachers have been found to positively influence students’ engagement, leading to greater student confidence and ability to develop and implement their SAE programs (Rubenstein et al., 2016). To develop exemplary SAE programs, teachers must provide clear student expectations (Rubenstein & Thoron, 2015). Further, when teachers have mandated SAE as a graded component, students were driven to be more successful (Bryant et al., 2022). Lewis et al. (2012) also suggested that assigning a grade value to an SAE program increased student participation.

SAEs have also been shown to influence local communities positively. Case in point, Retallick and Martin (2005) indicated that from 1991 to 2001, students who participated in SAE programs earned a combined 11-year average of $13,618,203 in Iowa. It was also found that Iowa students who participated in SAE programs invested 540,435 unpaid work hours and 1,965,451 paid hours, resulting in a mean of $1,443 per student and $55,948 for individual agricultural education programs (Retallick & Martin, 2005). Similarly, Hanagriff et al. (2010) reported on the massive economic impact of Texas SBAE students with SAEs. It was found that for the 62,000 FFA members in Texas, the average student had a $3,055 economic impact (Hanagriff et al., 2010).

In addition, participation in SAE programs have also been reported to influence critical
human capital and employability skill development. For example, Thiel and Marx (2019) posited that participation in Agriscience Research SAEs improved SBAE students’ perceived efficacy for developing 21st Century skills. Meanwhile, students’ engagement in Placement SAEs has been found to produce a statistically significant and positive relationship with career decision self-efficacy (Haddad & Marx, 2018). In comparison, Ramsey and Edwards (2012) identified the technical skills that SBAE teachers perceived their students to learn from participation in SAE programs. From this investigation, 161 varying skills were agreed upon among the seven AFNR pathways using a panel of experts (Ramsey & Edwards, 2012).

SAE programs have become a required educational experience of SBAE (The National Council for Agricultural Education, 2015). Through SAEs, students develop critical employment skills that can be applied to various careers in the agricultural industry. Further, The National Council for Agricultural Education (2015) has maintained that “exploration of career interests, requirements, and opportunities within a chosen career pathway in AFNR is a key component of quality SAE” (p. 4). These quality factors, however, may not be appropriate for students at the middle school level. As an illustration, many middle school students have only begun exploring career options but have not established firm career goals (Roberts, 2003). As such, Roberts (2003) suggested that middle school students pursue foundational-type SAE programs that focus on career exploration and agricultural literacy. Despite this, limited empirical evidence has been reported that supports such a claim. Consequently, one question has persisted: Is the modern structure and philosophy guiding SAE programs relevant to middle school agricultural education students?
Theoretical Framework

The theory of self-regulated learning (Zimmerman, 1998, 2008, see Figure 3.1) emerged as the most appropriate lens during data analysis and theme negotiation to interpret the findings of this investigation. Through this lens, learning is depicted as a three-phase cycle – (1) forethought, (2) performance, and (3) self-reflection – that individuals use to understand and adapt their environment to achieve a desired learning outcome (Zimmerman, 1998, 2008).

Figure 3.1. Zimmerman’s (1998) Self-Regulated Learning Phases

Forethought refers to “influential processes and beliefs that precede efforts to learn and set the stage for such learning” (Zimmerman, 1998, p. 2). Zimmerman (2008) delineated forethought into two categories (1) task analysis and (2) self-motivation beliefs. Task analysis includes critical duties such as goal setting in which individuals create a strategy to enhance their learning – an undertaking heavily influenced by their motivational beliefs. As such, in this phase, learners assign value to a task or skill, assess their outcome expectations of the achievement envisioned, and evaluate their self-efficacy to perform the new skill (Zimmerman, 2008).

These motivational beliefs reflect students’ commitment to achieving a goal and influence their success in the second phase of the cycle: performance (Zimmerman, 2008). The three categories of performance include: (1) attention focusing, (2) self-instruction, and (3) self-
monitoring to help learners focus on a task to achieve a goal (Zimmerman, 1998). Finally, in the self-reflection phase, self-regulated learners employ self-evaluation techniques to assess their learning and outcome attainment and analyze strategies they employ to meet their goals through self-assessment (Zimmerman, 2008).

Limited research has been published regarding self-regulated learning in SBAE. However, Filcher and Miller (2000) provided potentially useful learning strategies for distance learning, which included self-regulated learning. Meanwhile, McKendree and Washburn (2017) examined agricultural education teachers’ awareness and perceptions of self-regulation strategies as learners as well as how those teachers fostered self-regulated learning in their students. Further, Chumbley et al. (2018) reported on the self-regulation of learners engaged in online courses. In the current investigation, self-regulated learning emerged as a useful theory to help interpret the findings, establish themes, and assign meaning to the beliefs espoused by middle school agricultural education teachers. Framing our interpretation of the emergent findings through self-regulated learning, therefore, appeared to provide insight into their effective teaching and learning strategies and to establish a greater educational value to SAEs for their middle school students.

Purpose of the Study

This study’s purpose was twofold: (1) explain how middle school agricultural education teachers have successfully facilitated student learning through SAE programs, and (2) describe best practices for SAE programs at the middle school level. The research questions guiding this study were:

1. What SAE delivery and supervision approaches have been utilized by middle school agricultural education teachers to facilitate student learning?
2. What factors indicate high quality-middle school SAE programs?

**Methodology**

This study used an interpretive qualitative design to facilitate data collection and analysis (Merriam, 2009). Interpretive designs seek to describe how individuals construct knowledge as they make sense of their social world (Merriam, 2009). Therefore, this investigation was framed from a constructionism epistemological perspective (Koro-Ljunberg et al., 2009). Through the worldview of constructionism, meaning emerges as an individual interacts with their social environment (Crotty, 1998). Through this framing, I made sense of how exemplary middle school teachers facilitated quality student learning through SAEs. However, during this process, I recognized that my lived experiences influenced the interpretation of the findings (Merriam, 2009). As such, it was critical to address my personal biases and subjectivity.

**Reflexivity**

I was an agricultural education instructor for grades 7-12 in South Dakota prior to becoming a graduate student at Louisiana State University. During my time as middle school teacher, I incorporated SAE programming using a variety of methods, largely through the introduction of middle school students to agriscience research SAE projects. The philosophy behind this was twofold: (1) to introduce middle school students to FFA and SAE, including all aspects of research and data management, and (2) to establish a project developed around individual student interest that motivated students as they advanced through the agricultural education program. Because of these experiences, I became interested in middle school agricultural education programs and expanding opportunities for this population.
Participant Selection

I implemented a combination of purposeful and snowball sampling procedures to select participants for this study, which allowed me to access whether participants met the requirement of being a middle school teacher who facilitated exemplary SAE programs (Creswell & Poth, 2018). To achieve this, I selected the seven states with the highest middle school student enrollment and FFA membership: (1) Georgia, (2) Florida, (3) Virginia, (4) Missouri, (5) Delaware, (6) Oklahoma, and (7) Wisconsin (Jones et al., 2020). I contacted the state leaders of agricultural education from these seven states and asked them to nominate middle school agricultural education teachers who they considered to be exemplary regarding the facilitation of middle school student learning through SAEs. Despite multiple communication attempts, the teachers from Florida who were nominated by state leaders failed to respond. Further, the Missouri state leaders of agricultural education reported that middle school students were not granted FFA membership; therefore, they could not provide quality recommendations because they had no data on middle school SAEs. As a result, Florida and Missouri were omitted from the study. The two middle school agricultural education teachers from the list of nominees from each respective state leader received a personal email with information about the study, along with participant consent. Each participant agreed to participate (see Table 3.1).
Table 3.1. Participants’ Personal and Professional Characteristics

<table>
<thead>
<tr>
<th>Participant</th>
<th>State</th>
<th>Years Teaching</th>
<th>Middle School Grades Taught</th>
<th>Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DE</td>
<td>16</td>
<td>6-8</td>
<td>Traditionally Certified</td>
</tr>
<tr>
<td>2</td>
<td>DE</td>
<td>4</td>
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</tr>
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<td>3</td>
<td>GA</td>
<td>4</td>
<td>6-8</td>
<td>Traditionally Certified</td>
</tr>
<tr>
<td>4</td>
<td>GA</td>
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<tr>
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<td>Traditionally Certified</td>
</tr>
<tr>
<td>6</td>
<td>OK</td>
<td>10</td>
<td>8</td>
<td>Traditionally Certified</td>
</tr>
<tr>
<td>7</td>
<td>VA</td>
<td>2</td>
<td>6-8</td>
<td>Traditionally Certified</td>
</tr>
<tr>
<td>8</td>
<td>VA</td>
<td>35</td>
<td>6-8</td>
<td>Traditionally Certified</td>
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<tr>
<td>9</td>
<td>WI</td>
<td>1</td>
<td>8</td>
<td>Traditionally Certified</td>
</tr>
<tr>
<td>10</td>
<td>WI</td>
<td>28</td>
<td>6-8</td>
<td>Alternatively Certified</td>
</tr>
</tbody>
</table>

Data Collection

After obtaining Institutional Review Board (IRB) approval, semi-structured interviews were conducted with 10 participants. The interview questions were developed based on the purpose of the study. Interviews were conducted using Zoom, a virtual meeting platform. The platform provided video, audio, and transcription files upon completion of the interview, all of which were saved in password-protected software. The transcription was reviewed for accuracy against the original audio files. To triangulate the findings of this investigation, the participants also provided documentation of the policies and practices they used to facilitate SAEs in their programs. These documents included SAE: (a) information sheets, (b) rubrics, (c) assignments and relevant activities.
Data Analysis

Saldaña (2021) described coding as “a word of short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data” (p. 5). He further explained that the coding process allows a researcher to attribute meaning to data sources for analytic processes to make sense of participants’ experiences. For this study, I employed two methods of first-cycle coding: (1) in vivo coding, which utilizes words or phrases from the participants’ lexicon that allowed me to draw connections from the participants’ language throughout each transcript, and (2) values coding that allows a researcher to consider a participants’ values, beliefs, and attitudes about a particular topic (Saldaña, 2021). Values coding was employed to understand participants’ beliefs regarding SAE programs and why they incorporate such into their middle school agricultural education programs. After reducing the first-cycle codes, axial coding was employed to categorize the first-cycle codes based on similarities. Through peer negotiation, themes were consolidated resulting in five final themes. Theming the data through peer negotiations allowed me to construct meaningful categories based on participant responses (Saldaña, 2021).

It should be noted that the data were first analyzed through the lens of Kolb’s (1984) experiential learning theory because SAE programs allow students to learn through experiences and make connections between their previous knowledge and new experiences. However, through a peer negotiation and analysis process, we determined that the theory did not align adequately with this investigation’s emergent findings. As such, I analyzed participants’ transcripts and codes more deeply. During this re-analysis process, I perceived that Becker’s (1993) human capital theory might be a better fit. Human capital theory posits that while financial investments influence society positively, investments can also be made in individuals
through education and training, which can enhance family units, local communities, and regional economies (Becker, 1993). Although human capital theory allowed us to reckon with some of the discrepancies noted in our initial interpretation, it still did not best represent the views expressed by the middle school teachers in this investigation. During our third round of theme negotiation, self-regulated learning emerged as the most appropriate lens to interpret the study’s findings because it allowed us to authentically represent participants’ values while also staying true to the theory (Zimmerman, 1998, 2008)

**Building Quality into the Study**

Lincoln and Guba (1985) outlined four standards of trustworthiness that I employed in this study: (1) confirmability, (2) dependability, (3) transferability, and (4) credibility. Confirmability refers to a researcher’s explicitness regarding their decisions, biases, and other influences that can affect the study. I upheld confirmability by (a) providing a reflexivity statement, (b) a complete description of procedures for data collection, and (c) connections between conclusions and data. To uphold dependability, which refers to the degree to which the investigation was conducted consistently over time, I developed straightforward research questions and collected data across appropriate settings. The third standard, credibility, refers to the context by which data were collected. As such, I employed credibility by triangulating data across multiple sources, identifying uncertainties, and ensuring the data provided by participants made sense in the study’s context. The fourth standard, transferability, indicates how the study’s findings fit within other contexts. To ensure the findings in this study were transferable, I (a) fully described the participants to ensure accurate comparisons, (b) clearly described how participants were selected, and (c) linked the data to emerging theories.
Findings

After a thorough analysis of the data provided by the exemplary middle school teachers, five themes emerged: (1) an eye toward the future, where the teachers in this investigation incorporated goal setting through SAE as a learning tool to propel students to their next steps; (2) competition as a method of instruction, in which teachers used a competitive environment to motivate students to engage in high-quality learning experiences; (3) goal-driven learning outcomes, a theme by which teachers noticed student and school growth through participation in SAEs; (4) accountability for student learning, where teachers discussed checkpoints and benchmarks to encourage success in student goal achievement; and (5) challenges to facilitating learning in middle school SAEs, which outlined the barriers that detracted from providing valuable SAE learning experiences for middle school students. Ultimately, these findings illustrated how exemplary teachers navigated various contextual and structural challenges to facilitate learning for middle school students through SAEs.

Theme # 1: An Eye Toward the Future

Through the lens of self-regulated learning theory, having students assign value to learning tasks can enhance their understanding of concepts. When students value their learning tasks, they are more committed to their learning goals (Zimmerman, 2008). Therefore, to enhance students’ motivation to achieve a goal, educators can help their students understand how a learning task directly impacts their lives.

The middle school agricultural education teachers in this investigation understood the importance of helping their students find value in their learning through SAEs. To achieve this, participants reported using long-term planning, often multiple years into the future, as a motivational approach to encourage their students to engage in high-quality, sustained learning
and prepare them for life in the real world. For example, Participant #3 expressed: “We talk about SMART goals [in class] along with an assignment to come up with five SAE ideas [the students could incorporate as an SAE program]. Further, Participants #1, #2, #7, and #10 also indicated that most of their middle school students’ SAEs were “foundational” to help prepare them for deeper learning in high school agricultural education and their future careers. On this point, Participant #1 shared that they “align[ed] their expectations [to prepare students for] high school” and to “…give my 8th graders an idea of what they’re in for [in high school].” Case in point, Participant #2 shared: “if [students] have a haying operation at home, I tell them about the opportunities at the high school where [students] can run a haying operation through the school.” Conversely, Participant #3 espoused a different view on this issue:

An SAE project doesn’t necessarily, at the middle school level, have to have a whole lot of relevance to what a kid does when they graduate high school. [Middle school SBAE teachers] just want to get [students] active and involved, and if that means that they enjoy doing something, and [the students] want to pursue a hobby as their SAE project, then by all means, pursue a hobby.

The middle school teachers also explained that as students progressed to high school, they intended to increase the rigor and scope of their learning through SAEs to ensure they could successfully address complex issues and problems. For example, Participant #3 facilitated school-based agricultural mechanics SAE projects in their middle school program. They stated: “[Students] can only build a birdhouse for an ag mechanics project in the 6th grade [in my program]. I expect a bit more out of a 7th grader than a 6th grader, because [a student] has a little bit more experience in terms of woodworking. I want to see more.” To pace students appropriately, each of the teachers described using a scaffolding approach to student learning in SAEs by which their students initially acquired basic awareness of content in agriculture to provide them with the foundational knowledge and skills needed to engage with more issues and
problems more intimately later in their academic careers. Further, the middle school teachers described how they attempted to keep expectations similar for all students at this level while also providing information about Immersion SAEs so that they could expand their projects in the future. For example, Participant #7 noted:

We set up [the students’] foundational [SAEs] in 6th and 7th grades, and we’ll start Immersion SAEs in 8th grade. They’ll work on those [SAEs] until they … go to high school where they’ll continue with the same project, and [I will] add some components every year for the [Foundational SAEs], and they will progress based on their growth in the courses.

Regarding career development, multiple participants reported incorporating an agricultural career unit into their curriculum to raise students’ awareness about potential SAEs and possible career pathways. Participant #9 reported that such activities helped “match students with something that they already do” to explore potential future careers so that they could expand on their interests and begin brainstorming about SAEs in the future. These activities required students to discover average salaries, educational and training requirements, and work-related tasks – key learning milestones associated with Foundational SAEs. Participant #10 noted that students “have to get on some sort of path” and that teachers are “preparing them for future careers.” Participant #10 continued: whether students are completing a “career research project” or working on a “project at home,” they should be doing innovative projects based on their interests. Consequently, by helping students understand what they could achieve in the future through their SAEs, the middle school agricultural education teachers in this study appeared to gain student buy-in and set the stage for more impactful learning opportunities later in their students’ academic careers. Table 3.2 provides an overview of the SAEs the middle school teachers in this investigation reported their students engaged in most frequently.
Table 3.2 Commonly Reported Middle School SAEs

<table>
<thead>
<tr>
<th>SAE Type</th>
<th>$f$</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livestock (Beef, Sheep, Horse, Swine, Rabbits, Poultry)</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>Career Awareness Project</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>Agricultural Mechanics</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>Landscape Management</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Plant Science</td>
<td>3</td>
<td>30</td>
</tr>
</tbody>
</table>

**Theme #2: Competition as a Method of Instruction**

After obtaining student buy-in, the middle school agricultural education teachers stressed the importance of using competition as a method of instruction to encourage students to achieve their goals. Goal setting has been advanced as an important aspect of the self-regulated learner (Zimmerman, 2008). As such, students should learn about setting challenging yet attainable goals to achieve quality learning outcomes. To reinforce this, Participant #3 stated:

[Students] are creative. They’re innovative. It’s just a matter of where they’re at cognitively to understand exactly what [the students] are looking for in terms of down the road [when they’re] working on their record books for their proficiency applications and record keeping. Some of that might be a little more challenging for them. But, if we don’t challenge them, where’s our quality going to be when they graduate?

Through the lens of self-regulated learning theory, goals and external awards for achievement can enhance students’ self-efficacy on a given topic (Zimmerman, 2008). In the current investigation, the middle school agricultural teachers appeared to capitalize on the sentiment of self-regulated learning by using competition as a method of instruction to facilitate quality learning for their students engaged in SAEs. Case in point, every participant in this study mentioned the deep-rooted connection between SAE programs, FFA proficiency awards, and FFA membership degrees. When introducing the concept of SAEs to their students, multiple teachers reported using the National FFA Proficiency Award Program categories to set the context and establish the purpose and function of quality SAEs. On this point, Participant #9
explained: “I start out with the broad category of the proficiency or SAE area, break it down, [and explain] what [the students] can do. What proficiency area do they belong in?” The middle school teachers in the investigation also articulated that they were more likely to encourage students to conduct an SAE project if it aligned with a proficiency award area. The practice of completing SAEs with the goal of applying for proficiency awards in the future appeared to help the middle school teachers motivate their students to apply their learning from the classroom through real-world experiences. On this note, Participant #6 explained:

A lot of these students are very motivated to be successful, and they see the success of their peers older than them. There are three research proficiency award areas [in Oklahoma]. And, while they can’t fill [the applications] out as 8th graders, they do see their peers [succeed]. In Oklahoma, the state stars receive a $31,000 scholarship, and our 8th graders got to see [the state star win this year]. That’s motivating them to continue their research.

Although the teachers used awards as motivation for completing successful SAE programs, Participant #8 expressed a concern that there were “no achievement [awards]” for middle school FFA members at the national FFA level for SAE programs, except for the National FFA Agriscience Fair program. However, Participants #1, #2, #3, and #4 reported that their states have begun recognizing high-quality SAE programs for middle school students. Participant #3 noted: “In Georgia, we do a record-book competition, which is similar to a proficiency competition. It’s just oversimplified to a great degree.” Similarly, Participants #1 and #2 discussed the development of a State FFA Star Award for middle school SAE programs. In addition, Participants #6, #7, #8, and #9 incorporated a recognition program at the local level to celebrate middle school SAEs.

Participants also reported using the curriculum designed by the Agricultural Experience Tracker (AET) to introduce students to record-keeping because the AET aligns directly with proficiency award applications and FFA degrees. For instance, Participant #1 reported: “the
motivation is there [to complete SAE records books] because it gets the kids involved in learning the application process, as well.”

Additionally, some teachers used their school facilities to foster a competitive environment to facilitate quality student learning through SAEs. For instance, animal science laboratories and the use of “show teams” was mentioned by Participants #4, #5, and #6. When asked how SAEs were introduced into their program, Participant #5 reported: “the big [SAE program] in Oklahoma is showing livestock.” Participant #5 continued: “I’m in charge of the swine program here at [School District], and we split the other [species]. My teaching partners are in charge of sheep and goats.” The teachers also voiced how the competitive nature and financial awards received through livestock shows influenced students’ engagement with livestock-based SAE projects. On this point, Participant #4 reported: “[The students] actually get a lot of money. I just distributed $1,200, or something like that, [to the students] just by submitting [livestock] fair projects for free.”

Further, some teachers reported that record book submissions were required for their students to exhibit livestock at local fairs. For example, Participant #7 reported, “my [student’s] livestock-based SAEs, like those who have dairy cows or show pigs… their [SAE programs] are a little more intense because I’m making sure that they have their [record books] set up for the county fair.” Participant #7 continued: “[the student’s] motivation is to show the following year because their record book has to be turned in.” Similarly, Participant #8 indicated that “if [students] are showing livestock at the fair,” they keep records because “that’s a requirement for the fair.” The middle agricultural education teachers in this investigation also reported using competition guidelines as a learning tool to have their students complete agricultural mechanics projects and submit them for competitive events. As a result of this competition-driven
instructional approach, the participants reported that their students’ passion for expanding their knowledge grew as their SAEs expanded.

**Theme #3: Goal-Driven Learning Outcomes**

As a result of middle school teachers’ use of competition as an instructional approach to facilitate quality student learning in SAEs, they voiced multiple positive learning outcomes for their students. The participants largely attributed these outcomes to using goal setting and competition to motivate students to engage in learning experiences more profoundly through SAEs. Learning outcomes derived from goals have been shown to help self-regulated learners develop competence in key subject areas (Zimmerman, 1998). Although the overarching goal of the students’ SAEs, as articulated by the teachers in this study, was to obtain quality learning through achievement-based goals, multiple participants suggested that they also sought to “develop good people” (Participant #4, #6, and #9) through crucial learning experiences in SAEs. The teachers reported that they observed this outcome by witnessing their students’ academic and personal growth throughout their SAE projects. On this note, Participant #6 explained that students’ confidence in public speaking grew through presentations of agriscience research SAEs.

Although most teachers reported that their middle school students’ SAEs occurred in class, Participants #2, #4, and #6 perceived that the students began to see greater “connection[s] to agriculture” and a “connection to the real world” through SAE projects. To illustrate, Participant #6 shared that students have taken the knowledge learned from agriscience research SAE projects and incorporated such into other SAE projects. These connections appeared to increase students’ commitment to their SAE because it was “based on student interest,” as expressed by Participants #3, #6, #9, and #10. As students continued to learn through their SAEs,
the middle school teachers noticed that students’ “pride” for their work and “ownership” 
increased (Participants #7 and #9). Consequently, Participant #3 and Participant #10 noticed that 
the students would often begin “talking about” their SAEs with peers, and a sense of community 
would grow in the agricultural education classroom and school. When discussing how student 
SAEs were showcased, Participant #3 reported: “I hang the [SAE] posters in the hallway, and 
our teachers, as they come by during transition [periods], they’re like, ‘How are you putting 
these [SAE posters] up every day? It seems like every day I see a different [SAE poster].’ That 
kind of has a positive effect on the school. The [students] rally behind each other.” In addition, 
Participant #6 mentioned that school administrators and core-content classes noticed growth 
among students who participated in agriscience research projects.

The middle school teachers in this investigation also reported that livestock show projects 
were a popular student SAE. In several cases, when students participated in livestock shows, the 
teachers noticed that students benefitted by gaining career skills related to the agricultural 
industry. Participant #4 explained: “I have seen them change – everything about their being” 
through “developing and practicing hands-on skills” while caring for animals. Participant #4 
continued: “ag mechanics projects do not do that.” The teachers also articulated that increased 
growth of family time was another benefit of participating in livestock-based SAEs for students.

Multiple middle school teachers reflected on current and former students whose middle 
school SAE programs launched their future careers. Case in point, Participant #8 explained that 
because of the “exploration” component of their SAEs at the middle school level, their former 
student found a passion in something “unique” that they enjoyed and into built a business. 
Participant #10 provided an example of a student with a learning disability who overcame 
communication issues while building a relationship with their teacher through their SAE
program. The participant noted that the student “barely talk[ed] at school,” and the student’s speech therapist told the teacher, “[the student] doesn’t have a problem when talking to you. I mean, I’ve been talking to him for a while, but get [the student] talking about chickens and gardens, and [the student] just takes off.” Therefore, the teachers witnessed how SAE programs changed students’ lives and saw SAE as an investment into their future. To accomplish this, the middle school teachers expressed that accountability through documentation, grading, and SAE supervision was essential to successful learning through SAEs.

**Theme #4: Accountability for Student Learning**

Zimmerman (1998) argued that the self-reflective process was essential to self-regulated learning because it allowed students to assess if they achieve their goals, master the required content, and adjust their strategies for proper goal attainment. The middle school agricultural education teachers in this investigation reported a variety of methods for monitoring student performance in SAEs to hold their students accountable for learning. To support this notion, Participant #6 provided a grading rubric they used to monitor students’ progress, learning expectations, and project requirements for research-based SAEs which were initiated through participation in the Agriscience Fair (see Figure 3.2).
To ensure learning rigor and maintain high-quality SAE projects, the middle school agricultural education teachers employed various record-keeping approaches to encourage students to acquire essential data management and analysis skills. However, the delivery of record-keeping looked different for each participant. Participants #1, #2, #5, #6, #7, #8, #9, and #10 utilized The Agricultural Experience Tracker (AET) as a data management system, while Participants #3 and #4 reported using SAE record books that aligned with their state’s criteria for awards. Data management and analysis often occurred on “AET Fridays,” when class time was provided to allow students time to update their SAE records (Participant #5). Participant #6 incorporated “SAE Work Nights,” which allowed students to work on their agriscience research records after school hours. Further, middle school students were held accountable for their SAEs
as a graded component of their agricultural education course. Participants #1, #6, #7, #8, #9, and #10 indicated that SAEs were a graded component of their agricultural curriculum. Figure 3.3 demonstrates the experience guidelines provided by Participant #9. Further, Participants #1, #7, #9, and #10 facilitated learning through exploratory career research projects in which students researched a career, created a presentation, and logged documentation of this experience into their appropriate data management system. Participants #7, #9, and #10 required documentation of SAEs through student submitted photographs.

Figure 3.3. SAE Experience Planning Guide Provided by Participant #9

Zimmerman (1998) noted that learners evaluate their performance with feedback. Therefore, teachers should periodically assess students’ progress and provide feedback to determine whether learning goals have been reached. On this point, Participant #4 explained: “I require [the students] to do certain checkpoints throughout [the year]. [The SAE] starts in
August, so by September, they have to talk about why they’re doing [their SAE], what they’re doing… and a step-by-step [explanation of how they are going to do it]. Because I want them to document their experiences.” Further, the middle school teachers in this investigation reported assessing their students’ SAE projects through regular site visits. Participants #4, #5, #9, and #10 also reported on parental involvement through SAE agreements, SAE meetings for parents, or SAE visits with parental engagement. On this topic, Participant #10 provided an ‘SAE Agreement’ document (Figure 3.4) that required students to describe their SAE plan, develop an SAE risk assessment, and obtain parent signatures to begin work on their SAE programs.

Further, the middle school teachers completed SAE visits on-site with students, in the classroom, or through various learning laboratories provided through their school system. Participant #4 explained that breeders who sold livestock to students were also used as resources to provide expert knowledge to enhance students’ learning and as an additional strategy to hold students accountable for their learning. It should also be noted that Participants #3, #6, #9, and #10 included a classroom presentation as a summative assessment of student learning. This presentation was to evaluate students’ progress and learning for their chosen SAE. “Sharing their projects,” Participant #10 stated: “it kind of helps the kids. It helps them see what other kids are interested in… and sparks some ideas for them and some other interests.”
Despite the benefits of SAE programs, the middle school teachers in this investigation experienced several challenges that they perceived affected their ability to facilitate quality learning for middle school students engaged in SAEs. For example, Participant #4 indicated that “SAEs [were] time-consuming.” A significant reason for this was that the middle school agricultural education teachers in this study reported varying instructional time with the students, ranging from nine weeks to a full year. On this note, Participant #2 indicated: “I don’t have a lot of time, considering we are on a marking period schedule… Once [the students] get to high school, and [the students] have the teachers all year round, they can dive deeper into their SAE program.” To maximize classroom time, however, Participant #8 incorporated a group SAE
project in which the middle school students read Farm Bureau’s *Book of the Year* and created educational activities based on the book to improve elementary students’ agricultural literacy. Upon completion of the project, students documented their experiences in the AET.

Because of additional responsibilities assigned to middle school agricultural education teachers, SAEs were another item on their already “full plate.” Participant #4 explained: “I’m expected to advise [students’ SAEs] …my role has evolved from that, too. But I also have the responsibility of all the other components of the program.” Further, the middle school agricultural education teachers struggled to decide when to begin students on their SAE journey. Participant #8 shared: “We really don’t even talk about it as a unit until their 8th-grade class. Similarly, Participant #10 noted that students cannot start SAE programs too soon; otherwise, “it leads to some confusion down the road when they apply for awards” because “they cannot include any of their SAE project hours until they [are] in 7th grade [in their state].” Therefore, Participant #10 only required SAEs for 7th and 8th Grade students. Meanwhile, Participants #1, #3, #4, and #7 indicated incorporating SAEs in 6th Grade. However, Participant #8 felt 6th Grade was too young for students to begin an SAE project.

The teachers also noted that middle school students struggled to grasp the conceptual nature of SAEs. As a result, they perceived that middle school students often required heavy teacher guidance because they “lack[ed] the independent skills” (Participant #4) to complete SAEs in ways that high school students would. For example, Participant #8 argued that SAEs were a “very abstract concept for 8th graders.” Because middle school has historically been the entry point for students entering the agricultural education program, these students “don’t have the skillset” or “ability” to meet the learning demands required for Immersion SAEs (Participant #8). Further, multiple participants mentioned the age of middle school students affected their
ability to engage in placement SAEs. On this point, Participant #6 commented: “Our big employers of FFA members aren’t going to hire [the students] until they’re 16. Therefore, we have more entrepreneurship SAEs, where students are raising livestock and showing livestock.” Nevertheless, the middle school agricultural education teachers believed that SAEs had value and encouraged their students to engage in them through self-regulated learning.

Conclusions

The purpose of this study was twofold: (1) explain how middle school agricultural education teachers have successfully facilitated learning through SAE programs, and (2) describe best practices for SAE programs at the middle school level. In this study, findings emerged through five themes: (1) an eye toward the future, (2) competition as a method of instruction, (3) goal-driven learning outcomes, (4) accountability for student learning, and (5) challenges in facilitating learning for middle school SAEs. Therefore, I conclude that based on the data provided by participants in this investigation, SAE can be an integral component of student learning at the middle school level. To accomplish this, the middle school teachers in this study used a future-oriented mindset toward SAEs to set a foundation for their students’ learning trajectories, including preparing them for high school expectations and their potential career interests. Further, the middle school teachers in this study scaffolded student experiences to help them advance into more complex SAE programs later in their academic careers. These types of SAE experiences appeared to allow middle school students to explore potential careers based on their interests. Further, the teachers in this study included goal setting as a critical learning component in SAEs. This corroborated the findings of Rubenstein and Thoron (2014), who reported that goal planning and learning were critical to successful SAE programs and strengthened career choices. As such, by allowing students to observe what is ahead for them,
teachers helped students see value in these projects, especially regarding SAE-based competitions. The teachers in this investigation also embraced the diverse interests of student SAE projects and conducted unique projects to facilitate their learning.

 Supported by the work of Jones and Edwards (2019), the second theme described how the teachers used competition to build motivation for student learning. To accomplish such, the middle school teachers in this study reported using the National FFA Proficiency Award Program to expose students to the diverse opportunities available in SAE programs. This award program, along with membership degrees and the Agriscience Fair, could serve as external motivators for student participation (Bird et al., 2013). Content and curricular resources provided by the AET were also utilized to teach students about successful record-keeping and data management. Further, teachers in this investigation used livestock shows, agricultural mechanics shows, record book competitions, agriscience research, and FFA membership degrees to further illuminate the value of SAE programs for students. The teachers in this study also reported creating awards for high-quality middle school students at the local level to recognize students that learned through use of competition as a method of instruction.

 In theme three, goal-driven learning outcomes, the middle school teachers in this investigation discussed the learning attributes and personal growth that students achieved through setting goals to achieve positive outcomes. In the literature, Doss and Rayfield (2021) reported that administrators believed that involvement in FFA and SAE was important. Similarly, the teachers noted that administrators and core content teachers noticed the growth of students who engaged in learning through SAE. Although the goal was to have students experience learning through high-achieving SAE programs, connections were also made to the agricultural industry – a finding supported by the work of Ramsey and Edwards (2012).
According to the middle school teachers in this study, students with livestock-based SAEs were reported to obtain the most significant personal growth. In agreement with Thiel and Marx (2019), we conclude that middle school students can achieve skill attainment through participation in Immersion SAEs focused on agriscience research. Traits such as pride, ownership, and professional growth also emerged as positive outcomes associated with SAEs.

Emergent findings also revealed that the teachers in this study held students’ learning accountable through their SAE projects. From the middle school teacher’s perspective, accountability was essential to the success of high-quality SAEs. For instance, the teachers employed various methods to have students document their SAE program, such as SAE record books, whether through AET or paper records, to track their progress. Through this process, these middle school teachers reported that their students tracked time, finances, and skills, most of which were graded. On this point, Bryant et al. (2022) illuminated that when students received grades for their involvement in SAEs, they were more likely to be motivated to develop a competent project. The teachers reported using photo documentation as evidence to support that students were completing high-quality SAE programs. Further, they completed on-site or in-class supervision to evaluate their students’ experiences. Further, some of their students collaborated with livestock breeders to monitor the progress of livestock-based SAEs.

Similar to Eck and Davis (2023) who examined barriers to the successful implementation of SAEs at the middle school level, the teachers in this investigation expressed challenges concerning successfully facilitating student learning in SAEs. In particular, time was a major factor regarding whether SAEs would be successful for many middle school teachers. In this study, I also found that instructional time varied from nine weeks to one year of instruction and varied from block schedules to daily student engagement over an academic year. The middle
school teachers in this study also expressed concerns regarding when to begin their middle school students with SAE projects to not confuse students on future award applications and competitions in FFA. I also conclude that the teacher perceived that SAEs were hard to conceptualize for middle school students, and as a result, they often did not have the wherewithal to complete overtly complex projects independently. Finally, teachers in this investigation reported limited awards for middle school students’ SAE programs, which impacted their ability to motivate their students to engage in high-quality student learning.

Discussion, Implications, and Recommendations

Self-regulated learning appears to have been intimately intertwined with SAE programming at the middle school level (Zimmerman, 1998, 2008). Teachers have facilitated the self-regulated learning’s three core components of (a) forethought, where they allowed students to examine their current learning status and had students create realistic learning goals toward their SAEs, (b) performance, by which teachers allowed students to engage in their SAEs and held their students accountable as they advanced toward their learning goals, and (c) self-reflection, where teachers provided feedback as student’s monitored progress toward their established learning goals. Self-regulated learning is a strategy that teachers should continue to employ in all three components of agricultural education’s comprehensive three-circle model as they guide their students through learning experiences in the classroom and laboratory, as well as those experiences with achievement-oriented learning outcomes, such as proficiency awards, agriscience fair, career and leadership development events, and membership degrees.

Understanding how teachers have facilitated learning through SAE was vital to reimagining middle school agricultural education programs in the future. For example, this study illuminated how exemplary middle school teachers used competition as a method of instruction
to deepen their students’ learning. Despite this, livestock-based and career exploration emerged as two of the most frequently reported SAE types for middle school students among the exemplary teachers in this study. Although focusing on careers can be valuable for students, could this practice be too heavily emphasized at the middle school level? Perhaps having middle school students expand into additional SAE types could improve students’ knowledge and motivation before entering high school. As such, I recommend that an evaluation be conducted regarding the importance of career exploration versus agricultural literacy and skill development in SAEs at the middle school level. This knowledge could help reposition the discipline to create a more accurate framework that guides the facilitation of high-quality learning for middle school SAEs. Future research should also explore establishing indicators of high-quality SAE programs to elucidate best practices for middle school SAEs.

Because the length of instruction varied between states, paired with inconsistencies of when teachers see students during the school week, I recommend that future research on SAEs at the middle school level examine whether a program (i.e., lasting more than one year) or a project (i.e., lasting less than one year) approach would be more appropriate. Perhaps emphasizing projects rather than programs could make the planning and delivery of middle school SAEs for teachers less intensive. Further, perhaps this change could allow teachers to expose students to multiple SAE projects while still focusing on high-quality instruction and other duties. Examples could include in-class, cooperative, independent, or service-learning SAE projects. Future research should also examine the diverse SAE project types that middle school teachers could use to facilitate quality student learning.

Based on the findings of this investigation, I recommend the AET, and other SAE data management systems, explore creating a developmentally focused data management and record-
keeping option for middle school students. On this point, teachers in this investigation espoused that SAE was already too abstract for their students to grasp, especially regarding data management and record keeping. This change in approach could streamline the ease with which students are exposed to SAE record keeping and documentation. Finally, the National FFA Organization and state associations should consider ways by which to recognize and celebrate exemplary middle school SAE projects and programs. If all students are expected to complete an SAE, and proficiency awards are based on them, then middle school students should be granted the same opportunity.
CHAPTER 4. SUMMARY AND CONCLUSION

Middle school agricultural education programs have continued to increase across the U.S. (Jones et al., 2020). Because of this, it has become necessary to develop effective ways to provide quality learning experiences for middle school students. Nevertheless, limited empirical evidence has been published regarding agricultural education at the middle school level. Despite this, participation in middle school agricultural education can enhance students’ leadership, skill, and professional development (National FFA Organization, 2009), and prepare students as they transition into high school agricultural education programs (Tucker & McHugh, 2022).

Although the benefits middle school agricultural education can provide to students have been reported to be numerous, teachers have expressed concerns regarding their preparation to provide quality instruction (Golden et al., 2014; Jones et al., 2020), as well as limited opportunities available to this population of students (Golden et al., 2014). One key challenge has been facilitating quality learning for middle school students during Supervised Agricultural Experiences (SAE) (Eck et al., 2023). Because of this, I conducted a comprehensive scoping review on SBAE in middle school. This scoping review helped identify a need to investigate how exemplary middle school teachers have facilitated quality learning in SAEs.

Summary

Chapter 2, Emerging Trends for Middle School Agricultural Education in the United States: A Scoping Review, presented an analysis of peer-refereed journal articles published on agricultural education at the middle school level. I performed a Boolean search string for publications on middle school agricultural education and assessed the titles and abstracts of 91 publications to determine if they matched the search criteria of the study. As a result of this process, I included 12 peer-referred-journal articles in the study. For each article, I identified the
(a) type of article, (b) target participants, and (c) article context. Next, I coded the articles based on the article’s strength of evidence. This included: (a) practitioner wisdom/expert opinion, (b) qualitative and quantitative case studies, (c) qualitative and quantitative cohort studies, and (d) meta-analyses and systematic reviews (St. John & McNeal, 2015). I analyzed the articles through the lens of agricultural education’s comprehensive three-circle model (Croom, 2008) and Roberts’ and Ball’s (2009) conceptual model for agricultural subject matter as a content and context for teaching, and four themes emerged: (a) classroom/laboratory and program characteristics, (b) FFA, (c) SAE, and (d) teacher characteristics and needs.

The program characteristics of middle school agricultural education have been diverse, including (a) subject areas taught, (b) length of instructional time, (c) grade levels taught, and (d) impacts on middle school programs. Additionally, there have been inconsistencies across FFA programming regarding (a) chapter organization, (b) CDE organization, and (c) opportunities available to middle school students. It should be noted that SAE was the least reported area of emphasis in the published literature on middle school agricultural education. Finally, the scoping review illuminated the needs of middle school agricultural education teachers, including professional development needs and teacher frustrations. The findings suggested that more focus should be placed on middle school agricultural education instruction to develop best practices for facilitating learning opportunities for these students. Further, middle school agricultural education teachers needed more professional development opportunities to enhance their knowledge of providing high-quality learning experiences for their students.

Chapter 3, Self-Regulated Learning in Middle School Agricultural Education: Teachers’ Perspectives on Facilitating Quality Student Learning in Supervised Agricultural Experiences, examined the role of SAE in student learning at the middle school level. In this investigation, I
interviewed 10 exemplary middle school teachers from five states who were nominated by their state’s leader of agricultural education. Data was gathered using semi-structured interviews and participant-submitted documents. Then, through the negotiation of findings, five themes emerged: (1) an eye toward the future, (2) competition as a method of instruction, (3) goal-driven learning outcomes, (4) accountability for student learning, and (5) challenges for facilitating learning in middle school SAEs. The findings demonstrated the best practices that exemplary middle school teachers implemented to facilitate learning and barriers they perceived affected students as they participate in SAEs.

The investigation’s findings illuminated the value that teachers placed on SAEs as learning experiences for students. For example, the teachers in this investigation communicated the important connection between SAE and FFA award programs. The teachers also indicated that students experienced personal growth through their participation in SAE. As such, middle school agricultural education teachers held their students accountable as they advanced toward their learning goals. This investigation concluded that the middle school teachers valued student participation in SAEs and expressed that developing recognition programs for middle school SAEs could enhance students’ learning.

**Meta Conclusions and Recommendations**

This investigation generated two meta-conclusions supported by the two separate research articles. The first meta-conclusion was that middle school agricultural education teachers expressed concerns regarding their preparation and ability to provide quality instruction to middle school students. For example, I found that there have been inconsistencies regarding the length of instructional time, lack of educational standards for middle school programs, and quality teacher preparation opportunities at the middle school level. These barriers could inhibit
the quality of instruction provided to middle school students. Therefore, I recommend that future research be conducted to establish a national standard of benchmarks to be completed by agricultural education middle school agricultural education students. Further, to resolve issues regarding middle school agricultural education teacher preparation, I recommend conducting research to examine the practices employed by university agricultural education teacher preparation programs as they prepare preservice teachers for roles in middle school agricultural education programs.

The second meta-conclusion produced from this investigation was that although middle school agricultural education programs have continued to increase across the U.S., there have been limited opportunities for middle school students at the local, state, and national levels. In this investigation, I found that middle school students did have the opportunity to participate in some career and leadership development events; however, middle school students often competed against high school students. Therefore, future research could be conducted to explore competitive opportunities that focus on middle school students only. Further, despite agricultural education students being required to conduct quality SAEs, there have been no national level recognition programs for middle school students besides the Agriscience Fair. I recommend that leaders explore options to create recognition opportunities for middle school students regarding SAE.
APPENDIX A. INSTITUTIONAL REVIEW BOARD APPROVAL

Richie Roberts
LSUAG | Dept | Agricultural and Extension Education and Evaluation | CC00946

Michael Keenan
Chair, Institutional Review Board

DATE: 10-Feb-2023
RE: IRBAG-23-0009
TITLE: The Role of Supervised Agricultural Experiences in Middle School Agricultural Education Programs

SUBMISSION TYPE: Initial Application
Review Type: Exempt
Risk Factor: Minimal
Review Date: 10-Feb-2023
Status: Approved
Approval Date: 10-Feb-2023
Approval Expiration Date: 09-Feb-2026
Re-review frequency: (three years unless otherwise stated)
Number of subjects approved: 10
LSU Proposal Number:

By: Michael Keenan, Chair

Continuing approval is CONDITIONAL on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects*
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date, upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being and informed consent of the individual participants, including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
8. SPECIAL NOTE: When emailing more than one recipient, make sure you use bcc. Approvals will automatically be closed by the IRB on the expiration date unless the PI requests a continuation.

* All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents.

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APPENDIX B. CONSENT FORM FOR PARTICIPATION

Title: The Role of Supervised Agricultural Education Programs in Middle School Agricultural Education Programs

Investigators: Jacob Englin, master’s student

Purpose: The purpose of this qualitative research study is to examine the role of supervised agricultural education (SAE) programs in middle school school-based agricultural education.

Procedures: Interviews for this study will be completed on a video-conference site (Zoom, Microsoft Teams, or other). The interview will be scheduled based on your availability. Participation in this research will involve a primary interview that will last 30-45 minutes. Additionally, the primary investigator may contact you for follow-up questions if necessary. Participants will also be asked to provide documents for middle school SAE record requirements, assessment, or other samples that the teacher has available.

Risks of Participation: There are no known risks associated with this research project that are greater than normal encounters in everyday life.

Benefits of Participation: If this study is ever published in a peer-reviewed journal or conference proceedings, the primary investigator is willing to email a copy to the participants, if interested.

Confidentiality: The records of this study will be kept private. Any written results that include your views and/or direct statements will be concealed with a pseudonym. Research records, including video files and recordings of the virtual meeting will be kept on a password protected computer in a locked office. Only the researchers will have access to the records.

Compensation: There will be no compensation for participation in this study.

Contacts: You may contact any of the researchers at the following addresses and phone numbers: Jacob Englin, 225 J.C. Miller Hall, Louisiana State University, Baton Rouge, LA 70803, (605) 690-6866.

Participant Rights: I understand that my participation in this study is voluntary and that there is no penalty for refusal to participate. Also, you can withdraw from participation in this study at any time.

Consent Documentation: I have been fully informed about the procedures listed here. I am aware of what I will be asked to do and of the benefits of my participation. I also affirm that I am 18 years of age or older. By agreeing to participate in this study, consent will be implied since I am over the age of 18.
APPENDIX C. INTERVIEW PROTOCOL

Demographics of Subject

Name:
Age:
School District/Location:
Years Teaching:
Grades Taught:

Major Guiding Questions:
1. Could you explain yourself as an agricultural educator?
   
   Sub-questions (if necessary)
   - What is your teaching style?
   - Why did you choose to be an agricultural educator?

2. Could you describe the middle school agricultural education program in your school district?

   Sub questions (if necessary)
   - Is this a single teacher program? Multi? If so, how many teachers?
   - What is your role within the department?
   - How long is the middle school program (9 weeks, one year, something else)?

3. What is the role of the supervised agricultural experience (SAE) programs in your middle school program?

   Sub questions (if necessary)
   - How are they monitored in the program?
   - Are they required?
   - What grades complete the SAE?
   - When are SAE programs introduced to students?

4. What are the expectations for the middle school students regarding their SAE programs?

   Sub questions (if necessary)
   - Are there graded components? If so, what are they?
   - What record-keeping systems do you use?
   - How do you motivate students to complete SAE programs?
   - Do the expectations change as the students move up grades?

5. What are the expectations of the teachers regarding middle school SAE programs?
Sub questions (if necessary)
- How are the programs supervised?
- How many students are assigned to each teacher — if multi-teacher?

6. What constitutes a high-quality middle school SAE program?

Sub questions (if necessary)
- Do you follow the SAE for All models?
- What are the specific factors you look for when choosing SAE programs to consider for FFA SAE-related awards?
- Can you tell me about an exemplary SAE program in your program, and what makes it so?

7. How are SAE programs made available to middle school students?

Sub questions (if necessary)
- What types of SAE programs are commonly completed by students?

8. Are the SAE programs maintained as the student moves into high school?

Sub questions (if necessary)
- What is the transfer of records like?
- Are the expectations different for middle school students and high school students?

9. How have SAE programs impacted your middle school agricultural education program?

Sub questions (if necessary)
- What student success has there been?
- Is there an increase in student, community, and administration buy-ins?

10. Is there anything that I did not ask that you would like me to know regarding middle school SAE programs in the middle school level?
REFERENCES

References included in the scoping review of literature are indicated with an asterisk.


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VITA

Jacob Englin is a native of Bruce, South Dakota. He received his Bachelor of Science in Agricultural Education, Communication, and Leadership from South Dakota State University in May of 2014. After graduation, he worked as a 7-12 agricultural education teacher and FFA advisor before returning to school. He is a candidate to receive his Master of Science in Agricultural and Extension Education from Louisiana State University in August 2023. He plans to continue his education and pursue a Doctor of Philosophy from Louisiana State University. Eventually, he would like to become a teacher educator to continue making advancements toward agricultural education.