

DEVELOPING A SEQUENCE FOR MIDDLE SCHOOL AGRICULTURAL
EDUCATION CURRICULUM: A DELPHI STUDY

by

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ABSTRACT

This study asked questions pertaining to three separate areas involving middle school agriculture programs. The first purpose of this study was to determine a curriculum sequence to administer to middle school agriculture courses. The opportunities available or not available to middle school agricultural education, such as competitive events, were considered. Lastly, this study evaluated the needs of middle school agriculture teachers.

A few studies, Rayfield and Croom (2010), Golden, Parr, and Peake (2014), and Jones, Doss, and Rayfield (2020), have been previously conducted on this subject. With literature be limited to the three studies mentioned, additional research in this area could be beneficial. Texas House Bill 3 granted additional funding for Career and Technical Education programs Grade 6-12 (Texas Education Agency, 2019-b). Further planning for these programs is necessary in order to use that funding most appropriately.

A Delphi study allows researchers to select a panel of experts that are personally invested in the topic being studied (Akers, 2000). This study utilized the Delphi method to allow a target group of panelists to identify components that would help answer the questions in the purpose of this study. The panel was asked to answer three open-ended questions pertaining to middle school agriculture classroom content, outside-of-the-classroom opportunities, and resources for teachers. After the panel identified answers to the questions, they were able to reach consensus on what items should be included or offered to middle school agriculture programs. The study yielded 24 curriculum components, 23 opportunities, and 23 resources for middle school agriculture program success.

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I walked into the old Agriculture and Natural Sciences building 5 ½ years ago on a prospective student visit. The first person I met with was Dr. Kevin Williams. Little did I know that five years later that “Aggie backing” (I apologize for the profanity) incoming

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CHAPTER I

INTRODUCTION

Background and Setting

Agricultural education has formally been included in the education system since the passing of the Smith-Hughes Act of 1917 (Friedel, 2011). The Future Farmers of America was founded in 1928 to provide a structure to agricultural education with various competitive opportunities, a classroom model, and the continuation of the Supervised Agricultural Experience (SAE). Agricultural education has historically been limited to high school student membership (Golden, Parr, & Peake, 2014). It was not until 1988 that middle school student membership into FFA was allowed by the Future Farmers of America, which became known as the National FFA Organization that same year (Golden, Parr, & Peake, 2014; National FFA Organization, 2020-a).

To date, a limited amount of research has been conducted relating to middle school agriculture programs (Jones, Doss, & Rayfield, 2020). The majority of middle school agricultural education research was conducted after the inclusion of middle school membership into the National FFA Organization in the late 80s and early 90s. Into the 2000s and until now, only a handful of publications have been completed. Those studies were completed by Frick (1993), Rayfield and Croom (2010), Golden, Parr, and Peake (2014), and Jones, Doss, and Rayfield (2020).

Middle school agriculture programs have existed for over three decades (National FFA Organization, 2020-a). While these programs have been included for some time in the National FFA Organization, there are 107,856 middle school agricultural education students enrolled nationwide (Jones, Doss, & Rayfield, 2020). According to Golden, Parr, and Peake (2014), there are over 11,000 teachers delivering agricultural education curriculum in the U. S. including Puerto Rico and the Virgin Islands. Of those teachers, only 440 taught solely in middle schools. It seems there is room for growth in the area of middle school agricultural education. Georgia has reported the largest middle school agriculture membership with excess of 30,000 students (Jones et al., 2020). The study showed no implication of Texas involvement or reported membership.

There has been research completed vying for the importance of standard middle school education for more than 40 years. Resnick and Resnick (1985) wrote insistently that middle school curriculum in all areas is too plain for the capabilities of middle school students. Middle school education tends to focus on low-level skills. Upgrading curriculum to be more rigorous would require all levels of education to increase the rigor of education. The Smith-Hughes Act of 1917 was designed to better prepare students for careers. With low-level middle school curriculum, or a complete lack in agricultural curriculum at the middle school level, there is an opportunity to better prepare students for an agricultural career. Additionally, there seems to be a disregard for studies related to this instrumental period.

It seems the needs of these teachers were last identified six and 10 years ago (Golden, Parr, & Peake, 2014; Rayfield & Croom, 2010). However, according to middle school agricultural teachers there is a lack of resources and a greater lack in guidance.

Middle school agricultural science teachers find themselves trying to not interfere with the curriculum that is taught once the students get into high school and seem to struggle with how to obtain resources. The Texas education system allows for teachers to include any agriculture, food, and natural resources pathway courses to be offered at the junior high level to create higher level “completers” as students progress through into high school (Texas Education Agency, 2019-a). Moving high school courses to middle school would provide Texas Essential Knowledge and Skills support to the courses. However, Jones et al. (2020) found middle school agricultural education teachers feel students could burn out with beginning this curriculum too early.

When searching enrollment numbers on Texas agricultural education platforms and the Texas Education Agency website, no data pertaining to middle school agricultural education could be found. Establishing curriculum standards and bringing attention to the needs of middle school agricultural education teachers alone could encourage state provision for these programs.

Statement of the Problem

The Texas Education Agency (2020-a) requires school districts to meet basic requirements through Foundation Curriculum. This includes English language arts and reading, mathematics, science, and social studies. The TEA also states that schools must provide instruction in what is deemed as Enrichment Curriculum, such as Career and Technical Education (CTE) or fine arts. Within Career and Technical Education, the TEA provides 14 career clusters as options for instruction. agriculture, food, and natural Resources is offered with a course offering that mentions and outlines courses for high school, but not middle school agricultural education programs (Texas Education Agency,

2020-b). Therefore, the existence of curriculum standards, or Texas Essential Knowledge and Skills (TEKS) standards, provided by the State of Texas for middle school agriculture is nonexistent. Funding does exist for CTE in not only high school, but all grades 7-12 (Texas Education Agency, 2019-b). The approval of funding for these programs was approved in 2018 by the state legislature. This approval opened the door for more of programs like these to exist.

Rayfield and Croom (2010) found that a major need of middle school agricultural educators is in the area of curriculum support. Thus, the recommendation was made to conduct similar research in that area. The American Educational Research Association states middle school curriculum focuses on low-level skills causing a lack of depth when students arrive in high school (Resnick, 1985). Schools beginning CTE courses earlier could provide high-level material at the high school level. With the emphasis on career clusters, presented by the TEA (2020-b), this could provide opportunity for proficient student readiness in CTE related career selections.

Middle school agriculture programs are being added in Texas. However, in a recent study on this subject, state enrollment in middle school agricultural education programs was surveyed. There was found to be enrollment across 32 states that responded with a total of over 107,000 enrolled students (Jones et al., 2020). There was no indication of Texas involvement in the study. Therefore, collecting data regarding the future of middle school agricultural education programs in Texas could prove beneficial.

The challenge for communities and its agricultural science teachers is not obtaining approval from local governing authorities, rather it is determining what curriculum should be covered to not infringe upon the high school program (Rayfield &

Croom, 2010). With state funding available for these programs (Texas Education Agency, 2019-b), the question turns to teachers as to what they believe should be taught and offered at the middle school level to create a more cohesive sequence of education from middle school to high school. While an agricultural science teacher can technically take any high school course into a middle school classroom, creating a transparent and obvious path would be logical. The planning is historically left to agricultural science teachers to develop a sequence of courses and coordinate with other teachers to be sure no curriculum is infringed upon.

Jones et al. (2020) recommended curriculum standards be created for middle school agricultural education programs. Creating continuity within middle school programs across the state of Texas would provide more structure, resources, and opportunities for all programs. This study aims to assist in determining curriculum standards, outside-of-the-classroom opportunities, and evaluate resources needed by middle school agricultural education teachers.

Purpose and Objectives

The purpose of this study was to determine a curriculum sequence to administer middle school agriculture courses. Additionally, Golden, Parr and Peak (2014) suggested that a needs assessment should be completed every five to 10 years due to changing needs of these teachers. Information was collected from middle school and high school agricultural science teachers, agricultural education leaders from the Agricultural Teachers Association of Texas and the Texas FFA Association, and retired agricultural science teachers. The Delphi research method was utilized. As a means of accomplishing the purpose of this study, answers to four major questions were sought:

1. What classroom content (i.e. courses, topics, skills) should be offered at the middle school level to best set up students to enter into higher level curriculum upon high school arrival?
2. What is the appropriate grade level for the content recommended to be included in the curriculum to be taught?
3. What outside-of-the-classroom opportunities available in traditional agricultural education should be included at the middle school level?
4. What resources are needed for middle school agricultural science teachers to successfully teach middle school agriculture courses?

Significance of the Study

Over the past few years, increased inclusion of middle school agricultural programs have occurred in the State of Texas. The common concern in speaking with these agricultural teachers is not the need for funding or community support, but the need for more guidance from the state or related associations involved with agricultural education. This is shown in the research done by both Golden, Parr, and Peake (2014) and Rayfield and Croom (2010). Collectively, both studies found there needs to be more available in terms of in-service training, curriculum resources, and contests for teachers. Additionally, Jones, Doss, and Rayfield (2020) recommended development of curriculum standards for middle school agricultural programs in the U. S. This study also stated that little modern research has been conducted on the subject at the national level. In the studies reviewed, there was no data pertaining to any Texas middle school agricultural programs.

Frick (1993) completed an early collection of what middle school agriculture curriculum should be a sequence of. This study was designed to focus on a few areas with the primary being a modern evaluation of curriculum choices for middle school agriculture teachers; additionally, to focus on these areas of need determined by teachers to aid individuals focused on the development of curriculum and teacher resources. The study could encourage the state education agency to spend more in the development phase of middle school course offerings. This study aims to create a path for the future betterment of middle school agricultural education. Improvement and support for Texas middle school agricultural education programs could prove beneficial.

Assumptions

Assumptions were made prior to and during completion of this study. The researchers assume that all responses were answered in an unbiased and honest manner to best reflect the nature of middle school agricultural education programs in Texas. The assumption was made that the setting of each participant was similar in nature to other participants. It was also assumed that all participants were personally invested in the state of middle school agricultural education programs. Personal investment in the question is listed as important for successful completion of the Delphi Method (Akers, 2000). All teacher participants were assumed to be certified teachers currently or formerly teaching middle school agricultural education courses. Non-teacher participants were assumed to be knowledgeable in the area of middle school agricultural education. Researchers assumed that all demographic information was provided accurately. Participants were assumed to have understood the verbiage of the questions and to have recorded germane responses.

Limitations

The following limitations of the study that should be considered when reaching conclusions based on the findings:

1. Qualitative research and the Delphi method of collection allows for selection of study participants. Therefore, assumptions should be completed cautiously as use of the findings outside of the study participants could be limited.
2. Study responses were evaluated solely by the researcher, which could have led to unintentional skewing of the information.
3. Data was collected from a small sample of individuals personally invested in middle school agricultural education programs across the state of Texas.
4. Data was not collected from individuals personally invested in middle school agricultural education programs across the U. S.
5. The sample does not represent the large number of middle school agricultural education teachers across the state of Texas.
6. The sample does not represent the large number of middle school agricultural education teacher across the U. S.
7. Generalizations to other populations should not occur.

Definition of Terms

For the purpose of the study, the following definitions were used:

Agricultural Science Teacher (AST): A secondary education instructor that delivers curriculum focused on agriculture.

Agricultural Education Leaders: Employees, staff, or partners to the Texas FFA Association or the Agricultural Teachers Association of Texas.

Content: The curriculum to be taught at a given level within middle school agricultural education including but not limited to courses, topics, and skills that could be taught to students.

High School Agricultural Science Teacher: A teacher that educates students on topics related to agriculture in Grades 9, 10, 11, or 12 classrooms.

Middle School Agricultural Program (or various forms of the phrase utilized): As used in this study, the terms defines a program at the 6, 7, or 8 Grade level that is teaching, or will teach courses, on any subject of agriculture. Those subjects are not confined to basic or advanced curriculum.

Middle School Agricultural Science Teacher: A teacher that educates students on topics related to agriculture in 6, 7, or 8 Grade classrooms.

Outside-of-the-Classroom: Any opportunities available traditional agricultural education that could potentially be included in a middle school agriculture program, such as, but not limited to, FFA, Supervised Agricultural Experience, degree levels, and proficiency awards.

Resources: As related to this study, is an aid from outside the classroom that supports the effective teaching of middle school agricultural science teachers.

CHAPTER II

REVIEW OF LITERATURE

Introduction

This study was developed from a review of relevant literature. The following review was focused on agricultural education, specifically the presence of middle school agricultural education programs and entities supporting its existence. The study also reviewed the potential of middle school agricultural education programs.

Agricultural Education

Agricultural Education, as a whole, is a complex topic with many components. The following review seeks to explain agricultural education and provide context for those components in which it contains.

Public school education has formally included vocational education, now referred to as career and technical education, since the passing of the Smith-Hughes Act of 1917 (Friedel, 2011). However, school-based agricultural education can be traced to the year 1734 prior to the inception of the U. S. (McKim, Velez, Lambert, & Balschweid, 2017). The Smith-Hughes Act of 1917 was designed to adhere to the demand of a career ready workforce. The Smith Hughes Act of 1917 formally allowed for agricultural education in the school system. The Vocational Act of 1963 refocused vocational programs from just training in the area of farming to include other subject

areas such as agricultural mechanics and horticulture. Additional legislation was later passed that eliminated sex discrimination and included special needs students within vocational programs. In 2019, enrollment in agricultural education nationwide and in three U. S. territories exceeded 800,000 students in participation (National FFA Organization, 2020-b).

Support for Agricultural Education is comprised by a number of organizations deemed collectively as “Team Ag Ed” (National FFA Organization, 2020-b). The Team Ag Ed page on the National FFA Organization website states that “Agricultural education is a systematic program of instruction available to students desiring to learn about the science, business, and technology of plant and animal production and/or about the environmental and natural resources systems.”

The organizations recognized by the National FFA Organization as members of Team Ag Ed are the National Council for Agricultural Education, The U. S. Department of Education, National Association of Agricultural Educators (NAAE), National Association of Supervisors of Agricultural Education (NASAE), American Association of Agricultural Education (AAAE), Association for Career and Technical Education, National Farm & Ranch Business Management Education Association, Inc, National Young Farmer Educational Association, and National Post-secondary Agricultural Student Organization (PAS) (National FFA Organization, 2020-b).

School-Based Agricultural Education is built around The Three-Component Model (National FFA Organization, 2020-b). It is through this model that agricultural education instruction is delivered. This model includes three components: Classroom/Laboratory, Supervised Agricultural Experience, or SAE, and FFA. The intent

of this model is to provide opportunities for students in three areas that will prepare them for the workforce. Figure 1 shows The Three-Component Model as utilized by the National FFA Organization.

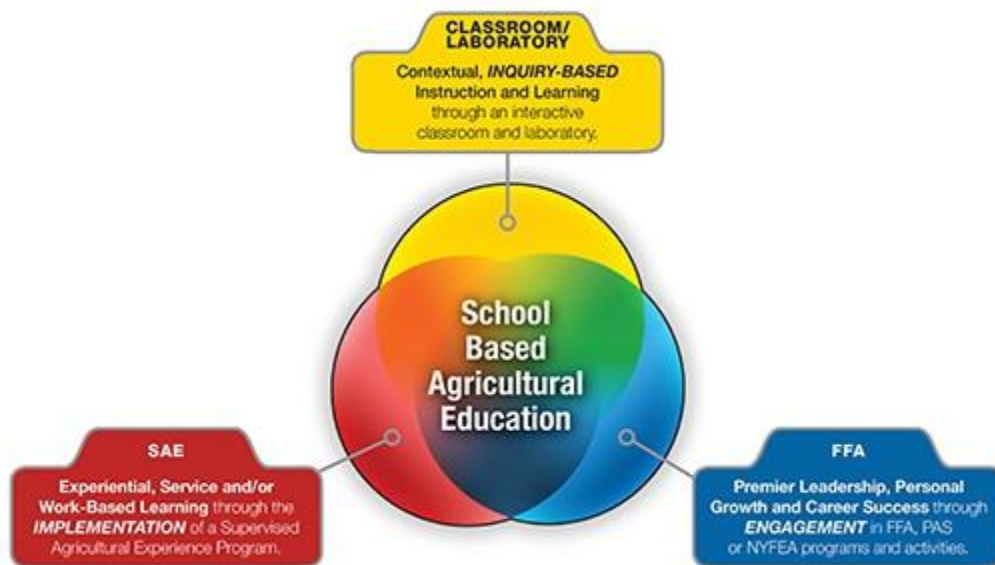


Figure 1 *The Three-Component Model of Agricultural Education (National FFA Organization 2020-b)*

A required element of agricultural education is students must have and maintain a Supervised Agricultural Experience (SAE). The SAE was developed by Rufus Stimson and was originally termed as a “home-project” (Rubenstein & Thoron, 2014). At the passing of the Smith Hughes Act of 1917, wording was included to enforce the requirement of a “directed or supervised practice in agriculture.” The intent of this required project was to provide application of classroom content through an out-of-the-classroom experience. While actual involvement in SAE has decreased, the requirement remains and a push from governing authorities has encouraged continued involvement in these programs. The National FFA Organization (2020-b) says that an SAE is

“Experiential, Service and/or Work-Based Learning through the IMPLEMENTATION of a Supervised Agricultural Experience Program.”

The second component included in agricultural education is Classroom/Laboratory. This component accounts for the in-school experience for students. Without Classroom/Laboratory the other two components would not exist. This is where agricultural science teachers deliver instruction on agricultural topics. The National FFA Organization (2020-b) says Classroom/Laboratory is “Contextual, INQUIRY-BASED Instruction and Learning through an interactive classroom and laboratory.

The final component of agricultural education is the FFA. The FFA component is the opportunities for students to be competitive outside of the classroom. This component reinforces Classroom/Laboratory teachings by taking what is taught and putting it on display against other FFA members. The National FFA Organization (2020-b) says that FFA is “Premier Leadership, Personal Growth and Career Success through ENGAGEMENT in FFA, PAS or NYFEA programs and activities.”

Middle School Agricultural Education is rarely mentioned in the founding and components of agricultural education. Nonetheless, the agricultural education model and supporting authorities could play an important role in the growth of middle school agriculture programs. A knowledge and understanding of how Agricultural Education exists and functions is essential to understanding its components. The National FFA Organization supports the Agricultural Education model and plays an important role in its existence (National FFA Organization, 2020-b).

The National FFA Organization

In the U. S., there are several youth organizations aimed at enhancing experience and exposure to the topics they represent. Since its inception, the National FFA Organization, formerly known as Future Farmers of America, was designed to help develop the future generations of agriculturists (National FFA Organization, 2020-a). The organization originally focused intently on farming, but overtime has evolved into more as technology in agriculture has developed. Ultimately, the program exists for youth development, whether a student is destined for a career in agriculture or elsewhere.

The National FFA Organization has seen immense growth in recent years. The National FFA Organization surpassed a record membership of over 700,000 members nationwide in 2019 (National FFA Organization, 2020-a). The organization was founded, as the Future Farmers of America, in 1928 with the meeting of only 33 delegates representing 18 states in Kansas City at the Third National Congress of Vocational Agriculture (Tummons, Simonsen, & Martin, 2017). In years prior, the American Royal Livestock Show began publicizing opportunities for agricultural students and creating opportunities for competition. Providing a place and opportunities is ultimately what led to the creation of the Future Farmers of America. The beginnings of the FFA was the culmination of years of a significant increase of interest in vocational programs, specifically agriculture.

The FFA existed as a program solely for high school students for decades following its founding (National FFA Organization, 2020-a). Its formal inclusion of middle school FFA membership did not exist until much later. The National FFA Organization delegates approved middle school membership for seventh and eighth

graders in 1988 at their yearly national convention. This opened the opportunity for FFA involvement by middle school agriculture students. The first found research regarding middle school agriculture students was completed a few years later to determine curriculum for the programs (Frick, 1993). This research focused largely on the inclusion of literacy and exploring topics of agriculture.

The FFA as an influential authority has played and is capable of playing a key role in the continued growth of middle school agricultural education programs. It could provide or aid in the provision of a framework for these programs. The benefits of the National FFA Organization's involvement in middle school agricultural programs are numerous and may be most important in enhancing these programs.

Benefits of the National FFA Organization

Agricultural Education's primary goals are to provide career ready students into the workforce upon high school graduation (McKim, Velez, Lambert, & Balschweid, 2017). Through the development and growth of the National FFA Organization, the opportunities in agricultural education have focused on not just creating career ready young people, but to also promote leadership skills and citizenship. The National FFA Organization mission is "to promote premier leadership, personal growth, and career success through agricultural education" (Horstmeier & Nall, 2007). Studies have found that FFA members excel in leadership abilities.

FFA members have been slated as exceptional in a variety of areas. Reports show that FFA members are more engaged in post-high school preparation, community activities, and school activities than the typical high school students (Horstmeier & Nall, 2007). FFA members are also provided opportunities to engage in real-world experiences

during high school through implementation of the Supervised Agriculture Experiences (Rubenstein & Thoron, 2014) This gives students the opportunity to apply classroom instruction at home. These members are pushed to portray exceptional leadership abilities and to begin having real-world experiences before ever leaving high school.

In the progression leading up to the creation of the Future Farmers of America in 1928, there was increased interest in judging competitions and opportunities for vocational agriculture students (Tummons, Simonsen, & Martin, 2017). Even early on, the benefits of creating an organization that provides and promotes work-based experiences for students was seen with importance. The organization has remained focused on creating opportunities and experiences for students to be best prepared for successful careers.

The National FFA Organization proves beneficial for the students that take part in its programs. The benefits of the FFA found in research are largely focused on high school students. However, the benefits of middle school agricultural education programs have not been evaluated. Increased research in the area of middle school agriculture could benefit such programs. To date, little research has been conducted on middle school agricultural programs.

Middle School Agricultural Science Programs

The National FFA Organization consisted of only high school agricultural education for the first 60 years of its existence (Golden, Parr, & Peake, 2014). In 1988, the organization amended their constitution to allow middle school student membership. Limited research has been conducted since the formal inception of middle school agricultural science programs to aid in the improvement of the program. Resnick and

Resnick (1985) insisted that higher difficulty curriculum be implemented at the middle school level in all subject areas. It was argued that students were more capable than traditionally expected and that they be given content that better fit their skills allowing for in depth material at the high school level.

A recent study concerning the state of middle school agricultural education programs in the U. S. has been published. Jones, Doss, and Rayfield (2020) sought to collect data from 50 states and Puerto Rico on enrollment information in middle school agricultural education programs. The top five states for middle school agricultural education enrollment in order were Georgia, Florida, Virginia, Missouri, and Delaware. Georgia was nearly double the second highest enrollment with over 30,000 middle school agriculture students. Of the reporting states, eight reported having sixth grade enrollment, 23 claimed seventh grade enrollment, and 24 states reported having eighth grade enrollment.

While data has not been published regarding the status of enrollment or existence of middle school agricultural education programs in Texas, we do know that these programs exist. Often, Texas middle school students determine a program of study when entering high school. The student chooses which of the fourteen programs of study they are most interested in being part of through high school (Texas Education Agency, 2020-b). Since this decision is often made in the 8th grade prior to instruction in any of the fourteen areas, giving students more exposure in middle school could prove as a substantial recruiting tool and grant confidence for an informed decision. Golden, Parr, and Peake (2014) found that focusing on the education of middle school students can have a substantial impact on shaping career patterns.

According to Rayfield and Croom (2010), this decision mirrors important junctions in the development theory presented by Erikson's Social-Emotional Development Theory. The middle school teacher's job is to display knowledge on a variety of subjects to create a path for informed student choice as they enter high school. The student is passing from the fourth stage of development, where mastery of cognitive skills and complex rules has taken place, into the fifth stage of development, where the student has a need to develop a unique identity. With a forming identity, introducing knowledge, such as agriculture, is important at this juncture.

In 1985, nearly one-fourth of all agricultural education teachers included a middle school agricultural education program (Frick, 1993). This study found in its review of literature that middle school agriculture programs should be distinct from high school agricultural education. It was recommended at the time that middle school agriculture programs focus on literacy and exploring topics of agriculture.

Modern literature on middle school agriculture education is sparse (Jones, Doss, & Rayfield, 2020). Two studies have found curriculum plans or recommendations for middle school agricultural programs. Jones et al. (2020) found five topics with high levels of inclusion in middle school agricultural education programs including: Career Exploration, Agricultural Literacy, Animal Science, Horticulture, and History of FFA. Frick (1993) reported that agricultural literacy and exploration of agricultural topics be the primary topics on middle school agriculture curriculum.

The Supervised Agricultural Experience (SAE) is a key component to agricultural education (Rich, Duncan, Navarro, & Ricketts, 2009). Jones et al. (2020) observed other opportunities existing outside of the classroom for middle school agricultural students.

Opportunities varied with some of the more consistent across various states being attending conventions, receiving the Discovery FFA Degree, State FFA Awards, Public Speaking Contests, and Creed Speaking.

In the study conducted by Jones et al. (2020), a survey was presented to represent the entire U. S. enrollment and current status of middle school agricultural programs. There was no indication of Texas involvement in the study. Collecting data regarding the future of middle school agricultural education programs could prove beneficial.

There is opportunity in the area of research for middle school agricultural education programs. With the recommendations of the completed studies, studies involving multiple areas could be conducted. Reevaluating needs or resources that would be helpful middle school agriculture teachers could provide support to those teachers. It would be worth it to further develop a sequence for middle school agriculture curriculum and evaluate other opportunities that are or could be available to middle school programs.

Nature of Middle School Age Students

In terms of development and age, we know that middle school students are in a different period of their life and education than that of their high school or even elementary counterparts. While middle school agricultural education research is lacking, literature does exist for the support of middle school age students. Challenges exist at any grade level and middle school student are not exception. Specifically, engaging students is a challenge and middle school students are not exempt from that challenge.

Wang & Holcombe (2010) stated that active engagement for middle school students is built around three components: cognitive engagement, behavioral engagement, and emotional engagement. Understanding a student's cognitive stage of

development can assist in how to engage a student based on their age. Additionally, understanding the two other forms engagement after cognitive, behavioral and emotional, can be especially helpful. These facets of engagement are totally interrelated meaning that requires the others in order to be the most successful.

In a review of Piaget's work on cognitive development theory, Ghazi, Khan, Shahzada, & Ullah (2014) found that the theorized four stages of cognitive development were sensorimotor (ages 0-2 years), pre-operations (ages 2-7 years), concrete operations (ages 7-11 years), and formal operations (ages 12-16 years). With middle school students ranging from 11-14 years of ages (6th grade 11-12 years, 7th grade 12-13 years, 8th grade 13-14 years), these students are transitioning from the concrete operations level of development and moving to the formal operations level of development.

The first stage of cognitive development is the sensorimotor stage, which is centered on the development of a person's senses, such as sight and smell (Ghazi et al. 2014). The second state is pre-operations which is when children learn through playing with their imagination. The next stage applies specifically to beginning middle school students. At the concrete operational stage of development, students begin thinking logically, but can struggle to have fluid logic. Students will begin to think in abstract manners and understand theoretical concepts. Middle students from 6th grade to beyond 8th grade operate in the formal operations level of development. This level of cognitive development says that students are fully able to think with abstract thought and conceptual thinking. Children at this level are able to think in an organized and effective manner.

Behavioral engagement refers to the physical actions of students that keep them involved in or out of the classroom (Wang & Holcombe, 2010). There are a variety of actions that can be provided for this age of student to meet the need of behavioral engagement. Student involvement in extracurricular activities is mentioned as a prime way to foster student engagement within the classroom. Additionally, in-class actions and tasks will help aid in this important form of engagement.

Emotional engagement directly affects a student's level of effort or will to succeed (Ulmanen, Soini, Pietarinen, & Pyhäntö, 2016). This form of engagement is based fully on how each student feels. Students hold either of two stances on school: 1) students see school as important and valuable to themselves or 2) they see it as worthless and unimportant for their future. The attitude that students carry on their interest in school immensely impacts their ability to be successful. Students with the first stance often have higher grades and tend to finish their time in school. Students with the second stance are more likely to carry lower grades and not complete their education.

Middle school students are often convinced that they do not fit in with anyone around them (Rankin, 1999). While the awkwardness of middle school is a challenge for these students, they are found to be incredibly receptive. Middle school students still enjoy formal learning and are typically eager to try new things. This reiterates why inclusion of middle school agricultural programs could be a key time for introduction of agricultural concepts. With an increased sense of interest in new things, introducing agriculture in middle school could potentially have long term impacts on students entering agricultural careers.

Middle school students provide a unique challenge in the field of education. Resources and support for middle school students as a whole exist and provide great support to teachers instructing at this level. Support specifically for middle school agricultural education teachers could help better benefit these students and enhance their program.

Competitive Opportunities- FFA, Livestock Shows

The Three-Component Model of agricultural education includes “FFA” as a necessary element (National FFA Organization, 2020-b). The National FFA Organization deems “FFA” as the opportunities for FFA members to compete in contests related to their classroom instruction. The National FFA offers a variety of contests that can vary by state association.

The Texas FFA Association (2020-a), a state association chartered under the National FFA Organization, provides contests in the area of Career Development Events, CDEs. There are 28 contests that are available to FFA chapters to participate in. A few of the contests available in CDEs are Ag Communications, Dairy Cattle, Entomology, and Livestock Judging. CDEs “build on what is learned in agricultural classrooms and encourage members to put their knowledge into practice.” Ultimately, these contests should help prepare students for careers in agriculture through expanding each individual’s skills in a variety of areas.

Leadership Development Events (LDEs) are also provided by the Texas FFA Association (2020-b). These contests are meant to create opportunities for students to enhance their own abilities in speaking, decision making, and demonstrate knowledge of agriculture. There are 10 contest recognized as LDEs. These contests include

parliamentary procedure, job interview skills, agricultural advocacy, and agricultural issues.

Additionally, there are a variety of other competitive opportunities featured through the FFA. The Texas FFA Association and the National FFA Organization both offer Speaking Development Events (SDEs) to members. SDEs are designed to promote students' abilities to express themselves publicly on a variety of subjects (Texas FFA Association, 2020-c). Other competitive events available to Texas FFA members are the Agriscience Fair, the Texas FFA Rodeo, invitational events, and the Hall of States Competition.

Livestock shows have involved a large number of agricultural education students from soon after the beginnings of formal agricultural education in the U. S. of America (Tummons, Simonsen, & Martin, 2017). It is even suggested to be a large contributor to the eventual forming of the Future Farmers of America. Early livestock shows, such as the American Royal Livestock Show, were instrumental in providing a place for agricultural competition to take place. The American Royal began providing livestock judging competitions, which led to increased interest by students in agricultural education. Kansas City, Missouri, the home of the American Royal Livestock Show, is where the Future Farmers of America was ultimately formed in 1928 at the first ever National FFA Convention.

Livestock shows provide students with experience in animal husbandry, time management, responsibility, and work ethic (Davis, Gurung, & Johnson, 2019). Major junior livestock shows are available to youth in Texas from the 3rd grade until graduation from high school. Livestock shows are available to middle school aged students. Major

livestock shows, and county/local livestock shows, are an out-of-the-classroom opportunity for many youth as they look for extracurricular opportunities to be involved with.

Competitive opportunities provide students the opportunity to gain knowledge and experience through various events. While some of the opportunities are already available to middle school agriculture students, there are some that are not. Researchers could evaluate current and possible middle school agricultural education competitive or non-competitive extracurricular opportunities for middle school programs. Competitive and non-competitive opportunities could be beneficial and are often a component of Career and Technical Education.

Career and Technical Education

Career and Technical Education (CTE), formally known as vocational education, exists to provide students with challenging content leading them towards current and emerging professions (Texas Education Agency, 2020-c; Gentry, Saiying Hu, Scott, & Rizza, 2008). The Smith-Hughes Act of 1917 initially provided funding for vocational secondary programs in agriculture, home economics, and trade and industry (Freidel, 2011). The TEA (2020-b) now approves fourteen career clusters to be used in preparing students for chosen professions within CTE areas. Students are granted the opportunity to select a learning pathway from the following clusters: (a) Agriculture, Food, and Natural Resources, (b) Architecture and Construction, (c) Arts, Audio Visual Technology, and Communications, (d) Business, Marketing, and Finance, (e) Education and Training, (f) Energy, (g) Health Science, (h) Hospitality and Tourism, (i) Human Services, (j) Information Technology, (k) Law and Public Service, (l) Manufacturing, (m) Science,

Technology, Engineering, and Mathematics, (n) Transportation, Distribution, and Logistics.

Within CTE in Texas, students are able to “concentrate” when choosing their “Program of Study” (Texas Education Agency, 2020-b). Students can become completers in a Program of Study for Level 1, Level 2, Level 3, or Level 4. Level 4 is completing one CTE course at each level in the chosen Program of Study. Some programs of study were also found to be more or less popular depending on race, gender, income level, and disability status. A study completed in Arkansas regarding CTE found that white male and female students are more likely to concentrate than other races (Dougherty, 2016). In Arkansas, students who decided to concentrate were 21% more likely to graduate than students who were largely similar that did not concentrate. Interestingly, the study also found that male and low-income students see the largest benefit from concentrating.

There is a vast amount of literature written on gifted students and on vocational education. Gentry et al. (2008) sought to combine the two in a study by evaluating gifted students enrolled in CTE. It was stated that CTE was an important component in development of gifted students. This study also found that CTE offers students real-world experiences in professionalism, competence, belonging, and goal setting.

Many researchers have found that CTE provides the relevance to the real-world that students often request (Plank, DeLuca, & Estacion, 2008). In the years 2000 and 2006, it was found that 90-96% of high school students take at least one CTE course. CTE is viewed as an important component of the high school environment for students to find a place of motivation and learning. It has been found to be most useful for non-college bound students.

Gottfried and Plasman (2018) discovered that students who participate in multiple CTE courses are less likely to drop out. More interestingly, this study found that as students progress in the education system the presence of CTE courses becomes more instrumental in retention. This could mean that providing more opportunities for CTE involvement at a younger age could prove to hold higher retention rates as students progress.

It has also been found that CTE can be beneficial to students with learning disabilities (Theobald, Goldhaber, Gratz, & Holden, 2019). Students with learning disabilities have higher rates of employment post-graduation from high school. CTE meets the needs of special education students and students with learning disabilities.

Career and Technical Education has clear benefits to students at the high school level. Based on literature describing CTE and the benefits contained, it could be theorized that such education would also benefit middle school education. Higher retention rates for high school graduation, real-world experience, and opportunities that fit students with disabilities are things that could be secured at a younger age for students and middle school Career and Technical Education could benefit that. Further research in this area could be beneficial and the processes in conducting this research is a key component.

The Delphi Method

The Delphi Method of research has been used in agricultural education to a great degree. This method of Delphi reverses the data collection process by casting a net over a large subject area to elicit a variety of answers, later to refine, rather than asking survey-type questions that only receive one or two answers (Gupta & Clarke, 1996). This qualitative technique was designed to avoid the negative effects of group decision making

allowing for a panel of experts from a similar interest group to best decide on a solution to a problem in their field.

Parente and Anderson-Parente (2011) found that Delphi studies mostly consists of four components including synthesis of a group consensus opinion, rankings between rounds, anonymous participation, and statistical predictions of the occurrence of the scenarios studied. It was also found that this process often elicits more accurate answers to the questions presented than traditional polls or focus groups. The Delphi technique can be used to evaluate issues, identify needs, or determine solutions (Akers, 2000). Panel members should be people who are personally invested or have great interest in the subject area.

The size of the panel of experts used in a Delphi study receives a variety of frequencies. Studies have been conducted with a panel as low as three participants to panels consisting of 80 members (Hallowell & Gambatese, 2010). It was suggested that 12-15 panel members is manageable by the facilitator. Akers (2000) found conflicting answers to the number of panelist ranging from a minimum of 10-15, no fewer than 25, and even recommendations that range from 26-500. Akers (2000), however, conducted a study beginning with 75 individuals agreeing to participate and ended with a successful three-round completion of 36 participants, after the literature review found that 20-100 is most acceptable for technique purposes.

The variable component to the Delphi process is determining the number of rounds needed for the panel to reach consensus. Akers (2000) found that multiple authorities on Delphi procedures consider three rounds sufficient to reach consensus. Others found two rounds were typically enough to reach a consensus. Rayfield and

Croom (2010) utilized a third round to only further evaluate items that had not reached consensus in the second round of the study.

Summary

While it has existed for some time, middle school agricultural education is still young. There is opportunity for its potential growth and expansion. Additional research would be useful in further understanding these programs and for identifying how it can be improved. Agricultural Education provides the framework for the program to be successful at the high school level and that framework could aid the middle school level. Entities, such as the National FFA Organization, have been helpful in supporting these programs by providing some level of extracurricular opportunity. Literature certainly demonstrates the benefits of FFA and of Career and Technical Education for students. Increasing enrollment and providing more opportunities for enrollment in middle school agricultural education programs could be an answer for retention, career-minded students, and provision of real-world experiences within the confines of the school building.

CHAPTER III

METHODOLOGY

Purpose and Objectives

The purpose of this study was to determine a curriculum sequence for programs that choose to include middle school agricultural education programs. Additional feedback was requested with questions focused on needs of middle school agricultural science teachers as recommended by Golden, Peak, and Parr (2014). A greater understanding of what programs could be beneficial from traditional agricultural education programs was also sought. To answer the questions, input was used from individuals directly involved with agricultural education programs: current middle school agricultural science teachers, career and technical education directors, staff from the Texas FFA Association, staff from the Agricultural Teachers Association of Texas, and recently retired agricultural science teachers. The panel of experts would remain anonymous to one other for the duration of the study. As a means to identifying the desired sequence the following questions were posed:

1. What classroom content (i.e. courses, topics, skills) should be offered at the middle school level to best set up students to enter into higher level curriculum upon high school arrival?

2. What is the appropriate grade level for the content recommended to be included in the curriculum to be taught?
3. What outside-of-the-classroom opportunities available in traditional agricultural education should be included at the middle school level?
4. What resources are needed for middle school agricultural science teachers to successfully teach middle school agriculture courses?

Research Design

Delphi was the fundamental procedure used to conduct this study. Gupta and Clarke (1996) said Delphi reverses the data collection process by casting a net over a large subject area to elicit a variety of answers to be refined rather than asking survey-type questions that only receive a few answers. The purpose of the technique is to bring a panel of experts in a specified subject area to consensus on a particular matter (Akers, 2000). The technique allows for varying opinions from the experts, but facilitates them toward consensus by the final round.

While there are not necessarily conflicting opinions on the number of rounds necessary for a Delphi study, there are a few considerations to be made based on the review of literature. It is agreed upon in multiple areas that the purpose of the Delphi technique is to allow the panel of experts to reach a consensus (Akers, 2000, Gupta & Clarke, 1996, Parente & Anderson-Parente, 2011). The only difference in findings is some state the number of rounds should be unlimited until a consensus is reached, however most researchers agree that a consensus can be reached in two to three rounds (Akers, 2000). This study utilized a Delphi method consisting of three rounds. Three

rounds was determined for use *a priori*. The researcher designed the rounds to elicit responses that could be narrowed down to an overall consensus by the expert panel.

Selection of the Panel

The panel consisted of individuals who were directly invested in middle school agricultural science programs either by currently teaching, formerly teaching, or by playing a role in the implementation of such programs. It is vital to the success of a Delphi study that every participant be somehow involved on a personal level with the problem or have strong desire or reason to invest time into the study (Akers, 2000). Akers conducted research using nominations from various state agricultural education supervisors. Participants in this study were identified in a similar method.

The panelists for this study were selected based on recommendations of potential participants from Texas area coordinators, university agricultural education faculty, Texas FFA Association staff, and Agricultural Teachers Association of Texas staff. Conversations to receive these recommendations took place via phone call. The phone calls requested that the individual provide names of other potential participants. The recommended persons were then contacted and asked for more potential participants. This method of survey participant selection is known as “snowball sampling.” Recommendations were recorded and later contacted through an email correspondence to gauge interest in participating in the study.

Initial communications requesting the interest of the potential panel were emailed August 24, 2020. This correspondence was sent to 47 potential panel participants requesting their participation in Round One of the study. The request returned 41

individuals that confirmed participation. The 41 confirmed participants were distributed the initial instrument.

Instrumentation

The Delphi technique consists of two to three open-ended questions in the initial round (Akers, 2000). Following a review of literature, studies by Akers (2000), Frick (1993), and Rayfield and Croom (2010) were reviewed to determine appropriate questions to accomplish the purposes of the study.

The primary purpose of the study was to determine a proper sequence for middle school agricultural science curriculum. Additionally, questions regarding needs of middle school agricultural science teachers and supplemental components typically in agricultural curriculum were also evaluated. The three questions included in the initial round of the study were:

1. What classroom content (i.e. courses, topics, skills) should be offered at the middle school level to prepare students for high level agricultural education curriculum in high school?
2. What out-of-the-classroom opportunities available in traditional agricultural education should be included at the middle school level?
3. What resources are needed for middle school agricultural science teachers to be successful?

Following development of these questions, instruments for the latter rounds, Two and Three, were later developed.

Reliability and Validity

Validity

The questions to be used in the initial instrument were evaluated by a committee of faculty in the Department of Agricultural Sciences at West Texas A&M University. Each faculty drew on their own knowledge of Delphi studies in order to determine the best terminology for each question. Faculty also questioned the appropriateness of each question to determine if the proposed questions fit the purpose of the study. Faculty had an opportunity to make any additions or subtractions from the questions as determined necessary.

Pilot Test

These three research questions were piloted by a panel of seven individuals with knowledge in the area of middle school agricultural education. These individual responses were used to determine the instruments order of questioning and to shape the wording of the questions further. After receiving the pilot test results, it was agreed upon by the researcher and graduate research assistants to change the order of the questions to how they are listed in the previous section. Initially, the third question was listed first. The pilot test took place during the week of August 24-31, 2020.

A Delphi study requires panelists to answer open-ended questions. Due to this, it is important that the responses to the questions meet the goals of the research purpose and objectives. The researchers determined that piloting the questions for the Round One was necessary to insure the questions accomplished their purpose.

Reliability

Akers (2000) cited information regarding the reliability of Delphi studies. It was found that the question of reliability can be met in a Delphi panel consisting of more than 13 experts. Hallowell and Gambatese (2010) tested the quantity of Delphi panels with quantities of 3 participants to quantities of 100 participants. The suggestion was made that 12-15 was the most manageable and thus the most reliable. Akers (2000) found conflicting recommendations on the size of the panel. Panels as low as 20 and as high as 100 people were suggested. For the initial size of the panel in this study, 47 potential participants were contacted.

Data Collection

First contact with the panel began with an email gauging the interest of nominees to participate in the study. This email included the topic of the study, the prospective significance, and requested that participants stay involved with all three rounds of data collection. Following three weeks of response time from the proposed individuals, the panel was recorded and the first round of the study began.

Obtaining an optimal response rate to the instrument was completed using Dillman's Tailored Design Method (Dillman, 2000). The initial email sent to possible panel participants explained the purpose of the study and requested individuals to confirm that they would participate in the study. The initial communication also set expectations for the nature of a Delphi study specifically. After distributing each instrument in every round, a follow-up request to complete the round was sent to each participant. This is consistent with Dillman's (2000) recommendations that response rates will increase with repeated contact. Data collection methods were based on Dillman's Tailored Design

Method. The responses rate for each round is recorded in the subsequent sections of this chapter.

Round One

The panel was emailed a link to an online form including the three Delphi questions on September 3, 2020. The email included a brief explanation of the study. The Institutional Review Board Consent Form was included to inform participants of their rights and provide background for the study. After one week, on September 10, 2020, panel members who had not yet completed the form were contacted by follow-up email to encourage participation. On September 14, 2020, 32 panelists had completed the form leading to a response rate of 78.05%.

Round Two

Responses from Round One were summarized. Frequencies, percentages, and ranks were utilized to evaluate Round One responses. The responses were evaluated for similar intent and combined. Akers (2000) utilized the computer program, Microsoft Word, to accomplish this task. The responses were evaluated by three researchers on their own, prior to coming together to look over the three placements. Conversations were held to further place the responses.

For each question asked, a variety of responses were identified. The first question was “What classroom content (i.e. courses, topics, skills) should be offered at the middle school level to prepare students for high level agricultural curriculum in high school?” The question led to the identification of 41 items said to be appropriate for middle school classrooms. The second question was “What out-of-the-classroom opportunities available in traditional agricultural education should be included at the middle school level?” The

second question elicited responses with 23 recommendations for potential expansion of activities in middle school programs. The final question was “What resources are needed for middle school agricultural science teachers to be successful?” This question gained insight to 23 potential resources necessary for middle school agriculture teachers.

In the second round, the panel was presented with an instrument requesting three tasks: (1) rate the 41 curriculum recommendations on appropriateness for the middle school level and select a suggest grade level (6th, 7th, or 8th) for its inclusion, (2) rate the level of appropriateness of 23 suggested extracurricular activities to be included in the programs, and (3) rate the 23 resources of middle school teachers in terms of most pressing.

The panel then rated the responses on a four-point Likert Scale 1 = “Strongly Disagree,” 2 = “Disagree,” 3 = “Agree,” 4 = “Strongly Agree.” This scale was utilized to determine each panel members’ opinion on regarding the pressure of needs or appropriateness of the inclusion of certain components in middle school agricultural education programs. An online survey was prepared and distributed to the panel members requesting their response on September 28, 2020. Panel members were contacted on October 5, 2020, by follow-up email to encourage participation in the second round of the study. Responses were last received on October 12, 2020. The end date led to 29 of the 32 panelists completing the second round instrument for a response rate of 90.63%.

Responses were analyzed for level of agreement based on the percentage level of agreement. Rayfield and Croom (2010) determined 80% *a priori* as the consensus level utilized in their own study. Akers (2000) determined 75% *a priori* as consensus in her study. 75% *a priori* was decided to be used in this study by the researchers.

Round Three

Round Three was the final round in the study. Responses from the second round were evaluated using frequencies, percentages, and ranks. Akers (2000) utilized the final round as a way to further evaluate the competencies identified in her study. Rayfield and Croom (2010) used the third round to evaluate items that did not reach the 80% *a priori* from their previous rounds. Akers (2000) took items not reaching a 75% level of agreement in the second round for further evaluation in the final round. While both methods were similar, Akers methods and suggestions were decided by the researchers to be most appropriate for this study. Consensus was found on several of the items evaluated in the second round of data collection.

The first question, “What classroom content should be offered at the middle school level to prepare students for high level agricultural curriculum in high school?”, led to 41 items for potential inclusion in middle school agriculture programs in Round One. Round Two led to consensus being found on 24 items at a 75% level of agreement. There were 17 items not reaching consensus at 75% level of agreement and were moved on to Round Three for further evaluation.

The second question, “What out-of-the-classroom opportunities available in traditional agricultural education should be included at the middle school level?”, led to 23 items that could be possible opportunities for middle school agriculture programs in Round One. Round Two found consensus on 16 of the items at a 75% level of agreement. There were 7 items not reaching consensus at 75% level of agreement and were moved on to Round Three for further evaluation.

The third question, “What resources are needed for middle school agricultural science teachers to be successful?”, led to 23 items indicated as resources needed for middle school agricultural science to be successful in Round One. Round Two found consensus on 18 of the items at a 75% level of agreement. There were 5 items not reaching consensus at 75% level of agreement and were moved on to Round Three for further evaluation.

Rayfield and Croom (2010) stated that after a third round if an item did not reach the *a priori* then there was sufficient evidence to rule out a consensus. Round Three was formatted similar to Round Two. An online survey was distributed to panel participants on October 19, 2020, with follow-up emails requesting participation taking place on October 26, 2020. Final responses were recorded on October 29, 2020. The Round Three response rate of 89.66% was recorded at the final date of responding.

Analysis of Data

Because of the use of an online platform and to maintain anonymity, individual panelists were each assigned a code to be used each round of the study. The code allowed the researcher to track every response in each round. This allowed the researcher to appropriately follow-up with panelists who had not yet responded. Codes were assigning using a “20” followed by the panelist’s number. Code information was provided in the email distributed to the panelists for each round of the study containing the survey link.

For each round, data was recorded by assigning a numerical value to each variable to be able to use in the instrument. The data was entered into SPSS statistical software and Microsoft Excel to be evaluated as qualitative data.

CHAPTER IV

RESULTS AND FINDINGS

Overview

The chapters prior discussed the background information for middle school agriculture education programs. The first chapter discussed the topic with historical context and the recommendations that led to the selection of this topic for research. The second chapter discussed literature of the sequence that led to middle school agriculture inclusion into the agricultural education model. Context was provided that gave insight to past literature in the area and the need for additional research in the subject of middle school programs. The third chapter described the methodology that took place to conduct this Delphi study including research design, panel selection, instrument development, collection of data, and analysis of data per round. This chapter reports the information collected to satisfy the purpose of this study. The study required three rounds of surveys to effectively use the Delphi process. Descriptive statistics were used to report on the responses collected.

Purpose and Objectives

The purpose of this study was to determine a curriculum sequence for middle school agricultural science courses. A needs assessment was also conducted as recommended to occur every 5 to 10 years by Golden, Parr, and Peak (2014). Information

was collected from current agricultural science teachers at the middle school and high school, agricultural education leaders, and retired high school and middle school agricultural science teachers. The Delphi research method was utilized. As a means of accomplishing the purpose of this study, answers to four major questions were sought:

1. What classroom content (i.e. courses, topics, skills) should be offered at the middle school level to best set up students to enter into higher level curriculum upon high school arrival?
2. What is the appropriate grade level for the content recommended to be included in the curriculum to be taught?
3. What outside-of-the-classroom opportunities available in traditional agricultural education should be included at the middle school level?
4. What resources are needed for middle school agricultural science teachers to successfully teach middle school agriculture courses?

The findings of each question are explained in the following text after the three Delphi rounds were conducted.

Round One

The Round One instrument was designed to provide answers to three primary research questions as well as collect demographic information of the panel participants. The initial open-ended questions used in Round One were as follows:

1. What classroom content (i.e. courses, topics, skills) should be offered at the middle school level to best set up students to enter into higher level curriculum upon high school arrival?

2. What outside-of-the-classroom opportunities available in traditional agricultural education should be included at the middle school level?
3. What resources are needed for middle school agricultural science teachers to successfully teach middle school agriculture courses?

The format utilizing open-ended questions for the primary round allowed the panelists to collectively generate a number of responses to be evaluated in the subsequent rounds of the study. Responses to each question were analyzed by the researchers then converged into a list without altering content.

Responses to Question One

Question 1: What classroom content (i.e. courses, topics, skills) should be offered at the middle school level to best set up students to enter into higher level curriculum upon high school arrival?

The responses to the first question were reviewed and converged by the researchers. The question regarding curriculum to be included in middle school agricultural education courses produced 41 differing responses from the panel. The 41 responses to the first question are listed in Appendix K. A few of the items found on question one were “Animal Science,” “Horticulture,” “Plant Science,” and “Teamwork.”

Responses to Question Two

Question 2: What outside-of-the-classroom opportunities available in traditional agricultural education should be included at the middle school level?

The second open-ended question used in Round One provided panelists the opportunity to comment on the opportunities that could be made available to middle school students outside of a classroom environment. The second question found a small

amount of difference among responses from the panel. After reviewing, the researchers converged and identified 23 responses from the panel. The responses from the second question are listed in Appendix L. Some of the items identified were “Greenhouse Management,” “Participation in Agriscience Fair,” “Local Ag Farm Field Trips,” and “Attend FFA Meetings.”

The researcher found variations of inclusion of Middle School and Greenhand Leadership, Speaking, and Career Development Events. With consultation of faculty at West Texas A&M University, it was determined that “Middle School” and “Greenhand” were different terms and chose to list them separately in Round Two of the study.

Responses to Question Three

Question 3: What resources are needed for middle school agricultural science teachers to successfully teach middle school agriculture courses?

The third question generated numerous responses with results similar to that of question two. This question requested that panelists speak on behalf of what resources middle school agricultural science teachers are in need of to teach successfully. The question returned a variety of responses that were evaluated and condensed by the researchers. Ultimately, there were 23 responses recorded from the panel on the third question. The responses to question three are listed in Appendix M. A few of the resources identified were “Supportive School District,” “Safety Trainings,” “Career Fairs,” and “Age Appropriate Curriculum Availability.”

Responses to Demographic Questions

This research collected information pertaining to the demographics of the panel of experts. This information did not influence the evaluation of the data related to the

purposes of this study, but was recorded for use in describing the nature of the panel. Specifically, the information provided the researchers additional insight into the nature of middle school agricultural science teachers included in the panel of experts. Demographic information was also collected.

While agricultural education was historically dominated by male agricultural science teachers, current data shows that in the past fifty years female agricultural science teachers have become the majority amongst new teachers (Enns & Martin, 2015). This study reaffirmed that data by displaying a majority of female panel members. Of the 32 respondents in the first round, 22 (68.75%) were female and 10 (31.25%) were male.

School classifications are used to determine size of school to place schools into competitive brackets for athletic, art, and academic championships hosted by the University Interscholastic League (UIL) by size (University Interscholastic League, 2020). The FFA and agricultural education is not governed by the UIL nor does it confine its competitions to similar sized schools competing against each other. The UIL standards are often used to help define and describe the size of schools that agricultural science teachers are employed at. For that reason, the size of school, based on UIL standards, was recorded in this study. The classifications from smallest to largest are 1A, 2A, 3A, 4A, 5A, and 6A. Of the panel participants, 31 of 32 participants indicated that they teach or have taught at one of the classifications of schools in Texas. The responses from the panel showed participant numbers relating to school size as follows: 3 (9.38%) from 1A, 5 (15.63%) from 2A, 5 (15.63%) from 3A, 10 (31.25%) from 4A, 4 (12.50%) from 5A, and 4 (12.50%) from 6A. One panel participant indicated they did not teach agricultural courses in Texas.

A measurement was collected in regard to number of years taught per panel member regardless of that experience taking place at the middle school or high school level. All 32 panel members did indicate some level of teaching experience. The average years taught by participants was $M = 11.09$ years of teaching. The minimum numbers of years taught was 1. The maximum number of years taught was 43.

A measurement was also taken to evaluate the number of panelists who had taught middle school agricultural science courses. The panelists indicated that 28 of the 32 participants had taught or are currently teaching middle school agriculture courses. The average years of middle school agriculture taught was $M = 3.28$ years of teaching. The minimum number of years spent teaching middle school was one year. The maximum number of years spent teaching middle school was 22 years.

Round Two

In Round Two, the panel of experts was presented with an instrument that requested two actions. The three questions from Round One were listed again, but this time with the responses from Round One rather than as open-ended questions. (1) The panel was asked to rate the 41 responses from Question One, the 23 responses from Question Two, and the 23 responses from Question Three in terms of level of agreement to be included or needed at the middle school level in agricultural education. A Likert scale was used in this rating which consisted of a 6-point option of selection for panelists. The six points were 1 = Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Slightly Agree, 5 = Agree, 6 = Strongly Agree. (2) The panel was asked to select the grade level, 6th, 7th, or 8th, to which each response for Question One would be the most appropriate to include within middle school agricultural curriculum.

Agreement Level for Responses

The panel of experts was asked to rate each response using a Likert scale. A six-point Likert scale was used to rate the responses (1 = Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Slightly Agree, 5 = Agree, 6 = Strongly Agree). The scale was used to determine each member of the panel's agreement level as to the inclusion of each response into classroom content, out-of-the-classroom opportunities, and the needs of middle school agricultural science teachers presented at this level of agricultural education.

The researchers established 75% as the level of agreement or higher for a response to be included in the curriculum or recommended opportunities for each question *a priori*. The percentage of the panel that agreed or strongly agreed was used to determine overall level of agreement. The percent level of agreement for each response in the three questions posed is featured in the sections to follow.

Recommended Grade Level

Of the three questions posed in the initial instrument, responses to Questions One were based solely on curriculum outcomes. Jones, Ross, & Rayfield (2020) examined the status of middle school programs in grade levels 6, 7, and 8, in the U. S. For that reason, the panel was asked to recommend to what grade levels each response in Question One would be the most appropriate. The panel was instructed to rate whichever and however many grade levels they felt were appropriate for that response to be included.

Agreement Level for Question One Responses

75% or higher was determined *a priori* as the level of agreement required for a response to reach consensus by the committee. The results of the level of agreement by

the panel is illustrated below in Table 4.1. “Total Agreement %” displayed in Table 4.1 was determined by the percentage of individuals who gave a rating of either 5 (“Agree”) or 6 (“Strongly Agree”).

Table 4.1

Round Two level of agreement for each response from Question One in Round One (n=29)

Response	Strongly Disagree <i>n</i>	Disagree <i>n</i>	Slightly Disagree <i>n</i>	Slightly Agree <i>n</i>	Agree <i>n</i>	Strongly Agree <i>n</i>	Total Agreement % <i>n</i>
History of Agriculture	0	0	0	0	10	19	100.0%
Public Speaking/Communication Skills	0	0	0	0	7	22	100.0%
Responsibility	0	0	0	0	5	24	100.0%
Supervised Agriculture Experience's (SAE)	0	0	0	0	8	21	100.0%
Teamwork	0	0	0	0	4	25	100.0%
Community Service	0	0	0	2	6	21	93.1%
FFA Knowledge	0	0	1	1	4	23	93.1%
FFA Opportunities/History	0	0	1	1	4	23	93.1%
Goal Setting	0	0	0	2	6	21	93.1%
Scientific Method	0	0	1	1	10	17	93.1%
Animal Science	0	0	0	3	12	14	89.7%
Careers and Opportunities in Agriculture	0	0	0	3	3	23	89.7%
Farm to Table	0	1	0	2	5	21	89.7%
Principles of AFNR	0	1	0	3	4	21	86.2%
Professionalism/Employability Skills	0	1	0	3	6	19	86.2%
Agricultural Education History/Structure	0	0	1	4	5	19	82.8%
Home and Farm Safety	0	0	1	4	8	16	82.8%
Judging Contests	0	1	1	4	12	11	79.3%
Plant Science	0	0	1	5	12	11	79.3%
Tool Identification	0	1	2	3	9	14	79.3%
Grit and Resiliency	0		0	7	6	16	75.9%

Table 4.1 Continued

Response	Strongly Disagree <i>n</i>	Disagree <i>n</i>	Slightly Disagree <i>n</i>	Slightly Agree <i>n</i>	Agree <i>n</i>	Strongly Agree <i>n</i>	Total Agreement % <i>n</i>
Horticulture	0	0	2	5	9	13	75.9%
Leadership Types	0	0	1	5	11	11	75.9%
Parliamentary Procedure	0	1	1	4	9	13	75.9%
Animal Welfare	1	1	1	5	8	13	72.4%
Basic Nutrition and Health	1	1	3	5	9	10	65.5%
Livestock Production	1	1	3	6	8	10	62.1%
Natural Resources	0	0	3	8	8	10	62.1%
Wood Working	0	0	1	10	8	10	62.1%
College Readiness	0	2	2	8	5	12	58.6%
Agricultural Research	0	1	2	10	11	5	55.2%
Soil Science	3	2	2	6	13	3	55.2%
Food Science/Safety	0	0	6	8	7	8	51.7%
Wildlife	0	0	7	7	8	7	51.7%
Ag Mechanics	2	6	3	4	11	3	48.3%
Small Animal Management	1	2	4	9	8	5	44.8%
United States Department of Agriculture Agencies	0	5	3	8	4	9	44.8%
Agricultural Math	0	2	6	9	11	1	41.4%
Biotechnology	4	5	9	3	4	4	27.6%
Floral Design	0	4	7	9	4	4	27.6%
Pest Management	0	4	10	10	3	2	17.2%

There was a high level agreement found by the panel of experts on Question One of Round Two. The panel collectively determined a one hundred percent level of agreement for five of the responses evaluated. Seventeen of the responses fell below the *a priori* of 75% level of agreement. The lowest rated response was “Pest Management” with only a 17.2% agreement level.

The responses that found a 100% level of agreement were “History of Agriculture,” “Public Speaking/Communication Skills,” “Responsibility,” “Supervised Agricultural Experiences (SAEs),” and “Teamwork.”

Responses that received a level of agreement 90-99% were “Community Service,” “FFA Knowledge,” “FFA Opportunities/History,” “Goal Setting,” and “Scientific Method.” These five responses all recorded a 93.1% level of agreement.

Responses existing that received an 80-89% level of agreement were “Animal Science” (89.7%), “Careers and Opportunities in Agriculture” (89.7%), “Farm to Table” (89.7%), “Principles of AFNR” (86.2%), “Professionalism/Employability Skills” (86.2%), “Agricultural Education History/Structure” (82.8%), and “Home and Farm Safety” (82.8%). There were seven responses reaching the 80-89% level of agreement.

There were seven responses recorded at a 75-79% level of agreement that met the 75% *a priori*. These items were the final items to be listed with consensus after Round Two. The responses were “Judging Contests” (79.3%), “Plant Science” (79.3%), “Tool Identification” (79.3%), “Grit and Resiliency” (75.9%), “Horticulture” (75.9%), “Leadership Types” (75.9%), and “Parliamentary Procedure” (75.9%).

Seventeen responses did not meet the level of agreement of 75% set by the researchers *a priori*. The seventeen responses were “Animal Welfare” (72.4%), “Basic

Nutrition and Health” (65.5%), “Livestock Production” (62.1%), “Natural Resources” (62.1%), “Wood Working” (62.1%), “College Readiness” (58.6%), “Agricultural Research” (55.2%), “Soil Science” (55.2%), “Food Science/Safety” (51.7%), “Wildlife” (51.7%), “Ag Mechanics” (48.3%), “Small Animal Management” (44.8%), “United States Department of Agriculture Agencies” (44.8%), “Agricultural Math” (41.4%), “Biotechnology” (27.6%), “Floral Design” (27.6%), and “Pest Management” (17.2%).

Recommended Grade Level Question One Responses

The first question in Round Two requested that panel members recommend grade level or grade levels that each response could be best included in middle school agriculture curriculum. This was the only portion of the Round Two instrument that requested this response. The panel members were asked to choose one or multiple responses on middle school grade levels of 6th, 7th, or 8th grade. The panel was provided a fourth option of “No Preference.”

Panel members selected the grade levels on a scale of 1-4 (1 = 6th Grade, 2 = 7th Grade, 3 = 8th Grade, 4 = No Preference). Allowing the panel to select grade level provided researchers with a guide to ordering the results of the responses based to put in them in a recommended sequence for instruction at the middle school level. The results of the panel’s level of agreement for each grade level for each response that reached consensus are illustrated in Table 4.2.

Table 4.2

Percentage of panelists that selected given grade levels for each response reaching consensus (n=29)

Response	6th Grade		7th Grade		8th Grade		No Preference	
	<i>n</i>	<i>f</i>	<i>n</i>	<i>f</i>	<i>n</i>	<i>f</i>	<i>n</i>	<i>f</i>
Agricultural Education History/Structure	16.0%	8	36.0%	18	40.0%	20	8.0%	4
Animal Science	17.7%	9	31.4%	16	39.2%	20	11.8%	6
Careers and Opportunities in Agriculture	21.8%	12	32.7%	18	34.6%	19	10.9%	6
Community Service	24.2%	15	32.3%	20	32.3%	20	11.3%	7
Farm to Table	24.6%	14	31.6%	18	31.6%	18	12.3%	7
FFA Knowledge	9.1%	4	31.8%	14	45.5%	20	13.6%	6
FFA Opportunities/History	8.9%	4	33.3%	15	44.4%	20	13.3%	6
Goal Setting	18.9%	10	32.1%	17	35.9%	19	13.2%	7
Grit and Resiliency	21.2%	11	30.8%	16	34.6%	18	13.5%	7
History of Agriculture	18.5%	10	35.2%	19	33.3%	18	13.0%	7
Home and Farm Safety	20.0%	10	28.0%	14	36.0%	18	16.0%	8
Horticulture	19.6%	10	27.5%	14	37.3%	19	15.7%	8
Judging Contests	7.5%	3	27.5%	11	45.0%	18	20.0%	8
Leadership Types	7.9%	3	29.0%	11	44.7%	17	18.4%	7
Parliamentary Procedure	0.0%	0	17.9%	5	67.9%	19	14.3%	4
Plant Science	15.2%	7	30.4%	14	41.3%	19	13.0%	6
Principles of AFNR	5.9%	2	20.6%	7	58.8%	20	14.7%	5
Professionalism/Employability Skills	16.3%	8	30.6%	15	36.7%	18	16.3%	8
Public Speaking/Communication Skills	20.7%	12	32.8%	19	37.9%	22	8.6%	5
Responsibility	24.1%	14	32.8%	19	31.0%	18	12.1%	7
Scientific Method	18.0%	9	32.0%	16	32.0%	16	18.0%	9
Supervised Agriculture Experience's (SAE)	10.6%	5	34.0%	16	44.7%	21	10.6%	5
Teamwork	23.3%	14	33.3%	20	31.7%	19	11.7%	7
Tool Identification	13.6%	6	31.8%	14	43.2%	19	11.4%	5

The results illustrated in Table 4.2 were analyzed to determine the level of agreement by the panel for each item to be most appropriate to consider including the item in the curriculum. A majority selection by the panel was considered to be high a level of agreement. Due to few items reaching a majority, the data was viewed as potentially not critical. Two items secured a majority recommendation from the panel and were all at the 8th grade level. The two items that received a majority recommendation for

a grade level were “Parliamentary Procedure” (67.9%) and “Principles of AFNR” (58.8%).

The level of agreement for each grade level was later referenced after a final consensus on all items was completed in Round Three of the study. Akers (2000) utilized the mode as the deciding factor for when an item should be introduced.

Agreement Level for Question Two Responses

The panel was asked to rate the level of agreement for items that could be available to middle school agricultural education outside the confines of a classroom. The responses were focused on items that traditionally are included at the high school level. 75% was established *a priori* to determine consensus on items from the initial question in the first instrument. The panel identified 23 items that could be made available outside of the classroom to middle school agriculture programs. Table 4.3 illustrates the level of agreement for each item found on Question Two. “Total Agreement %” displayed in Table 4.3 was determined by the percentage of individuals who gave a rating of either 5 (“Agree”) or 6 (“Strongly Agree”).

Table 4.3
Round Two level of agreement for each response from Question Two of Round One (n=29)

Response	Strongly Disagree <i>n</i>	Disagree <i>n</i>	Slightly Disagree <i>n</i>	Slightly Agree <i>n</i>	Agree <i>n</i>	Strongly Agree <i>n</i>	Total Agreement % <i>n</i>
Attend FFA Meetings	0	0	0	0	6	23	100.0%
Career Exploration Field Trips	0	0	0	0	7	22	100.0%
Community Service Experiences	0	0	0	0	4	25	100.0%
Local Ag Farm Field Trips	0	0	1	0	10	18	96.6%
Plan and Implement Supervised Agricultural Experience	0	0	0	1	10	18	96.6%
Greenhand Career Development Events Participation	0	0	2	1	7	19	89.7%
Greenhand Leadership Development Events Participation	0	0	2	1	7	19	89.7%
Greenhand Speaking Development Events Participation	0	0	2	1	8	18	89.7%
Middle School Career Development Events	0	0	0	3	4	22	89.7%
Middle School Leadership Development Events	0	0	0	3	4	22	89.7%
Middle School Speaking Development Events	0	0	0	3	5	21	89.7%
Leadership Camp Participation	0	0	2	2	8	17	86.2%
Participation in Agriscience Fair	0	0	2	2	10	15	86.2%
Ag Product ID Contest	0	0	2	3	13	11	82.8%
Greenhand Camp Participation	0	0	2	3	7	17	82.8%
Fundraising	0	1	1	5	9	13	75.9%
Photography Competitions	0	0	5	6	6	12	62.1%
School Ag Farm Management	0	1	4	7	8	9	58.6%
Program of Activities Planning	0	0	5	8	7	9	55.2%
Cooking/Baking Competitions	0	1	4	9	8	7	51.7%
Greenhouse Management	1	1	1	11	7	8	51.7%
National Archery in the School Programs (NASP)	0	2	4	8	8	7	51.7%
4H Contest Participation	5	3	0	7	6	8	48.3%

The panel rated responses provided from Question Two of Round One. The 23 responses evaluated for inclusion as “out-of-the-classroom” opportunities found a level of agreement of one hundred percent on three items. 16 of the 23 items reached the 75% *a priori* for consensus set by the researcher. Seven items did not reach consensus. The item with the lowest level of agreement was “4H Contest Participation” (48.3%).

The three items that reached 100% level of agreement were “Attend FFA Meetings,” “Career Exploration Field Trips,” and “Community Service Experiences.”

Two items had above a 90% level of agreement by the panel. The two items both reaching 96.6% level of agreement were “Local Ag Farm Field Trips” and “Plan and Implement Supervised Agricultural Experience.”

A larger number of items reached an 80-89% level of agreement. These ten items were “Greenhand Career Development Events” (89.7%), “Greenhand Leadership Development Events” (89.7%), “Greenhand Speaking Development Events” (89.7%), “Middle School Career Development Events” (89.7%), “Middle School Leadership Development Events” (89.7%), “Middle School Speaking Development Events” (89.7%), “Leadership Camp Participation” (86.2%), “Participation in Agriscience Fair” (86.2%), “Ag Product ID Contest” (82.8%), and “Greenhand Camp Participation” (82.8%).

The “Middle School” and “Greenhand” Leadership, Speaking, and Career Development Events showed an identical level of agreement. However, the researcher noted that the items labeled “Middle School” had a higher number of participants select 6 (“Strongly Agree”) than the items labeled “Greenhand.” The “Middle School” items labeled 6 (“Strongly Agree”) held percentages at 75.9% (“Leadership Development Events”), 75.9% (“Career Development Events”), and 72.4% (“Speaking Development Events”). The “Greenhand” items labeled 6

(“Strongly Agree”) held percentages at 65.5% (“Leadership Development Events”), 65.5% (“Career Development Events”), and 62.1% (“Speaking Development Events”).

One item reached a level of agreement between 75-79%. The lone item reaching this bracket of agreement was “Fundraising” (75.9%).

There were seven items that did not reach the of 75% set by the researcher to be considered consensus set *a priori*. The seven items not reaching consensus were “Photography Competitions” (62.1%), “School Ag Farm Management” (58.6%), “Program of Activities Planning” (55.2%), “Cooking/Baking Competitions” (51.7%), “Greenhouse Management” (51.7%), “National Archery in the School Programs (NASP)” (51.7%), and “4H Contest Participation” (48.3%)

Agreement Level for Question Three Responses

Question Three asked the panelists to rate their level of agreement on resources that would be necessary for success of middle school agricultural education programs. For this study, “resources” was defined as any aid from outside the classroom that a teacher receives that supports the effective teaching middle school Agricultural Science Teachers. The responses from Round One were converged and identified as 23 potential resources that middle school agricultural programs could need. A 75% level of agreement was established *a priori* meaning at this level of agreement by the panel consensus is reached. Table 4.4 illustrates the level of agreement for each item found on Question Three. “Total Agreement %” displayed in Table 4.4 was determined by the percentage of individuals who gave a rating of either 5 (“Agree”) or 6 (“Strongly Agree”).

Table 4.4

Round Three level of agreement for each response from Question Three of Round One (n=29)

Response	Strongly Disagree <i>n</i>	Disagree <i>n</i>	Slightly Disagree <i>n</i>	Slightly Agree <i>n</i>	Agree <i>n</i>	Strongly Agree <i>n</i>	Total Agreement % <i>n</i>
Internet Access	0	0	0	0	3	26	100.0%
Supportive School District	0	0	0	0	4	25	100.0%
Age Appropriate Curriculum Availability	0	0	0	1	9	19	96.6%
Basic Classroom Supplies	0	0	0	1	10	18	96.6%
Community Involvement	0	0	0	2	6	21	93.1%
Technology Access	0	0	0	2	4	23	93.1%
Basic Shop Equipment	0	0	0	3	13	13	89.7%
FFA Manuals	0	0	0	2	8	18	89.7%
Funding	1	0	0	2	5	21	89.7%
Texas Essential Knowledge and Skills (TEKS)	0	1	1	1	6	20	89.7%
Field Trip Opportunities	0	0	0	4	7	18	86.2%
Learning Laboratory Access	0	0	0	3	7	18	86.2%
Offline Curriculum	0	0	0	4	10	15	86.2%
Scope and Sequence	0	1	0	3	7	18	86.2%
Safety Trainings	0	0	0	5	9	15	82.8%
Vehicles for Transportation	0	0	0	5	8	16	82.8%
Bullying Prevention Programs	0	0	3	2	8	15	79.3%
Online Curriculum (i.e. ICEV)	0	2	1	3	6	17	79.3%
Capital Equipment (i.e. Ag Shop, Project Barn)	0	1	2	5	8	13	72.4%
ATAT Middle School Mentorship Programs	1	1	1	6	10	10	69.0%

Table 4.4 Continued

Response	Strongly Disagree <i>n</i>	Disagree <i>n</i>	Slightly Disagree <i>n</i>	Slightly Agree <i>n</i>	Agree <i>n</i>	Strongly Agree <i>n</i>	Total Agreement % <i>n</i>
Social Media Trainings	0	0	6	3	6	14	69.0%
Career Fairs	0	1	4	6	11	7	62.1%
Text Books	2	1	1	9	9	7	55.2%

The majority of the items listed on Question Three received a high level of agreement. Items that reached the consensus level of 75% by the panel for Question Three totaled 18 in Round Two. These were items that the panel felt were resources that were necessary for a middle school agricultural science teacher to be successful. Two items reached 100% level of agreement with total support by the panel. The two items that reached 100% were “Internet Access” and “Supportive School District.” The lowest rated item was “Text Books” with a 55.2% level of agreement.

Four items reached the threshold between 90-99% agreement. The items reaching this level were “Age Appropriate Curriculum Availability” (96.6%), “Basic Classroom Supplies” (96.6%), “Community Involvement” (93.1%), and “Technology Access” (93.1%).

Several responses reached the 80-89% level of agreement by the panel. The items that reached this level were “Basic Shop Equipment” (89.7%), “FFA Manuals” (89.7%), “Funding” (89.7%), “Texas Essential Knowledge and Skills” (89.7%), “Field Trip Opportunities” (86.2%), “Learning Laboratory Access” (86.2%), “Offline Curriculum” (86.2%), “Scope and Sequence” (86.2%), “Safety Trainings” (82.8%), and “Vehicles for Transportation” (82.8%).

The remaining responses to meet the 75% *a priori* were between the 75-79% level of agreement. The responses reaching this level of agreement were “Bullying Prevention Programs” (79.3%) and “Online Curriculum” (79.3%).

The responses not reaching the consensus on Round Two for Question Three were “Capital Equipment” (72.4%), “ATAT Middle School Mentorship Programs” (69.0%), “Social Media Trainings” (69.0%), “Career Fairs” (62.1%), and “Text Books” (55.2%)

Round Three

Selection of Items for Round Three

The researcher and a committee of faculty at West Texas A&M University determined 75% *a priori* to be used to determine if items had reached consensus in Round Two and Round Three. Items that did not reach consensus in Round Two were included in Round Three for a final evaluation by the committee before being removed from consideration in the program. The committee agreed that meeting the consensus level on Round Two was sufficient to set aside the items for inclusion in the curriculum. In addition, the committee determined that an item needed to fail to reach consensus two times in order to sufficiently claim no consensus had been reached on the item. This decision replicated the methods used by Rayfield & Croom (2010).

The committee set aside items reaching a 75% level of agreement in Round Two for inclusion in the curriculum. Items not reaching 75% were include in the Round Three instrument.

The Round Three instrument looked identical to the instrument used in Round Two. This instrument gave the panelists the opportunity to give a final rating on the items that had not reached consensus previously. In Round Three, the items were rated using a six point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Slightly Disagree, 4 = Slightly Agree, 5 = Agree, 6 = Strongly Agree). Panel members were not asked to repeat the procedure of selecting a recommended grade level as that information was collected in Round Two.

Agreement Level for Question One Responses

The initial round of the study posed a question regarding content to be included in the classroom at the middle school level. Round Two found consensus on 24 of the items initially identified and did not find consensus on the other 17 items. The 17 items not reaching consensus were included in the Round Three instrument. Levels of agreement for items included in Round Three are found in Table 4.5.

Table 4.5

Percentage level of agreement on Round Three items evaluated from Question One (n=26)

Response	Strongly Disagree <i>n</i>	Disagree <i>n</i>	Slightly Disagree <i>n</i>	Slightly Agree <i>n</i>	Agree <i>n</i>	Strongly Agree <i>n</i>	Total Agreement % <i>n</i>
Wood Working	1	0	1	0	16	7	88.5%
Animal Welfare	1	1	2	1	7	13	76.9%
Basic Nutrition and Health	1	0	0	2	14	6	76.9%
Livestock Production	1	0	2	2	12	8	76.9%
Food Science/Safety	2	1	2	4	13	3	61.5%
Natural Resources	1	0	2	5	11	5	61.5%
Soil Science	1	1	3	4	13	3	61.5%
Wildlife	1	0	1	6	11	5	61.5%
Agricultural Research	2	4	0	6	8	5	50.0%
College Readiness	0	4	4	3	5	8	50.0%
Small Animal Management	0	1	5	4	8	5	50.0%
Ag Mechanics	2	1	1	9	7	5	46.2%
United States Department of Agriculture Agencies	0	2	5	5	7	5	46.2%
Agricultural Math	1	3	2	8	7	3	38.5%
Floral Design	0	3	2	9	5	5	38.5%
Biotechnology	3	4	3	10	2	2	15.4%
Pest Management	1	4	8	6	4	0	15.4%

In Round Three on the first question, consensus was found on items that did not previously reach consensus in Round Two. Four items reached the 75% level of agreement to meet consensus. These responses were items that could be included in middle school agriculture curriculum.

The four items that reached consensus and were thus included in the curriculum were “Wood Working” (88.5%), “Animal Welfare” (76.9%), “Basic Nutrition and Health” (76.9%), and “Livestock Production” (76.9%). These items had previously been evaluated in appropriate grade level for inclusion in Round Two.

There were 13 items that did not reach consensus again in Round Three. Due to a lack of agreement for inclusion the researchers felt sufficient grounds for elimination were met. The 13 items eliminated from the curriculum were “Food Science/Safety” (61.5%), “Natural Resources” (61.5%), “Soil Science” (61.5%), “Wildlife” (61.5%), “Agricultural Research” (50.0%), “College Readiness” (50.0%), “Small Animal Management” (50.0%), “Ag Mechanics” (46.2%), “United States Department of Agriculture Agencies” (46.2%), “Agricultural Math” (38.5%), “Floral Design” (38.5%), “Biotechnology” (15.4%), and “Pest Management” (15.4%).

Agreement Level for Question Two Responses

Question Two in the initial instrument focused on out-of-the-classroom opportunities that could be provided for middle school agricultural education programs. The committee found 23 items in Round One and reached consensus on 16 of the items. The 7 not reaching consensus were evaluated for a final time in Round Three. Table 4.6 shows the level of agreement for each of the items included to be reevaluated from Question Two.

Table 4.6

Percentage level of agreement for Question Two responses in Round Three (n=26)

Response	Strongly Disagree <i>n</i>	Disagree <i>n</i>	Slightly Disagree <i>n</i>	Slightly Agree <i>n</i>	Agree <i>n</i>	Strongly Agree <i>n</i>	Total Agreement % <i>n</i>
Photography Competitions	1	1	2	5	10	6	61.5%
School Ag Farm Management	1	1	3	4	11	5	61.5%
National Archery in the School Programs (NASP)	1	0	2	7	11	4	57.7%
Program of Activities Planning	1	2	1	7	9	5	53.8%
4H Contest Participation	2	4	2	4	6	7	50.0%
Cooking/Baking Competitions	1	2	3	7	5	7	46.2%
Greenhouse Management	1	2	1	9	8	4	46.2%

Round Three findings for the second question from the initial instrument found no consensus on items evaluated. The 7 items that were evaluated from Question Two failed to reach the of 75% level of agreement for consensus set *a priori*. Due to not reaching this level of agreement, the researchers determined a sufficient level of consensus to eliminate each of the items.

Items eliminated out-of-the-classroom opportunities for middle school agricultural education programs were “Photography Competitions” (61.5%), “School Ag Farm Management” (61.5%), “National Archery in the School Program (NASP)” (57.7%), “Program of Activities Planning” (53.8%), “4H Contest Participation” (50.0%), “Cooking/Baking Competitions” (46.2%), and “Greenhouse Management” (46.2%).

Agreement Level for Question Three Responses

The third question in the initial instrument regarded resources needed for middle school agricultural science teachers to teach most successfully. The initial instrument found 23 items that could help me this need. Of the 23 items found, consensus was reached on 18 of the items in Round Two. There were 5 items that did not reach consensus. These items were evaluated for level of agreement a second time in Round Three. Table 4.7 shows the level of agreement for each item included in Round Three for Question Three.

Table 4.7

Percentage level of agreement for Question Three responses in Round Three (n=26)

Response	Strongly Disagree <i>n</i>	Disagree <i>n</i>	Slightly Disagree <i>n</i>	Slightly Agree <i>n</i>	Agree <i>n</i>	Strongly Agree <i>n</i>	Total Agreement % <i>n</i>
ATAT Middle School Mentorship Programs	1	0	1	3	13	8	80.8%
Capital Equipment (i.e. Ag Shop, Project Barn)	1	0	1	3	12	9	80.8%
Social Media Trainings	2	1	2	3	9	9	69.2%
Text Books	1	2	1	4	13	5	69.2%
Career Fairs	2	2	2	4	9	7	61.5%

Question Three found some level of consensus among the items that were evaluated. 5 items were evaluated with 2 of the items reaching consensus. The 2 items that reached the 75% level of agreement were set aside to be included in the list of resources need for Middle School Agricultural Science teachers to be successful.

The 2 items reaching consensus were “ATAT Middle School Mentorship Programs” (80.8%) and “Capital Equipment (i.e. Ag Shop, Project Barn)” (80.8%). The three items that did not reach consensus resulting in elimination were “Social Media Trainings” (69.2%), “Text Books” (69.2%), and “Career Fairs” (61.5%).

CHAPTER V

RECOMMENDATIONS AND CONCLUSIONS

Summary

The previous four chapters set context for middle school agricultural education programs, the lack of research in the area, methodology for this study, and the findings resulting from it. Chapter I discussed background information regarding middle school agricultural education programs and the modern opportunities available to them. Chapter II provided background information into all facets of agricultural education and the processes contained within the Delphi method of research. Additionally, it granted the opportunity to discuss prior research conducted since the inception of middle school agricultural programs. Chapter III developed the framework for with which the study would take place utilizing the Delphi method. Chapter IV presented the findings of the study through descriptive statistical measures and discussed the results of the subsequent three rounds of instruments contained in the study. This final chapter will further discuss the results presented in Chapter IV and recommend how the information found in the study can be implemented.

Middle School Agricultural Education was formerly added to the Agricultural Education model by the National FFA Organization in 1988 (Golden, Parr, & Peake, 2014; National FFA Organization, 2020-a). The actual figures related to the population of

middle school agriculture programs in Texas is a mystery, while other states, such as Georgia, report an enrollment of over 30,000 students (Jones, Doss, & Rayfield, 2020). However, schools in Texas are including middle school agriculture courses at an increasing amount. The Texas Education Agency, TEA, recently announced additional funding for these programs in House Bill 3 (Texas Education Agency, 2019-b). Rayfield & Croom (2010) recommended research concerning curriculum standards for middle school agricultural education. This study aims to assist in development of the creation of curriculum to support middle school agricultural science teachers.

Purpose and Questions

The purpose of this study was to determine a curriculum sequence to administer middle school agriculture courses. Additionally, Golden, Parr and Peak (2014) suggested that a needs assessment should be completed every five to 10 years due to changing needs of these teachers. Information was collected from middle school and high school agricultural science teachers, agricultural education leaders from the Agricultural Teachers Association of Texas and the Texas FFA Association, and retired agricultural science teachers. The Delphi research method was utilized. As a means of accomplishing the purpose of this study, answers to four major questions were sought:

1. What classroom content (i.e. courses, topics, skills) should be offered at the middle school level to best set up students to enter into higher level curriculum upon high school arrival?
2. What is the appropriate grade level for the content recommended to be included in the curriculum to be taught?

3. What outside-of-the-classroom opportunities available in traditional agricultural education should be included at the middle school level?
4. What resources are needed for middle school agricultural science teachers to successfully teach middle school agriculture courses?

Panel of Experts

The Delphi process utilizes a group of experts in order to reach consensus on a group of questions (Parente & Anderson-Parente, 2011). Researchers recommend various sizes for a Delphi panel (Akers, 2000). For purpose of this study, the researcher identified 47 people for potential inclusion on the panel. 41 of the experts that were contacted agreed to participate in the initial round of the study. Round One saw participation from 32 panelists. Round Two saw participation from 29 panelists. Round Three had participation from 26 panelists. The panel was formed by current middle school agricultural science teachers, former agricultural science teachers, and leaders from state associations directly involved with agricultural education.

Discussion and Implications

With an understanding of middle school agricultural education programs and through the review of other research, the need for further research was found to be a necessity. This study helped to identify ways to better support middle school agricultural science teachers through curriculum development, extracurricular opportunity development, or reviewing resources to be used in support.

Middle school agricultural education programs are well supported in a variety of ways by research conducted prior to this, while it may not be obvious at initial viewing.

Literature regarding the changes in a middle school student's life and other literature pertaining to middle school supports these students.

Middle school students are often convinced that they do not fit in with anyone around them (Rankin, 1999). These students are found to be highly receptive to new material in a formal learning environment. This could largely be because of their social-emotional development (Rayfield & Croom, 2010). Rayfield and Croom found that as a student progresses into and through middle school cognitively they are passing from Piaget's fourth level of development to the fifth. It is at this stage that a human begins to develop a unique identity. This means the choices presented to them could carry weight. This study collected information regarding appropriate curriculum for middle school learners in middle school agriculture programs. In evaluating Piaget's levels of cognitive development, this study could assist curriculum developers and educational authorities in supporting middle school agriculture programs through standard development.

Jones et al. (2020) found five topics with high levels of inclusion in middle school agricultural education programs including: Career Exploration, Agricultural Literacy, Animal Science, Horticulture, and History of FFA. Frick (1993) reported that agricultural literacy and exploration of agricultural topics be the primary topics on middle school agriculture curriculum. These previous studies found similar curriculum components to the ones found in this study. Careers, Animal Science, Ag Literacy, and FFA were all completed. These elements prove to remain relevant in studies of similar nature, therefore are expected to remain included as time progresses in the life of middle school agricultural programs.

While the study took place in the 80s, The American Educational Research Association evaluated the abilities of middle school students (Resnick, 1985). It was found that curriculum often provided to middle school students is often leans toward low-level skills thus underselling the students' ability. Further research in the area of middle school allows for development of curriculum that focuses on preparing students with higher level lessons. This would allow high school programs to teach more in depth to better prepare students for careers in agriculture (Akers 2000).

The research implied that though Grade levels 6, 7, and 8 were requested in relation to each of the curriculum components evaluated, there was varying opinion on where the items should be included. Grade 8 possessed the highest frequency of responses for most items evaluated. This could possibly be for the reason that there is a higher existence of middle school agriculture classes at Grade 8. However, due to a lack of data for enrollment in Texas that could be incorrect. Further research pertaining to grade levels offered is encouraged.

Rayfield and Croom (2010) found that curriculum support is needed for middle school agricultural science teachers to be most successful. This study begins a movement towards the further creation and development of such curriculum. It was clear in this study that the resources that the Delphi panelists felt strongly toward various forms of curriculum offerings.

A Delphi study provides value in that it creates opportunity for more questions to be asked and considered. A Delphi study does not always provide conclusive answers to given questions. It does however create a conversation on the areas of need and of further studies that need to be conducted.

Conclusions

Research Question One

Research Question One: What classroom content (i.e. courses, topics, skills) should be offered at the middle school level to bet set up students to enter into higher level curriculum upon high school arrival?

The initial asking of Research Question One yielded 41 responses that the panel recommended as possible content be included in middle school agricultural curriculum. In Round Two, the panel was asked to rate their level of agreement of the inclusion of the 41 items. The researchers determined *a priori* a 75% level of agreement was required for an item to reach consensus to be included in the curriculum. At the end of Round Two, 24 of the 41 items had reached consensus by the committee. Items that did not reach consensus in Round Two were reevaluated by the panel for a final decision on the items' inclusion in the curriculum. After Round Three, 4 additional responses reached the 75% level of agreement, which led to their addition to the curriculum. The researchers determined that sufficient consensus was found to eliminate the remaining 13 items from the curriculum. The following items reached consensus and are recommended for inclusion in the curriculum:

1. History of Agriculture
2. Public Speaking/Communication Skills
3. Responsibility
4. Supervised Agricultural Experiences (SAE)
5. Teamwork
6. Community Service

7. FFA Knowledge
8. FFA Opportunities/History
9. Goal Setting
10. Scientific Method
11. Animal Science
12. Careers and Opportunities in Agriculture
13. Farm to Table
14. Principles of AFNR
15. Professionalism/Employability Skills
16. Agricultural Education History/Structure
17. Home and Farm Safety
18. Judging Contests
19. Plant Science
20. Tool Identification
21. Grit and Resiliency
22. Horticulture
23. Leadership Types
24. Parliamentary Procedure
25. Wood Working
26. Animal Welfare
27. Basic Nutrition and Health
28. Livestock Production

Based on the committee's consensus agreement on the 28 items found above, these items are encouraged to be included in building curriculum for middle school agricultural science programs.

Research Question Two

Research Question Two: What is the appropriate grade level for the content recommended to be included in the curriculum to be taught?

Scholastic Level of Inclusion for Content

The researchers reviewed the suggestions from the panel to determine the scholastic level, or grade level, that each topic should be introduced to students. In modelling the works of Akers (2000), it was determined to utilize mode responses to place each of the items identified from Research Question One. The committee through evaluation were able to determine, which grade level to place each item. Items that had a high frequency of selection in multiple categories, and seemed to be subjects that were logical to be taught twice, were often repeated in the curriculum for the various grade levels. Additionally, due to the panel's frequency of selection those items were seen as important to include at any level.

Akers (2000) selected potential curriculum components for agricultural communications curriculum by selecting items that had higher than a 50% level of selection for a given grade level. In this study, few items reached higher than a 50% level of agreement. All items, with the exception of "Parliamentary Procedure," that reached consensus by the panel are recommended to be included in curriculum at any level from Grade 6-8. "Parliamentary Procedure" is not recommended to be taught at Grade 6 as the panel had a 0% selection rate of this item.

After reviewing the data, many of the curriculum items reached the highest level of selection at Grade 8. The researchers determined that placing an item at strictly one grade level based on frequency and not repeating the item in the curriculum at a different grade level was not possible. For that reason, the researchers determined that the items could be repeated in the curriculum at any grade level.

Teachers deserve the right to choose when and at what Grade level they implement the recommended curriculum components. Granting autonomy will allow the teachers the ability to plan based on the resources available to them. Each school district is going to vary in the curriculum that best fits. Allowing teachers to have a say in the specified Grade level would benefit them the most.

Research Question Three

Research Question Three: What outside-of-the-classroom opportunities available in traditional agricultural education should be included at the middle school level?

The third research question discussed opportunities that should be included at the middle school level. The Round One instrument returned 23 items that should be included for these programs. In Round Two, the items were rated based on the panel's level of agreement for the items being made available. A 75% level of agreement was established as consensus for items to be included. 16 items reached consensus in Round Two. The 7 items that did not meet consensus in Round Two were reevaluated by the panel in Round Three. In the final round, the committee did not reach consensus on any of the 7 items therefore eliminating them from the opportunities recommended to be included in middle school programs. The committee reached consensus on 16 out-of-the-classroom opportunities that should be included at the middle school level:

1. Attend FFA Meetings
2. Career Exploration Field Trips
3. Community Service Experiences
4. Local Ag Farm Field Trips
5. Plan and Implement Supervised Agricultural Experiences
6. Greenhand Career Development Events
7. Greenhand Leadership Development Events
8. Greenhand Speaking Development Events
9. Middle School Career Development Events
10. Middle School Leadership Development Events
11. Middle School Speaking Development Events
12. Leadership Camp Participation
13. Participation in Agriscience Fair
14. Ag Product ID Contest
15. Greenhand Camp Participation
16. Fundraising

Based on the findings in Question Two, these 16 items are recommended to be included as out-of-the-classroom opportunities to be made available to middle school agricultural programs. The 6 items labeled with “Middle School” and “Greenhand” for Leadership, Career, and Speaking Development events brought forth identical levels of agreement. However, there was a higher number of “Strongly Agree” selections by the panel in the instrument with items labeled “Middle School.” Therefore, the researchers

would recommend development of separate contests for “Middle School” development events students rather than including them in “Greenhand” development events.

Research Question Four

Research Question Four: What resources are needed for middle school agricultural science teachers to successfully teach middle school agriculture courses?

The fourth question discussed resources that are most needed for middle school agricultural science teachers to teach successfully. In the initial instrument, the panel named 23 items that could be instrumental resources for teachers. Round Two provided panelists an opportunity to choose a level of agreement for each of the 23 resources. A 75% level of agreement was considered consensus on each item to determine its inclusion as a valid resource needed. Round Two found a consensus on 18 of the 23 items. These items were set aside to be included in the conclusions of the study. The 5 items that did not reach consensus were evaluated again in Round Three by the panel. In the final round, consensus was met on 2 of the 5 items. The 3 items not reaching consensus were eliminated from consideration as needs of middle school agricultural science teachers. The following items met the consensus level and were determined as resources that middle school agricultural science teachers need to teach successfully:

1. Internet Access
2. Supportive School District
3. Age Appropriate Curriculum Availability
4. Basic Classroom Supplies
5. Community Involvement
6. Technology Access

7. Basic Shop Equipment
8. FFA Manuals
9. Funding
10. Texas Essential Knowledge and Skills (TEKS)
11. Field Trip Opportunities
12. Learning Laboratory Access
13. Offline Curriculum
14. Scope and Sequence
15. Safety Trainings
16. Vehicles for Transportation
17. Bullying Preventing Programs
18. Online Curriculum
19. ATAT Middle School Mentorship Programs
20. Capital Equipment (ie. Ag Shop, Project Barn)

Based on the responses of the panel, the aforementioned 20 items are recognized as important resources in order for middle school agricultural science teachers to teach most successfully. The items are listed in order of highest level of agreement with the committee finding a 100% level of agreement on the importance of “Internet Access” and a “Supportive School District.”

Recommendations

The research contained herein was analyzed utilizing descriptive measures. Therefore, outcomes should be implemented with caution. The following are recommendations for further research and for application of this study.

Recommendations for Research Question One

Research Question One: What classroom content (i.e. courses, topics, skills) should be offered at the middle school level to bet set up students to enter into higher level curriculum upon high school arrival?

1. This study was only conducted with a sample of experts in Texas. Assumptions to the entire population of middle school agriculture programs should be made cautiously.
2. A Delphi study allows for consensus to be made by individuals with strong interest in the subject area being evaluated. The curriculum items found in this study reached sufficient levels of agreement to be included in middle school agriculture programs.
3. Despite the encouragement to not draw conclusions to the overall population, the participants were experts in the field of agricultural education. The researcher determined that the data collected could be applied and used as a basis for further development of the curriculum.
4. This study focused on identifying potential curriculum components, but did not identify the details for each curriculum component. Further research should be conducted to delineate curriculum components found in this study.
5. Due to a lack of curriculum resources, the 24 content responses should be included within Middle School Agricultural Education.

6. Middle school agriculture offerings at each Grade level vary by school district.
The 24 content items identified in this study should be distributed contingently in each school district based on grade levels offered.
7. The state of Texas does not provide curriculum standards or guidance to middle school agriculture teacher. The 24 content items should be communicated to Agricultural Education authorities to encourage further development of curriculum standards for Middle School Agriculture Programs.
8. This study determined that they 24 curriculum items should be incorporated into middle school agriculture programs. The 24 curriculum items should be utilized in preparing courses for middle school agricultural education.
9. There is a lack of research in this subject area, therefore additional studies be conducted to further evaluate curriculum for middle school agricultural programs.

Recommendations for Research Objective Two

Research Objective Two: Identify the appropriate grade level for content recommended to be included in the curriculum.

1. Participants selected a wide variety of responses for Grade level on each of the curriculum components. Therefore, the items could be used at any Grade level and it is recommended that the needs of the school district be considered in choosing.
2. School districts vary in what grade levels are offered. Analysis of what grade levels are offered for middle school agriculture programs should take place in Texas.

3. Previous studies and state agricultural education authorities did not provide information regarding the current state of middle school agricultural education enrollment. Further data be collected on enrollment information in middle school agriculture programs in Texas.
4. Due to the varying level of Grade levels offered by school districts, research should be conducted to determine what grade levels should be offered at the middle school level.

Recommendations for Research Question Three

Research Question Three: What outside-of-the-classroom opportunities available in traditional agricultural education should be included at the middle school level?

1. The nature of many of the items selected pertained to opportunities that require a variety of needs to take place. Creation, development, funding, and proximity to agricultural locations were a few things that would be needed for the some of the opportunities to take place. Some items found would be simpler to implement than others.
2. This Delphi study only allowed for identification of outside-of-the-classroom opportunities. Further research evaluating each of the recommended outside-of-the-classroom opportunities should be conducted.
3. The findings of this study presented opportunities that could be made available. Additional research should be conducted that evaluates possible implementation procedures for the opportunities found.
4. Panelists in this study found the opportunities to be important to the success of middle school agricultural education programs. The 16 out-of-the-classroom

opportunities identified should be considered for inclusion within middle school agricultural education.

5. State authorities on agricultural education can help implement opportunities found in this study. The 16 opportunities be communicated to agricultural education authorities to encourage inclusion of the opportunities in middle school programs.
6. With only a few studies regarding this subject in existence, additional should studies be conducted to further evaluate out-of-the-classroom opportunities for middle school agricultural programs.

Recommendations for Research Question Four

Research Question Four: What resources are needed for middle school agricultural science teachers to successfully teach middle school agriculture courses?

1. Resources found were both literal and figurative, but were determined important by the panel and each possess their own methods for implementation. Research should take place that evaluates implementation procedures of the supports or programs found in this study.
2. Delphi panelists identified the resources in this study as important. The 20 resources needed for middle school programs should be made available to teachers.
3. Assistance from the state and national level has been important to agricultural programs at all levels. The 20 resources be communicated to agricultural education authorities to encourage their addressing in middle school programs.

4. Few studies have taken place regarding resources for middle school agriculture programs. Additional studies should be conducted to further evaluate resources required for middle school agricultural programs.

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APPENDIX A
IRB CONSENT

IRB Consent Form

A Delphi Study Assessing the Development of a Sequence for Middle School Agricultural Education Curriculum:

- Project Title: A Delphi Study Assessing the Development of a Sequence for Middle School Agricultural Education Curriculum
- Researchers: Kevin Williams – Associate Professor – West Texas A&M University
Micah Davidson – Graduate Research Assistant – West Texas A&M University
- Conditions: As a survey participant, you will be asked to participate in three rounds of data collection. All around will be available through an online platform and take less than 10 minutes to complete. The first round will consist of short answer responses to questions pertaining to the needs, curriculum, and opportunities available to middle school agriculture programs. Questions are designed to gather information tied to middle school agriculture programs. The questionnaire will be conducted with an online Qualtrics form. The link to the form will be provided to you in an invitational email for the study.
- Purpose: The purpose of this study is to identify a recommended plan for middle school agriculture program curriculum, evaluate needs of middle school agricultural science teachers, and determine traditional opportunities of high school agricultural education to include in the middle school program. For this research, needs are defined as necessities to the effectiveness of the middle school agricultural science teacher. Components are defined as supplemental features to traditional agricultural education that typically take place outside of the classroom.
- Voluntary: Participation in this research study is completely voluntary. You have the right to withdraw at any time or refuse to participate entirely. By completing the survey, you the survey participant will have provided consent to participate in the study. If you desire to withdraw, please close your Internet browser. If under the age of 18 years old, please exit out and close you Internet browsers.
- Risk: There are no direct risks for participants.

Confidential: All data obtained from participants will be kept confidential and will only be reported in an aggregate. All questionnaires will be concealed, and no one other than the primary investigator listed below will have access to them. The data collected will be stored in the HIPPA-compliant, Qualtrics-secure database until it has been deleted by the primary investigator.

Contact: If you have questions regarding this study, you may contact Dr. Kevin Williams, kwilliams@wtamu.edu in the Department of Agricultural Sciences at West Texas A&M University. Additional questions may be addressed to Dr. Angela Spaulding, Vice President for research and compliance and Dean of graduate studies.

Questions: If you have any question about your rights, contact:
Dean of Graduate School and Research
Kilgore Research Center
Room 103
Canyon, TX 79016
806-651-2730

Thank you for your participation
Kevin Williams
Associate Professor WTAMU

APPENDIX B
SURVEY INSTRUMENT #1

Developing a Sequence for Middle School Agriculture Curriculum

Q1

What classroom content (i.e. courses, topics, skills) should be offered at the middle school level to prepare students for high level agricultural curriculum in high school?

Please list as many examples as possible.

Q2

What out-of-the-classroom opportunities available in traditional agricultural education should be included at the middle school level? Please list as many examples as possible.

Q3

What resources are needed for middle school agricultural science teachers to be successful? Please list as many examples as possible.

Q4

What is your gender?

- ☐ Male
- ☐ Female
- ☐ Prefer not to answer

Q5

What size of high school are/were you employed at?

- ☐ 1A
 - ☐ 2A
 - ☐ 3A
 - ☐ 4A
 - ☐ 5A
 - ☐ 6A
 - ☐ Did not teach public school in Texas
-

Q6

How many total years did you teach or have you taught? If you have not taught in public school, skip this question.

Q7

How many years have you taught middle school agriculture courses? If you have not taught middle school, skip this question.

Q8

Please enter your assigned participant code below:

Thank you for taking time to take this survey. Please be on the lookout for the next round of the study that will be distributed very soon.

APPENDIX C
SURVEY INSTRUMENT #2

Round 2: Developing a Sequence for Middle School Agriculture Curriculum

Q1

Directions:

For each topic listed we are asking that you do TWO things. First, indicate your level of agreement as to whether the topic should be included in middle school agricultural courses. Use the following scale to indicate your level of agreement: 1= Strongly Disagree, 2= Disagree, 3= Slightly Disagree, 4= Slightly Agree, 5= Agree, 6= Strongly Agree. Second, indicate where the competency should be introduced based on the following levels: 6th grade, 7th grade, 8th grade, Do Not Include. Please select as many grade levels as appropriate.

(Q1 Instrument visible on next page)

	Please select your level of agreement for inclusion at the middle school level for each item. (1= Strongly Disagree, 2= Disagree, 3= Slightly Disagree, 4= Slightly Agree, 5= Agree, 6= Strongly Agree)						Please select the grade level each should be taught. Select all that apply.			
	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree	6th Grade	7th Grade	8th Grade	No Preference
Ag Mechanics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Agricultural Education History/Structure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Agricultural Math	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Agricultural Research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Animal Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Animal Welfare	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Basic Nutrition and Health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Biotechnology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Careers and Opportunities in Agriculture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
College Readiness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Community Service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Farm to Table	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FFA Knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FFA Opportunities/History	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Floral Design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Food Science/Safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Goal Setting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grit and Resiliency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
History of Agriculture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q2

Directions:

For each topic listed we are asking that you indicate your level of agreement as to whether the opportunity should be included in middle school agricultural programs. Use the following scale to indicate your level of agreement: 1= Strongly Disagree, 2= Disagree, 3= Slightly Disagree, 4= Slightly Agree, 5= Agree, 6= Strongly Agree.

	Please select your level of agreement for inclusion at the middle school level for each item. (1= Strongly Disagree, 2= Disagree, 3= Slightly Disagree, 4= Slightly Agree, 5= Agree, 6= Strongly Agree)					
	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
4H Contest Participation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ag Product ID Contest	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Attend FFA Meetings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Career Exploration Field Trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community Service Experiences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cooking/Baking Competitions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fundraising	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Greenhand Camp Participation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Greenhand Career Development Events Participation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Greenhand Leadership Development Events Participation	0	0	0	0	0	0
Greenhand Speaking Development Events Participation	0	0	0	0	0	0
Greenhouse Management	0	0	0	0	0	0
Leadership/Greenhand Camp Participation	0	0	0	0	0	0
Local Ag Farm Field Trips	0	0	0	0	0	0
Middle School Career Development Events	0	0	0	0	0	0
Middle School Leadership Development Events	0	0	0	0	0	0
Middle School Speaking Development Events	0	0	0	0	0	0
National Archery in the School Programs (NASP)	0	0	0	0	0	0
Participation in Agriscience Fair	0	0	0	0	0	0
Photography Competitions	0	0	0	0	0	0
Plan and Implement Supervised Agricultural Experience	0	0	0	0	0	0
Program of Activities Planning	0	0	0	0	0	0
School Ag Farm Management	0	0	0	0	0	0

Q3

Directions:

For each resource listed we are asking that you indicate your level of agreement as to whether the resource is necessary for success in middle school agricultural programs. Use the following scale to indicate your level of agreement: 1= Strongly Disagree, 2= Disagree, 3= Slightly Disagree, 4= Slightly Agree, 5= Agree, 6= Strongly Agree.

(Q3 Instrument visible on next page)

	Please select your level of agreement for inclusion at the middle school level for each item. (1= Strongly Disagree, 2= Disagree, 3= Slightly Disagree, 4= Slightly Agree, 5= Agree, 6= Strongly Agree)					
	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
Age Appropriate Curriculum Availability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ATAT Middle School Mentorship Programs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Basic Classroom Supplies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Basic Shop Equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bullying Prevention Programs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Capital Equipment (i.e. Ag Shop, Project Barn)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Career Fairs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Community Involvement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FFA Manuals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Field Trip Opportunities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Funding	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet Access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning Laboratory Access (i.e. classroom labs, greenhouses, livestock facility)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Offline Curriculum	0	0	0	0	0	0
Online Curriculum (i.e. ICEV)	0	0	0	0	0	0
Safety Trainings	0	0	0	0	0	0
Scope and Sequence	0	0	0	0	0	0
Social Media Trainings	0	0	0	0	0	0
Supportive School District	0	0	0	0	0	0
Technology Access	0	0	0	0	0	0
Texas Essential Knowledge and Skills (TEKS)	0	0	0	0	0	0
Text Books	0	0	0	0	0	0
Vehicles for Transportation	0	0	0	0	0	0

Q4

Please enter your assigned participant code below:

Thank you for taking time to take this survey. Please be on the lookout for the final round of the study that will be distributed very soon

APPENDIX D

SURVEY INSTRUMENT #3

Round 3: Developing a Sequence for Middle School Agriculture Curriculum

Q1

Directions:

For each topic listed we are asking that you do TWO things. First, indicate your level of agreement as to whether the topic should be included in middle school agricultural courses. Use the following scale to indicate your level of agreement: 1= Strongly Disagree, 2= Disagree, 3= Slightly Disagree, 4= Slightly Agree, 5= Agree, 6= Strongly Agree. (Q1 Instrument visible on next page)

	Please select your level of agreement for inclusion at the middle school level for each item. (1= Strongly Disagree, 2= Disagree, 3= Slightly Disagree, 4= Slightly Agree, 5= Agree, 6= Strongly Agree)					
	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
Ag Mechanics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Agricultural Math	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Agricultural Research	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Animal Welfare	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Basic Nutrition and Health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biotechnology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
College Readiness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Floral Design	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Food Science/Safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Livestock Production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Natural Resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pest Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Small Animal Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soil Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
United States Department of Agriculture Agencies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wildlife	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wood Working	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q2

Directions:

For each topic listed we are asking that you indicate your level of agreement as to whether the opportunity should be included in middle school agricultural programs. Use the following scale to indicate your level of agreement: 1= Strongly Disagree, 2= Disagree, 3= Slightly Disagree, 4= Slightly Agree, 5= Agree, 6= Strongly Agree.

	Please select your level of agreement for inclusion at the middle school level for each item. (1= Strongly Disagree, 2= Disagree, 3= Slightly Disagree, 4= Slightly Agree, 5= Agree, 6= Strongly Agree)					
	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
4H Contest Participation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cooking/Baking Competitions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Greenhouse Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
National Archery in the School Programs (NASP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Photography Competitions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Program of Activities Planning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
School Ag Farm Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q3

Directions:

For each resource listed we are asking that you indicate your level of agreement as to whether the resource is necessary for success in middle school agricultural programs. Use the following scale to indicate your level of agreement: 1= Strongly Disagree, 2= Disagree, 3= Slightly Disagree, 4= Slightly Agree, 5= Agree, 6= Strongly Agree.

	Please select your level of agreement for inclusion at the middle school level for each item. (1= Strongly Disagree, 2= Disagree, 3= Slightly Disagree, 4= Slightly Agree, 5= Agree, 6= Strongly Agree)					
	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
4H Contest Participation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cooking/Baking Competitions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Greenhouse Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
National Archery in the School Programs (NASP)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Photography Competitions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q4

Please enter your assigned participant code below:

Thank you for taking time to take this survey.

APPENDIX E

SURVEY PILOT TEST EMAIL

Good Morning,

Thank you for agreeing to pilot test my survey questions. Attached you will find a Word document containing the prospective questions for the survey. If you could just type your answers on the Word document and send it back that would work best. Thank you so much for your willingness to participate.

Sincerely,

Micah Davidson

Recruitment Coordinator & Graduate Research Assistant
Department of Agricultural Sciences
West Texas A&M University

APPENDIX F
INITIAL INTEREST EMAIL

Good Morning,

It was recommended that I gain your insight on my research study for my graduate thesis. My study is aimed at improving Middle School Ag Programs. This email is simply serving as an interest gauge. Would you be willing to participate? If so, please let me know. The first survey will likely be sent out this week. Thank you so much.

Sincerely,

Micah Davidson

Recruitment Coordinator & Graduate Research Assistant

Department of Agricultural Sciences

West Texas A&M University

O: XXX.XXX.XXXX C: XXX.XXX.XXXX

My Strengths: Belief | Includer | Positivity | Developer | Responsibility

APPENDIX G
INITIAL INSTRUMENT EMAIL

Good Afternoon ????,

Thank you for your willingness to participate in my thesis study entitled “Developing a Sequence for Middle School Agriculture Curriculum.” This is a 3-round research project (a Delphi study), so we are asking that you participate in all 3 rounds. None of the rounds should take longer than 10 minutes to complete. Your participation will help identify ways to improve Middle School Ag Programs in the State of Texas. Below is a link to the first round survey. **Please complete this survey by Monday, September 14, 2020, and enter your assigned code where it asks you to do so.**

Assigned Participant Code: ????

Link to Survey: https://wtamuuw.az1.qualtrics.com/jfe/form/SV_6stbI5vYrc9JYUd

Attached are your rights within participation, background information for the study, and the nature of a Delphi study.

Participation in this research study is completely voluntary. You have the right to withdraw at any time or refuse to participate entirely. If the access link does not work, please contact the researcher.

Sincerely,
Micah Davidson

Recruitment Coordinator & Graduate Research Assistant
Department of Agricultural Sciences
West Texas A&M University
O: XXX.XXX.XXXX C: XXX.XXX.XXXX

My Strengths: Belief | Includer | Positivity | Developer | Responsibility

APPENDIX H

REMINDER EMAIL FOR ALL ROUNDS

Good Morning ????,

This email is to serve as a friendly reminder to please fill out the survey mentioned in the prior email below. Your participation is greatly appreciated. Thank you so much.

Sincerely,
Micah Davidson

Recruitment Coordinator & Graduate Research Assistant
Department of Agricultural Sciences
West Texas A&M University
O: XXX.XXX.XXXX C: XXX.XXX.XXXX

My Strengths: Belief | Includer | Positivity | Developer | Responsibility

APPENDIX I
INSTRUMENT #2 EMAIL

Good Afternoon ????,

Thank you for participating in the initial round of the study entitled “Developing a Sequence for Middle Agricultural Curriculum.” Again, we request your participation in Round 2 of this 3 round study. None of the rounds should take longer than 10 minutes to complete. This round gives you the opportunity to rate the responses of each panel member. Below is a link to the second round survey. **Please complete this survey by Monday, October 12, 2020, and enter your assigned code where it asks you to do so.**

Assigned Participant Code: ????

Link to Survey: https://wtamuuw.az1.qualtrics.com/jfe/form/SV_ctKuYMRQJJGgSm9

Participation in this research study is completely voluntary. You have the right to withdraw at any time or refuse to participate entirely. If the access link does not work, please contact the researcher.

Sincerely,
Micah Davidson

Recruitment Coordinator & Graduate Research Assistant
Department of Agricultural Sciences
West Texas A&M University
O: XXX.XXX.XXXX C: XXX.XXX.XXXX

My Strengths: Belief | Includer | Positivity | Developer | Responsibility

APPENDIX J

INSTRUMENT #3 EMAIL

Good Morning ????,

Your participation in the first two rounds was immensely appreciated. Myself and the other researchers cannot thank you enough. With that, we request your participation in the third and *final* round of this study. This round should not take longer than 10 minutes to complete. This round gives you the opportunity to rate the responses again that did not reach consensus on Round Two. Below is a link to the third round survey. **Please complete this survey by Thursday, October 29, 2020, and enter your assigned code where it asks you to do so.**

Assigned Participant Code: ????

Link to Survey: https://wtamuw.az1.qualtrics.com/jfe/form/SV_eycJSDM7PYDltB3

Participation in this research study is completely voluntary. You have the right to withdraw at any time or refuse to participate entirely. If the access link does not work, please contact the researcher.

Sincerely,
Micah Davidson

Recruitment Coordinator & Graduate Research Assistant
Department of Agricultural Sciences
West Texas A&M University
O: 806.651.2550 C: 940.372.3779

My Strengths: Belief | Includer | Positivity | Developer | Responsibility

APPENDIX K
FORTY-ONE RESPONSES FOUND IN QUESTION ONE OF ROUND ONE

FORTY-ONE RESPONSES FOUND IN QUESTION ONE OF ROUND ONE

Responses

1. Ag Mechanics
2. Agricultural Education History/Structure
3. Agricultural Math
4. Agricultural Research
5. Animal Science
6. Animal Welfare
7. Basic Nutrition and Health
8. Biotechnology
9. Careers and Opportunities in Agriculture
10. College Readiness
11. Community Service
12. Farm to Table
13. FFA Knowledge
14. FFA Opportunities/History
15. Floral Design
16. Food Science/Safety
17. Goal Setting
18. Grit and Resiliency
19. History of Agriculture
20. Home and Farm Safety
21. Horticulture
22. Judging Contests

23. Leadership Types
24. Livestock Production
25. Natural Resources
26. Parliamentary Procedure
27. Pest Management
28. Plant Science
29. Principles of Agriculture, Food, and Natural Resources (PAFNR)
30. Professionalism/Employability Skills
31. Public Speaking/Communication Skills
32. Responsibility
33. Scientific Method
34. Small Animal Management
35. Soil Science
36. Supervised Agricultural Experiences (SAEs)
37. Teamwork
38. Tool Identification
39. United States Department of Agriculture Agencies
40. Wildlife
41. Wood Working

APPENDIX L

TWENTY-THREE RESPONSES TO QUESTION TWO OF ROUND ONE

TWENTY-THREE RESPONSES TO QUESTION TWO OF ROUND ONE

Responses

1. 4H Contest Participation
2. Ag Product ID Contest
3. Attend FFA Meetings
4. Career Exploration Field Trips
5. Community Service Experiences
6. Cooking/Baking Competitions
7. Fundraising
8. Greenhand Camp Participation
9. Greenhand Career Development Events Participation
10. Greenhand Leadership Development Events Participation
11. Greenhand Speaking Development Events Participation
12. Greenhouse Management
13. Leadership Camp Participation
14. Local Ag Farm Field Trips
15. Middle School Career Development Events
16. Middle School Leadership Development Events
17. Middle School Speaking Development Events
18. National Archery in the School Programs (NASP)
19. Participation in Agriscience Fair
20. Photography Competitions
21. Plan and Implement Supervised Agricultural Experience

- 22. Program of Activities Planning
- 23. School Ag Farm Management

APPENDIX M

TWENTY-FOUR RESPONSES TO QUESTION THREE OF ROUND ONE

TWENTY-FOUR RESPONSES TO QUESTION THREE OF ROUND ONE

Responses

1. Age Appropriate Curriculum Availability
2. ATAT Middle School Mentorship Programs
3. Basic Classroom Supplies
4. Basic Shop Equipment
5. Bullying Prevention Programs
6. Capital Equipment (i.e. Ag Shop, Project Barn)
7. Career Fairs
8. Community Involvement
9. FFA Manuals
10. Field Trip Opportunities
11. Funding
12. Internet Access
13. Learning Laboratory Access (i.e. classroom labs, greenhouses, livestock facility)
14. Offline Curriculum
15. Online Curriculum (i.e. ICEV)
16. Safety Trainings
17. Scope and Sequence
18. Shop Project Lab Plan
19. Social Media Trainings
20. Supportive School District

- 21. Technology Access
- 22. Texas Essential Knowledge and Skills (TEKS)
- 23. Text Books
- 24. Vehicles for Transportation