AN EXPLORATORY EVALUATION OF THE AGRICULTURAL CAREER EXPERIENCES CURRICULAR RESOURCE

By

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Abstract: This exploratory evaluation explored Oklahoma SBAE students' perceived knowledge, experience, interest to learn more, and motivation to pursue a career in the Agriculture, Food, and Natural Resources (AFNR) Career Pathway (The National Council for Agricultural Education, 2015) areas while engaging the Agricultural Career Experience (AgCE) Curricular Resource. The study also sought to evaluate the resource by obtaining SBAE students and teachers' perceptions of their experience. Ajzen's (1991) Theory of Planned Behavior guided the evaluation's attempt to understand the influences impacting SBAE students and teachers experience with the resource. Using a convergent, parallel mixed-methods design (Creswell, 2012), data were collected through questionnaires and interviews with students (n = 30) and teachers (n = 10). Descriptive statistics and eclectic coding strategies (Saldaña, 2016) were used to explain the quantitative and qualitative findings. Quantitative and qualitative data were then analyzed to evaluate the curricular resource. The evaluative study found the resource to meet curricular needs associated with Supervised Agricultural Experiences (SAEs) and AFNR exposure. However, challenges such as usability of the resource, student engagement, and timing impacted the students' and teachers' perceptions of the resource. It was concluded that the resource serves as a viable tool for SBAE teachers to implement with their students. It is recommended that the resource is improved and re-released to SBAE teachers.

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CHAPTER I

INTRODUCTION

Literacy is a robust topic that is researched extensively across a wide variety of disciplines (Brinkley, 2009; Brune et al., 2020; Dale et al., 2017; Jones-Jang et al., 2021, Longhurst et al., 2020; Liu, 2009; Honeyman et al., 2022; Ricketts et al., 2006; Smith et al., 2018; Tummons et al., 2020). Specifically, research surrounding agricultural literacy seeks to measure and increase basic agricultural knowledge among all producers and consumers of agricultural products (Brune et al., 2020; Longhurst et al., 2020; Meischen & Trexler, 2003; Powell et al., 2008; Roberts & Ball, 2009; Spielmaker et al., 2014; Tummons et al., 2020; Vallera & Bodzin, 2016). Agricultural literacy includes a person's knowledge, attitude, and behavior related to agricultural concepts (Brune et al., 2020). Teaching rich, agricultural context provides the opportunity for learning to occur, and in turn, develops agriculturally literate citizens and a skilled agricultural workforce (Roberts & Ball, 2009), which is imperative given the role agriculture plays in society and the U.S. national security (Dale et al., 2017).

Developing an agriculturally literate society (Brune et al, 2020; Longhurst et al, 2020; Spielmaker et al, 2014) is an uphill battle as the world population is projected to increase to 9.7 billion by the year 2050 (United Nations, 2019). This continual increase creates a larger potential gap in knowledge that is more challenging to fill. Given the disconnect in the agricultural industry, there is a need to focus on educating consumers more efficiently and effectively (Dale et al., 2017). Considering this need, the National Agricultural Literacy Logic Model (NALLM) was

created through a collaborative effort to meet societal needs and research priorities (Spielmaker et al., 2014). These needs are evident as agriculture currently employs 11% of the U.S. population with agriculturally related jobs; however, only 1.3% are specifically labeled *farming* (United States Department of Agriculture, 2020). Proactive advocacy efforts are needed to decrease the knowledge gap by increasing agricultural experiences for all, specifically the 89.0% of Americans who are not employed by agriculture.

Fortunately, School-Based Agricultural Education (SBAE) programs serve as a vehicle to minimize the gap and increase general agriculture knowledge by focusing on future agricultural leaders (Colbath & Morrish, 2010; Dale et al., 2017; Roberts & Ball, 2009; Snider, 2019; Terry et al., 1992; Wright et al., 1994). Teaching in and about agriculture through instruction, Supervised Agricultural Experiences (SAEs), and career and leadership development, SBAE increases agricultural knowledge and understanding among students (Croom, 2008). In a study of incoming freshmen at Oklahoma State University, Dale et al. (2017) found those students who had previous agricultural experiences through their involvement in 4-H and FFA programs and had participated in SBAE courses in high school, had significantly higher scores in general knowledge of agriculture compared to those who did not have such experiences. Notably, however, developing, exposing, and implementing agricultural education for fall students has been and continues to be an evolving process (Rice & Kitchel, 2016; Roberts & Dyer, 2004; Snider et al, 2021).

SAEs, as a component of SBAE programs, can be traced back one century ago to Rufus Stimson (1919) who believed once students are exposed to agricultural opportunities in the classroom, they deepen their understanding through application in real-world scenarios. Today, that perspective continues as Smith and Rayfield (2016) concluded, during a historical examination of project-based learning, that applying knowledge gained in the classroom to projects and experiences is interwoven in the fabric of the foundation of SBAE. Further, student participation in an agricultural experience is a foundational piece of their involvement in a SBAE

program (Lewis et al., 2012). In 1994, Cheek et al. stated, "[SAE] in agricultural education programs incorporate experiential learning and direct application of knowledge into students' curriculum to enhance learning" (p. 1). Not only are these experiences valuable to student learning, but critical skills also are obtained through creating career portfolios, maintaining online records, and managing data (Aviles, 2015; Emis & Dillingham, 2002).

SAE programs prepare students for future endeavors and create opportunities to build relationships among students, teachers, and industry professionals within the communities (Robinson & Haynes, 2011). However, for the desired experience to be cultivated, SBAE teachers must be prepared to expose, supervise, and guide students throughout the learning process (Baker & Robinson, 2018). Challenges arise for SBAE teachers as there is a wide variety of SAE opportunities and an often-limited availability to fully grasp and expose students adequately (Doss & Rayfield, 2019). Preparation of SBAE teachers to introduce and supervise SAE projects falls under the teacher-educator umbrella; however, as the structure of SAE has evolved, limited resources have been provided by change makers for how to advise SAE projects (Lewis et al., 2012; Rubenstein & Thoron, 2015). Similarly, Doss and Rayfield (2019) identified limited teacher content knowledge related to SAEs as a critical issue warranting further research. Given involvement of the SBAE teacher is critical to developing successful SAE programs (Rubenstein & Thoron, 2015), solutions are needed to address the dissonance between SAE programs in both theory and practice (Robinson & Haynes, 2011).

Purposeful experience and reflection are necessary for developing the skill set within preservice teachers to effectively advise student SAEs (Rank & Retallick, 2017). In addition, student interest and motivation have been identified as critical factors affecting the development of SAE programs (Bird et al., 2013; Rubenstein & Thoron, 2015). "It is important that the instructor begin the experience with the student's interests in mind so students can draw meaning from the experience" (Baker et al., 2012, p. 12). Despite the value it brings to student learning,

consideration is needed for the time that is required to understand and then teach SAE competencies (Rank & Retallick, 2007).

Synthesizing how students learn most effectively with the need for experiences to increase general knowledge and understanding of the agricultural industry (Baker et al., 2012; Bird et al., 2013; Moser & McKim, 2021; Rice & Kitchel, 2016; Tummons et al., 2020) led to the need to create the Agricultural Career Experiences (AgCE). AgCE is an online digital curricular resource that provides foundational agricultural career experiences within the AFNR Career Pathways. AgCE was designed for the traditional classroom setting as well as independent, self-paced learning. Agricultural education faculty and graduate students at Oklahoma State University collaborated with state leaders across the agricultural industry to identify relevant experiences and skills associated with careers along the eight National AFNR Career Pathways for SBAE students. Additionally, Agricultural Education and Communication was included in the AgCE as it is recognized as its own pathway in the state of Oklahoma. Collaborative efforts continued as faculty and staff within agricultural education employed the Institute for Teaching and Learning Excellence at Oklahoma State University to develop an online digital platform to host the industry focused, interactive worksheet experiences, that were created.

Research Problem Statement

Project-based learning and SAEs are integral components of a SBAE program (Smith & Rayfield, 2016); however, the need to involve students in SAEs has been a constant and ongoing struggle for SBAE teachers for at least the last three decades (Stewart & Birkenholz, 1991). SBAE teachers are often the most influential source of inspiration when it comes to developing and increasing students' motivation and interest to improve their SAEs (Baker et al., 2012; Bird et al., 2013; Rubenstein & Thoron, 2015). Unfortunately, SBAE teachers sometimes lack sufficient knowledge regarding SAEs, specifically (Doss & Rayfield, 2019), and within various

AFNR Career Pathways, generally (Snider et al., 2021). Therefore, research is needed to further explore the resources available that might increase teacher knowledge and student engagement in these areas.

Purpose and Objectives

The purpose of the study was to evaluate how the AgCE curricular resource impacted both SBAE students and teachers. Specifically, the study sought to:

1. Describe the SBAE students' personal characteristics, such as sex, age, ethnicity, home community size, high school classification, and years of experience in the SBAE program.
2. Evaluate the impact of the AgCE curricular resource on SBAE students' knowledge, experience, motivation, and interest related to their self-selected AFNR career pathway experience.
3. Determine SBAE teachers' perceptions of the AgCE as a curricular resource for teaching SBAE students about SAEs.

Limitations

The following limitations were identified for this study:

1. The findings of this study are limited to the students, teachers and SBAE programs who participated in this pilot study and should not be generalized to a larger population.
2. The participants were limited to students enrolled in the class of an Oklahoma SBAE teacher who was identified as potential participant and agreed to test the resource.
3. The AgCE curricular resource was limited to those who had access to a computer and high-speed internet.

4. Career Pathways were limited to Agricultural Education and Communication, Agribusiness Systems, Animal Systems, Food Products and Process Systems, Natural Resource Systems, Plant Systems, and Power, Structural and Technical Systems.

5. The experiences were developed by multiple graduate student cohorts and professors in agricultural education at Oklahoma State University, which caused some inconsistency over time.

Assumptions

The following assumptions were identified for this study:

1. Participants were truthful in their responses to the questionnaire, though it was possible for self-perceived bias to occur in the responses provided by these individuals.

2. Participants had adequate resources to complete experiences.

3. Teachers presented the AgCE to their students in an authentic, honest, and positive way.

Definitions of Key Terminology

Agricultural Career Experience: Digital curricular resource for select careers in the agricultural industry. Oklahoma State University faculty in agricultural education and state leaders in agriculture aligned the content with the National AFNR Career Pathways.

Agricultural Education. "The scientific study of the principles and methods of teaching and learning as they pertain to agriculture" (Barrick, 1989, p. 26).

*Interes*t: Intrinsic motivation for individuals through appealing, novelty, challenging, or aesthetic value (Ryan & Deci, 2000).

Knowledge: The fact or condition of knowing something with familiarity gained through experience or association.

Literacy: Having competence or knowledge in a specified area.

Motivation: ". . . [M]eans to be moved to do something" (Ryan & Deci, 2000, p. 54) either intrinsically or extrinsically.

National Agriculture, Food, and Natural Resources (AFNR) Career Pathways: Career pathways consisting of educational standards related to meeting the workforce expectations and needs of the agriculture, food, and natural resources industry (The National Council for Agricultural Education, 2015).

Supervised Agricultural Experiences (SAEs): "programs that allow you to apply knowledge and skills through experiential, service, and work-based learning opportunities" within agricultural education (Official FFA Manual, p. 2)

School-Based Agricultural Education (SBAE): Agricultural education instruction delivered through three major components: contextual learning, work-based learning, and personal leadership development. Students are prepared for "successful careers and a lifetime of informed choices in the global agriculture, food, fiber, and natural resources systems" (National FFA Organization, 2021, Agricultural Education, para. 1).

CHAPTER II

REVIEW OF LITERATURE

Background and History of School-Based Agricultural Education in the United States

Milestone events and champions for agricultural education undergird the development and current state of SBAE. The Smith-Hughes Act of 1917 inspired the idea for the organization of FFA, formerly known as Future Farmers of America (Official FFA Manual, 2021). As such, the Act was monumental because it provided federal funding and structure for vocational education (Roberts & Ball, 2009) and the development of the agricultural education program (Camp & Crunkilton, 1985).

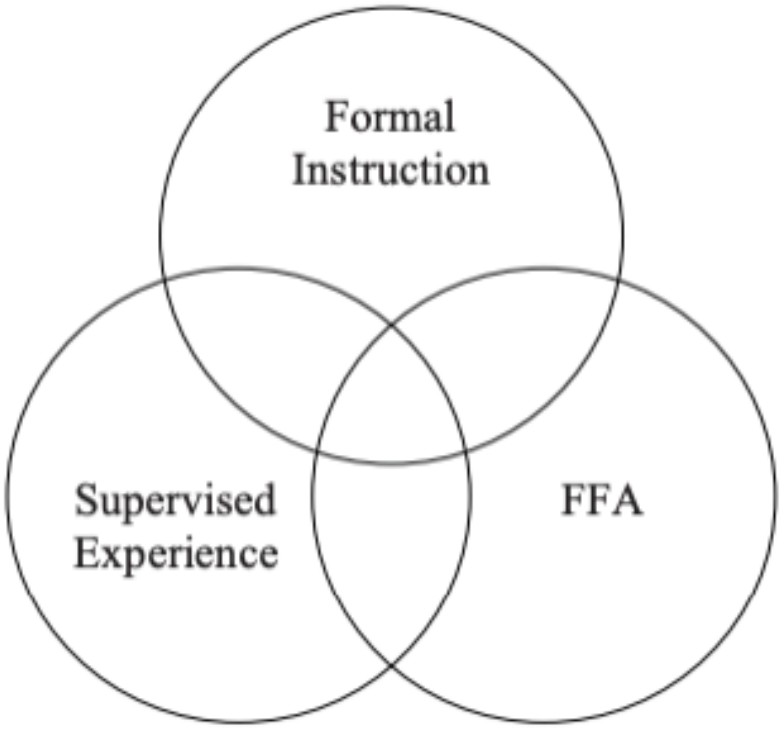
The SBAE program is structured on agriculture, food, and natural resources and delivered through three interconnected components (National Association of Agricultural Educators, 2020): (a) FFA, "an intra-curricular student organization for those interested in agriculture and leadership" (National FFA Organization, 2022, About FFA, para. 4); (b) Supervised Agricultural Experiences (SAE) or "work-based learning" (National FFA Organization, Agricultural Education, para. 3), based off the Stimson (1919) model that aimed to teach agricultural practices through project-based learning to improve the student's home farming operation; and (c) classroom and laboratory instruction (National FFA Organization, 2022).

The integrated three components of agricultural education provide a model for effective

and efficient execution of the SBAE program (Croom, 2008). The conceptual understanding of the program, depicted in a Venn Diagram (see Figure 1) focuses on having three equally balanced components (Croom, 2008). Although evidence supporting the model's development and origin is lacking, Croom (2008) concluded "each of the three components of the agricultural education model originated at separate times in American history but were developed simultaneously" (p. 117) and thus remain important and viable expectations of successful SBAE programs.

Figure 1

Diagram of the Integrated Three-Component Agricultural Education Model



Note. (Croom, 2008, p. 111). Figure reprinted with permission.

The Smith-Hughes Act of 1917 emerged as a foundational component of the model's development as it linked the classroom and SAE components of the model and provided federal

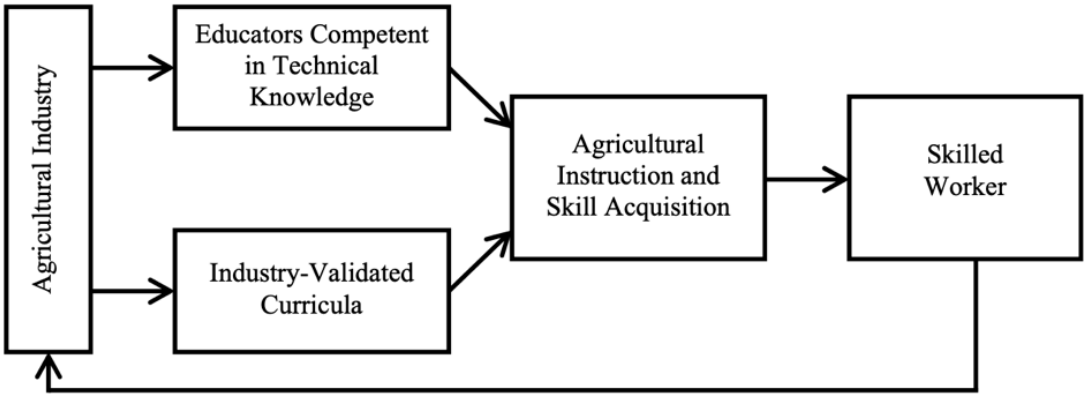
funding to support SBAE programs (Croom, 2008; The Smith-Hughes Act for Vocational Education, 1917). Additionally, the incorporation of the federal charter provided the opportunity for FFA to exist in schools (Croom, 2008). The purpose of teaching students' skills through the context of agriculture, as exhibited through a SBAE program, is to increase agricultural literacy through educating students (Dailey et al., 2001).

The evolution of SBAE can be understood by reflecting on the work of Rufus Stimson and his development of project-based learning, because "neither skill nor business ability can be learned from books alone, nor merely management from others. . . Both require active participation, during the learning period, in productive farming operations of real economic or commercial importance" (Stimson, 1919, p. 32). The FFA (SBAE student-led organization) Mission Statement "FFA makes a positive difference in the lives of students by developing their potential for premier leadership, personal growth and career success through agricultural education" (Official FFA Manual, 2021, p. 6), further embodies the philosophy underpinning the historical and present-day development of agricultural education (Croom, 2008). Similarly, Barrick (1989) stated, "What is taught must have as its purpose to improve the methods and principles of teaching and learning" (p. 28). Both statements speak to the intentional approach to preparing SBAE students and FFA members alike for their future endeavors for college and careers, simultaneously, within the context of agriculture (Roberts & Ball, 2009).

As seen in Figure 2, Roberts and Ball (2009) developed a content-based model for teaching agriculture, grounded in technical education curricula to develop skills for SBAE students regarding their future career endeavors. As agriculture is dynamic and ever changing, educators must be connected to, engaged in, and have awareness of the agricultural industry. In addition, they rely on teaching industry-validated curriculum to improve the skill acquisition and overall agricultural literacy of students who, in turn, have a direct impact back on the industry (see Figure 2).

Figure 2

A Content-Based Model for Teaching Agriculture



Note. Figure reprinted with permission

Career and Technical Education

SBAE is the practice of teaching specific career skills in an agricultural context to middle school, high school, and post-secondary education students (Stauffer, 2020) and is embedded in the career clusters of Career and Technical Education (CTE) (Advance CTE, Career Clusters, 2022). The United States Department of Education (USDE), Office of Career, Technical, and Adult Education includes the Division of Academic and Technical Education (DATE), which "is responsible for helping all students acquire challenging academic, technical, and employability skills to succeed in postsecondary education and in-demand careers" (USDE, OCTAE, para. 1). This division assumes responsibility for supporting CTE programs under the Carl D. Perkins Career and Technical Education Act of 2006, the most recent federal law supporting CTE, (USDE, OCTAE, 2022; Granovskiy, 2016). "[CTE] provides students of all ages with the academic and technical skills, knowledge, and training necessary to succeed in future careers to become lifelong learners" (Advance CTE, About CTE, 2022, para. 1). More specifically, "[t]oday's cutting-edge, rigorous and relevant [CTE] prepares youth and adults for a wide range

of high-wage, high-skill, high-demand careers" (ACTE, What is CTE, 2022, para. 1). The structure of CTE prepares workplace competencies in learners through experiential learning while also increasing the high school graduation rate for CTE students above the national average (Advance CTE, About CTE, 2022).

National Career Clusters Framework

Implementation of CTE programs is more clearly explained through the National Career Clusters Framework, which is comprised of 16 Career Clusters and 79 Career Pathways to help guide learners toward success in their future college and career endeavors (Advance CTE, Career Clusters, 2022). "The National Career Clusters Framework provides structural alignment and a common language to bridge education and work, empowering each learner to explore, decide and prepare for dynamic and evolving careers" (Advance CTE, Advancing the National Career Clusters Framework, 2020, para. 8). The framework was first established in 2001 and has not experienced any substantial structural changes since its inception; however, it was updated in 2012 (Advance CTE, 2022). Each Career Cluster (i.e., industry area focused on careers aligned with the national CTE standards) has a structure that identifies and explains four sets of knowledge and skill expectations for demonstrating competency within each career pathway. The four categories are: (a) Foundational Academic Expectations, including state academic standards for all secondary schools, which are assumed to have been attained; (b) Essential Knowledge and Skills, which include topics and standards that apply to all careers and are consistent throughout all clusters and pathways; (c) Cluster (Foundation) Knowledge and Skills, which encompass topics and standards that apply to all careers in the AFNR cluster; and (d) Pathway Knowledge and Skills, which include topics, standards and indicators that apply to the specific pathway (Advance CTE, Career Clusters, AFNR, 2022).

The 16 career clusters include: (a) Agriculture, Food and Natural Resources; (b) Architecture and Construction; (c) Arts, A/V Technology and Communications; (d) Business Management and Administration; (e) Education and Training; (f) Finance; (g) Government and Public Administration; (h) Health Science; (i) Hospitality and Tourism; (j) Human Services; (k) Information Technology; (l)) Law, Public Safety, Corrections and Security; (m) Manufacturing; (n) Marketing; (o) Science, Technology, Engineering and Mathematics; and (p) Transportation, Distribution and Logistics. Advance CTE is committed to ensuring the framework for each cluster is current and relevant, learner-centric, and focused on the community's economy and needs. (Advance CTE, 2022).

The Agricultural, Food and Natural Resources (AFNR) career cluster, provides the structure and framework for SBAE as a program under the CTE umbrella (see Figure 3). "[It] is focused on the production, processing, marketing, distribution, financing, and development of agricultural commodities and resources including food, fiber, wood products, natural resources, horticulture, and other plant and animal products or resources" (Advance CTE, Career Clusters, AFNR, 2022, para. 1). Further, seven Career Pathways are identified within the AFNR Career Cluster with knowledge and skills statements and a plan of study. Figure 3 displays the seven AFNR Career Pathways: Agribusiness Systems, Animal Systems, Environmental Service Systems, Food Products and Processing Systems, Natural Resources Systems, Plant Systems, and Power, Structural and Technical Systems (Advance CTE, Career Clusters, AFNR, 2022).

Figure 3

Curriculum Framework of the National Agriculture, Food, and Natural Resources (AFNR) Content Standards

Note. (The National Council for Agricultural Education, 2015). Figure reprinted with permission.

National AFNR Content Standards

Although the partnership between CTE and SBAE has evolved over the past century, effective teaching of agricultural education is dependent on the framework provided by the National Career Clusters Framework. However, in 2014, the National Council for Agricultural Education (NCAE) organized more than 270 secondary and postsecondary experts in agriculture to complete a yearlong, multi-stage review and revision process of the AFNR Career Cluster to develop the AFNR Career Pathways and Content Standards (The National Council for Agricultural Education, AFNR Standards, 2015). The purpose of the National AFNR Content Standards was to "provide state agricultural education leaders and educators with a high-quality, rigorous set of standards to guide what students should know and be able to do after completing a

program of study in one of the AFNR career pathways" (The National Council for Agricultural Education, AFNR Standards, para. 1, 2015). Although the content is structured by the National Career Clusters Framework provided by CTE, it provided updated revisions including an expansion from seven to eight pathways by adding Biotechnology Systems (The National Council for Agricultural Education, AFNR Standards, 2015). The following sections are devoted to listing and describing the Career Pathways in detail.

Agribusiness Systems (ABS) Pathway

The ABS Pathway is the "study of agribusinesses management, including record keeping, budget management, business planning, and sales/marketing" (The National Council for Agricultural Education, Agribusiness Systems Career Pathway, 2015 p. 2). SBAE students must demonstrate competence in five standards to complete the ABS Pathway's plan of study. The five standards include: ABS.01: Apply management planning principles in AFNR businesses; ABS.02: Use record keeping to accomplish AFNR business objectives, manage budgets, and comply with laws and regulations; ABS.03: Manage cash budgets, credit budgets and credit for an AFNR business using generally accepted accounting principles; ABS.04: Develop a business plan for an AFNR business; and ABS.05: Use sales and marketing principles to accomplish AFNR business objectives (The National Council for Agricultural Education, Agribusiness Systems Career Pathway Standards, 2015).

Animal Systems (AS) Pathway

The AS Pathway is the "study of animal systems, including content areas such as life processes, health, nutrition, genetics, management, and processing, as applied to small animals, aquaculture, exotic animals, livestock, dairy, horses, and/or poultry" (The National Council for Agricultural Education, Animal Systems, 2015, p. 2). SBAE students must demonstrate competence in eight standards to complete the AS Pathway's plan of study. The eight standards

include: AS.01: Analyze historic and current trends impacting the animal systems industry; AS.02: Utilize best-practice protocols based on animal behaviors for animal husbandry and welfare; AS.03: Design and provide proper animal nutrition to achieve desired outcomes for performance, development, reproduction, and/or economic production; AS.04: Apply principles of animal reproduction to achieve desired outcomes for performance, development and/or economic production; AS.05: Evaluate environmental factors affecting animal performance and implement procedures for enhancing performance and animal health; AS.06: Classify, evaluate, and select animals based on anatomical and physiological characteristics; AS.07: Apply principles of effective animal health care; and AS.08: Analyze environmental factors associated with animal production (The National Council for Agricultural Education, Animal Systems Pathway Standards, 2015).

Biotechnology Systems (BS) Pathway

The BS Pathway is the "study of using data and scientific techniques to solve problems concerning living organisms with an emphasis on applications to AFNR" (The National Council for Agricultural Education, Biotechnology Systems, 2015, p. 2). A collaboration between The NCAE, Common Career and Technical Core Standards, and Health Sciences: Biotechnology Research and Development (HL-BRD) led to the development of the following standards. SBAE students must demonstrate competence in three standards to complete the BS Pathway's plan of study. The three standards include: BS.01: Access factors that have influenced the evolution of biotechnology in agriculture; BS.02: Demonstrate proficiency by safely applying appropriate laboratory skills to complete tasks in a biotechnology research and development environment; and BS.03: Demonstrate the application of biotechnology to solve problems in AFNR systems (The National Council for Agricultural Education, Biotechnology Systems Pathway Standards, 2015).

Environmental Service Systems (ESS) Pathway

The ESS Pathway is the "study of systems, instruments, and technology used to monitor and minimize the impact of human activity on the environment" (The National Council for Agricultural Education, ES Systems Career Pathway, 2015, p. 2). SBAE students must demonstrate competence in four standards to complete the ESS Pathway's plan of study. The four standards include: ESS.01: Use analytical procedures and instruments to manage ESS; ESS.02: Evaluate the impact of public policies and regulations on ESS operations; ESS.03: Develop proposed solutions to environmental issues, problems, and applications using scientific principles of meteorology, soil science, hydrology, microbiology, chemistry, and ecology; ESS.04: Demonstrate the operation of ESS; and ESS.05: Use tools, equipment, machinery, and technology common to tasks in ESS (The National Council for Agricultural Education, Environmental Science Systems Pathway Standards, 2015).

Food Products and Processing Systems (FPPS) Pathway

The FPPS Pathway is the "study of food safety and sanitation, nutrition, biology, microbiology, chemistry, human behavior in local and global food systems, food selection and processing for storage, distribution and consumption, and the development of the food industry" (The National Council for Agricultural Education, FPP Systems Career Pathway, 2015, p. 2). SBAE students must demonstrate competence in four standards to complete the FPPS Pathway's plan of study. The four standards include: FPPS.01: Develop and implement procedures to ensure safety, sanitation, and quality in FPP facilities; FPPS.02: Apply principles of nutrition, biology, microbiology, chemistry, and human behavior to the development of food products; FPPS.03: Select and process food products for storage, distribution, and consumption; and FPPS.04: Explain the scope of the food industry and the historical and current developments of FPP (The

National Council for Agricultural Education, Food Products and Processing Systems Career Pathway Standards, 2015).

Natural Resources Systems (NRS) Pathway

The NRS Pathway is the "study of management, protection, enhancement, and improvement of soil, water, wildlife, forests, and air as natural resources" (The National Council for Agricultural Education, NR Systems Career Pathway, 2015, p. 2). SBAE students must demonstrate competence in four standards to complete the NRS Pathway's plan of study. The four standards include: NRS.01: Plan and conduct natural resource management activities that apply logical, reasoned, and scientifically-based solutions to natural resource issues and goals; NRS.02: Analyze the interrelationships between natural resources and humans; NRS.03: Develop plans to ensure sustainable production and processing of natural resources; and NRS.04: Demonstrate responsible management procedures and techniques to protect, maintain, enhance, and improve natural resources (The National Council for Agricultural Education, Natural Resource Systems Career Pathway Standards, 2015).

Plant Systems (PS) Pathway

The PS Pathway is the "study of plant life cycles, classifications, functions, structures, reproduction, media, nutrients, and growth and cultural practices through the study of crops, turf grass, trees, shrubs, and/or ornamental plants" (The National Council for Agricultural Education, PLS Systems Career Pathway, 2015, p. 2). SBAE students must demonstrate competence in four standards to complete the PS Pathway's plan of study. The four standards include: PS.01: Develop and implement a crop management plan for a given production goal that accounts for environmental factors; PS.02: Apply principles of classification plant anatomy, and plant physiology to plant production and management; PS.03: Propagate, culture and harvest plants and plant products based on current industry standards; and PS.04: Apply principles of design in plant

systems to enhance the environment (The National Council for Agricultural Education, PLS Systems Career Pathway Standards, 2015).

Power, Structural, and Technical Systems (PSTS) Pathway

The PSTS Pathway is the "study of agricultural equipment, power systems, alternative fuel sources, precision technology, woodworking, metalworking, welding, and project planning for agricultural structures" (The National Council for Agricultural Education, PSTS Career Pathway, 2015, p. 2). SBAE students must demonstrate competence in five standards to complete the PSTS Pathway's plan of study. The five standards include: PSTS.01: Apply physical science principles and engineering applications to solve problems and improve performance; PSTS.02: Operate and maintain AFNR mechanical equipment and power systems; PSTS.03: Service and repair AFNR mechanical and power systems; PSTS.04: Plan, build, and maintain AFNR structures; and PSTS.05: Use control, monitoring, geospatial, and other technologies in AFNR (The National Council for Agricultural Education, PSTS Career Pathway Standards, 2015).

Career pathways and content standards, if implemented as intended, enhance all components of the SBAE program (The National Council for Agricultural Education, 2015). Their development ensures alignment with Common Career and Technical Core Standards as well as identified crosswalks for Common Core English Language Arts and Mathematics, Next Generation Science Standards, Green/Sustainability Knowledge and Skill Statements, and National Standards for Financial Literacy (The National Council for Agricultural Education, 2015). Collaboration with other standards provides support for SBAE teachers as they educate their students. However, the recent revision and framework adoption of the AFNR Career Pathways and Content Standards, although needed, faced concerns surrounding SBAE teacher needs for implementing the new curricula (Snider et al., 2021). Research has shown teacher self-efficacy has a direct connection to effective teaching and teacher satisfaction (Clemons &

Lindner, 2019; Eck & Edwards, 2019; Eck et al., 2021; Kauffman et al., 2002; Lamm et al., 2017; McKim & Velez, 2015; Moser & McKim, 2021; Rice & Kitchel, 2020; Snider et al., 2021; Wang & Knobloch, 2006).

To better understand this concern, Snider et al. (2021) obtained student teachers' perceived competence to teach the recently revised AFNR Career Pathways and Content Standards. Although specific to student teachers in Oklahoma, the study assessed career pathways that provide structure to the content taught in agricultural education (Snider et al., 2021). Specifically, perceived levels of importance and competence were correlated with a level of comfort from their previous lived experiences. The deficiencies in perceived interest and strengths of various career pathways impacted their teaching of agricultural education in those areas (Snider et al., 2021). Therefore, a need exists to increase the knowledge and competence of SBAE teachers to instruct students across the Career Clusters and Pathways. These revised career pathways and content standards guide "the development of well-planned curriculum and assessments for AFNR-related CTE programs" (The National Council for Agricultural Education, 2015, AFNR Standards, para. 1) as they provide an in-depth overview of the various sectors of the agricultural industry. At a general level, the Career Pathways provide a framework for improving students' agricultural literacy.

Agricultural Literacy

The production of food, fiber, and natural resources has changed drastically as the agricultural industry has continued to meet the task of producing additional agricultural products with fewer resources. As such, agriculture plays a key role in society and is fundamental to U.S. national security (Dale et al., 2017). Agricultural literacy includes a person's knowledge, attitude, and behavior related to agricultural concepts (Brune et al., 2020). To effectively educate youth, teachers must know and be competent in the content they teach (Loewenburg-Ball et al., 2008).

However, research indicates that in addition to population challenges, the agricultural content knowledge of SBAE teachers is a challenge facing educational and advocacy efforts (Rice & Kitchel, 2016; Tummons et al., 2020). In a 2016 study by Rice and Kitchel, beginning teachers perceived various deficiencies in agricultural content knowledge. Similarly, findings from Snider et al. (2021) identified inconsistencies in agricultural content knowledge of SBAE student teachers across the various pathways, which can influence the curriculum taught.

The need for agricultural literacy is met by a broad approach to SBAE that extends across multiple grade levels and implements variability of teaching methods. The well-developed structure of SBAE, specifically the Career Pathways and Comprehensive Model for Agricultural Education, has the potential to minimize the agricultural knowledge gap and increase general understanding and involvement with SBAE students (Colbath & Morrish, 2010; Dale et al., 2017; Snider et al., 2021; Terry et al., 1992; Wright et al., 1994). Agricultural education incorporates a variety of learning opportunities for students to apply their SBAE knowledge to the agricultural industry. "The successful integration of each of these three components results in a strong program that produces well-rounded individuals who are prepared to be leaders in agriculture, business, and industry" (National Association of Agricultural Educators, para. 5). SBAE teachers can employ the model, using the curriculum structure provided by the AFNR Career Pathways and Content Standards, to provide rich and meaningful experiential learning opportunities (Baker et al., 2012) which can increase students' agricultural knowledge and competence in the AFNR industry (Baker et al., 2014).

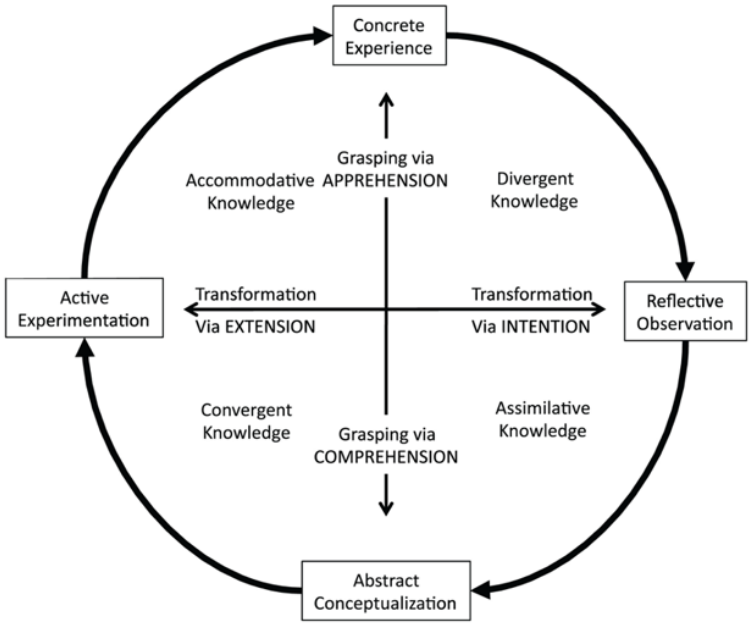
Experiential Learning

"Learning is the process whereby knowledge is created through the transformation of experience" (Kolb, 1984, p. 38). Kolb's (1984) model (see Figure 4) demonstrates the process of experiential learning. Four modes, concrete experience (CE), reflective observation (RO), abstract

conceptualization (AC), and active experimentation (AE), guide the learning process for any experience (Kolb, 1984). Simply described, once a learning experience has occurred, it is imperative for teachers to ask: "What happened?," "So what?," and "Now what?" after their experience to foster reflection, evaluation, and a plan for future execution (Baker et al., 2012, p. 1). Baker et al. (2012) emphasized how problem-based learning creates an environment for scaffolding knowledge through connecting experiences and rejuvenating student attitudes toward learning (Baker et al., 2012; Dewey, 1938; Knobloch, 2003, & Stimson, 1919). In doing so, this learning environment can have a critical impact on the agricultural literacy of students (Baker et al., 2012).

Figure 4

Kolb's (1984) Model of Experiential Learning Process



Note. Reprinted from Experiential Learning: Experience as the Source of Learning and Development (p. 42), by David A. Kolb, 1984, Englewood Cliffs, NJ: Prentice-Hall, Inc. Copyright 1984 by Prentice-Hall, Inc. Reprinted with permission.

Agricultural education has employed experiential learning since its inception (Baker et al., 2012). In fact, Retallick (2010) found experiential learning to serve as a solution in decreasing the dissonance between learning and experiencing in SAEs. Baker et al. (2012) recognized these similarities and overlaid Kolb's (1984) model on the agricultural education model to conceptualize how experiential learning exists among all components of the SBAE program, including SAEs. Baker et al. (2012) stated:

> It is imperative that experiences provided in agricultural education, from the livestock exhibition ring to the laboratory activity, and from the state FFA convention to the chapter FFA banquet, include purposeful reflection, gentle guiding toward abstraction, and an opportunity for students to experiment actively with their newfound learning. (Baker et al., 2012, p. 12)

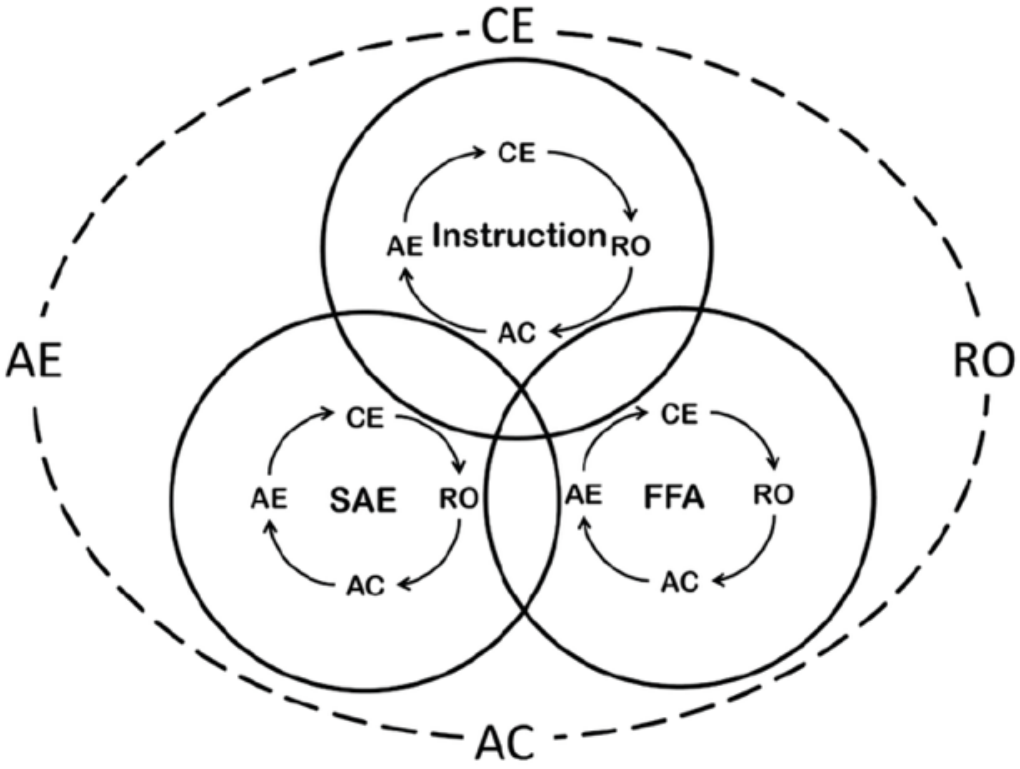
SBAE teachers are uniquely positioned to provide opportunities that meet various learning styles and enhance student learning. Baker et al. (2012) recognized the opportunity to ". . . operationalize the role of experiential learning further in relation to agricultural education" (p. 8).

The Comprehensive Model for Secondary Agricultural Education (see Figure 5) embeds experiential learning within and throughout the comprehensive (i.e., three-circle) model for agricultural education. Basically, concrete experiences occur in the classroom, during career and leadership development, and during supervised agricultural experiences (i.e. project-based learning). Baker et al. (2012) created this model because of the nature of SBAE and SBAE teachers' unique ability to employ experiential learning activities and opportunities throughout the curriculum. Further, this cycle does not only happen within one circle, but also throughout the model. For example, a student may own a livestock project as their SAE, be enrolled in the Animal Science course and participate on the Veterinary Science CDE team. What is discussed in the course, applies to the students' project and the CDE material, thus creating an opportunity for

concrete experiences followed by reflective observations and abstract conceptualization in any of the circles and be followed by active experimentation in the same or different circle. Given this rationale, Baker et al. (2012) attempted to push back on the traditional thought that experiences were related to the SAE circle only. Rather, meaningful experiences can enhance learning throughout the SBAE program, including SAEs.

Figure 5

Comprehensive Model for Secondary Agricultural Education



Note. Baker et al., 2021, p. 9. Figure reprinted with permission.

Supervised Agricultural Experience Programs

Historical Overview of SAEs

SAEs have been referenced as "work-based learning" opportunities (National FFA Organization, Agricultural Education, para. 3). SAE's roots stem back to one century ago when Rufus Stimson employed project-based learning at the Smith Agricultural School (Stimson, 1919). The concept was designed for students to learn how to apply agricultural production methods on their personal farms (Croom, 2008). The concrete connection between Stimson and SBAE was formed when collaboration with Mr. Charles Prosser led to the production of three similar documents: Prosser's (1912) sixteen theorems of vocational education, Stimson's (1919) home-project method, and the Smith-Hughes Act of 1917 (Moore, 1988; Smith & Rayfield, 2016; Wirth, 1972). Expectations for project-based experiences in SBAE were outlined in the Smith-Hughes Act (The Smith-Hughes Act for Vocational Education, 1917), which stated: "schools shall provide for directed or supervised practice in agriculture, either on a farm provided by the school or other farm, for at least six months per year" (p. 934). The significance of this concept and the federal funding that structured it still holds true today; however, the practice of SAEs in SBAE programs has continued to evolve.

The Vocational Education Act of 1963 produced the first expansion to the Smith-Hughes (1917) framework on home-project method to include other occupations in addition to farming (Camp & Crunkilton, 1985). This change was significant to SAEs as the concept expanded to include other career opportunities in agriculture. Notably, it removed specific requirements for project-based learning, such as the funding restraints on programs to only serve students who had pre-existing farm projects (Smith & Rayfield, 2016; Stewart & Birkenholz, 1991). Terminology regarding the home-project method also changed with this evolution in legislation to Supervised Occupational Experience (SOE) programs, a term more encompassing of the times regarding

career opportunities in the agricultural industry (Smith & Rayfield, 2016). Consistent with current research recommendations regarding SBAE teacher needs for implementing SAEs (Doss & Rayfield, 2019; Snider et al., 2021), national workshops were conducted as special projects of the National FFA Foundation and sponsored by DEKALB AgResearch for SBAE teachers, state staff members, and teacher educators to exchange ideas and learn how to implement SOE programs more effectively (The National Future Farmer, 1984, p. 4).

Although efforts were made to increase awareness about these changes in SBAE, student participation revealed concerns in the mid-1990s as research failed to suggest "SAE programs were educationally beneficial, warranting student participation" (Dyer & Osborne, 1995, p. 6). As part of a larger study regarding SAEs, Dyer and Osborne (1996) were able to identify factors that influence SAE program participation. Teacher attitudes and previous SAE experience has consistently been found to influence SAE program quality throughout nearly three decades of research (Dyer & Osborne, 1995; Rubenstein & Thoron, 2015).

Intricately connected, student motivation is consistently identified in the literature as a challenge for SBAE teachers (Bird et al., 2013; Osborne, 1988a). Although the expectation remained, clear structure and direction for SOE programs, traditionally home farm projects, began to fade with the passing of the Vocation Education Act of 1963 because teachers were unfamiliar with managing the new types of projects (Smith & Rayfield, 2016). Unfortunately, these concerns have remained, likely due to the lack of observed guidance and support over the past 30 years (Doss & Rayfield, 2019; Dyer & Osborne, 1995; Retallick, 2010). Nonetheless, actions by the National FFA Organization do appear to follow recommendations from researchers regarding support efforts to mediate SAE changes.

Specifically, National FFA released the *Agriculture Teacher's Manual* in 1998, which included a SAE Overview section. "Supervised agricultural experiences (SAE) programs are

teacher-supervised, individualized, hands-on, student-developed projects that give students real-world experience in agriculture" (p. 10-2). This section of the manual outlined what may be involved in a SAE from the advisor's perspective, such as benefits of the project on student learning, the instructor's role, quality indicators with a rubric for guidance, key resources, partnership success guides, program development checklist, and Student-Parent/Guardian(s)-Instructor Conference Record sheet. Each of these items identified in the *Agriculture Teacher's Manual* closely resembles the recommendations outlined by Dyer and Osborne (1996) when SAE participation was identified as a concern due to changes in the program component.

Approximately ten years later, Retallick (2010) conducted a similar study where he found two areas of dissonance: first, between theory and practice of SAEs and second, between learning and experience of SAEs. Recommendations to address the dissonance between theory and practice included reviewing SAEs, refining their purpose, and "determin[ing] how to fully implement that purpose given the issues classroom teachers face" (p. 66) with a creative and innovative mindset (Retallick, 2010). The dissonance between learning and experience was observed through findings indicating primary focus on record keeping and exposure to real-world experiences while disregarding development of agricultural and life-long learning skills (Retallick, 2010).

> To move beyond the dissonance between (a) theory and practice and (b) learning and experience, it is recommended that teacher education programs and teacher in-service programming go beyond the theoretical purpose of SAE and expose teachers to a variety of proven experiential learning approaches for incorporating SAE into a variety of educational settings, especially those settings that limit participation. (p. 67)

Thus, SAE for All was developed and released by the National FFA Foundation and The NCAE in 2017 to reflect the most recent framework for the formally known home-projects and SOEs (SAE for All, 2020; SAE for All Teacher Guide, 2017).

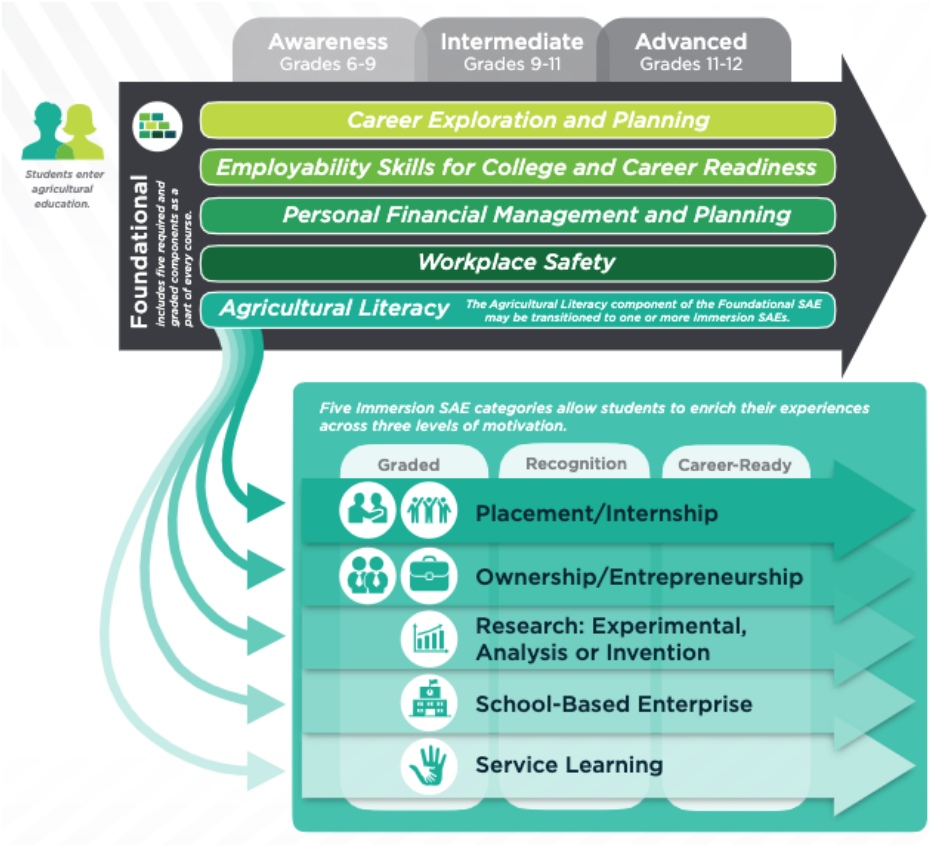
SAE for All

SAE for All defined SAEs as "programs that allow you to apply knowledge and skills through experiential, service, and work-based learning opportunities" within agricultural education (Official FFA Manual, p. 2). Six types of SAEs were identified by National FFA including: Foundational, Ownership/Entrepreneurship, Placement/Internship, Research-Based, School-Based Enterprise, and Service Learning (Official FFA Manual, 2021, p. 12).

Foundational and Immersion SAEs can be more clearly understood using Figure 6. As shown, students can grow from Awareness to Advanced in Foundational SAEs. However, transitioning students from Foundational to Immersion is the ideal goal for SBAE students to achieve.

Figure 6

SAE Student Roadmap



Note. SAE for All Teacher Handbook

Foundational

Foundational SAEs provide SBAE students with an opportunity to "learn the different facets of agriculture and what careers in agriculture may interest [them]" (Official FFA Manual, 2012, p. 12). This SAE type has five required components: Career Exploration and Planning, Employability Skills for College and Career Readiness, Personal Financial Management and Planning, Workplace Safety, and Agricultural Literacy (SAE for All, 2022). Guided resources for this SAE are available in three levels: Awareness, new students who are unsure of their career interest; Intermediate, experienced students who completed the Awareness level and have

identified their career interest; and Advanced, students who have completed the previous two levels and know their career interests.

SBAE students will finish the *Career Exploration and Planning* component by researching AFNR career opportunities, completing interest inventories, developing a career goal, and brainstorming their plan to achieve their career goals. Once goals are outlined, it is imperative *Employability Skills for College and Career Readiness*, such as responsibility, critical thinking, and communication, are acquired. A key component to planning career goals is to explore *Personal Financial Management and Planning* practices to ensure goals are met. *Workplace Safety* is critical for SBAE students to understand whether they enter hazardous occupations or encounter general health, safety, and environmental scenarios. *Agricultural Literacy* is designed to expand students' understanding of the significant role agriculture plays in society (SAE for All, 2020; see Figure 5). Once students meet the expectations for Foundational SAEs, they can build on their experience by acquiring additional experiences in the career path for which they are most interested, which is referred to as Immersion SAEs.

Immersion

Immersion SAEs are an extension to the Agricultural Literacy Component of Foundational SAEs (SAE for All, 2022). Immersion experiences enhance students' agricultural industry knowledge, help them learn financial independence and management skills, and either confirm or refute their interest in continuing down that potential career path (SAE for All, 2022). Although Immersion SAEs consume more time and energy than Foundational SAEs, they do not exclude participation in other areas of the program. Rather, students are empowered to increase responsibility and foster deeper understanding and personal growth. Five Immersion SAEs exist: placement/internship, ownership/entrepreneurship, research, school-based enterprise, and service-learning.

Placement/Internship SAEs allow SBAE students to work for someone else and potentially receive payment (Official FFA Manual, 2021). Whether volunteering time, working a part-time job, or completing an internship opportunity, this category allows students to grow personally and professionally in an area of agriculture that interests them. “Students are encouraged to grow a Placement SAE into an internship in the future” (SAE for All, Immersion SAEs, 2022, para. 2). Possible examples include, but are not limited to, teaching a gardening class, working for a floral shop, and interning with a local farm supply store (Official FFA Manual, 2021).

Ownership/Entrepreneurship SAEs provide students an opportunity to obtain the role of *boss* and operate their own agriculturally-related business. “The basic requirements are that [they] own the enterprise, make the management decisions, and take the financial risk with the ultimate goal of earning a profit” (Official FFA Manual, 2021, p. 11). Similar to placement SAEs, students are encouraged to turn their ownership SAE into an entrepreneurship experience (SAE for All, 2022). The possibilities within this category are endless as students could begin owning animals, operating a landscape business, training service dogs, or growing and selling plants, to name a few (Official FFA Manual, 2021).

Research SAEs provides students the opportunity to “research, invent or analyze” agricultural practices, resources, and perceptions (Official FFA Manual, 2021, p. 12). SBAE students can conduct their own research studies on specific topics within the agricultural industry to better understand past, present, and future approaches. Research ideas include “effects of cropping practices on wildlife populations, comparing plant growth of hydroponics and conventional methods, or investigating the perceptions of community members towards alternative agricultural practices” (Official FFA Manual, 2021, p. 12).

School-based Enterprise SAEs provide students the opportunity to have a SAE using school resources. “This type of SAE is owned [by the school or FFA chapter] and managed by [the students] using school facilities” (Official FFA Manual, 2021, p. 12; SAE for All, 2022). This category is not to be completed during normal classroom instructional hours; rather, it must be conducted outside of the school day. Examples include raising livestock in a school facility, renting space to grow plants, building and repairing resources and structures in the agricultural mechanics laboratory, or forming a cooperative, LLC, partnership, or some other business structure (Official FFA Manual, 2021). School-based enterprises are great opportunities for students to develop their own products to be marketed through their business.

Service-learning SAEs allow SBAE students to conduct a needs assessment by setting goals, objectives, a budget, and then implementing a project. “This project may be for a school, a community organization, religious institution or nonprofit organization. It cannot be for the benefit of an FFA chapter” (Official FFA Manual, 2021, p. 12). This category allows creativity while building citizenship for the community within the AFNR standards and career-ready practices. Service-learning is a great SAE for students who have interest and enjoy being involved in their community (SAE for All, 2022).

The structure and guidance provided through SAE for All is designed to help SBAE teachers and students initiate and navigate SAEs. For example, the SAE boardwalk (see Figure 7), SAE: Real Learning for a Real Future graphic provides a visual map to conceptualize the process for SAE growth throughout the SBAE program (SAE for All, 2022). As students enter the program and enroll in a SBAE class, they will explore careers and opportunities through a Foundational SAE. Once students have experienced growth and identify further interest in their SAE area, they will be able to develop an immersion SAE where they will further develop their college and career readiness.

Figure 7

SAE: Real Learning for a Real Future

Note. SAE for All Teacher Guide p. 22

SAEs in Oklahoma

On April 9, 2014, House Bill (HB) 3006, titled, "Schools; limiting agricultural education programs to certain grades; agricultural experience projects; emergency" (p. 1), was approved by Governor Fallin, Oklahoma, after passing the Senate (Y: 43, N: 0, Abs: 5) and House Appropriations and Budget Committee meeting (Y: 24, N: 0, NV: 0, Abs: 0) (OK HB3006, 2014). This legislation was authored by Biggs, Sherrer, Hoskin, Smalley, Condit, and Lockhart of

the House and Justice and Brecheen of the Senate (OK HB3006, 2014). Specifically, this legislation stated:

> An Act relating to schools; limiting agricultural education programs to certain grades; prohibiting technology center school districts from operating agricultural education programs or FFA chapters; requiring certain students to have a supervised agricultural experience project; providing for transportation for agricultural and FFA programs; providing for codification; and declaring an emergency (OK HB3006, 2014).

Moreover, through emergency legislation, HB 3006 installed a definite line between comprehensive high schools and CTE centers regarding SBAE programs, and it introduced specific requirements in Section 1, item B stating, "Each student enrolled in an agricultural education program shall participate in a [SAE] project" (OK HB3006, 2014, p. 2) on student participation in SAEs that replicated the Smith-Hughes Act of 1917. Technically, specific wording that required SAE projects for students in SBAE programs had been non-existent for fifty years, since 1963. Although Smith and Rayfield (2016) explained that the expectation for students to participate in SAE programs had remained, the terminology tied to federal funding was removed in the Vocational Education Act of 1963.

The Agricultural Experience Tracker

In addition, the "Agricultural Education Division of the Oklahoma State Department of CTE adopted the Agricultural Experience Tracker (AET) as their official record-keeping tool in 2014, requiring all 8th and 9th grade SBAE students to maintain data (i.e., records) related to their SAE" (personal communication, Rose Bonjour, November 10, 2021). Essentially, full emersion into the AET would occur in the 2017 to 2018 school year when the 2014 to 2015 freshman class became seniors. SAE participation and FFA membership are displayed in the tables below.

As shown in Table 1, Oklahoma students are engaged in four types of SAEs including Foundational, Placement, Research, and Entrepreneurship for the years 2017 to 2021. Total SAE participation fluctuates between 20,957 total SAEs, in the school year following the onset of the COVID-19 pandemic, to 30,857, in the complete school year prior to the pandemic. Consistency in participation throughout the four years of data are shown in the Placement and Research SAE type categories. Data of interest in this table are shown by the gradual increase in Foundational type SAEs while a gradual decrease is observed in the Entrepreneurship type SAE category. Potential reasons for these changes in participation could be impacts from the pandemic, changes in SBAE student population, or the adoption of AET as the data management system.

Table 1

SAE participation by Type in Oklahoma from 2017-2021

School Year	Foundational	Placement	Research	Entrepreneurship	Total
2017 to 2018	7514	6816	1429	13251	28990
2018 to 2019	8888	7636	1655	12951	30857
2019 to 2020	10853	7381	1937	11692	25093
2020 to 2021	10603	6236	1936	9623	20957

Note. Four of the six SAE categories are documented in this table. School-Based and Service Learning are excluded due to the nature of experience creation in AET.

Table 2 indicates Oklahoma SBAE students' SAE participation by Career Pathway. BIO and ESS consistently have had the lowest participation, with NRS and FPPS following closely; all four have less than 1,000 Oklahoma SBAE students indicating their SAE in those Career Pathway areas. Conversely, AS makes up an estimated 40% of SAEs in Oklahoma with well over 10,000 students identifying their SAEs in the AS Career Pathway area. ABS, PLS, and PSTS all consistently have between 1,000 to 4,000 students classifying their SAEs in these Career Pathway

categories. The AS Career Pathway notably is the most common SAE type in Oklahoma, followed by PS, PSTS, and ABS (see Table 2).

Table 2

SAE Participation by Career Pathway in Oklahoma from 2017-2021

School Year	ANS	ABS	BIO	ESS	FPPS	NRS	PS	PSTS	Total
2017 to 2018	16,860	1,550	103	484	763	537	3,080	2,573	25,950
2018 to 2019	16,611	1,795	128	556	866	793	3,713	2,737	27,199
2019 to 2020	14,419	1,494	46	407	680	553	3,236	2,341	23,176
2020 to 2021	12,069	1,257	39	324	645	451	2,570	1,993	19,348

Note. Students who selected "Cluster Skills" and "Career Ready Practices" as their Career Pathway were excluded from this table.

Oklahoma's FFA membership for school years 2014 to 2015, the first school year to implement the AET as the data management system for the state to 2020 to 2021 is expressed in Table 3. Given Oklahoma is an affiliate membership state with the National FFA Organization membership, numbers provide a reliable indicator for students enrolled in SBAE programs. Membership numbers show a steady decline as the state adoption of the AET as the data management system for SBAE programs continues until full adoption and beyond. The reason for the decline is unknown; however, it could be attributed to the AET serving as a more accurate approach to documenting membership.

Table 3

FFA Membership in Oklahoma

School Year	Total Membership
2014 to 2015*	27,177
2015 to 2016*	27,205
2016 to 2017*	26,798
2017 to 2018	26,597

2018 to 2019	26,785
2019 to 2020	26,465
2020 to 2021	24,271

Note. * Indicates potential data excluded from SAE data because of AET adoption and accessibility.

Supervising Agricultural Experiences as a SBAE Teacher

SBAE teacher and student understanding of SAEs has been emphasized in the literature for decades; yet, deficiencies still exist (Doss & Rayfield, 2019; Dyer & Osborne, 1996; Wilson & Moore, 2007). Research surrounding SAEs is increasing as a need for guidelines, resources, and instructional support related to teaching SAEs are needed for SBAE teachers (Rubenstein & Thoron, 2014; Rubenstein & Thoron, 2015; Rubenstein et al., 2016; Rubenstein et al., 2014; Smith & Rayfield, 2016, Snider et al., 2021). As such, research consistently supports the benefits associated with SAEs as SBAE students acquire professional skills that attribute to future career planning and exploration (Rubenstein & Thoron, 2014; Rubenstein & Thoron, 2015; Rubenstein et al., 2016; Rubenstein et al., 2014; Smith & Rayfield, 2016). Specifically, Smith and Rayfield (2016) conducted an early historical examination of the project-based learning model and how it developed into what is known today as SAEs. Their findings indicated that SAEs continue to be a core component of the SBAE program. Although SAEs are a core component, the decline in participation and quality of SAEs continues to be a concern relating back to SBAE teacher competence and implementation (Doss & Rayfield, 2019; Rubenstein & Thoron, 2014; Rubenstein & Thoron, 2015; Rubenstein et al., 2016; Snider et al., 2021).

SBAE teachers employ the framework and provide the opportunity for successful SAE programs (Rubenstein & Thoron, 2014; Rubenstein & Thoron, 2015). However, Doss and Rayfield (2019) found that SBAE teachers were mostly unaware of recent changes related to SAEs, as implemented by the National FFA Organization. Additionally, preparing SBAE teachers

to implement SAEs into their programs and having adequate resources to do so appears to be an ongoing challenge (Rank & Retallick, 2017). Although a small subset of SBAE teachers (those who are alternatively certified) value and self-perceive themselves to be knowledgeable about SAE opportunities within the industry, their performance deems otherwise (Robinson & Haynes, 2011). Ultimately, SBAE teachers "are having difficulty implementing [SAEs], even though they value it conceptually as a program component" (Rank & Retallick, 2017, p. 143).

Smith's and Rayfield's (2016) historical examination provided a deeper insight into the intent and use of the project-based learning method over the past decade. As the profession seeks to find balance between traditional and contemporary approaches to implementing SAEs (Smith & Rayfield, 2016), research clearly identifies additional challenges to effectively executing SAEs within SBAE programs – the most notable being gaps in knowledge of SBAE teachers (Doss & Rayfield, 2019; Robinson & Haynes, 2011). Given SAEs are structured on the AFNR Content Standards and Career Pathways, Snider et al. (2021) found student teachers' perceived level of competence to teach across the career pathways was lower than their perceived level of importance, further supporting the literature that suggests SBAE teachers have limited knowledge of and are lacking the confidence to teach SAEs in alignment with AFNR Career Pathways (Doss & Rayfield, 2019; Robinson & Haynes, 2011; Snider et al., 2021). "Experience leads to competence" emerged as a persistent theme in Snider et al. (2021, p. 40), which highlights the need for experience-based learning and resources for SBAE teachers.

Current resources available to SBAE teachers include SAE for All and AgExplorer (SAE for All, 2022; AgExplorer, 2022). "AgExplorer is a robust, comprehensive career resource to help you explore the broad range of careers within the industry of agriculture brought to you by the National FFA Organization" and includes educator resources for each Career Pathway area (AgExplorer, About, 2022, para 1). Complementary with SAE for All, both programs provide online, curricular support for SBAE teachers to introduce SAEs to their students for exploration

and development (SAE for All, 2022; AgExplorer, 2022), Unfortunately, these resources do not appear to be meeting the needs of teachers to develop and supervise SAE projects (DiBenedetto et al., 2018) within the AFNR Career Pathways (Snider et al., 2021) as limited research exists for supportive resources.

Agricultural Career Experiences (AgCE)

The use of digital resources has been an emphasis in education since the turn of the century (Saettler, 2004). As such, the need for impactful, innovative curriculum to expose SBAE students to Agricultural Career Pathways, SAEs, and prospective careers in the agricultural industry (Retallick, 2010; Wenglinsky, 1998) led to the development of AgCE. Funded by a USDA SPECA Grant, this digital curricular resource was designed for the traditional classroom setting, as well as independent learning, to meet the needs of all students involved in SBAE classrooms and programs.

Roughly 10 agricultural education faculty and graduate students at Oklahoma State University and 30 state leaders in agriculture convened for a full-day brainstorming session at the Oklahoma Department of Agriculture, Food, and Forestry (ODAFF) in the Fall of 2018 to determine the key skills and educational components that should be developed and included in the AgCE resource for each career pathway. Specifically, the team identified important careers within the nine National AFNR Career Pathways, as well as the key skills and experiences SBAE students should obtain related to these careers. Collaborative efforts continued as faculty and staff within agricultural education partnered with the university's Institute for Teaching and Learning Excellence to develop the online digital platform, known as AgCE, and released it to Oklahoma SBAE teachers and students.

The AgCE was made available to teachers and students as an online, digital resource. It consisted of the following six AFNR Career Pathways and one additional pathway for a total of

seven: (a) Agribusiness Systems, (b) Animal Systems, (c) Food Products and Processing Systems, (d) Natural Resource Systems, (e) Plant Systems, (f) Power, Structural, and Technical Systems, and (g) Agricultural Communications, a pathway specific to Oklahoma. The resource included curriculum for five career experiences within each of the seven career pathways, accounting for 35 total career experiences in which students could engage, explore, and learn. These experiences were created by faculty and graduate students in agricultural education with expertise in teaching, learning, and curricular design. Two recognized AFNR Career Pathways (Biosystems and Environmental Science Systems) were still being developed at the time of this evaluation. The career experiences consisted of digital worksheets, which include career exploration into the career pathway, career exploration into the specific career, developing and conducting an interview over the specific career, applying foundational knowledge needed for the specific career, and creation of a career plan (see Appendix A).

Theoretical Framework

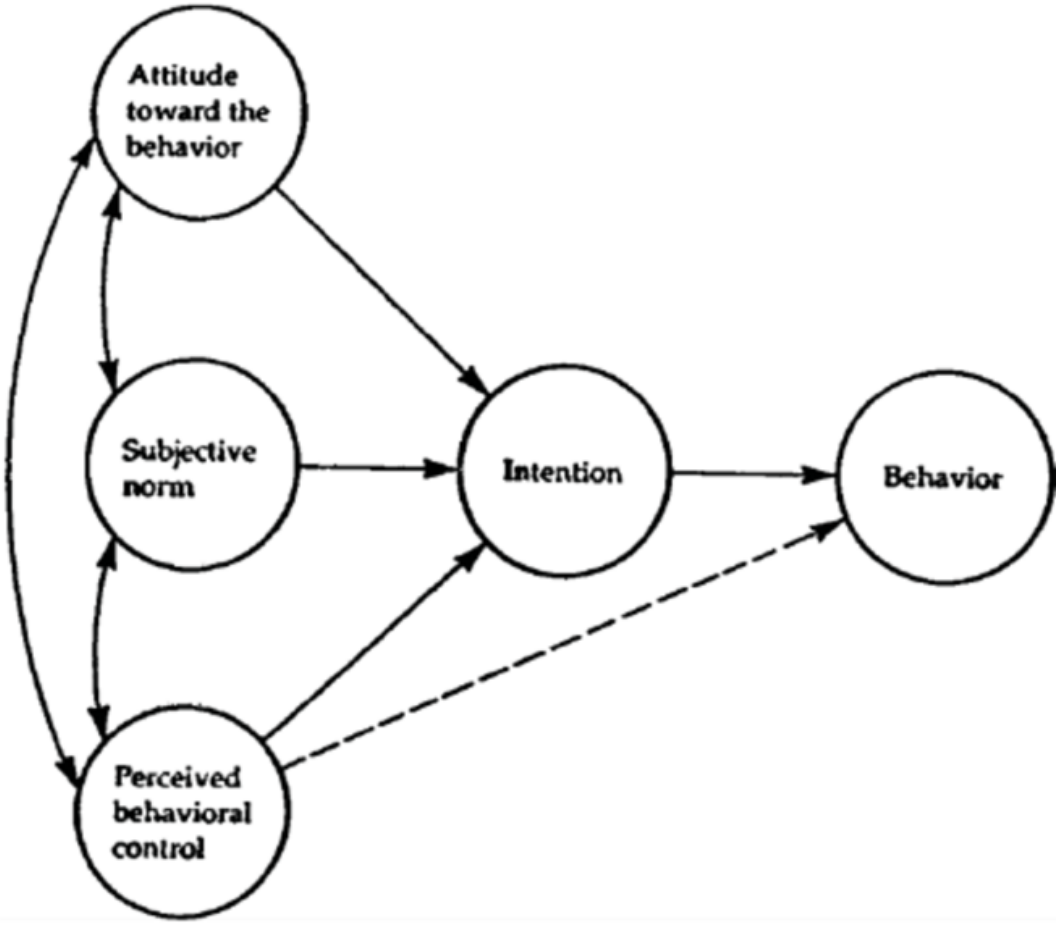
Ajzen's (1991) theory of planned behavior (TPB) undergirded this mixed-method evaluation. TPB attempts to explain an "… individual's intention to perform a given behavior" (Ajzen, 1991, p. 181). The behavior in our study is assumed to be teachers' implementation of students' participation in the AgCE digital curricular resource. In our evaluation, we chose this model to better understand the implementation of the AgCE curricular resource from the perspective of both students and teachers. Given this is a mixed-method evaluation, both SBAE teachers' and students' behaviors are necessary to include and assess. SBAE teachers were tasked with introducing the AgCE resource into their learning environments and were assessed through qualitative measures. SBAE students were expected to access and use the resource during a class setting and were assessed through their quantitative responses to questionnaires seeking their perceptions of it.

Previous research studies employed TPB to understand the behavior in their study through a lens considering attitudes, subjective norms, and behavioral controls. Specifically, Wells and Miller (2020) used an adapted TPB to explore the behaviors associated with adopting virtual reality (VR) technologies in SBAE classrooms. Given the novelty of virtual reality and limited adoption across education, this study provided support for employing TPB in our evaluation of the AgCE. Their study focused on how prior experiences and personal beliefs shaped intentions and behaviors associated with using VR technologies. When considering SAEs and curricular resources for introducing them in SBAE, prior experiences and personal beliefs are understood to be influential given their evolution documented throughout literature. Further, TPB was employed by Eck et al. (2021) to understand preservice teachers' intent to teach agricultural education. Their research considered prior experiences and personal beliefs in addition to predicting entrance into the profession and longevity. The current evaluation seeks to understand the prior experiences and personal beliefs that influence SAE participation from a curriculum lens and what influences future intentions to employ the AgCE as a SAE curricular resource.

Three determinants of intention are considered in Ajzen's (1991) model; attitude toward the behavior, subjective norm, and perceived behavioral control (see Figure 8). Behavioral beliefs, which lead to determining behaviors based on the desirable or undesirable consequences individuals associate with them can result in favorable or unfavorable attitudes toward the behavior (Ajzen, 1991). Normative beliefs, determined by others' approval or disapproval of the behavior and motivation to which the individual wishes to comply, can determine a person's intent to perform the behavior (Ajzen, 1991). Finally, control beliefs, which are influenced by prior experiences, available resources, and perceived difficulty, influence the perceived behavioral control toward the intention to perform the behavior (Ajzen, 1991).

Figure 8

Ajzen's (1991) Theory of Planned Behavior Model



Note. From the Theory of Planned Behavior Article (p. 182), by Icek Ajzen 1991, in the *Organizational Behavior and Human Decision Process Journal, 50,* 179-211.

For our evaluation, we posited SBAE students and teachers align their beliefs of attractors and detractors associated with implementing the AgCE curricular resource to employ SAE programs that are driven toward AFNR Career Pathways. Understanding initial beliefs and opinions in addition to developed beliefs and opinions can influence the adoption and use of the AgCE provides a deeper understanding for the implementation of the resource during this evaluation (Fishbein & Ajzen, 2010). We believe this framework best guides our evaluation

because attitudes toward teacher implementation and students' initiating the AgCE are dependent on teachers' perceived needs associated with SAEs and students' perceived experience while initiating the AgCE. Further, their attitude influences the culture of classroom and adoption of the resource throughout the class. Ultimately, the usability of the resource from account creation to completing all five experiences in a career pathway impacts students' and teachers' intention to embrace the AgCE fully. Thus, this framework guides the research objectives to evaluate the AgCE as a curricular resource from both the student and teacher perspectives.

CHAPTER III

METHODOLOGY

Research Problem Statement

Project-based learning and SAEs are integral components of a SBAE program (Smith & Rayfield, 2016); however, the need to involve students in SAEs has been a constant and ongoing struggle for SBAE teachers for at least the last three decades (Stewart & Birkenholz, 1991). SBAE teachers are often the most influential source of inspiration when it comes to increasing and developing students' motivation and interest to develop their SAEs (Baker et al., 2012; Bird et al., 2013; Rubenstein & Thoron, 2015). Unfortunately, SBAE teachers lack sufficient knowledge regarding SAEs, specifically (Doss & Rayfield, 2019), and within various AFNR Career Pathways, generally (Snider et al., 2021). Therefore, research is needed to further explore the resources available that might increase teacher knowledge and student engagement in these areas.

Purpose and Objectives

The purpose of the study was to evaluate how the creation of the AgCE curricular resource impacted both SBAE students and teachers. Specifically, the study sought to:

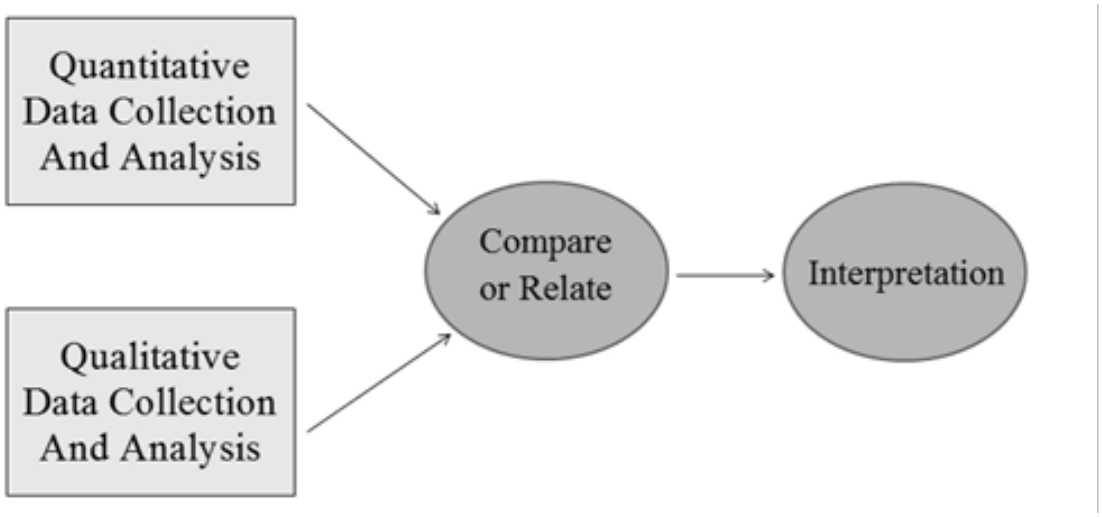
1. Describe the SBAE students' personal characteristics, such as sex, age, ethnicity, home community size, high school classification, and years of experience in the SBAE program.
2. Evaluate the impact of the AgCE curricular resource on SBAE students' knowledge, experience, motivation, and interest related to their self-selected AFNR career pathway experience.
3. Determine SBAE teachers' perceptions of the AgCE as a curricular resource for teaching SBAE students about SAEs.

Research Design

A convergent, parallel mixed-methods design (Creswell, 2012) was used to evaluate the AgCE as a curricular resource from both a student and teacher perspective. Mixed-methods studies allowed our data to be triangulated ". . . by collecting and converging (or integrating) different kinds of data bearing on the same phenomenon" (Creswell, 2012, p. 536). Further, mixed-methods research is based on pragmatism (Tashakkori & Teddlie, 1998), i.e., whether or not something works correctly. Therefore, in light of the purpose of this study, it is appropriate to use the mixed-methods design. Specifically, the convergent, parallel design (see Figure 9) best guides the qualitative and quantitative data collection and analysis to explain the findings further (Creswell, 2012).

Figure 9

The Convergent Parallel Design



Note. Creswell's (2012) convergent, parallel mixed-methods design.

In a convergent parallel mixed-methods design, quantitative and qualitative data are collected and merged simultaneously to determine findings associated with the research problem (Creswell, 2012). This design provides a more thorough understanding of the findings through the "worldview" of both quantitative and qualitative lenses (Creswell, 2012, p. 537). This evaluation included the collection of both quantitative and qualitative data on two levels, a process supported by Creswell (2012), and included teachers and students. This model fit the evaluation best due to the two distinct populations of interest, students and teachers, and because it allowed for quantitative and qualitative data to be collected at different times for comparison and interpretation purposes for "a more complete understanding of [the] research problem" (p. 540).

The AgCE resource has the potential to impact all students enrolled in Oklahoma SBAE programs in 2020 (N = 24,271). However, for the purpose of this evaluation, purposeful sampling (Creswell, 2012) was used to recruit Oklahoma SBAE teachers. SBAE students were recruited through their teachers' participation. All 467 SBAE teachers were contacted via email (see

Appendix B) on December 7, 2020, regarding the AgCE resource. Responses from five SBAE teachers were received, and further information was shared with those five teachers on December 15, 2020. Additionally, 32 teachers responded and received further information on January 10, 2021. From the 36 interested SBAE teachers in Oklahoma, our study represents seven distinct SBAE programs in Oklahoma that agreed to implement AgCE in their curriculum. The seven SBAE programs consisted of 14 SBAE teachers. Two taught in single-teacher programs and five were in multi-teacher programs with either two or three SBAE teachers. Four programs were in rural (population less than 10,000) communities, and three existed in suburban communities (population less than 50,000, but more than 10,000).

The quantitative portion of the study employed survey research. Specifically, descriptive statistics were used to assess the perceived knowledge, experience, interest, and motivation change in students' experience because of interacting with the materials in the AgCE digital resource. In addition to the content, the resource incorporates quantitative questionnaires (see Appendix B & C). Students were asked to complete the questionnaires before and after engaging in an experience. Upon accessing the link and entering the site, students selected a pathway of interest. Before engaging in the content, they were asked to complete the pre-experience questionnaire, collecting perceptions in relation to the completed experience worksheet from their chosen Career Pathway. Then, after completing the experience provided in their selected pathway of interest, they were prompted to complete the post-experience questionnaire.

Findings revealed not all programs implemented AgCE successfully. From those teachers who implemented AgCE, 67 SBAE students initiated the AgCE website by completing the demographic questionnaire. Fifty-eight of those students completed the AgCE Entry Questionnaire for their chosen career pathway areas of interest, resulting in 81 responses. Thirty-three of those students initiated an AgCE Career Pathway experience and completed a pre-questionnaire for the first experience within a career pathway. Further, 28 of the 33 SBAE

students completed the entire experience (i.e. AS.01) and provided complete data sets, including both pre and post experience questionnaires for the first experience in their chosen career pathway. Seven students then initiated a second experience in their chosen career pathway, four completed the second experience providing pre and post experience questionnaires data. Finally, one of those students initiated and completed the third experience in their chosen career pathway area, proving pre and post questionnaire data for three of the five experiences. It total, 33 complete data sets were obtained from SBAE students.

Given not all students completed experiences in the AgCE, qualitative research was employed with SBAE teachers who agreed to implement the resource in their classrooms starting in October 2021. To gain perspective from both SBAE teachers who implemented the AgCE successfully and those who did not, a sample of SBAE teachers (n = 10) agreed to participate in the qualitative data collection phase of the study. In addition, qualitative research procedures, in this case an interview protocol (see Appendix D), were used to assess teachers' perceptions of the resource and its contents. Participants were those teachers who incorporated the AgCE resource into their curriculum (N = 5) with their students as well as those who initially agreed to pilot test the curriculum but ultimately failed to do so (N = 5).

Qualitative data were specific to SBAE teachers only and were gathered through Zoom interviews. Interviews consisted of six semi-structured questions, lasting approximately 30 to 45 minutes. SBAE teachers who participated in the interviews varied in their level of engagement with the resource, some fully implemented the resource with their students while others only considered implementation into their classroom. Specifically, we were interested in how well the teachers perceived the AgCE resource functioned for them and their students.

Quantitative Data

Instrumentation

Multiple questionnaires were used to collect quantitative data. The Demographic Questionnaire and Career Pathway Entry Questionnaires were developed in the AgCE website and made available for students to complete within the web browser. Specific PDF worksheet documents were created across each AFNR Career Pathway experience. These documents were uploaded to the AgCE website and made accessible for SBAE students to download. Specific Career Pathway experiences included questionnaires that students completed through Google Forms prior to and after engaging in an AgCE experience. Specifically, Quick Response (QR) codes were included within the Career Pathway experience PDFs for students to scan and complete both questionnaires.

Digital questionnaires allowed for immediate data collection as responses were stored on the AgCE website as well as a Google Drive. We were able to access the data and communicate with SBAE teachers if needed on SBAE student responses. All research-development questionnaires were reviewed for face and content validity, as suggested by Salkind (2010). Three agricultural education professors and one instructor at Oklahoma State University served as the review panel. They reviewed, discussed, and edited verbiage of questions, scale of measurement and execution through the website and worksheets. Combined, members of the review panel had 90+ years of experience teaching and conducting research in SBAE. They were all former SBAE teachers from Oklahoma, have served on FFA and SAE committees, and worked directly in teacher preparation for SBAE at Oklahoma State University. In addition, the three professors were tenured, full professors who engage in the scholarship of teaching and learning. Specifically, their research has been focused on improving SBAE teacher competency, efficacy, and

experiences. Given the exploratory nature of this evaluation, the knowledge acquired through the study's findings will influence future development and implementation of the AgCE.

The Demographics Questionnaire was built into the AgCE website and collected personal characteristic data including grade level for the 2020-2021 school year, years enrolled in SBAE, community classification, age, ethnicity, and gender. This information allowed us to describe the population and understand students' previous knowledge related to the content. Additionally, participant responses were compared across select demographics to identify trends and determine unique factors regarding students' knowledge and desire to pursue AFNR careers as a result of their interaction with the AgCE resource.

Career Pathway Entry Questionnaires for each AFNR Career Pathway (four items) were built into the AgCE website to obtain SBAE students' perceived knowledge, experience, interest, and motivation toward their chosen Career Pathway. Five Career Pathway options were made available at the time of data collection. They included Agribusiness Systems, Animal Systems, Natural Resource Systems, Plant Systems, and Power, Structural and Technical Systems. SBAE student perceptions were assessed using a five-point Likert-type scale (1 = Not at All, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely) to examine the following questions: (a) How knowledgeable do you consider yourself to be in your chosen Career Pathway?, (b) How experienced do you consider yourself to be in your chosen Career Pathway?, (c) How interested are you to learn more about your chosen Career Pathway?, and (d) How motivated are you to pursue a career in your chosen Career Pathway? The questionnaire was completed by SBAE students prior to completing a specific experience within their chosen Career Pathway.

The Entry Questionnaire (four items) was duplicated for the Exit Questionnaire, which was to be completed if participants successfully finished all five experiences in their chosen Career Pathway. The same questions, with five-point Likert-type scale (1 = Not at All, 2 =

Slightly, 3 = Moderately, 4 = Very, 5 = Extremely) responses were included as well as three additional questions: (e) How beneficial did you find your chosen Career Pathway experience to be?, (f) How likely would you be to recommend your chosen Career Pathway experience?, and (g) Rank the clarity of the Career Pathway experience. The Exit Questionnaire sought to collect changes between the participants' perceived knowledge, experience, interest, and motivation in their chosen Career Pathway before completing all five Career Pathway experiences.

Specific Career Pathway experiences included both pre-experience and post-experience questionnaires (four items) embedded in Career Pathway experience PDF worksheets. The questionnaires were developed through Google Forms formatted similarly to the Entry and Exit Questionnaires. Questions sought to collect participants' knowledge, experience, interest, and motivation. Among all seven Career Pathways, five specific experiences were created for the SBAE students to engage through the digital worksheets. Within the five experiences, students explored the day-to-day interactions of the specific career experience using the AgExplorer, created an experience for their AET record book, conducted an interview with their SBAE teacher and/or career professional, explored the financial and salary information associated with the career, and created a career plan.

The structure and design of these experiences and questionnaires were guided by teaching and learning practices. Once students initiated the AgCE and completed an experience, they were able to indicate their perceived knowledge gain in the post-questionnaires for the research to assess. All experiences enabled students to research information, apply what they learned in an interview with a career professional, and develop a personal career plan. Learners were prepared, instructed, engaged, and assessed through their capstone career plan assignment that requires them to present on the following topics: (a) their career goal, (b) post-secondary aspirations and options, (c) employability skills and leadership development, (d) personal financial literacy and planning, (e) workplace experience opportunities, and (f) academic planning and progress.

Data Collection

To address Objective 1, SBAE students completed a researcher-developed questionnaire focused on personal characteristics. This questionnaire sought to gather information regarding their personal and community characteristics and demographic data. SBAE students were asked to create an AgCE account using their pre-existing, active Google Account as the online platform required a google login. Once AgCE accounts were created by connecting to their Google accounts, responses were obtained through the personal characteristics' questionnaire generated from the website that populated after their accounts were created.

To address Objective 2, researcher-developed questionnaires were developed to collect data before (Pre-Experiences Questionnaire) and after (Post-Experience Questionnaire) initiating the career pathway and each experience within. QR codes that linked to Google Form questionnaires were embedded into the Career Pathway experience PDF worksheets for participants to scan and complete. Responses were collected and evaluated before and after completing each of the career pathway experiences.

Data Analysis

For Objective 1, descriptive (i.e., frequencies and percentages) were reported to describe the personal and community characteristics and demographic data of the participants. For Objective 2, measures of central tendency and variability (i.e., means and standard deviations, respectively) were determined to describe the perceived levels of knowledge, experience, motivation, and interest regarding their chosen career pathway experience. The measure of effective of the career pathway experience, the Wilcoxon test to examine differences between pre and post data. Responses were reported as a group per National AFNR Career Pathway. Data were analyzed in IMB SPSS. Basic descriptive statistics for demographic information were calculated, including means and standard deviations to describe perceived levels of knowledge,

experience, motivation, and interest toward the career pathway experiences. Responses were reported as a whole; however, they were also aggregated and reported as a group per National AFNR Career Pathway.

Qualitative Data

Instrumentation

A semi-structured interview protocol was developed to ask questions that would not "get a simple yes and no answer, but describe an episode, a linkage, an explanation . . . to evoke good responses" (Stake, 1995, p. 65). Six questions were created for the SBAE teachers focused on their experiences teaching SAEs across the AFNR Career Pathways. SBAE teachers were asked to elaborate on their experience with the AgCE and the recommendations they might offer for advancing the contents developed in the resource. Questions were developed and assessed by a committee of four faculty and staff members at Oklahoma State University to evaluate content validity, as suggested by Salkind (2010). Three of the members were agricultural education faculty with a combined 90+ years of experience teaching SBAE on the secondary and post-secondary level. They are all former SBAE teachers from Oklahoma, have served on FFA and SAE committees, and work directly in teacher preparation for SBAE. They have advised SAE projects in addition to teaching SAE advisement to preservice teachers. In addition, the three faculty are tenured full professors who engage in the scholarship of teaching and learning. Specifically, their research has been focused on improving SBAE teacher competency, efficacy, and experiences.

Interviews were conducted with SBAE teachers, via Zoom, and lasted between 30 to 45 minutes. I took field notes in addition to asking the interview questions, making notes of facial expressions and tone of voice. At the end of each interview, I compared my field notes to the transcripts between participants to triangulate the data. The ten SBAE teachers who participated

represented SBAE programs that initiated the AgCE with the creation of a teacher account profile (i.e., the SBAE teacher created an AgCE account using their Google email, similar to the student account creation). One additional SBAE program initiated the AgCE; however, the teacher was not able to facilitate the students' experience due to medical reasons. As such, the qualitative portion of the study was limited to 10 teachers. Of those, one taught at a single-teacher program, three taught at a two-teacher program, and two taught at a three-teacher program. To accommodate teachers' busy schedules, Zoom interviews were conducted between August 25, 2021, and February 20, 2021.

Data Collection

To address objective three, qualitative interviews of both participating and non-participating teachers were transcribed, coded, and interpreted to determine SBAE teachers' perspectives regarding the teaching and implementation of SAEs. Six questions from the interview protocol were developed and are listed below.

1. Can you explain what a supervised agricultural experience is?
2. What is your process for helping students learn about SAEs?
3. What resources do you use to teach your students about SAEs?
4. How would you describe your experience with the AgCE curricular resource?
5. Did you use the AgCE curricular resource? Why or why not?
6. What potential do you see for AgCE to be a useful resource to teachers in the future?

Reflexivity Statement

Potential biases were presented based on my related experiences and perspectives. I grew up with an agricultural background and participated in a SBAE program where I had a SAE and received both my State and American FFA Degrees, the two highest honors bestowed on SBAE students. In addition, I completed a student teaching internship in Agricultural Education in 2014

and taught SBAE for six years in northwest Oklahoma. I was employed in 2020 as a graduate student in agricultural education to help finalize the AgCE resource. My responsibilities included: making modifications and updates to the AgCE curricular experiences, working with ITLE to develop and modify the online platform or website, and contacting my network of SBAE teachers to pilot test this project with their students. As such, I have intimate experience with the product and believe in its potential to educate and help SBAE teachers and students learn about agriculture and agricultural careers in a positive, productive, and engaging way. My personal experience regarding SAEs, Career Pathways, and the AgCE impacts my personal expectations and knowledge for implementing this curricular resource. I attempted to control these biases through structuring the interview protocol, memoing, and using bracketing during the analysis of participants' interviews (Calsyn & Winter, 1999).

Data Analysis

Interviews were conducted and transcribed verbatim. The researcher listened to each of the interviews multiple times to ensure accuracy of the transcript and reflected on the data collected. During the field notes and transcript review, a general understanding of the data was gained along with several themes. The coding procedures of Saldaña (2016) were used to interpret the data. Eclectic coding strategy, a hybrid coding method suited for explorative research, was used to code the data (Saldaña, 2016). Eclectic coding creates comprehensive themes from the data by allowing the researcher to employ more than one coding system (Saldaña, 2016). In Vivo, pattern, and descriptive coding were used to conduct three levels of coding based on suggestions by Saldaña (2016). In Vivo codes were used in the first cycle of analysis because they allowed for the preservation of the participants' voices (Saldaña, 2016). The second level used the pattern coding procedure to arrange the In Vivo codes into patterned groups (Saldaña, 2016). Finally, descriptive coding was used during the third cycle to create final

themes from the patterned codes. The last step was chosen to help portray my interpretation of the data's meaning (Saldaña, 2016).

Logic Model

Because this study was evaluative in nature, a logic model was developed. Specifically, McLaughlin's and Jordan's (2015) five-stage process of developing a logic model was used to construct our evaluation. The five-stage process consists of the following: Stage 1: Collecting information germane to the program, Stage 2: Defining the central program, Stage 3: Drawing meaning of the various elements central to the program, Stage 4: Creating the logic model to conceptualize the program and its intended impact, and Stage 5: Validating the program's model with key stakeholders.

Figure 10 provides the logic model created to guide this evaluation. Aligning with McLaughlin's and Jordan's five-stage process, I (the lead evaluator) referred to the original project development team's goals and objectives to review the purpose of the AgCE in SBAE programs. I reassessed the career pathway experiences as well as the logistics of the website.

Once the necessary information was collected, I focused on the problems that were not germane to the program's needs (Stage 2). The problem centered on SBAE teachers' implementation of SAEs and SBAE students' lack of knowledge and interest in SAEs and careers in agriculture. For Stage 3, I evaluated the quantitative data to understand student knowledge, experience, interest, and motivation toward AFNR Career Pathways as well as their responses to the qualitative instrument regarding their use of the AgCE. Next, I organized statements and themes around the qualitative interviews conducted with SBAE teachers to understand their previous experience, current practices, and future ideas for incorporating the AgCE into their curriculum instruction. In Stage 4, the logic model was designed using the information collected including inputs, activities, and outputs, as well as short-term, intermediate, and long-term goals

(see Figure 10). Finally, data were assessed to determine the practical application and validation of the logic model during Stage 5. Both qualitative and quantitative data were used to describe the experience of the participants, both teachers and students, regarding their interaction with the AgCE.

Figure 10

Reasoned Action Model for Evaluating the Implementation of the Agricultural Career Experiences Resource into SBAE Programs.

Program: Implementation of Agricultural Career Experience into SBAE programs					
Goal: Increase SBAE students' participation in Supervised Agricultural Experience programs.					
Inputs	**Activities**	**Outputs**	**Short-term**	**Intermediate**	**Long-term**
Need for increased curricular resources	Shared curricular resource with virtual teaching guides	Supported SBAE teachers who can utilize the AgCE curricular resource	SBAE teachers can meet the 100% SAE participation requirement	SBAE students invest in SAE projects and experience growth.	An increased number of SBAE students have direct experiences with agriculture
Need for example SAE experiences	SBAE teachers guide students through AgCE	SBAE students acquire greater understanding of career opportunities in agriculture	SBAE teachers can confidently teach AFNR Career Pathway experiences	SBAE teachers experience growth in their confidence to advise SAE projects.	An increased number of SBAE students pursue careers in agriculture
USDA grant funding to develop resources			SBAE teachers can use a curriculum to teach their students about SAE opportunities		An increased number of SBAE students are knowledgeable about the agricultural industry

Note. Logic model for the impact of the AgCE curricular resource on SBAE students' knowledge of career opportunities.

CHAPTER IV

FINDINGS

Research Problem Statement

Project-based learning and SAEs are integral components of a SBAE program (Smith & Rayfield, 2016); however, the need to involve students in SAEs has been a constant and ongoing struggle for SBAE teachers for at least the last three decades (Stewart & Birkenholz, 1991). SBAE teachers are often the most influential source of inspiration when it comes to increasing and developing students' motivation and interest to develop their SAEs (Baker et al., 2012; Bird et al., 2013; Rubenstein & Thoron, 2015). Unfortunately, SBAE teachers lack sufficient knowledge regarding SAEs, specifically (Doss & Rayfield, 2019), and within various AFNR Career Pathways, generally (Snider et al., 2021). Therefore, research is needed to further explore the resources available that might increase teacher knowledge and student engagement in these areas.

Purpose and Objectives

The purpose of the study was to evaluate how the creation of the AgCE curricular resource impacted both SBAE students and teachers. Specifically, the study sought to:

1. Describe the SBAE students' personal characteristics, such as sex, age, ethnicity, home community size, high school classification, and years of experience in the SBAE program.

2. Evaluate the impact of the AgCE curricular resource on SBAE students' knowledge, experience, motivation, and interest related to their self-selected AFNR career pathway experience.

3. Determine SBAE teachers' perceptions of the AgCE as a curricular resource for teaching SBAE students about SAEs.

Quantitative Findings and Interpretations

Objective 1 sought to describe select personal characteristics of high school students enrolled in SBAE programs. Sex, age, ethnicity, home community size, and high school classification were reported using frequencies and percentages. Years of experience in a SBAE program also were presented as a personal characteristic using frequencies and percentages.

Sixty-seven SBAE students initiated the AgCE by creating a profile and completing a demographic questionnaire. Regarding sex, 22 (32.84%) were female, 44 (65.67%) were male, and one (1.49%) preferred not to answer (see Table 4). Twenty-three (34.33%) of the students were between 12 and 14 years old, 41 (61.19%) of the students were between 15 and 17 years old, and three (4.48%) were 18 years of age or older. One (1.19%) student reported Asian or Pacific Islander as their ethnicity, one (1.19%) student reported Black or African American as their ethnicity, one (1.19%) student reported Hispanic or Latino as their ethnicity, 11 (16.42%) students reported Native American or American Indian as their ethnicity, seven (10.45%) students reported two or more ethnicities, and 46 (66.86%) reported their ethnicity as White. Twenty-four

(35.82%) identified their home community size as being suburban, while 43 (64.18%) identified their community as being rural. Nineteen (28.36%) students identified as being 8th graders, 21 (31.34%) identified as being 9th graders, 13 (19.40%) identified as being 10th graders, 9 (33.43%) identified as being 11th graders, and 5 (7.46%) identified as being 12th graders. Regarding years of experience in a SBAE program, five (7.46%) students reported less than one year, 24 (35.82%) reported one year, 17 (25.37%) reported two years, three (11.94%) reported three years, and 13 (19.40%) reported four years (see Table 4).

Table 4

Personal Characteristics of High School SBAE Students (n = 67) in Oklahoma who Initiated the AgCE during the Spring 2021 Semester

Characteristics	*f*	%
Sex		
Female	22	32.84
Male	44	65.67
Prefer not to answer	1	1.49
Age		
12 to 14	23	34.33
15 to 17	41	61.19
18+	3	4.48
Ethnicity		
Asian/Pacific Islander	1	1.49
Black or African American	1	1.49
Hispanic or Latino	1	1.49
Native American or American Indian	11	16.42
Two or more	7	10.45
White	46	68.66
Home Community Size		
Rural	43	64.18
Suburban	24	35.82
Grade/Classification		
8th	19	28.36
9th	21	31.34
10th	13	19.40
11th	9	13.43
12th	5	7.46
Years of Experience in SBAE Program		
Less than 1	5	7.46
1	24	35.82

2	17	25.37
3	3	11.94
4	13	19.40

Note. Participants were asked to complete a questionnaire after initiating the AgCE website.

In addition to initiating the AgCE by creating a profile and completing a demographic questionnaire, 28 SBAE students initiated a Career Pathway area and completed both a pre- and post-experience questionnaire for at least one career pathway experience. Regarding sex, 8 (28.57%) were female, 19 (67.86%) were male, and one (3.57%) preferred not to answer (see Table 5). Sixteen (57.14%) of the students were between 12 and 14 years old, and 12 (42.86%) of the students were between 15 and 17 years old. Three (10.71%) students reported Native American or American Indian as their ethnicity, two (7.14%) students reported two or more ethnicities, and 23 (82.15%) reported their ethnicity as White. 21 (75.00%) identified their home community size as being suburban, while 7 (25.00%) identified their community as being rural. Fifteen (53.57%) students identified as being 8th graders, 5 (17.86%) identified as being 9th graders, 3 (10.71%) identified as being 10th graders, and 5 (17.86%) identified as being 11th graders. Regarding years of experience in a SBAE program, three (10.71%) students reported less than one year, 14 (50.00%) reported one year, 4 (14.29%) reported two years, one (3.57%) reported three years, and six (21.43%) reported four years.

Table 5

*Personal Characteristics of High School SBAE Students (*n *= 28) in Oklahoma who Initiated and Completed One AgCE Career Pathway Experience during the Spring 2021 Semester*

Characteristics	*f*	%
Sex		
Female	8	28.57
Male	19	67.86
Prefer not to answer	1	3.57
Age		
12 to 14	16	57.14
15 to 17	12	42.86

Ethnicity		
Native American or American Indian	3	10.71
Two or more	2	7.14
White	23	82.15
Home Community Size		
Rural	21	75.00
Suburban	27	25.00
Grade/Classification		
8th	15	53.57
9th	5	17.86
10th	3	10.71
11th	5	17.86
Years of Experience in SBAE Program		
Less than 1	3	10.71
1	14	50.00
2	4	14.29
3	1	3.57
4	6	21.43

Note. Participants were asked to complete a questionnaire after initiating the AgCE website.

Objective 2 sought to determine the impact of the AgCE curricular resource on students' knowledge, experience, interest to learn more, and motivation to pursue a career in their chosen AFNR career pathway experience. The four questions were included in all questionnaires and were designed with a 5-point, Likert-type scale. When initiating the AgCE, SBAE students were asked to complete the Entry Questionnaire for any of the career pathways they were interested in. Next, students identified a career pathway area to pursue, and they were then asked to complete the pre-experience questionnaire prior to the experience and the post-questionnaire after completing the experience. The post-experience questionnaire was structure similarly with additional questions regarding clarity, how beneficial they found it, and how likely they would be to recommend it. After completing all five experiences within the career pathway area, students were asked to repeat the questionnaire as a post-pathway evaluation.

The structure of the questionnaire distribution was attributed to the website design and allowed for responses to be tracked at each level of student interaction. Collecting data prior to and after students engaged in an AgCE experience allowed for a pre-experience and post-experience evaluation comparison. Additionally, after completing an AgCE pathway experience,

students were asked to identify the clarity of the experience, their recommendation of the experience, and how beneficial they found the experience to be.

The majority of students completed the questionnaire for the AS (30.86%) and PSTS (24.69%) career pathway areas. Students indicated they were between *slightly* to *moderately* knowledgeable about and experienced with the career pathway they completed the questionnaire for (see Table 6). Additionally, students were *moderately* to *very* interested to learn more and motivated to pursue a career in the career pathway area they chose to explore.

Table 6

*SBAE Student Perceptions toward Career Pathways prior to selecting which AgCE Career Pathway to initiate (*n = *81)*

	Knowledge		*Experience*		*Interest*		*Motivation*	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
ABS (*n* = 11)	2.00	0.89	1.73	1.10	3.36	1.03	3.55	0.82
ACS (*n* = 7)	2.86	1.21	3.29	1.11	3.14	1.21	3.29	1.25
AS (*n* = 25)	2.64	0.86	2.36	0.91	3.56	1.08	3.52	1.16
FPPS (*n* = 2)	2.50	0.71	2.00	1.41	3.50	0.71	4.00	1.41
NRS (*n* = 6)	2.67	0.52	2.33	1.03	3.17	0.75	3.17	1.17
PS (*n* = 10)	2.60	0.84	2.10	0.99	3.10	0.74	2.90	1.29
PSTS (*n* = 20)	2.55	0.83	2.40	0.99	3.65	1.04	3.30	1.03

Note. ABS = Agribusiness Systems, ACS = Agricultural Communications Systems, AS = Animal Systems, FPPS = Food Products and Processing Systems, NRS = Natural Resources Systems, PS = Plant Systems, PSTS = Power, Structural, and Technical Systems. Participants were asked to complete an entry questionnaire prior to choosing an AgCE Career Pathway to initiate on 5-point, Likert-type scale (1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely) for their knowledge, experience, interest to learn more, and motivation to pursue a career in the specific career pathway area. SBAE students were free to complete these questionnaires for multiple career pathway areas; therefore, responses do not reflect the number of participants.

SBAE student who initiated the AgCE and completed a career pathway experience provided data that were analyzed by pathway and collectively. Thirty SBAE students completed both pre-experience and post-experience questionnaires for the first experience in the career pathway area they initiated and completed. Four SBAE students completed both pre-experience and post-experience questionnaires for the second experience in the career pathway area they initiated and completed. One SBAE students completed both pre-experience and post-experience questionnaires for the third experience in the career pathway area they initiated and completed. Data for the first and second experiences are analyzed collectively and are displayed in Tables 7 and 8.

SBAE students perceived themselves to be between *slightly* and *moderately* knowledgeable ($M = 2.77$, $SD = 0.97$) in their chosen career pathways prior to completing the first career pathway experience. After completing the first experience, students completed the post-experience questionnaire indicating a slight increase in their perceived knowledge ($M = 2.97$, $SD = 1.03$). Although continuing to be between *slightly* and *moderately* knowledgeable, participating students collectively 0.20 in their perceived average knowledge after completing the first experiences. Further, the four students who initiated and completed the second experience, perceived themselves to be between *slightly* knowledgeable ($M = 2.00$, $SD = 0.82$) in their chosen career pathway prior to completing the second experience. Once completing their second experience, an increase in perceived knowledge ($M = 3.50$, $SD = 0.50$) supported by a large effect size. These students now perceive themselves to be between *moderately* and *very* knowledgeable after completing two career pathway experiences within their chosen career pathway. These data are displayed in Tables 7 and 8.

In addition to perceived knowledge, the SBAE students who initiated a career pathway in the AgCE initially perceived themselves to be *slightly* and *moderately* experienced *(*$M = 2.63$, $SD = 0.99$). Although small, an increase was observed in perceived knowledge *(*$M = 2.77$, $SD = 1.07$)

after completing the first experience. Consequently, the four students who continued to the second experience perceived themselves be between *slightly* experienced *(M* = 2.00, *SD* = 0.82) prior to the second experience, yet increased to *moderately* to *very* experienced *(M* = 3.50, *SD* = 1.00) after completing the second experience. Although the sample sizes do not meet the assumption of sample size, the increase is supported by a large effect size (Cohen, 1969). These data are displayed in Tables 7 and 8.

During the pre-experience questionnaire for the first experience, students were asked, "How interested are you to learn more about [career pathway]?" to which they responded *moderately* to *very* interested (*M* = 3.53, *SD* = 0.97). During the second experience, However, a slight decrease (0.6) was observed on the post-experience questionnaire after students completed the first experience, it is important to recognize the impact on students' collective interest in the career pathway experiences. Given this decrease was slight, students still perceived their interest in the AS Career Pathway to be between *moderately* and *very* interested (*M* = 3.47, *SD* = 1.22) after completing the experience. Prior to the four students completing the second experience, they also perceived themselves to be *moderately* to *very* interested (*M* = 3.50, *SD* = 0.58). During the second experience, there was a slight decrease (0.3) observed on the post-experience questionnaire; however, students still perceived their interest in their chosen career pathway to be between *moderately* and *very* interested (*M* = 3.47, *SD* = 1.22) after completing the experience. These data are displayed in Tables 7 and 8.

Perceived motivation to pursue a career in their chose career pathway consistently ranged from *moderately* motivated to *very* motivated both before and after students initiated the first and second career pathway experiences. Prior to completing the first pre-questionnaire, student motivation (*M* = 3.50, *SD* = 1.20) toward their career pathway showed moderate motivation with a similar response in post-experience motivation (*M* = 3.50, *SD* = 1.25). During the second experience, the four students indicated they were *moderately* to *very* motivated (*M* = 3.50, *SD* =

0.50) to pursue a career in this career pathway area on both the pre-experience and post-experience questionnaire. These data are displayed in Tables 7 and 8.

Perceived knowledge, experience, interest to learn more, and motivation to pursue a career in their chosen career pathway is valuable to knowing the impact of the AgCE; however, further information was gathered on the platform itself. The post-experience questionnaire additionally sought to receive feedback through questions such as: "On a scale from 1 to 5, how beneficial did you find the experience to be?," "On a scale from 1 to 5, how likely would you be to recommend the resource?," and "On a scale from 1 to 5, rank the clarity of the experience." Additionally, students perceived the AgCE experiences to be *moderately* to *very* clear during the first experience (M = 3.20, SD = 1.32) with a decrease to *slightly* to *moderately* clear (M = 2.75, SD = 1.50) after the second. Students were *moderately* likely to recommend (M = 3.00, SD = 0.95) the AgCE as a resource after completing the first experience and *moderately* to *very* likely to recommend (M = 3.25, SD = 1.50) after completing the second experience. Finally, students found the AgCE experiences to be *moderately* beneficial (M = 3.03, SD = 1.16) after the first experience, and *slightly* to *moderately* beneficial after the second (M = 2.75, SD = 1.50). These data are displayed in Tables 7 and 8.

Table 7

Descriptive Statistics of SBAE Students Responses to the first experience in their chosen AgCE Career Pathway (n = 30)

	M	*SD*	*r*
Knowledge			.23
Pre	2.77	0.97	
Post	2.97	1.03	
Experience			.14
Pre	2.63	0.99	
Post	2.77	1.07	
Interest			.09
Pre	3.53	0.97	

Post	3.47	1.22	
Motivated			.02
Pre	3.50	1.20	
Post	3.50	1.25	
Clarity	3.20	1.32	
Recommend	3.00	0.95	
Beneficial	3.03	1.16	

Note. Participants were asked to complete a questionnaire after initiating and completing their first experience in their self-chosen pathway experience on 5-point, Likert-type scale (1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely) for their knowledge, experience, interest, and motivation. The Wilcoxon Signed Ranks Test was used because the data failed normality (Wilcoxon, 1945), effect sizes were determined based on Cohen (1969) reporting knowledge to have a small effect size ($r = 0.23$), and experience to have a small effect size ($r = 0.14$). Interest ($r = 0.09$) and motivation ($r = 0.02$) both reported very small effect sizes.

Table 8

Descriptive Statistics of SBAE Students Responses to the second experience in their chosen AgCE Career Pathway (n = 4)

	M	*SD*	*r*
Knowledge			.82
Pre	2.00	0.82	
Post	3.25	0.50	
Experience			.80
Pre	2.00	0.82	
Post	3.50	1.00	
Interest			.50
Pre	3.50	0.58	
Post	3.47	1.22	
Motivated			.00
Pre	3.50	0.58	
Post	3.50	0.58	
Clarity	2.75	1.50	
Recommend	3.25	1.50	
Beneficial	2.75	1.50	

Note. Participants were asked to complete a questionnaire after initiating and completing their second experience in their self-chosen pathway experience on 5-point, Likert-type scale (1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely) for their knowledge, experience,

interest, and motivation. The Wilcoxon Signed Ranks Test was used because the data failed normality (Wilcoxon, 1945). Although the data failed to meet assumption of sample size, effect sizes were determined based on Cohen (1969) reporting knowledge to have a large effect size (r = 0.82), experience to have a large effect size (r = 0.80), interest to have a large effect size (r = 0.50) and motivation to not have an effect size (r = 0.00).

The ABS experience in the AgCE aligns with the National AFNR Pathway for ABS. The experiences include daily operations, planning and organizing, business and accounting, record keeping, and career financing. Six SBAE students initiated the ABS pathway. Five SBAE students completed both the pre and post questionnaires for the first experience (ABS.01), and one SBAE student completed the pre-questionnaire only for ABS.01. These data are displayed in Table 9.

SBAE students perceived themselves to be between *moderately* and *very* knowledgeable (M = 3.40, SD = 0.55) in the ABS Career Pathway prior to completing the career pathway experience. After completing one experience (ABS.01), five of the students completed the post-experience questionnaire indicating a slight increase in their perceived knowledge (M = 3.60, SD = 0.55). Participating students in the ABS Career Pathway increased in their perceived average knowledge after completing ABS.01 by 0.20. These data are displayed in Table 9.

In addition to perceived knowledge, the SBAE students who initiated the ABS Career Pathway on AgCE initially perceived themselves to be *slightly* to *moderately* experienced (M = 2.80, SD = 0.45). This observation was obtained during the pre-questionnaire for ABS.01. Once students completed the first experience in ABS, they perceived their experience to increase by 0.60 in their perceived average experience (M = 3.40, SD = 0.55). This increase observed an average change in experience to *moderately* to *very* experienced in ABS Career Pathway after completing one experience. These data are displayed in Table 9.

Prior to completing the ABS.01 experience, students were asked, “How interested are you to learn more about agribusiness?” to which they responded *moderately* to *very* interested (*M* = 3.60, *SD* = 0.55). With a slight increase, students perceived the first experience to impact their interest in agribusiness by 0.20 average mean score. On the post-questionnaire, students indicated they are still *moderately* to *very* interested (*M* = 3.80, *SD* = 1.10) in learning more about agribusiness after completing ABS.01. These data are displayed in Table 9.

Perceived motivation to pursue a career in ABS ranged from *moderately* motivated to *very* motivated (*M* = 3.60, *SD* = 0.89) as students initiated the AgCE platform. Once students completed the ABS.01 experience, they indicated growth in their motivation to pursue a career in this career pathway. Specifically, post-experience questionnaires found a mean average increase of 0.40 in motivation. The response after completing the first experience in ABS portrayed students to be *very* motivated (*M* = 4.00, *SD* = 1.00). These data are displayed in Table 9.

Table 9

*Perceived Impact of the First Experience within Agribusiness Systems Pathway on High School SBAE Students (*n = *5)*

	M	*SD*	*r*
Knowledge			.45
Pre	3.40	0.55	
Post	3.60	0.55	
Experience			.78
Pre	2.80	0.45	
Post	3.40	0.55	
Interest			.26
Pre	3.60	0.55	
Post	3.80	1.10	
Motivated			.63
Pre	3.60	0.89	
Post	4.00	1.00	
Clarity	3.20	0.45	
Recommend	3.60	0.55	
Beneficial	3.60	0.55	

Note. Participants were asked to complete a questionnaire after initiating and completing the first pathway experience on 5-point, Likert-type scale (1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely) for their knowledge, experience, interest to learn more, and motivation to pursue a career in the ABS Career Pathway. The Wilcoxon Signed Ranks Test was used because the data failed normality (Wilcoxon, 1945). Although the data failed to meet assumption on sample size, effect sizes were determined based on Cohen (1969) reporting knowledge to have a moderate effect size ($r = 0.45$), experience to have a large effect size ($r = 0.78$), interest to have a small effect size ($r = 0.26$), and motivation to have a large effect size ($r = 0.63$).

In addition to asking about students' perceived knowledge, experience, interest to learn more, and motivation to pursue a career in the ABS Career Pathway, the post-experience questionnaire sought to receive feedback on the quality of the AgCE pathway by asking: "On a scale from 1 to 5, how beneficial did they find the experience?," "On a scale from 1 to 5, how likely would you be to recommend the experience?," and "On a scale from 1 to 5, rank the clarity of the experience." Clarity ($M = 3.20$, $SD = 0.45$) was perceived to be between *moderately* clear in ABS.01. Students were *moderately* likely to *very* likely to recommend ($M = 3.60$, $SD = 0.55$) the AgCE as a resource after completing the first experience in ABS. Finally, they found this pathway experience to be between *moderately* and *very* beneficial ($M = 3.60$, $SD = 0.55$).

The AS experience within the AgCE aligns with the National AFNR Pathway for AS. The experiences include veterinary science, livestock enterprise trends, marketing, nutrition, and meat processing, pathogen analysis, consumer grading, safe food handling practices, and emerging food technologies. Thirteen SBAE students initiated the AS pathway. However, only seven completed both the pre and post questionnaires for the first experience (AS.01). Two SBAE students completed the pre-questionnaire only for AS.01, and one SBAE student partially completed the pre-questionnaire in addition to completing the post-questionnaire for AS.01. Two (15.38%) SBAE students completed both the pre and post questionnaires for the second

experience (AS.02), and two (15.38%) SBAE students completed the pre-questionnaire only for AS.02. These data are displayed in Tables 10 and 11.

SBAE students perceived themselves to be between *slightly* and *moderately* knowledgeable ($M = 2.57$, $SD = 0.79$) in the AS Career Pathway prior to completing the first career pathway experience. After completing the first experience, students completed the post-experience questionnaire indicating a slight increase in their perceived knowledge ($M = 2.71$, $SD = 0.95$). Although continuing to be between *slightly* and *moderately* knowledgeable, participating students in the AS Career Pathway increased 0.14 in their perceived average knowledge after completing AS.01. Further, the two students who initiated and completed the second experience, perceived themselves to be between *slightly* and *moderately* knowledgeable ($M = 2.50$, $SD = 0.71$) in the AS Career Pathway prior to completing the second career pathway experience. Once completing their second experience, an increase in perceived knowledge ($M = 3.50$, $SD = 0.71$) supported by a large effect size. These students now perceive themselves to be between *moderately* and *very* knowledgeable after completing two career pathway experiences within the AS Career Pathway. These data are displayed in Tables 10 and 11.

In addition to perceived knowledge, the SBAE students who initiated the AS Career Pathway on AgCE initially perceived themselves to be *slightly* to *moderately* experienced *(*$M = 2.71$, $SD = 1.25$). This observation was obtained during the pre-questionnaire for AS.01 where they indicated no change in their perceived experience *(*$M = 2.71$, $SD = 1.25$) after completing the first experience. Consequently, the two students who continued to the second experience perceived themselves be between *slightly* to *moderately* experienced *(*$M = 2.50$, $SD = 0.71$) prior to the second experience, yet increased to *very* experienced *(*$M = 4.00$, $SD = 1.41$) after completing AS.02. Although the sample sizes do not meet the assumption of sample size, the increase is supported by a large effect size (Cohen, 1969). These data are displayed in Tables 10 and 11.

During the pre-experience questionnaire for the first experience, students were asked, "How interested are you to learn more about animal systems?" to which they responded *moderately* to *very* interested (*M* = 3.86, *SD* = 1.07). However, a slight decrease (0.29) was observed on the post-experience questionnaire after students completed the first experience, indicating AS.01 negatively impacted their collective interest in the career pathway experience. Given this decrease was slight, students still perceived their interest in the AS Career Pathway to be between *moderately* and *very* interested (*M* = 3.57, *SD* = 1.51) after completing the experience. During the second experience, AS.02, the two students indicated they were *very* interested (*M* = 4.00, *SD* = 0.00) to learn more on both the pre-experience and post-experience questionnaire. These data are displayed in Tables 10 and 11.

Perceived motivation to pursue a career in AS consistently ranged from *moderately* motivated to *very* motivated both before and after students initiated the first AS experience. Prior to completing the pre-questionnaire, student motivation (*M* = 3.00, *SD* = 1.15) toward the AS Career Pathway showed moderate motivation; however, the post-questionnaire produced a slight increase in motivation (*M* = 3.29, *SD* = 1.25) for pursuing a career in the AS Career Pathway. During the second experience, AS.02, the two students indicated they were *very* motivated (*M* = 4.00, *SD* = 0.00) to pursue a career in this career pathway area on both the pre-experience and post-experience questionnaire. These data are displayed in Tables 10 and 11.

Table 10

*Perceived Impact of the First Experience within Animal Systems Pathway on High School SBAE Students (*n = *7)*

	M	*SD*	*r*
Knowledge			.38
Pre	2.57	0.79	
Post	2.71	0.95	
Experience			.00

Pre	2.71	1.25	
Post	2.71	0.95	
Interest			.38
Pre	3.86	1.07	
Post	3.57	1.51	
Motivated			.31
Pre	3.00	1.15	
Post	3.29	1.25	
Clarity	3.29	0.95	
Recommend	2.71	0.95	
Beneficial	3.00	1.15	

Note. Participants were asked to complete a questionnaire after initiating and completing the first pathway experience on 5-point, Likert-type scale (1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely) for their knowledge, experience, interest, and motivation toward the AS Career Pathway. The Wilcoxon Signed Ranks Test was used because the data failed normality (Wilcoxon, 1945). Although the data failed to meet assumption on sample size, effect sizes were determined based on Cohen (1969) reporting knowledge to have a moderate effect size ($r = 0.38$), experience to not have an effect size ($r = 0.00$), interest to have a moderate effect size ($r = 0.38$), and motivation to have a moderate effect size ($r = 0.31$).

Table 11

*Perceived Impact of the Second Experience within Animal Systems Pathway on High School SBAE Students (*n = *2)*

	M	*SD*	*r*
Knowledge			.71
Pre	2.50	0.71	
Post	3.50	0.71	
Experience			.71
Pre	2.50	0.71	
Post	4.00	1.41	
Interest			.00
Pre	4.00	0.00	
Post	4.00	0.00	
Motivated			.00
Pre	4.00	0.00	
Post	4.00	0.00	

Clarity	3.00	1.41
Recommend	3.00	1.41
Beneficial	3.00	1.41

Note. Participants were asked to complete a questionnaire after initiating and completing the second pathway experience on 5-point, Likert-type scale (1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely) for their knowledge, experience, interest, and motivation toward the AS Career Pathway. The Wilcoxon Signed Ranks Test was used because the data failed normality (Wilcoxon, 1945). Although the data failed to meet assumption on sample size, effect sizes were determined based on Cohen (1969) reporting knowledge to have a large effect size ($r = 0.71$), experience to have a large effect size ($r = 0.71$), interest to not have an effect size ($r = 0.00$), and motivation to not have an effect size ($r = 0.00$).

Perceived knowledge, experience, interest to learn more, and motivation to pursue a career in the AS Career Pathway is valuable to knowing the impact of the AgCE; however, further information was gathered on the platform itself. The post-experience questionnaire additionally sought to receive feedback through questions such as: "On a scale from 1 to 5, how beneficial did you find the experience to be?," "On a scale from 1 to 5, how likely would you be to recommend the resource?," and "On a scale from 1 to 5, rank the clarity of the experience." Additionally, students perceived the AS experiences to be moderately clear during the first experience ($M = 3.25$, $SD = 1.04$) as well as the second ($M = 3.00$, $SD = 1.41$). Students were *slightly* to *moderately* likely to recommend ($M = 2.75$, $SD = 1.04$) the AgCE as a resource after completing the first experience in AS and *moderately* likely to recommend ($M = 3.00$, $SD = 1.41$) after completing the second experience. Finally, students found this pathway experience to be *moderately* beneficial ($M = 3.00$, $SD = 1.20$) after the first experience, as well as after the second ($M = 3.00$, $SD = 1.41$). These data are displayed in Tables 10 and 11.

The FPPS experience within the AgCE aligns with the National AFNR Pathway for FPPS and includes inspection and food-borne illness prevention, product production and development,

and food transportation and distribution. One SBAE student initiated the FPPS pathway, completing the first experience within the career pathway area. This SBAE students completed both the pre and post questionnaires for the first experience (NRS.01). These data are displayed in Table 12.

One SBAE student perceived themselves to be *slightly* knowledgeable ($M = 2.00$, $SD = 0.00$) in FPPS prior to completing the career pathway experience. After completing one experience (FPPS.01), the post-experience questionnaire indicated no change in their perceived knowledge ($M = 2.00$, $SD = 0.00$). These data are displayed in Table 12.

In addition to perceived knowledge, the SBAE student who initiated the FPPS Career Pathway on the AgCE initially perceived themselves to be *not at all* experienced ($M = 1.00$, $SD = 0.00$) in FPPS prior to completing the career pathway experience. After completing one experience (FPPS.01), the post-experience questionnaire indicated no change in their perceived experience ($M = 1.00$, $SD = 0.00$). These data are displayed in Table 12.

Prior to completing the FPPS.01 experience, students were asked "How interested are you to learn more about natural resources?" to which they responded *moderately* interested ($M = 3.00$, $SD = 0.00$). After completing one of five experiences (FPPS.01), the post-experience questionnaire indicated no change in their perceived interest ($M = 3.00$, $SD = 0.00$). These data are displayed in Table 12.

Related to interest, students were asked how motivated they were to pursue a career in FPPS both before and after completing the AgCE experiences. Student motivation toward a career in food products and processing proved to be consistent in the pre-experience and post-experience questionnaires indicating they were and are *very* motivated ($M = 4.00$, $SD = 0.00$) to pursue a career in FPPS. These data are displayed in Table 12.

Table 12

*Perceived Impact of the First Experience within Food Products and Processing Systems Pathway on High School SBAE Students (*n = *1)*

	M	*SD*	*r*
Knowledge			.00
Pre	2.00	0.00	
Post	2.00	0.00	
Experience			.00
Pre	1.00	0.00	
Post	1.00	0.00	
Interest			.00
Pre	3.00	0.00	
Post	3.00	0.00	
Motivated			.00
Pre	4.00	0.00	
Post	4.00	0.00	
Clarity	4.00	0.00	
Recommend	4.00	0.00	
Beneficial	5.00	0.00	

Note. The participant was asked to complete a questionnaire after initiating and completing the first pathway experience on 5-point, Likert-type scale (1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely) for their knowledge, experience, interest, and motivation toward the NRS Career Pathway.

In addition to asking students' perceived knowledge, experience, interest to learn more, and motivation to pursue a career in the FPPS Career Pathway, the post-experience questionnaire sought to receive feedback on the quality of the AgCE pathways by asking: "On a scale from 1 to 5, how beneficial did they find the experience?," "On a scale from 1 to 5, how likely would you be to recommend the experience?," and "On a scale from 1 to 5, rank the clarity of the experience." Students perceived the FPPS experience to be *very* clear ($M = 4.00$, $SD = 0.00$). Students were *very* likely to recommend ($M = 4.00$, $SD = 0.00$) the AgCE as a resource after completing the first experience in FPPS. Finally, they found this pathway experience to be and *extremely* beneficial ($M = 5.00$, $SD = 0.00$). These data are displayed in Table 12

The NRS experience within the AgCE aligns with the National AFNR Pathway for NRS. Experiences include assessing and managing wildlife in different ecosystems, fishing pole ecology, natural resource inventory, water source preservation, and personal resource inventory. One SBAE student initiated the NRS pathway, completing the first and second experiences within the career pathway area. This SBAE students completed both the pre and post questionnaires for the first experience (NRS.01) and the second (NRS.02). These data are displayed in Tables 13 and 14.

The SBAE student perceived themselves to be *moderately* knowledgeable (*M* = 3.00, *SD* = 0.00) in natural resources prior to completing the first career pathway experience. After completing one experience (NRS.01), they completed the post-experience questionnaire indicating no change in their perceived knowledge (*M* = 3.00, *SD* = 0.00). The same student then continued to the second experience (NRS.01) where they indicated they were *not at all* knowledgeable (*M* = 1.00, *SD* = 0.00) prior to the second experience. However, the post-experience questionnaire for the second experience indicated a two-point increase in perceived knowledge to *moderately* knowledgeable (*M* = 3.00, *SD* = 0.00). These data are displayed in Tables 13 and 14.

In addition to perceived knowledge, the SBAE students who initiated the NRS Career Pathway on AgCE initially perceived themselves to be *slightly* experienced *(M* = 2.00, *SD* = 0.00). This observation was obtained during the pre-questionnaire for NRS.01 which increased by 2.00 in their perceived experience *(M* = 4.00, *SD* = 0.00) after completing the first experience. Continuing in the NRS Career Pathway area, the students perceived themselves be *slightly* experienced *(M* = 2.00, *SD* = 0.00) prior to the second experience, yet increased to *moderately* experienced *(M* = 4.00, *SD* = 1.41) after completing NRS.02. These data are displayed in Tables 13 and 14.

Prior to completing the NRS.01 experience, students were asked "How interested are you to learn more about natural resources?" to which they responded *very interested* (*M* = 4.00, *SD* = 0.00). After completing the experience, the one student completed the post-experience questionnaire indicating a 2-point decrease in interest after completing the first experience in the NRS Career Pathway. Nonetheless, they continued to the second experience Career Pathway experiences (NRS.01), the student perceived themself to be *moderately* interested in the NRS Career Pathway (*M* = 3.0, *SD* = 0.00), as they indicated in both the pre-experience and the post-experience questionnaire. These data are displayed in Tables 13 and 14.

Related to interest, students were asked how motivated they were to pursue a career in NRS both before and after completing the AgCE experiences. Student motivation toward a career in natural resources proved to be consistent in the pre-experience and post-experience questionnaires. The one student indicated they are *extremely* motivated (*M* = 5.00, *SD* = 0.00) to pursue a career in NRS prior to and after completing the first experience within the NRS career pathway. Further, the same student indicated they were *moderately* motivated (*M* = 3.00, *SD* = 0.00) to pursue a career in NRS prior to and after completing the second NRS career pathway experience. These data are displayed in Tables 13 and 14.

Table 13

*Perceived Impact of the First Experience within Natural Resource Systems Pathway on High School SBAE Students (*n = *1)*

	M	*SD*	*r*
Knowledge			.00
Pre	3.00	0.00	
Post	3.00	0.00	
Experience			.00
Pre	2.00	0.00	
Post	4.00	0.00	
Interest			.00
Pre	4.00	0.00	

Post	2.00	0.00	
Motivated			.00
Pre	5.00	0.00	
Post	5.00	0.00	
Clarity	2.00	0.00	
Recommend	3.00	0.00	
Beneficial	5.00	0.00	

Note. The participant was asked to complete a questionnaire after initiating and completing the first pathway experience on 5-point, Likert-type scale (1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely) for their knowledge, experience, interest, and motivation toward the NRS Career Pathway.

Table 14

*Perceived Impact of the Second Experience within Natural Resource Systems Pathway on High School SBAE Students (*n = *1)*

	M	*SD*	*r*
Knowledge			.00
Pre	1.00	0.00	
Post	3.00	0.00	
Experience			.00
Pre	2.00	0.00	
Post	3.00	0.00	
Interest			.00
Pre	3.00	0.00	
Post	3.00	0.00	
Motivated			.00
Pre	3.00	0.00	
Post	3.00	0.00	
Clarity	1.00	0.00	
Recommend	2.00	0.00	
Beneficial	1.00	0.00	

Note. The participant was asked to complete a questionnaire after initiating and completing the second pathway experience on 5-point, Likert-type scale (1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely) for their knowledge, experience, interest, and motivation toward the NRS Career Pathway.

Perceived knowledge, experience, interest to learn more, and motivation to pursue a career in the AS Career Pathway is valuable to knowing the impact of the AgCE; however, further information was gathered on the platform itself. The post-experience questionnaire additionally sought to receive feedback through questions such as: "On a scale from 1 to 5, how beneficial did you find the experience to be?," "On a scale from 1 to 5, how likely would you be to recommend the resource?," and "On a scale from 1 to 5, rank the clarity of the experience." Additionally, the student perceived the NRS experiences to be *slightly* clear during the first experience ($M = 2.00$, $SD = 0.00$) and *not at all* clear after the second ($M = 1.00$, $SD = 0.00$). They were *moderately* likely to recommend ($M = 3.00$, $SD = 0.00$) the AgCE as a resource after completing the first experience in NRS and *slightly* likely to recommend ($M = 2.00$, $SD = 0.00$) after completing the second experience. Finally, students found this pathway experience to be *extremely* beneficial ($M = 5.00$, $SD = 1.00$) after the first experience and *not at all* beneficial after the second ($M = 1.00$, $SD = 0.00$). These data are displayed in Tables 13 and 14.

The PS experience within the AgCE aligns with the National AFNR Pathway for PS. The experiences include backyard gardening, community beautification projects, greenhouse opportunities, floral design, and plant propagation. Four SBAE students initiated the PS pathway. Three SBAE students completed both the pre and post questionnaires for the first experience (PS.01) and one SBAE student completed the pre-questionnaire only for PS.01. These data are displayed in Table 15.

As observed in Table 15, nine SBAE students perceived themselves to be *slightly* to *moderately* knowledgeable ($M = 2.22$, $SD = 1.20$) in plant science prior to completing the PS Career Pathway first experience. After completing PS.01, students completed the post-experience questionnaire indicating a slight increase in their perceived knowledge ($M = 2.67$, $SD = 1.22$). Although continuing to be *slightly* to *moderately* knowledgeable, participating students in the PS

Career Pathway increase 0.45 in their perceived average knowledge, with a moderate effect score, after completing one experience. These data are displayed in Table 15.

In addition to perceived knowledge, the SBAE students who initiated the PS Career Pathway on AgCE initially perceived themselves to be *slightly* to *moderately* experienced (M = 2.56, SD = 1.24). This observation was obtained during the pre-questionnaire for PS.01. Once students completed the experience in PS, they perceived their experience to decrease by 0.23 in their perceived average experience (M = 2.33, SD = 1.22). Although a decrease, they still perceived themselves to be between *slightly* and *moderately* experienced after completing the first PS experience. These data are displayed in Table 15.

During the pre-experience questionnaire, students were asked "How interested are you to learn more about plant science?" to which they responded *moderately* interested (M = 3.11, SD = 1.17). As the students continued through the experience, their interest to learn more stayed consistent in the *moderately* interested (M = 3.11, SD = 1.27) during the post-experience questionnaire. These data are displayed in Table 15.

The four students who initiated the PS Career Pathway indicated they were *moderately* motivated (M = 4.11, SD = 1.30) to pursue a career in the PS career pathway area prior to completing the AgCE experience. However, the nine students who followed through to complete the experience and post-experience questionnaire indicated a decrease in motivation (M = 3.00, SD = 1.50). This decrease was observed after students completed the first of five career pathway experiences (PS.01), resulting in a drop within the *moderately* motivated range. These data are displayed in Table 15.

Table 15

*Perceived Impact of the First Experience within the Plant Systems Pathway on High School SBAE Students (*n = *9)*

	M	*SD*	*r*
Knowledge			.38
Pre	2.22	1.20	
Post	2.67	1.22	
Experience			.24
Pre	2.56	1.24	
Post	2.33	1.22	
Interest			.00
Pre	3.11	1.17	
Post	3.11	1.27	
Motivated			.12
Pre	3.11	1.30	
Post	3.00	1.50	
Clarity	2.56	1.33	
Recommend	2.56	1.13	
Beneficial	2.67	1.32	

Note. Participants were asked to complete a questionnaire after initiating and completing the first pathway experience on 5-point, Likert-type scale (1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely) for their knowledge, experience, interest, and motivation toward the PS Career Pathway. The Wilcoxon Signed Ranks Test was used because the data failed normality (Wilcoxon, 1945). Although the data failed to meet assumption on sample size, effect sizes were determined based on Cohen (1969) reporting knowledge to have a moderate effect size ($r = 0.38$), experience to have a small effect size ($r = 0.24$), interest to have no effect size ($r = 0.00$), and motivation to have a small effect size ($r = 0.12$).

Perceived knowledge, experience, interest to learn more, and motivation to pursue a career in the PS Career Pathway is valuable to knowing the impact of the AgCE; however, further information was gathered on the platform itself. The post-experience questionnaire additionally sought to receive feedback through questions such as: “On a scale from 1 to 5, how beneficial did you find the experience to be?,” “On a scale from 1 to 5, how likely would you be to recommend the resource?,” and “On a scale from 1 to 5, rank the clarity of the experience.” It was found that students perceived the PS experience to be *slightly* to *moderately* clear ($M = 2.56$, $SD = 1.33$). Students were *slightly* to *moderately* likely to recommend ($M = 2.56$, $SD = 1.13$) the AgCE as a resource after completing the first experience in PS. Finally, they found this pathway experience

to be *slightly* to *moderately* beneficial (*M* = 2.67, *SD* = 1.32). These data are displayed in Table 15.

The PSTS experience within the AgCE aligns with the National AFNR Pathway for PSTS. The experiences include energy production impact on daily life, cereal grain production, agricultural engineering, planning machinery, protection, and hands-on career opportunities. Eleven SBAE students initiated the PSTS pathway. Seven SBAE students completed both the pre-experience and post-experience questionnaires for the first of five experiences (PSTS.01), one SBAE student completed the pre-questionnaire only for PSTS.01, and one SBAE student partially completed the pre-questionnaire in addition to completing the post-questionnaire for PSTS.01. One SBAE student also completed both the pre-experience and post-experience questionnaires for the second (PSTS.02) and third (PSTS.03) experiences. These data are displayed in Tables 16, 17, and 18.

SBAE students perceived themselves to be between *moderately* and *very* knowledgeable (*M* = 3.29, *SD* = 0.79) in the PSTS Career Pathway prior to completing the first career pathway experience. After completing the first experience, students completed the post-experience questionnaire indicating the same level of perceived knowledge (*M* = 3.29, *SD* = 1.11). Further, one student who chose to initiate and complete the second experience, perceived themselves to be *slightly* knowledgeable (*M* = 2.00, *SD* = 0.00) in the PSTS Career Pathway prior to completing the second career pathway experience. Once completing their second experience, they recorded an increase in perceived knowledge (*M* = 3.00, *SD* = 0.00). Further, the same student perceived themselves as *moderately* knowledgeable (*M* = 3.00, *SD* = 0.00) when completing the pre- and post-experience questionnaires for the third experience in the PSTS career pathway. These data are displayed in Tables 16, 17, and 18.

In addition to perceived knowledge, the SBAE students who initiated the PSTS Career Pathway on AgCE initially perceived themselves to be *slightly* to *moderately* experienced *(M* = 2.86, *SD* = 0.69). This observation was obtained during the pre-questionnaire for PSTS.01 where they indicated an increase in their perceived experience *(M* = 3.00, *SD* = 1.00) after completing the first experience. During the second experience, the one student perceived themselves be *not at all* experienced *(M* = 1.00, *SD* = 0.00) prior to the second experience, yet increased to *moderately* experienced *(M* = 3.00, *SD* = 0.00) after completing PSTS.02. Consequently, they perceived themselves to be moderately experienced prior to experience three; however, during the post-experience questionnaire they indicated a decrease to slightly experienced after completing PSTS.03. These data are displayed in Tables 16, 17, and 18.

During the pre-experience questionnaire for the first experience, students were asked, "How interested are you to learn more about animal systems?" to which they responded *moderately* to *very* interested (*M* = 3.71, *SD* = 0.95). Their perceived interest increased, although staying in the *moderately* to *very* interested (*M* = 3.86, *SD* = 1.07) range. Considering the student who continued through experience two and three, they indicated they were *moderately* interested (*M* = 3.00, *SD* = 0.00) to learn more prior to completed experience two. An increase to *very* interested (*M* = 4.00, *SD* = 0.00) was documented after completing experience two. During the third experience, the student indicated they were still *very* interested (*M* = 4.00, *SD* = 0.00); however, the post-experience questionnaire for PSTS.03 reflected a decrease to *slightly* interested (*M* = 2.00, *SD* = 0.00). These data are displayed in Tables 16, 17, and 18.

SBAE students perceived themselves to be *very* motivation (*M* = 4.014, *SD* = 1.21) to pursue a career in PSTS prior to initiating the first pathway experience. However, after completing PSTS.01, post-experience questionnaires reflected a decrease, SBAE students were *moderately* to *very* motivated (*M* = 3.71, *SD* = 1.11) to pursue a career in PSTS after completing the first career pathway experience. During the second experience, PSTS.02, the students

indicated they were *moderately* motivated (*M* = 3.00, *SD* = 0.00) to pursue a career in this career pathway area on both the pre-experience and post-experience questionnaire. Lastly, the pre-experience questionnaire for PSTS.03 indicated the student was *moderately* motivated (*M* = 3.00, *SD* = 0.00), yet the *post*-experience questionnaire for PSTS.03 reflected a decrease to *slightly* motivated (*M* = 2.00, *SD* = 0.00) after completing the third experience. These data are displayed in Tables 16, 17, and 18.

Table 16

*Perceived Impact of the First Experience within the Power, Structural, and Technical Systems Pathway on High School SBAE Students (*n = *7)*

	M	*SD*	*r*
Knowledge			.00
Pre	3.29	0.76	
Post	3.29	1.11	
Experience			.14
Pre	2.86	0.69	
Post	3.00	1.00	
Interest			.38
Pre	3.71	0.95	
Post	3.86	1.07	
Motivated			.51
Pre	4.14	1.21	
Post	3.71	1.11	
Clarity	3.43	1.81	
Recommend	3.29	0.76	
Beneficial	3.14	1.35	

Note. Participants were asked to complete a questionnaire after initiating and completing the pathway experience on 5-point, Likert-type scale (1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely) for their knowledge, experience, interest, and motivation toward the PSTS Career Pathway. The Wilcoxon Signed Ranks Test was used because the data failed normality (Wilcoxon, 1945), effect sizes were determined based on Cohen (1969) reporting knowledge to not have an effect size (*r* = 0.00), experience to have a small effect size (*r* = 0.14), interest to have a moderate effect size (*r* = 0.38), and motivation to have a large effect size (*r* = 0.51).

Table 17

*Perceived Impact of the Second Experience within the Power, Structural, and Technical Systems Pathway on High School SBAE Students (*n = *1)*

	M	*SD*	*r*
Knowledge			.00
Pre	2.00	0.00	
Post	3.00	0.00	
Experience			.00
Pre	1.00	0.00	
Post	3.00	0.00	
Interest			.00
Pre	3.00	0.00	
Post	4.00	0.00	
Motivated			.00
Pre	3.00	0.00	
Post	3.00	0.00	
Clarity	4.00	0.00	
Recommend	5.00	0.00	
Beneficial	4.00	0.00	

Note. The participant was asked to complete a questionnaire after initiating and completing the second pathway experience on 5-point, Likert-type scale (1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely) for their knowledge, experience, interest, and motivation toward the PSTS Career Pathway.

Table 18

*Perceived Impact of the Third Experience within the Power, Structural, and Technical Systems Pathway on High School SBAE Students (*n = *1)*

	M	*SD*	*r*
Knowledge			.00
Pre	3.00	0.00	
Post	3.00	0.00	
Experience			.00
Pre	3.00	0.00	
Post	2.00	0.00	
Interest			.00
Pre	4.00	0.00	

Post	2.00	0.00	
Motivated			.00
Pre	3.00	0.00	
Post	2.00	0.00	
Clarity	2.00	0.00	
Recommend	3.00	0.00	
Beneficial	1.00	0.00	

Note. The participant was asked to complete a questionnaire after initiating and completing the second pathway experience on 5-point, Likert-type scale (1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Very, 5 = Extremely) for their knowledge, experience, interest, and motivation toward the PSTS Career Pathway.

Perceived knowledge, experience, interest to learn more, and motivation to pursue a career in the AS Career Pathway is valuable to knowing the impact of the AgCE; however, further information was gathered on the platform itself. The post-experience questionnaire additionally sought to receive feedback through questions such as: "On a scale from 1 to 5, how beneficial did you find the experience to be?," "On a scale from 1 to 5, how likely would you be to recommend the resource?," and "On a scale from 1 to 5, rank the clarity of the experience." Additionally, students perceived the PSTS career pathway to be *moderately* to *very* clear (M = 3.43, SD = 1.81) during the first experience, *very* clear (M = 4.00, SD = 0.00) during the second experience, and *slightly* clear (M = 2.00, SD = 0.00) regarding the third experience. Students were *moderately* to *very* likely to recommend (M = 3.29, SD = 0.76) the AgCE as a resource after completing the first experience in PSTS, *extremely* likely to recommend (M = 5.00, SD = 0.00) after completing the second experience, and *moderately* likely to recommend (M = 3.00, SD = 0.00) the resource after the third experience. Finally, students found this pathway experience to be *moderately* beneficial (M = 3.14, SD = 1.35) after completing the first experience, *very* beneficial (M = 4.00, SD = 0.00) after the second experience, and *not at all* beneficial (M = 1.00, SD = 0.00) after the third experience. These data are displayed in Tables 16, 17, and 18.

One career pathway experience was not initiated by students, Agricultural Communications Systems (ACS). ACS with the Oklahoma Agricultural Communications Pathway Experiences and includes photography, broadcasting, press releases, graphics, and presentations. ACS is not documented in the SAE report because it is not nationally recognized.

Findings and Interpretations associated with the Qualitative Data

Data for this portion of this study were collected through qualitative interviews with 10 SBAE instructors. A brief overview of the teachers is included in Table 19. The interviews were conducted with teachers who responded to an email indicating they would be interested in implementing the AgCE online curricular resource for SAEs in their classrooms. Each SBAE teacher advises SAE projects in their program and agreed to pilot test the use of the AgCE online platform in their classroom during this pilot program release. Data were transcribed verbatim and reviewed several times. Reviewing the data consisted of reading, taking notes, highlighting, and blending the notes together to form a clearer image. Findings can be observed through objective three.

The typical SBAE teacher in this study is a mid-career, traditionally certified person in a multi-teacher program. Most of these teachers (60%) were certified through a university in Oklahoma and teach in the northeast area of the state. Perceptions of the AgCE curricular resource were consistent among those teachers who implemented it in their classes and those who did not. Each teacher recognized the value of a resource like the AgCE as they aim to facilitate SAEs for each of their students. They all indicated they would be interested in trying the resource again with their students after gaining a better understanding and improvements to the program.

Table 19

Pseudonyms Connecting Programs and SBAE Teachers

School Site	SBAE Teacher	AgCE Implementation
A	Mr. Cook (9 years, Rural, Multi-Teacher)	Yes
	Ms. Peters (9 years, Rural, Multi-Teacher)	Yes
B	Mr. Irwin (3 years, Rural, Single Teacher)	No
C	Mr. Overton (8 years, Suburban, Multi-Teacher)	No
	Mrs. Reynolds (10 years, Suburban, Multi-Teacher)	Yes
D	Ms. Baggs (5 years, Rural, Multi-Teacher)	No
E	Ms. Goodman (7 years, Suburban, Multi-Teacher	No
	Mr. Yadon (9 years, Suburban, Multi-Teacher)	No
F	Mr. Hall (8 years, Suburban, Multi-Teacher)	Yes
	Mrs. Hall (8 years, Suburban, Multi-Teacher)	Yes

Note. Ten SBAE teachers from six SBAE programs initiated the AgCE with the intention of implementing it with their SBAE students.

Mr. Cook and Ms. Peters, Site A

Located in northeast Oklahoma, Mr. Cook is in his sixth-year teaching at Site A in a two-teacher program with Ms. Peters. He is traditionally certified in Agricultural Education and received his bachelor's degree from a regional university in Oklahoma in 2013. Prior to his six years at Site A, Mr. Cook taught for three years in northwest Oklahoma in a single-teacher program with a supportive rural farming community. His teaching partner, Ms. Peters, is in her fourth year at Site A where she and Mr. Cook share responsibilities and serve around 150 students in grades 8-12. Ms. Peters also is traditionally certified in Agricultural Education, and she received her bachelor's degree from a state-wide, land-grant university in Oklahoma in 2013. Prior to her four years at Site A, Ms. Peters taught for five years in northwest Oklahoma in a single-teacher program with a supportive rural farming community. Site A is a rural community, but the "nearby city is growing closer each day," according to Mr. Cook. Student enrollment at

Site A, grades 9-12, is approximately 460 in a community of 4,248 (United States Census Bureau, 2020), with a graduation rate of 87.9% (Oklahoma School Report Card, 2021).

Mr. Irwin, Site B

Located in northwest Oklahoma, Mr. Irwin is in his third year at the small, rural school to which he began his teaching career. He is traditionally certified in Agricultural Education and received his bachelor's and master's degrees from a state-wide, land-grant university in Oklahoma in 2017 and 2019. Site B serves 31 students (Oklahoma School Report Card, 2021), grades 9-12, in a community with a population of 124 (United States Census Bureau, 2020), with a graduation rate of 100% (Oklahoma School Report Card, 2019). Mr. Irwin is in a single-teacher program that serves around 30 students, grades 8-12, each year. His program prides itself on state-wide involvement in the FFA as well as engagement in the local community.

Mr. Overton and Mrs. Reynolds, Site C

Located in northeast Oklahoma, Mr. Overton is in his third year at the program he started. He is traditionally certified in Agricultural Education and received his bachelor's degree from a state-wide, land-grant university in Oklahoma in 2014. Mr. Overton started at Site C as a single-teacher program that has now grown to a two-teacher program in years two and three. His teaching partner, Mrs. Reynolds is in her second-year teaching at Site C where they serve approximately 175 students in their program, grades 8-12. Their high school, Site C, serves 1,578 students, grades 9-12, (Oklahoma School Report Card, 2021) in a community with a population of 37,290 (United States Census Bureau, 2020), with a graduation rate of 82.5% (Oklahoma School Report Card, 2020). Mrs. Reynolds is traditionally certified in Agricultural Education and received her bachelor's and master's degrees from a state-wide, land-grant university in Oklahoma (in 2011 and 2013). Prior to teaching at Site C, Mrs. Reynolds taught in a three-teacher program in a rural community in southwest Oklahoma for six years as well as a two-teacher

program in a suburban community in central Oklahoma for two years, and Mr. Overton taught in a three-teacher program in a suburban community in northwest Oklahoma for three years as well as a three-teacher program in a rural community in southwest Oklahoma for two years.

Ms. Baggs, Site D

Located in northeast Oklahoma, Ms. Baggs is in her third-year teaching at Site D, a two-teacher program with around 50 students, grades 8-12, serving a supportive rural community. She is traditionally certified in Agricultural Education and received her bachelor's degree from a regional university in Oklahoma in 2011. Additionally, she received her master's degree in Plant and Soil Science from a state-wide, land-grant university in 2013. Prior to teaching at Site D, Ms. Baggs taught for two years at a two-teacher program in central Oklahoma, followed by four years working for a farm equipment company. Ms. Baggs's teaching partner is a veteran SBAE teacher of 20-plus. Together, they teach in a community with a population of 5,028 (United States Census Bureau, 2020). Site D serves 246 students, grades 9-12, (Oklahoma School Report Card, 2021), with a graduation rate of 94.2% (Oklahoma School Report Card, 2020), in a community that also supports a regional university with an agricultural program.

Ms. Goodman and Mr. Yadon, Site E

Located in central Oklahoma, Ms. Goodman is in her third-year teaching at Site E, a three-teacher program with around 175 students, grades 8-12. One of her teaching partners, Mr. Yadon, is in his ninth-year teaching at Site E where he began his teaching career. They are both traditionally certified in Agricultural Education and received their bachelor's degrees from a state-wide, land-grant university in Oklahoma. Prior to teaching at Site E, Ms. Goodman taught at two rural, single-teacher programs in southwest Oklahoma for four years before moving to Site E. Site E's total high school enrollment is 1,254 (Oklahoma School Report Card, 2021), with a graduation rate of 89.3% (Oklahoma School Report Card, 2020), in a community with a

population of 48,394 (United States Census Bureau, 2020). The suburban community also hosts a land-grant university in addition to a satellite campus of a regional college.

Mr. and Mrs. Hall, Site F

Located in northeast Oklahoma, Mr. Hall is in his fourth-year teaching at Site F, which is a three-teacher program. He teaches with his wife, Mrs. Hall in addition to their third teaching partner. He is traditionally certified in Agricultural Education and received his bachelor's degree from a state-wide, land-grant university in Oklahoma. Mrs. Hall is also traditionally certified in Agricultural Education from a state-wide, land-grant university where she received both her bachelor's and master's degrees. Prior to these four years, Mr. Hall taught in a two-teacher program in a rural community in southwest Oklahoma for four years while Mrs. Hall taught in a single-teacher program in a rural community in the same area. Site F serves 3,485 students, grades 9-12, (Oklahoma School Report Card, 2021), with a graduation rate of 89.7% (Oklahoma School Report Card, 2020), in a community with a population of 25,949 (United States Census Bureau, 2020). Site F serves around 215 students in their program, grades 9-12.

Objective three sought to determine SBAE teachers' perceptions of the AgCE as a curricular resource for teaching SBAE students about SAEs. The achievement of this objective was further informed through the use of an interview protocol. SBAE teachers were asked interview questions regarding their experience exploring and implementing the AgCE resources, how well they perceived their students' interaction with AgCE, and recommendations for developing the AgCE resource further.

Theme: Implementing AgCE Effectively

"In theory, it could have been really great," Mrs. Reynolds acknowledged as she explained the struggles she encountered while using the AgCE in her classroom.

> At first, I was all about choice and for them to find what they'd like to do. So, I told them to do whichever experience they want. It was a terrible idea because they are eighth graders, and there were too many options. I couldn't supervise all their questions.

Additionally, Mrs. Reynolds was challenged by the lack of student motivation to complete assignments, which is worse than she has experienced before, and she attributes it to the impact of the Covid-19 pandemic. Another challenge Mrs. Reynolds identified with managing the individualized approach of the AgCE in her classroom is the capabilities of learners. She explained she had some students who have lower reading comprehension and other students who are high achievers speeding through the experiences. Mrs. Hall shared a similar experience with her students and stated, "I struggled with executing the AgCE as it was not as turnkey as I was hoping."

Although managing students did not appear to challenge Ms. Peters as severely as Mrs. Reynolds, she shared sentiments about the program not being user-friendly. "My students found it difficult to navigate, especially my younger classes. Ms. Peters expressed her own fatigue stating, "For me, the interest stopped as I told them to read this, click here, and complete these worksheets" given she attempted to implement the AgCE in all her classes. Overall, she stated, "It was kind of hit and miss, depending on the class." Although Mr. Cook shared challenges with the resource, he explained, "Once I got on and messed around in it, it was kind of easier to work with than it was in the beginning." Given the importance of interest in SAEs and using the program, Ms. Baggs shared concerns aligning to the challenges Ms. Peters and Mrs. Reynolds alluded to. She stated, "I see a struggle with having a valid turnout because students just don't take anything seriously. . . . I fear some teachers using this as a sub assignment and then not following up with it." Mr. Yadon confirmed this potential use. He stated: "I would like to use it, especially when we're gone for long periods of time, like National [FFA] Convention."

Theme: Increasing SAE Awareness

Mr. Hall does his best to teach a variety of SAE opportunities to meet the interest of the students in his suburban school district. He appreciated the use of the AgCE as "it helped students to be able to see that there are certain things out there that can be considered an SAE that they didn't previously realize because of the AgCE" and in turn "it is a launching pad for students to develop their SAEs." Mr. Cook agreed with Mr. Hall stating, "My students really did enjoy it because it kind of opened their eyes to some of the SAEs or agricultural experiences they wouldn't think about traditionally," Mr. Cook used it for sub work, instructing his students to write an essay over what they learned from choosing an experience that they would not normally consider doing in the future and what made them choose that experience. He explained that he learned things about his students that he did not previously know because with bigger classes he might not know certain things about specific students.

In addition, some students found that they had an interest in an area that they did not originally find interesting. Mr. Cook reflected on this in relation to his own personal experiences where he spent two years of college studying something he no longer found interesting. Mrs. Hall, in agreement, discussed a senior student who planned to attend college but could not choose a course of study. She explained how she used this resource to help identify an area of interest while eliminating certain options. The same sentiments were shared by Ms. Baggs. She stated, "I think it would be a good tool to help students figure out which direction they want to go later on down the road." As the role of an SBAE teacher toward SAEs changes over time, Mr. Hall acknowledged the usefulness of the resource because of its variety and connection to the agricultural industry. He appreciates the agricultural content that broadens students' knowledge as well as exposing them to potential careers.

Theme: Motivating Students to Succeed

Mrs. Hall, Mrs. Reynolds, Ms. Peters, and Ms. Baggs all discussed the challenges associated with student interest. Mrs. Hall stated, "I did it with my freshman, my intro students. Some of them took it seriously, some just kind of blew through it, and then I have one student who thought it was really simple and not detailed enough." This statement reflects the challenges identified by Mrs. Reynolds when implementing the resource into her classroom. Moreover, she stated, "Students were very overwhelmed by the steps and lost motivation after they realized that the first experience in the pathway was one of five." She offered a potential solution by stating, "In theory, you could assign it over a semester, but that would likely result in a lot of zeros in my classes."

Technological advancements in the classroom inspired a solution that was identified by both Ms. Peters and Mrs. Reynolds – gamification. Specifically, Mrs. Reynolds asserted, "I suggest you gamify it to increase student interest." A lack of interactive components coupled with a lot of reading was identified by Ms. Peters and led to her suggestion, "If you could gamify it, like Journey 2050, then I think it could be very engaging and educational for students." Consequently, this approach could have the potential to engage students and eliminate concerns regarding students' intentional interaction with the program. Nonetheless, SBAE teacher involvement to guide and support SAE projects would still be needed to ensure intentionality.

Theme: Identifying a Target Audience

Challenges arise with a variety of SAE projects as SBAE teachers attempt to manage them all to a high level. "I would prefer it be more curriculum-based, where my perspective as the teacher could eliminate some of the individual assignment confusion." However, she acknowledged, "I am teaching eighth graders so it might be different with older, more experienced students." Ms. Peters somewhat contradicted Mrs. Reynolds statement by saying, "I

feel like it's aimed more toward my eighth graders and freshman, but if it's not then I don't know if I would do it." Regardless, Ms. Baggs assessed, "I think it can be a really good resource in Oklahoma, where I feel like we do not have a very strong curriculum." In addition, she stated, "It could be a really good piece of the puzzle, where maybe in your younger classrooms like your eighth, ninth and tenth graders are figuring out what pathway they want to focus on for their SAE." She concluded, "I could see it becoming an actual curriculum that ties in with the AET, career pathways, and agricultural certificates students can receive."

Theme: Learning to Do

Mr. Overton, Mr. Yadon, and Mr. Irwin did not implement the AgCE and all expressed sentiments associated with their lack of understanding regarding the AgCE and how it hindered their confidence to execute it with their students. Specifically, Mr. Overton shared, "I would say for me, just probably selfishly, I am leery about trying new things in the classroom that maybe I don't necessarily understand really well." He also acknowledged, "I think it's a great resource that we could use, I was just too unfamiliar and that was my excuse for why I didn't really use it." His concerns were echoed by Mr. Irwin who stated, "I would like to use it, I just need more clarity on how to use it through a conversation like we are having now." Although resources were provided, the timing and convenience of them might have impacted their use as Mr. Yadon expressed, "I could have used a little more guided help from a teacher and student perspective; however, when you sent out those resources we were back in school." Mr. Overton and Mr. Yadon shared similar regrets explaining their need for a structured in-service over the summer or less busy time of the year.

Theme: Timing Challenges

Timing appeared as a theme for not using the AgCE resource as SBAE teacher resources are busy. Mr. Yadon expressed, "I didn't get the time to really try it with my students because we

were switching between online and in-person on a week-to-week basis." Further, "I started it online, but then we started back in person, and I didn't want my students to be working on a computer when we could be doing hands-on activities." Other timing dilemmas were identified by Ms. Baggs and Mr. Irwin that related directly to their calendar. Ms. Baggs, also did not implement the resource, she elaborated, "I didn't dig too deep into it because we got busy with stock shows and then CDEs, and I kind of forgot about it." Similarly, Mr. Irwin shared, "I got lost in the hustle and bustle of the weeks as the semester started." These challenges had a direct influence on the SBAE teachers' implementation of the AgCE resource.

CHAPTER V

CONCLUSION

Research Problem Statement

Project-based learning and SAEs are integral components of a SBAE program (Smith & Rayfield, 2016); however, the need to involve students in SAEs has been a constant and ongoing struggle for SBAE teachers for at least the last three decades (Stewart & Birkenholz, 1991). SBAE teachers are often the most influential source of inspiration when it comes to increasing and developing students' motivation and interest to develop their SAEs (Baker et al., 2012; Bird et al., 2013; Rubenstein & Thoron, 2015). Unfortunately, SBAE teachers lack sufficient knowledge regarding SAEs, specifically (Doss & Rayfield, 2019), and within various AFNR Career Pathways, generally (Snider et al., 2021). Therefore, research is needed to further explore the resources available that might increase teacher knowledge and student engagement in these areas.

Purpose and Objectives

The purpose of the study was to evaluate how the creation of the AgCE curricular resource impacted both SBAE students and teachers. Specifically, the study sought to:

1. Describe the SBAE students' personal characteristics, such as sex, age, ethnicity, home community size, high school classification, and years of experience in the SBAE program.

2. Evaluate the impact of the AgCE curricular resource on SBAE students' knowledge, experience, motivation, and interest related to their self-selected AFNR career pathway experience.

3. Determine SBAE teachers' perceptions of the AgCE as a curricular resource for teaching SBAE students about SAEs.

Conclusions

The typical SBAE student participating in this study was a white, eighth-grade male in his first year in an agricultural education program living in rural Oklahoma. It can be concluded students are most interested in the AS Career Pathway prior to initiating the AgCE curricular resource. This was evident from the 13 students who initiated the AS career pathway experience, attributing to approximately 35% of the quantitative findings. Students are most interested in learning more about the animal industry and what careers are available to them. This conclusion aligns with current records regarding SAEs among Oklahoma SBAE programs as it is the most populated career pathway area, approximately 62% of all SAEs in Oklahoma SBAE programs (see Table 2).

SBAE students are more agriculturally literate after engaging in the AgCE. This conclusion is supported by the participants' increase in perceived knowledge about specific AFNR Career Pathways. Perceived knowledge increased across all Career Pathways when comparing pre-experience and post-experience questionnaires. Given students gained perceived knowledge in these experiences, their control beliefs are more likely to be positively influenced toward using the AgCE resource (Ajzen, 1991). Specifically, NRS exhibited the largest gain in

perceived knowledge; however, only two students were documented in that experience. The next largest gain was observed in the AS career pathway experiences, the most populated career pathway in the AgCE and among Oklahoma SBAE students statewide.

SBAE students' have more career pathway experience after engaging in the AgCE. This conclusion is in alignment with literature regarding the importance of experiences both by enhancing learning (Baker et al., 2012) and level of importance, scaffolded through content knowledge, for the agricultural industry based on previous experiences (Snider et al., 2021). There was an increase in perceived experience for all Career Pathways in the AgCE as indicated by a medium effect size between pre-experience and post-experience questionnaires. This perceived increase in experience could influence students' control beliefs toward the resource (Ajzen, 1991). Further, the largest gain in experience was observed in the NRS career pathway; however, is it important to consider the number of participants while also acknowledging these students likely had the most to learn about this career pathway given the lack of popularity of this type of SAE in Oklahoma (The AET, 2022). The smallest gains in experience, however, were found in the AS and PSTS career pathway areas. This finding is expected, however, as those areas are the two most populated career pathway areas for Oklahoma SAE. It is possible, students were familiar with those two career pathway areas before engaging with AgCE.

SBAE students' interest in continuing their experience in the AgCE is affected by their experience in the AgCE career pathway they chose to initiate. As students learned more about their chosen career pathway through the AgCE, their interests or perception of their experience with the resource could influence their desire to learn more about potential SAEs or future career opportunities within that career pathway area (Ajzen, 1991). The conclusion above supports the purpose of Foundational SAEs (SAE for All, 2022) to expose students to career opportunities that may interest them before pursuing an immersion SAE. On the other hand, it is also possible these factors deter participation given the students review of the career pathway experiences within the

AgCE resource. Upon initiating the AgCE, students indicated they were between *moderately* and *very* interested in learning more about the Career Pathway they chose to explore. After completing their chosen experience, ABS, PS, and PSTS interest to learn more increased. In contrast, SBAE students who completed the AS and NRS Career Pathways resulted in a decrease in their interest to learn more about the career pathway within the AgCE resource.

Students' motivation to pursue a career in their chosen Career Pathway area is not influenced by their experience with the AgCE. Prior to and after initiating the AgCE resource and pathway experiences, students indicated they were between *moderately* and *very* motivation to pursue a career in their chosen Career Pathway. Relating this to the theoretical frame of the study, SBAE students' behavioral beliefs toward the career pathway stayed consistent and were not influenced by normative or control beliefs (Ajzen, 1991). This leads to the thought AgCE is not adequately motivating students toward their future career interests, indicating Foundational SAEs (SAE for All, 2022) may not be effective in helping choose an immersion SAE associated with a career pathway.

Some aspects of the AgCE resource need to be improved given the weakness identified by the teachers and students who initiated it. Components intended to develop interest and motivate student learning need to be revised. Further, the AgCE experiences were deemed moderately clear by students who participated in the study, indicating room for improvement with instructions and expectations. These areas for improvement contribute to the conclusion SBAE students may not recommend the AgCE to other students. Ultimately, these perceived difficulties from their engagement with the AgCE negatively affect control beliefs as explained by Ajzen (1991) and decrease future intentions to initiate the AgCE resource.

AgCE is an effective curricular resource for SBAE teachers to implement in their classrooms and facilitate SAE development. Given teacher capacity concerns for implementing

new curriculum, this must be considered in the AgCE improvements to ensure the resource is user-friendly and turnkey. This conclusion is supported by research regarding teacher knowledge of and perceptions toward educational resources that are impactful for student learning and development (Loewenburg-Ball et al., 2008).

Teachers believe AgCE increases awareness of SAE opportunities among SBAE students and helps them introduce a variety of project ideas. This conclusion aligns with Retallick (2010) and National FFA's efforts to develop resources around SAEs that enhance SBAE teachers' ability to implement them effectively (SAE for All, 2022). Similarly, this conclusion is supported by the quantitative data in that students identified interest in learning about and motivation to pursue a future career in five of the seven career pathway experiences included in AgCE.

SBAE teachers' approach to implementing the AgCE resource influences SBAE students' experience. Based on the qualitative findings, teachers employed the resource differently in their classrooms. Some had all students complete the same experience, while others let them choose the experience or challenged them to try something with which they were not familiar. This conclusion aligns with the behavioral and control beliefs explained in Ajzen (1991) by influencing students' behavior to initiate, complete, and recommend the AgCE.

The teacher resources for AgCE are not user-friendly. This inhibited SBAE teacher implementation and contributed to negative attitudes toward the AgCE. Previous challenges relating to curricular resources, especially those designed for SAEs and career pathways, are documented in the literature by Retallick (2010) as well as Doss and Rayfield (2019), Dyer and Osborne (1996), Rubenstein and Thoron (2015), Smith and Rayfield (2016), and Snider et al. (2021). Further, Snider et al. (2021) stated knowledge and competence in both SAE types and the avenue in which to teach them influences SBAE teachers' ability to effectively execute the curriculum. Thus, it can be concluded that effective instruction of content, specifically relating to

SAEs, requires structured guidance or some sort of instruction for the teachers. Further, control beliefs (Ajzen, 1991) are influenced when SBAE teachers do not have available resources and perceive the content to be difficult, potentially deterring instruction of all SAEs and the use of the AgCE. Qualitative data from all SBAE teachers supported this conclusion.

Further development of the AgCE resource is needed to ensure that it is accessible and clear to teachers for implementation. Making necessary improvements to the content as well as the management of the resource will lessen the dissonance between theory and practice as well as learning and experience, as discussed in Retallick (2010). This conclusion is supported by three qualitative findings: 1) Implementing AgCE Effectively, 2) Capitalizing on Student Interest, and 3) Identifying a Target Audience. Consistent with previous research on student motivation (Bird et al., 2013; Osborne, 1988a), SBAE teachers indicated that they were losing student interest and motivation very early in the implementation because of the complexity of the website and worksheets. Further, capabilities of students such as age and educational level were noted as distinguishing factors during their implementation. These findings can be triangulated with the quantitative findings associated with student interest, motivation, and overall perception of the AgCE.

Although the AgCE is a viable solution for meeting the needs associated with implementing SAEs in SBAE, timing is a critical component to its effectiveness as a curricular resource. Timing influenced this implementation of the AgCE curricular resource in three ways. First, the capacity of SBAE teachers is limited as they are expected to meet a variety of expectations (Rank & Retallick, 2017). Introducing the wide scope of SAE opportunities is difficult and supervising that scope of SAE projects is even more challenging (Doss & Rayfield, 2019; Retallick, 2010; Robinson & Haynes, 2011). These challenges were all identified by SBAE teachers in their personal interviews, indicating they valued the program and hoped they could employ it at some point. Further, the timing during the school year when the resource was

released, in addition to the time they had to learn and review the resource, were noted as well. The impact of timing was multifaceted and challenging for many of the SBAE teachers.

Recommendations for Research

Recommendations for research include examining true content knowledge as compared to perceived knowledge gained using the objectives outlined in the AgCE. This research can influence future practice by ensuring effectiveness in curriculum development. Further, the findings from this recommendation can support content knowledge deficiencies identified in previous research (Rice & Kitchel, 2016; Tummons et al., 2020). Similar to knowledge, future research should examine how the participants explain their experience and determine participant growth in experience. This can be compared with the Comprehensive Model for Secondary Agricultural Education (Baker et al., 2012) to determine how the AgCE can better incorporate experiential learning throughout the SBAE program. Research findings can evaluate growth in addition to providing future improvements to the AgCE.

More specifically, future research should also include examining how this data expands throughout the entire pathway experience and determine what specific interests SBAE students have regarding the pathway area. The AgCE should continue gauging interest as students continue through the program to know if an experience is negatively impacting their motivation toward a career. This research will promote future development of the program that is effective for engaging students by gaining interest to learn. Overall quality of the resource should also be continually researched. As such, the perceived level of clarity can be used to identify the gaps in clarity and improve the resource for future use. Findings from these recommendations can provide support for explaining why students did not find their career pathway experience beneficial and what changes they might offer for improving the resource. Finally, it is

recommended future research explore the teachers' approach to implementing the resource in their learning environments and ensures the content aligns with their objectives.

Recommendations for Practice

Recommendations for future practice include further development of the AS and NRS Career Pathways in the AgCE as findings indicated the experiences decreased student interest in learning more. Further, SBAE students indicated they would not recommend the NRS career pathway after completing one experience. Therefore, it is recommended that the AS and NRS Career Pathway experience content be re-evaluated by resource developers and in-service SBAE teachers. It is also recommended that NRS Career Pathway experiences be evaluated for content validity and curricular structure. Future practice should also include focus groups and professional development opportunities for SBAE teachers to implement and manage SAEs within these specific pathway areas.

Supportive curricular resources (Dyer & Osborne, 1996) and professional development workshops, such as those conducted by National FFA in the 1980s (The National Future Farmer, 1984), are critical to ensuring SBAE teachers' effective instruction of SAEs. Professional development opportunities should be offered by groups such as NAAE, National FFA, Teacher Educators, and The AET to teachers where they are provided with the AgCE resource and taught how to use it in various learning environments. Thus, it is recommended collaboration occurs with practicing, in-service, SBAE teachers to evaluate and improve the AgCE, in its entirety, as a curricular resource. Now that teachers have introduced the resource in their classrooms, they can provide appropriate adjustments for presenting an effective, turnkey resource for SBAE programs.

Future practice should also include final development of the two career pathways, ESS and BIO, to ensure the AgCE offers five career pathway experiences for each of the eight AFNR

Career Pathways plus AES for the Oklahoma Agricultural Communications pathway. SBAE teachers will then be able to offer the full diversity of career opportunities within the agricultural industry. Finally, it is recommended that the resource is re-introduced for implementation during a time of the school year that is most appropriate for SBAE teachers, once appropriate changes are made. Specifically, this release should occur during a summer in-service for SBAE teachers to implement at the beginning of the school year, or another time they deem most ideal.

Discussion and Implications

The purpose of the AgCE was to provide a curricular resource to SBAE teachers for increasing agricultural career knowledge and SAE participation among their students. The anticipated outputs were identified in the findings of this study as SBAE students indicated perceived knowledge and experience growth of career opportunities in agriculture. Therefore, it can be implied that the AgCE increases agricultural knowledge within the industry, specifically in the Career Pathway area SBAE students choose to explore. Thus, AgCE has the potential to develop a more agriculturally literate society (Brune et al., 2020; Dale et al., 2017). It can also be implied that the AgCE creates an experience for participants to grow in their understanding of the Career Pathways through experiential learning. Thus, students are closer to identifying a career they are interested in because of the AgCE. Further, SBAE teachers provided validation in the students experience as well as indicating their perceptions for utilizing the resource. Given the evaluative nature of this study, the findings provide guidance for improving the resource to improve the achievement of the projects' deemed outputs.

The results of the qualitative and quantitative findings indicate that the resource is proving to support overall SAE knowledge and participation. This is congruent with previous research students on the needs SBAE teachers regarding AFNR Career Pathways and SAEs (Doss & Rayfield, 2019; Retallick, 2010; Snider, 2021). Additionally, SBAE teachers believe that it is

needed and can be a useful curricular tool for improving their learning environment and exposing their students to careers in the agricultural industry. This positive attitude toward the AgCE further supports the theoretical framework guiding this evaluation, the Theory of Planned Behavior (Ajzen, 1991), indicating the recommendations further increase effective use of the AgCE as a curricular resource in SBAE programs.

Although the quantitative findings of this study are encouraging, the small number of participants warrants further investigation. Having only 29 complete data sets limits the study's generalizability. Further, the instrument was entirely self-reported perceptions, limiting the study with personal bias and a lack of actual content knowledge growth. Finally, a lack of complete pathway completion prevents the ability to evaluate the entire pathway, much less the entire curricular resource. These factors should be considered when examining the quantitative findings of this study. Qualitative findings associated with this study provide supporting information for the limitations in the quantitative findings.

In its current form, the AgCE is an incomplete curricular resource. Only six of the eight AFNR Career Pathways (The National Council for Agricultural Education, AFNR Standards, 2015) were developed fully prior to this study. As such, the results are limited to those six. The remaining two pathway areas (ESS and BIO) should be developed, and field tested. Specifically, five experiences each should be created for these two pathway areas so that the resource is fully developed for access and implementation. Once finalized, the AgCE should be retested among SBAE students and teachers.

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APPENDICES

APPENDIX A

Example AgCE Experience (ABS.01)

AgCE
AGRICULTURAL CAREER EXPERIENCES

Agricultural Career Experiences

AGRIBUSINESS SYSTEMS

Agribusiness Operations

What do the day-to-day operations look like in an agribusiness?

ABS.01

AT HOME

AT PARTNER SITE

IN-SCHOOL

TIME 4 (1 2 3 4 5)

RESOURCES 2 (1 2 3 4 5)

TRANSPORTATION 3 (1 2 3 4 5)

Student Name: _____

Experience Introduction

This is a fillable form with live links embedded in the text. Please download or print as needed.

Consider the food on your table, where did it come from? Who produced it? Somewhere a production agribusiness produced the food you consume. Many people do not consider the day-to-day operations that go into producing the food they consume. Have you ever considered where something came from? In order to understand where your food comes from, you need to understand the agribusiness process involved in producing it. Not only is it important to understand this aspect of agriculture, but you should consider agribusiness as a potential career! There are many career opportunities within agribusiness, consider which one interests you!

In this experience you will:

- Explore a career in agribusiness.
- Speak with your agriculture teacher to better understand the opportunities.
- Shadow an agribusiness professional.

Before you begin…

Over 9 billion people will rely on YOU to supply them food, fiber, fuel, and resources! How will you join that effort and make a difference? Perhaps it will be in Agribusiness!

Dig around and learn a bit about careers that are related to Agribusiness systems!

Go to the following link: https://agexplorer.com/focus/agribusiness-systems

1. Watch the provided video.
2. Explore the jobs that are available.
3. Select four that sound interesting to you – write those below:

CLICK HERE to complete the Pre-Experience Questionnaire

Job 1

Job 2

Job 3

Job 4

Creating Your Experience

Open a new window and login to the AET

- theaet.com
- Your school ID is _____.
- Your username is _____.
- Your password is _____.

Click on Project/Experience Manager (SAE,WBL) which can be found under the Student Dashboard, Profile, Journal, or Finances.

- **NEW to the Agricultural Career Experiences?**
  - Add New
    - Name: Ag Career Experiences
    - Experience Focus: School Based
    - Tracking Your Experience: Foundational
    - Primary Experience Category: Career Ready Practices
    - Primary Subcategory: Career Ready Practices
    - Save
  - **Complete the Pencil - SAE Plan**
    - This is your opportunity to outline your expectations for this experience. You choose the career pathway and experience based on your interest.
    - Use the examples provided by the AET to complete all four tabs: Description, Time Investment, Financial Investment, Learning Objectives (Skills).
      - Add/Explore Skill Areas, choose FND.A1.01, FND.A1.02, FND.A1.03, FND.A2.01, FND.A2.03, FND.A3.02, FND.A3.04, FND.A3.05.

- **AET Experience for the Ag Career Experiences created?**
  - Stay up to Date
    - Under Journal select Time in your AET Projects/Experiences (SAE/WBL) and journal about your experiences within the Agricultural Career Experiences.

STEP 1: Available Opportunities

Careers in Agribusiness Systems are typically very focused on finance and business. There are agricultural business professionals that spend their career impacting the agricultural industry. Do you know exactly how this happens?

In this step of the experience, you are asked to have a conversation with your agriculture teacher about careers in the Agribusiness Systems pathway. Use the guide below to make that happen:

Agriculture Teacher Interview Guide

Teachers Name: _____

Subjects Taught: _____

Date of Interview: _____

1. Introduce yourself and explain your interest in agribusiness.
2. Share your description of daily agribusiness operations in food production with your teacher. Ask them to review and discuss it with you. Where are your correct? Where are you a bit wrong? What could be added to your understanding of the process? You should also prepare a number of questions you have about the process.
3. What future problems does your teacher see in food production?
4. Why are people so disconnected to the food production process and the understanding of agribusinesses?
5. Ask your teacher about potential shadowing experiences with an agribusiness professional related to food production.
6. Thank your agriculture teacher for their time.

After completing this step, go journal about what you learned in AET.

STEP 2: Agribusiness Professional

One important question you should be considering is, “what would a career in agribusiness look like?” As you begin to figure out what careers you would like, and which ones you would avoid, it is important to get out in the field and speak with people that are in this career.

Your task for step 2 is to identify an individual that is currently working in this field. Perhaps you could connect with a university professor at a college or university near you or an agribusiness professional in your community. There is an interview guide below to collect your thoughts. Once you interview your industry expert, go back to your career plan and adjust based on what you learned! Is this a job for you?

Agribusiness Professional Interview Guide

Industry Professional Name: _____

Current Career Title: _____

Date of Interview: _____

Date of Interview: _____

1. Introduce yourself and explain your interest in agribusiness management and food production.
2. First, will you briefly describe your career?
3. What about your job do you like the most?
4. What are the challenging elements of your current job?
5. What are some of the skills that are most important for someone to be successful in this job?
6. What would I need to do to one day get a job like the one you are in?
7. What kind of safety training would I need to do this job?
8. What is your opinion on the future of food production?
9. How will we meet the demand of the growing population with the limited resources available today? In 20 years?
10. What advice do you have for a high school student interested in a career in agriculture?
11. Think of a number of questions unique to your personal experience.
12. Thank the industry professional for their time and send a professional thank you card.

After completing this step, go journal about what you learned in AET.

STEP 3: Personal Finance Management

Understanding the impact of a chosen career on your personal finances is crucial. Personal finance includes much more than simply cashing a paycheck! Being familiar with your annual and monthly salary, potential benefits, and taxes will set you up for success in the long-run. Though many of these factors will vary based on your employer, location, etc., it is important to have a basic understanding of these concepts. To help with the completion of this page, you may search online, however the best source of information is always someone currently working in your career field of interest!

What is the average annual salary range for someone in your career field of interest?

Circle the "base" salary written above. Often, a base salary is a starting point for someone with no prior experience. Thinking about the number you circled, list at least three factors which might cause your annual income to move from the base salary to the upper end of the salary range? Consider specifics like seniority
(how many years of experience), post-secondary education (certificates, specializations, degrees, trainings), and employer type.

1.

2.

3.

Using the base salary number as your starting point, calculate your average taxes owed per year as an individual. To do this, use the following chart to select which tax bracket you would be in, then calculate the amount of taxes owed annually, and subtract this number from your base salary. This would be your "take home" amount.

Base Salary Amount	2017 Average Percent Owed in Taxes
Between $9,326.00 and $37,950.00	15% owed
Between $37,951.00 and $91,900.00	25% owed
Between $91,000.00 and $191,650.00	28% owed

(CONTINUED ON NEXT PAGE)

Step 3: Personal Finance Management

CONTINUED...

What is your remaining “take home” annual salary?

What is your “take home” monthly salary?

Brainstorm a list of all other expenses you would need to pay on a monthly basis and estimate how much these expenses would cost. Examples of expenses might be groceries or a car payment.

Monthly Expense	Estimated Cost per Month

(CONTINUED ON NEXT PAGE)

Step 3: Personal Finance Management

CONTINUED...

Oftentimes, workers are compensated with benefits in addition to a salary. Search online or have a conversation with someone in your selected career field about if/to what extent these benefits are commonly included in a benefits package. Capture what you find in the space below.

Medical, Vision, and/or Dental Insurance

Stipend for cellphone, internet, or other

technology Retirement packages

Perks—example: work vehicle, travel stipend

Vacation days

Sick days

After completing this section, what are two conclusions you have made about personal financial management in relation to your selected career field?

After completing this step, go journal about what you learned in AET.

Step 4: Career Plan

The ultimate goal of all foundational SAE's is to develop, refine, and revisit your career plan! If this is your first foundational SAE – GREAT! You will get the opportunity to craft a career plan for the very first time. Perhaps you have never thought about a career – do not be overwhelmed by the task of identifying careers you are interested in. This is the timPare in your life to explore, try things out, learn about the job, and start to figure out what you are good at and what you enjoy! This plan should change and grow throughout your time in agricultural education.

The outline below is from the *SAE For All* guide that outlines what a career plan should include. Use a word processing software to create this document. Simply take the headings from the list below and start to fill in the prompts. This helps you start to plan and prepare for an exciting career in the next few years! You will turn this into your agricultural teacher when you are done.

1. Career Goal

a. Results from career interest inventory (e.g., Ag Explorer or another career planning tool)
b. Description of interest area (e.g., AFNR or another Career Pathway)
c. Job outlook
d. Educational requirements
e. Industry certifications available and/or needed

2. Post-secondary Aspirations & Options

a. Required education based on career goal
b. Institutions under consideration
    i. Programs of study (e.g., degree, certificate, training, etc.)
    ii. Length of program
    iii. Cost of program

3. Employability Skills & Leadership Development

a. Leadership goals in FFA
b. Career-aligned CDEs
c. Leadership and personal development activities
d. Opportunities available outside of FFA
e. School organizations
f. Community organizations

Step 4: Career Plan

4. Personal Financial Literacy & Planning

a. Anticipated cost of post-secondary education or career training
b. Financial plan for meeting anticipated costs
    i. Earnings and savings plan
c. Resources for scholarships, grants and loans
d. FASFA and federal aid

5. Workplace Experience Opportunities

a. Assessment of skills needed to learn to achieve SAE goals
b. Assessment of skill development and ability to articulate skills gained
c. Workplace safety certifications/preparation

6. Academic Planning & Progress

a. Four-year academic plan for high school graduation and career goal attainment
    i. Clarify that this is not a static four-year plan; it is a dynamic plan that evolves no matter where the student starts
    ii. Include all postsecondary options (e.g., two-year, four-year, military, etc.)
    iii. Align academic plan to career plan
b. Identification of advanced credit opportunities
c. Updated semi-annually or quarterly

After completing this step, go journal about what you learned in AET.

Completing the Experience

Save your work and turn it in using your teachers' preferred method. Complete the Post-Experience questionnaire (click here) and then go to AET to journal about what you learned throughout this experience.

APPENDIX B

Pre-Experience Questionnaire

ABS.01 Pre

Please indicate your opinion about each of the questions below by marking one of the five responses ranging from (1) “Not at all” to (5) “Extremely."

easewel.okstate@gmail.com Switch account

* Required

Email *

Your email

On a scale from 1 to 5, how KNOWLEDGEABLE do you consider yourself to be in agribusiness *ABS.01* prior to this specific pathway experience?

	1	2	3	4	5	
Not at all	○	○	○	○	○	Extremely

On a scale from 1 to 5, how EXPERIENCED do you consider yourself to be agribusiness *ABS.01* prior to this specific pathway experience?

	1	2	3	4	5	
Not at all	○	○	○	○	○	Extremely

On a scale from 1 to 5, how INTERESTED are you to learn more about agribusiness *ABS.01* prior to this specific pathway experience?

	1	2	3	4	5	
Not at all	○	○	○	○	○	Extremely

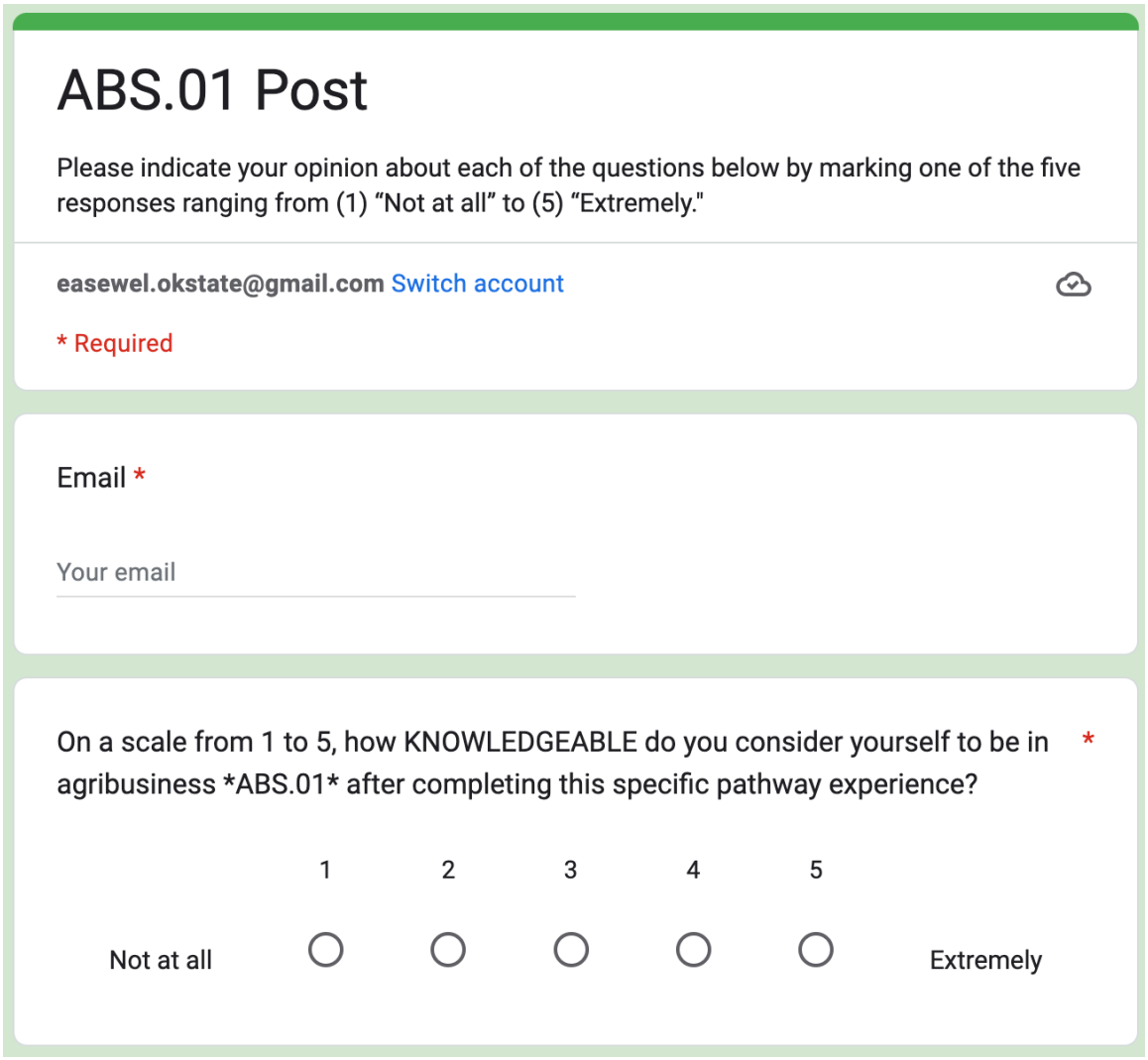
On a scale from 1 to 5, how MOTIVATED are you to pursue a career in agribusiness *ABS.01* prior to this specific pathway experience?

	1	2	3	4	5	
Not at all	○	○	○	○	○	Extremely

Submit Clear form

APPENDIX C

Post-Experience Questionnaire



ABS.01 Post

Please indicate your opinion about each of the questions below by marking one of the five responses ranging from (1) “Not at all” to (5) “Extremely."

easewel.okstate@gmail.com Switch account

* Required

Email *

Your email

On a scale from 1 to 5, how KNOWLEDGEABLE do you consider yourself to be in agribusiness *ABS.01* after completing this specific pathway experience? *

	1	2	3	4	5	
Not at all	○	○	○	○	○	Extremely

On a scale from 1 to 5, how EXPERIENCED do you consider yourself to be agribusiness *ABS.01* after completing this specific pathway experience? *

	1	2	3	4	5	
Not at all	○	○	○	○	○	Extremely

On a scale from 1 to 5, how INTERESTED are you to learn more about agribusiness *ABS.01* after completing this specific pathway experience? *

	1	2	3	4	5	
Not at all	○	○	○	○	○	Extremely

On a scale from 1 to 5, how MOTIVATED are you to pursue a career in agribusiness *ABS.01* after completing this specific pathway experience? *

	1	2	3	4	5	
Not at all	○	○	○	○	○	Extremely

Next Clear form

Experience Review

Please indicate your opinion about each of the questions below by selecting one of the five responses.

On a scale from 1 to 5, how beneficial did you find the Agribusiness Operations *ABS.01* experience? *

	1	2	3	4	5	
Not at all	○	○	○	○	○	Extremely

On a scale from 1 to 5, how likely would you be to recommend the Agribusiness Operations *ABS.01* experience? *

	1	2	3	4	5	
Not at all	○	○	○	○	○	Extremely

On a scale from 1 to 5, rank the clarity of the Agribusiness Operations *ABS.01* experience. *

	1	2	3	4	5	
Very confusing	○	○	○	○	○	Very clear

What suggestions do you have you to improve the Agribusiness Operations *ABS.01* experience?

Your answer

Back Submit Clear form

APPENDIX D

Interview Protocol

SBAE Teacher Interview Questions:

1. Can you explain what a supervised agricultural experience is?
2. Can you describe the process for students to learn about SAEs?
    a. Can you tell me about your role as a teacher, teaching your students about SAEs?
        i. Can you further explain the expectation surrounding SAEs in your classroom?
    b. Can you tell me about your role as an advisor of SAEs?
        i. How do you manage SAEs?
    c. Can you further explain what students need to have an SAE?
3. What resources do you utilize to teach your students about SAEs?
    a. Could you further explain those resources
4. How would you describe your experience with the Agricultural Career Experiences?
5. Did you use the Agricultural Career Experiences?
    a. I did not use it –
    b. I did use it –
        i. Why or why not?
    c. [If you used it]
        i. Could you further explain the Agricultural Career Experiences as resource in relation to teaching students about SAEs?
            1. Why did it aide in your teaching of SAEs?
            2. Why did it not aide in your teaching of SAEs?
        ii. How would you describe your observations of your students' use of the AgCE?

1. Can you further describe the benefits you experienced with the Agricultural Career Experiences?
2. Can you further describe the challenges you experienced with the Agricultural Career Experiences?

APPENDIX E

AgCE Recruitment Email

Subject: Agricultural Career Experience classroom curriculum/research project

Message:

Good morning all,

For those of you who do not know me, my name is Emily Sewell, and I taught agricultural education in Woodward, Oklahoma for the past six years. I recently made a transition back to Stillwater and am currently a Graduate Teaching and Research Assistant in the Department of Agricultural Education, Communications, and Leadership at Oklahoma State University. The purpose of my email is to share with you the Agricultural Career Experiences (AgCE).

Over the past few months, I have had the opportunity to work on a project called the Agricultural Career Experiences which is a website designed to teach students enrolled in agricultural education about the career opportunities within each of the Career Pathways. Currently, we have five experiences (pdf worksheets) within each of the following Career Pathways: Agribusiness Systems, Animal Systems, Food Products, and Processing Systems, Natural Resource Systems, Plant Systems, and Power, Structural, and Technology Systems. These experiences are interactive and we hope they will be beneficial to your classroom instruction.

This program is set up for you and your students to create an account with a google account. Once students create an account they will be prompted to answer a variety of demographic questions before being able to jump into a pathway. Once they have completed those questions they will have the opportunity to pick and choose between the seven Career Pathways and their experiences. They will be prompted to take a “Pre-Survey” once they choose a pathway and again when they are working on the downloadable PDF experiences. These surveys are asking questions related to the student’s prior knowledge, experience, interest, and motivation to pursue a career in the chosen pathway or experience. At the end of each experience and pathway, there will be another set of surveys asking the same questions but rather from the post-experience perspective. Their responses to those surveys will be used for our research project as we hope to generalize why students choose the specific pathways and experiences.

Due to this being a research project, if you choose to participate in this project the following opt-out consent forms are necessary for us to use the data your students provide. Students over 18 can download and complete this form, while students under 18 can download and complete this form. If students or their parents/guardians choose to not participate in this study they will need to return this form and not create an account on the website.

Approved: 12/04/2020
Protocol #: IRB-20-516

APPENDIX F

IRB Approval Letters

Quantitative IRB Approval Letter

Oklahoma State University Institutional Review Board

Date:	12/04/2020
Application Number:	IRB-20-516
Proposal Title:	Agricultural Career Experience
Principal Investigator:	Emily Sewell
Co-Investigator(s):	
Faculty Adviser:	Shane Robinson
Project Coordinator:	
Research Assistant(s):	
Processed as:	Exempt
Exempt Category:	

Status Recommended by Reviewer(s): Approved

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in 45CFR46.

This study meets criteria in the Revised Common Rule, as well as, one or more of the circumstances for which continuing review is not required. As Principal Investigator of this research, you will be required to submit a status report to the IRB triennially.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBManager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, adviser, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 405-744-3377 or irb@okstate.edu.

Sincerely,
Oklahoma State University IRB

Qualitative IRB Approval Letter

Oklahoma State University Institutional Review Board

Date:	07/28/2021
Application Number:	IRB-21-314
Proposal Title:	School-Based Agricultural Education Teacher Perceptions of the Agricultural Career Experiences
Principal Investigator:	Emily Sewell
Co-Investigator(s):	
Faculty Adviser:	Shane Robinson
Project Coordinator:	
Research Assistant(s):	
Processed as:	Exempt
Exempt Category:	

Status Recommended by Reviewer(s): Approved

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in 45CFR46.

This study meets criteria in the Revised Common Rule, as well as, one or more of the circumstances for which continuing review is not required. As Principal Investigator of this research, you will be required to submit a status report to the IRB triennially.

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2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
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Sincerely,
Oklahoma State University IRB

VITA

Emily Anne Sewell

Candidate for the Degree of

Master of Science

Thesis: AN EXPLORATORY EVALUATION OF THE AGRICULTURAL CAREER EXPERIENCES CURRICULAR RESOURCE

Major Field: Agricultural Education

Biographical:

Education:

Completed the requirements for the Master of Science in Agricultural Education and Leadership at Oklahoma State University, Stillwater, Oklahoma in December, 2022.

Completed the requirements for the Bachelor of Science in Agricultural Education at Oklahoma State University, Stillwater, Oklahoma in 2014.

Experience:

Oklahoma State University – Stillwater, Oklahoma – August 2020 – Present
Department of Agricultural Education, Communications and Leadership
Graduate Teaching Assistant
Coordinator – Future Agricultural Education Teacher Academy
Woodward Public Schools – Woodward, Oklahoma – July 2014 - June 2020
Certified Agricultural Education Teacher & FFA Advisor

Professional Memberships:

American Association for Agricultural Education, AAAE
National Association for Agricultural Education, NAAE
Oklahoma Agricultural Education Teacher Association, OAETA
Association of Career and Technical Educators, ACTE
Oklahoma Association of Career and Technical Educators, OKACTE