

# Beginning SBAE Teacher Perception of CASE Training and Curriculum Implementation

## Abstract

*With the perpetual increase in STEM-related jobs and a renewed focus on the importance of these content areas, school-based agricultural education (SBAE) teachers shoulder the important task of implementing inquiry-based learning opportunities to prepare students for future STEM careers. The Curriculum for Agricultural Science Education (CASE) is one source of professional development that provides teachers with agriculture-focused STEM content and pedagogical enrichment. This study sought to examine beginning SBAE teachers' perceptions of CASE Agriculture, Food, and Natural Resources (AFNR) training, as well as the implementation of the curriculum into their programs. We interviewed six CASE certified teachers who had completed one year of teaching experience. Four main themes and eight sub-themes emerged from the interviews: active learning (i.e., institute training and active learning in the secondary setting), time commitments, resource availability (i.e., financial funding and material availability, and curriculum (i.e., a comprehensive introductory course; coursework planning; gaining confidence; and student motivation). Overall, the teachers perceived the CASE curriculum to be a great resource, but they also experienced some challenges associated with resource availability and were somewhat displeased with the duration and intensity of the CASE Institute program. Recommendations for research and practice are included.*

**Keywords:** Curriculum for Agricultural Science Education; beginning teachers

## Introduction

In an ever-changing world, STEM career availabilities are extensive and expanding (Noonan, 2017; Vilorio, 2014). Individuals with STEM careers have the potential to serve as innovators for future progress; however, there is a lack of trained individuals to fill the demand for careers available (Noonan, 2017). Dobbs et al. (2012) specified more than half of the STEM positions available remain open due to the unavailability of qualified workers. Additionally, Vilorio (2014) highlighted careers in STEM fields are expected to grow to more than nine million positions by 2022. With vast possibilities of potential STEM careers in the agricultural industry, agricultural education programs need to highlight the STEM concepts which are already part of their curriculum.

DiBenedetto et al. (2015) reported inquiry-based education can bolster school-based agricultural education (SBAE) students' abilities to perform scientific reasoning activities (e.g., investigation process of observing, questioning, experimenting, analyzing results, drawing conclusions, and sharing their findings). Inquiry-based learning in the classroom supports the development of critical thinking skills and higher reasoning abilities in students (DiBenedetto et al. 2015; Wells et al., 2015). Since agricultural education requires a foundation of broad knowledge, due to the multi-dimensional manner of the agricultural industry, agricultural educators are expected to possess a diverse skill set to be prepared for their future careers. Based on previous findings (Rice & Kitchel, 2017), SBAE teachers do not feel they have the credibility needed to teach STEM due to the vastness of topics encompassed in SBAE programs. Moreover, Claycomb and Petty (1983) reported beginning teachers' lack of classroom experience further reduces their personal perceived content credibility. Rice and Kitchel (2015) pointed to professional development as a means of attaining content knowledge and curriculum to mitigate this stress. Due to the multitude of various contexts in agricultural education and the agricultural education discipline's focus on enhancing STEM integration (AAAE Research Priority

3; Stripling & Ricketts, 2016), the professional development needs of teachers are vast. Smalley and Smith (2017) noted that all early career SBAE teachers in their study had had an acute need for professional development associated with course planning and curriculum design, as these were major obstacles for teachers to overcome when entering the classroom.

Beginning teachers have identified a variety of concerns. Previous studies found classroom instruction / management (Johnson et al., 1989; Stair et al., 2012; Touchstone, 2015), advising FFA activities, and curriculum development (Myers et al., 2005; Stair et al., 2012; Touchstone, 2015) as the areas of greatest concern for beginning teachers. The beginning teachers' concerns associated with curriculum development and classroom instruction, implies there is a strong need for high-quality teaching resources and curriculum.

The Curriculum for Agricultural Science Education (CASE) is one source of professional development which incorporates inquiry-based learning and is available to SBAE teachers. Since the inception of the CASE curriculum in 2009, the number of CASE-certified teachers has increased to over 4,500 teachers in 46 states, plus the Virgin Islands (CASE, 2021). With the demand for curriculum availability, educators need to gain the most benefit out of such professional development opportunities.

CASE is a venture through the National Council for Agricultural Education with a focus on the development of agricultural education curriculum which integrates science, math, and language skills through means of active, inquiry-based, and experiential-based learning opportunities (CASE, 2011). CASE provides intensive professional development institutes that aid teachers in attaining curricula within desired areas (e.g., animal science, plant science, agricultural engineering, natural resources, and agricultural business). Participants within an institute complete activities and projects just as a student would in their SBAE classrooms. Upon completion of the CASE Institute, certified participants are given access to the curriculum, as well as the ability to obtain the resources to teach the subject matter within their classrooms (CASE, 2011).

Previous findings reported professional development events for teachers should include useful training tactics to ensure the development of teaching techniques, content information, and resource availability to the teachers participating (Darling-Hammond & Richardson, 2009; Desimone et al. 2002; Garet et al., 2001). Ulmer et al. (2013) noted the CASE model of professional development has a strong focus on content knowledge and hands-on learning. Moreover, Ulmer et al. (2013) found CASE professional development bolstered SBAE teachers' science teaching efficacy and outcome expectancy. The findings of Pauley et al. (2019) purported that CASE certified SBAE teachers in their study had a higher perceived science knowledge but had lower intentions to teach science when compared to non-certified CASE teachers. Regarding resource availability, previous studies found SBAE teachers enjoyed the availability of course content from CASE (Lambert et al., 2014) while studies have indicated resource availability has served as a barrier to implementation (Bird & Rice, 2021; Wells et al., 2019).

Various studies have been conducted to understand teachers' perceptions of CASE implementation and training (Bird & Rice, 2021, Lambert et al., 2014; Ulmer et al. 2013; Wells et al., 2019). Lambert et al. (2014) signified the need to examine the readiness of pre-service teachers to implement the CASE curriculum in their first year of teaching. Wells et al. (2019) provided insight on pre-service teachers' use of the CASE curriculum who were currently engaging in their student teaching experiences. While this study provides insight on beginning teachers' perceptions of teaching with the CASE curriculum, it is important to determine the perceptions of beginning teachers who have fully implemented the curriculum in their classrooms for a whole school year. The purpose of this study was

to describe beginning SBAE teachers' experiences associated with engaging in an Agriculture, Food, and Natural Resources (AFNR) CASE institute and describe the implementation of the curriculum in their SBAE programs.

### **Conceptual Framework**

This study was guided by the concept of self-efficacy (Bandura, 1986). Bandura (1986) defined self-efficacy as "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (p. 391). An individual's sense of self-efficacy impacts their decisions about what they choose to actively participate in, the effort they put forth, and their tenacity toward that activity to reach mastery (Bandura, 1997). Self-efficacy is multidimensional and is a context-specific construct (Zimmerman & Cleary, 2006). Bong (2006) reported that beliefs related to self-efficacy may be task, skill, or domain-specific. Bandura (1997) noted four main sources of teacher self-efficacy, including: (1) mastery learning experiences, (2) social persuasion, (3) physiological and emotional states, and (4) vicarious experiences.

Social persuasion is the emotional support from other individuals (Bandura, 1997). Skaalvik and Skaalvik (2007) noted persuasive communication is "most effective when those who convey the efficacy information are viewed as competent and reliable" (p. 612). McKim and Velez (2016) defined physiological and emotional states as the "Internal state and emotions when considering or completing the task" (p. 74). Bandura (1997) described vicarious experiences as, "Experiences that alter efficacy beliefs through transmission of competencies" (p. 79). Mastery learning experiences, which are regarded as the strongest source of self-efficacy (Bong & Skaalvik, 2003; Pajares, 1997), are the experiences of an individual while completing a task.

Beginning teachers have a variety of concerns when entering the classroom (Johnson et al. 1989; Myers et al., 2005; Stair et al., 2012; Touchstone, 2015). One common concern frequently mentioned in literature is curriculum development (Cannon et al., 2012; Joerger, 2002; Myers et al., 2005; Rayfield et al., 2014; Ruhland & Bremer, 2002). The developed curriculum developed by CASE could presumably serve to mitigate this concern of beginning teachers. Aside from receiving curriculum, the CASE Institutes (CI) serve as a source of professional development where teachers have the opportunity to engage in the curriculum from a student standpoint and they also are expected to lead others in various activities and projects (i.e., mastery learning experiences). The CASE lead teachers who facilitate the CIs and the experienced teachers who are enrolled in the CIs, provide a rich learning experience for beginning teachers as they see a model of curriculum implementation and have a chance to receive immediate feedback on their work (e.g., vicarious learning experiences and / or social persuasion).

### **Purpose and Objectives**

The purpose of this study was to describe beginning SBAE teachers' experiences associated with engaging in an Agriculture, Food, and Natural Resources (AFNR) CASE institute and describe the implementation of the curriculum in their SBAE programs. This study specifically focused on first-year agricultural educators who were certified within the AFNR content area. The following objectives served as a guide for this study:

1. Describe beginning SBAE teachers' perceptions associated with the benefits and challenges pertaining to becoming certified in the CASE AFNR Institute.
2. Identify factors that contribute to the benefits and challenges beginning SBAE teachers encounter when implementing the CASE AFNR curriculum into their classrooms.

3. Describe beginning SBAE teachers' perceptions of the CASE AFNR curriculum material.

### Methods

This study encompassed case study methods to examine beginning SBAE teachers' experiences associated with engaging in an AFNR CASE Institute (CI), and their subsequent implementation of the curriculum in their programs. The case study approach serves as an empirical method to investigate a "contemporary phenomenon (the "case") in depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident" (Yin, 2018, p. 15).

The case in this study was bounded by time (same CASE CI, and taught CASE for two semesters), curriculum (i.e., all SBAE teachers were certified in the CASE AFNR curriculum), and teacher experience (i.e., first-year teachers). While this single-case study was bounded by teacher experience, it was considered to be an instrumental case study because the main focus was on CASE training and implementation. This study focused on first year SBAE teachers who recently completed their first year of teaching. All of the teachers involved in this study earned CASE AFNR certifications directly after finishing their student teaching experiences. The timeframes we chose best represented the detailed accounts of recent experiences within the CI and holding a new teaching position.

We used records from pre-service CI, as well as the Agricultural Education Instructor Directory to identify and collect contact information of potential participants. We also used three-pronged selection criteria to further narrow the recruitment of SBAE teachers. Specifically, to be considered for this study the SBAE teachers must have (1) completed the AFNR CI to full certification, (2) completed their first year of teaching in an SBAE program, and (3) implemented the CASE AFNR curriculum in a year long SBAE course. Of the eight candidates recruited for this study, six agreed to participate in the one-on-one interviews.

The majority of SBAE teacher who participated in this study was female ( $n = 5$ , 83.33%) and taught in a rural school with student enrollments ranging from 40 to 400 ( $n = 5$ , 83.33%). None of the participants had experienced CASE curriculum throughout their secondary education background, nor had any of the teachers been certified in an area other than CASE AFNR. All of the teachers in this study taught the CASE AFNR curriculum in year-long courses. Participants reported their total student enrollment in CASE AFNR ranged from two to 48 students (multiple sections were taught in some schools).

The six individuals which were interviewed attended the same pre-service CI to become CASE certified teachers. The CI was a 90-hour professional development training which immersed the participants in the content-specific projects and activities of the CASE AFNR curriculum which their students will encounter in their classes over a semester or year of instruction. CASE implements a train-the-trainer professional development model where experienced SBAE teachers are tasked with facilitating the learning for their peers. CASE (n.d.) asserted that this model is an "effective strategy to ensure continuity across professional development events and relatability between teacher trainers and participants" (para. 2). Based on the CASE model, two experienced SBAE teachers who had collectively taught the CASE AFNR curriculum for over 18 years, served as the lead teachers for this CI. The CI was held at an off-campus teacher training center and two large classrooms were used to facilitate lecture and laboratory aspects of the curriculum.

This case was comprised of six teachers who all obtained a traditional SBAE teacher licensure from [University] and participated in the CASE CI the summer after they graduated with their Bachelor of Science degrees. All of the teachers in this study taught in the state of [State] where they integrated the CASE curriculum in their year-long Introduction to AFNR courses at their respective high schools.

### Data collection

We conducted semi-structured interviews to determine the beginning teachers' perceptions of their CASE training experience and implementation of the curriculum in this case study. A qualitative approach, such as the semi-structured interview, is an appropriate way to stimulate a conversation about participants' experiences and allows for the interview questions to guide the interview, but also leaves room for the participant to determine its direction (Knox & Burkard, 2009).

The interview consisted of three major sections: (1) professional characteristics (e.g., school demographics / size and teacher characteristics), (2) CI / training, and (3) CASE AFNR curriculum implementation. Specifically, the following items served as the main components of the interview protocol (see Table 1).

Table 1

*Interview Protocol Items Regarding SBAE Teachers' Experiences in CASE Institute and Implementation of the Curriculum*

Items	
CASE Training	
1	Describe your motivations associated with participating in the CASE training?
2	What aspects of the CASE training did you like?
3	Were there certain aspects of the CASE training you feel could be improved?
	a. What challenges did you face within your CASE training?
	b. If you could change one thing about your training, what would it be?
CASE Implementation	
4	Tell me about your overall experience with your first semester teaching AFNR?
5	How much of the AFNR curriculum did you use within your first year?
6	What benefits, if any, do you associate with the implementation of this curriculum in your program?
	a. What is the one thing you most enjoy about the curriculum?
7	What challenges, if any, do you associate with the implementation of this curriculum in your program?
	a. What aspects of the curriculum would you like to change?
8	If given the opportunity, would you get CASE certified in any other subject areas?
	a. If so, which curriculum?

Along with the items presented on the interview protocol, probing questions were used to encourage participants to provide in-depth information about their experiences. We conducted and recorded (for transcription purposes) one-on-one interviews via the Zoom online communication platform. The entire research team participated in the interview process. One member of the research team served as the lead facilitator of the interview; they were tasked with verbalizing the purpose of the study at the beginning of the interview, asking questions from the interview protocol, asking probing questions, and providing closing comments. The other members of the research team were tasked with completing field notes (i.e., descriptive and reflective notes) for each interview. The field notes were

recorded to aid in recalling ideas and concepts communicated by the SBAE teachers. After each interview, we met to debrief and discuss the interview.

### **Data analysis**

Once the research team had collected the data, they were transcribed. Each participant was assigned a pseudonym once the themes were identified to ensure confidentiality. The team analyzed transcripts, field notes, and recorded interviews to identify commonly emerging themes among participants. We used both inductive and deductive approaches to develop a codebook for our study. Before engaging in the coding process, our research team reviewed previous literature and the framework of our study to put forth possible themes which should be included in the initial codebook, a priori. Based on the Roberts et al. (2019) coding model, we inductively applied the initial codes to the raw qualitative data and deductively developed additional codes based on the review of the raw data.

The team independently reviewed data and developed initial codes and thematic domains before comparing notes. A constant comparative method of data analysis was used along with content analyses to identify themes (Merriam, 2009). Utilizing open coding procedures posited by Williams and Moser (2019), we sifted through the data (i.e., interview transcripts, field notes, and associated data sources) and organized similar phrases and concept indicators in broad initial thematic domains. We repeatedly reviewed the initial themes, sub-themes, and codes until all members of our research team agreed that a sufficient representation of the thematic domains had been established. To establish inter-rater reliability amongst the three coders on our research team, we compared the presence or absence of a set of themes and the observation frequency of each theme.

When all coders agreed with the importance of a given thematic domain, these areas of data were considered to be good representations of the code. The research team held further discussions regarding sections of data which two or more coders aligned with a code. If only one coder matched a section of data with a given code, the section of data was deemed not to be a clear representation of the code. Any minor disagreements between the coders were recorded in the codebook. While our coding team did not achieve absolute agreement on all codes, we discussed the coding differences which served to inform the codebook development until all members of the team agreed the results represented the data. The codes and sub-codes for the broad initial thematic domains were documented in our codebook using Boyatzis' (1998) recommended classifications (i.e., label, definition, description, qualifications / exclusions, and raw data examples).

Following the open coding process, we engaged in axial coding processes to further refine, align and categorize themes (Williams & Moser, 2019). During this process, we sought to identify relationships between the open codes to develop core codes. We used chunking and displaying to structure our codebook to examine interrelated and contextualize relationships between concepts and categories (Roberts et al., 2019). Finally, primary categories or themes were named. Finally, we integrated the categories which were developed in the axial coding process into cohesive expressions. This process allowed us to further refine the data by systematically aligning the main themes to other categories which were selectively coded.

Qualitative research practices were utilized to establish the trustworthiness of the results. Lincoln and Guba's (1985) four evaluation criteria (i.e., credibility, transferability, confirmability, and dependability) guided us to ensure the trustworthiness of the study. We included a rich, thick description of the participants, the setting and format of the CASE training, and the process we used to collect and analyze the data to enhance the transferability of this study to other contexts or settings with

a different group of respondents (Korstjens & Moser, 2018). We developed an audit trail throughout the various stages of the study to further enhance the dependability and confirmability of findings (Korstjens & Moser, 2018).

Prolonged engagement with the SBAE teachers, member checking, and investigator triangulation bolstered the credibility of the findings. We conducted the member checking process by bringing the preliminary analysis, which included an overview of identified themes, back to the SBAE teacher interviewees, to determine if we accurately interpreted their perceptions and sentiments expressed in the interviews. Moreover, the member checking process allowed participants to provide suggestions on the current themes and identify what was missing in the analysis. Korstjens and Moser (2018) noted member checking “strengthens the data...because researcher and respondents look at the data with different eyes” (p. 121).

### **Findings**

This qualitative study sought to describe beginning SBAE teachers’ experiences engaging in a CASE AFNR institute and to describe the implementation of the curriculum in their SBAE programs. A total of four themes, including eight sub-themes, emerged from the data coding. The themes (and sub-themes) included active learning (i.e., institute training and active learning in the secondary setting), time commitments, resource availability (i.e., financial funding and material availability issues), and curriculum (i.e., comprehensive introductory course; coursework planning; gaining confidence; and student motivation).

#### **Active Learning**

When the beginning SBAE teachers were questioned about the benefits of the CASE curriculum, all the teachers mentioned the term active learning. The working definition of active learning provided to the participants was “a method of learning in which students are actively or experientially involved in the learning process and where there are different levels of active learning, depending on student involvement” (Bonwell & Eison, 1991). Moreover, the teachers who participated in this study reported active learning was paramount when it came to the training they received in the CASE institute and the benefits for their students who engage in the CASE curriculum in their classes.

#### ***Institute Training***

Active learning was commonly noted as a significant component of the interviewees’ training in the CASE Institute. The SBAE teachers reflected on their experiences with teaching CASE before (i.e., while student teaching) and after attending an institute and becoming CASE certified teachers. Ms. Williams taught CASE AFNR during student teaching, before becoming certified in the content area. “I struggled during student teaching because I never had the training,” she said. “I had no prior knowledge of it, so I ended up relying a lot on my cooperating teacher to coach me through the activities.” Similarly, Ms. Miller had some frustrations while trying to student teach the curriculum before becoming a CASE AFNR certified teacher: “When I student taught I used CASE and it was the same thing every single day that she had them do, and I kind of picked up on that which was frustrating.” Going to the CASE training helped both beginning teachers gain more insight into the curriculum. Ms. Williams stated,

I liked that when we were being trained we actually got to participate in it. We got to walk through what these activities looked like. I don’t know about anyone else, but I am an extremely visual learner. I need to see what’s happening to fully understand what it is that needed to be done and how the lessons went.

Ms. Miller commented she enjoyed getting to experience the curriculum firsthand and “being able to ask questions along the way to the experienced teachers who taught it. They were able to give us tips like ‘oh this works well’ or ‘this you probably need to do more explaining,’” or even different methods of teaching the curriculum. As Ms. Miller explained her CASE CI experience she said, “we went through different ways of going through the purpose or getting students’ attention or just other teaching methods that go along with presenting the curriculum, which was very different than my experiences student teaching.” While Ms. Moore and Ms. Johnson did not mention their student teaching experience, they did mention similar benefits when attending the CASE Institute. Ms. Moore expressed, “It was nice that it was very interactive and moved at a great pace to understand the material.” While Ms. Johnson stated a similar perspective.

I liked how we went through every lesson so that when you teach it a month later you remember doing it. I’m glad they didn’t run it where they just explained. I liked actually getting to do the experiments ourselves. Getting to participate helped me learn and I liked hearing how our instructors implement it.

### ***Active Learning in The Secondary Setting***

Teachers held similar ideals concerning active learning when implementing the CASE AFNR curriculum into their own classrooms. Ms. Moore stated, “The kids really liked all the hands-on activities.” Ms. Williams also claimed one of the benefits she saw implementing the curriculum.

My students really enjoy getting to do things. They aren’t sitting there listening to me talk or taking notes, which I am guilty of in some of my other classes. We talk and they take notes. I like that CASE AFNR brings it to a minimum.

Ms. Johnson agreed by saying, “I like the experiments for my students, and I like that the curriculum is very learning-by-doing based.” Ms. Williams also found the active participation was beneficial in her classroom. Specifically, Ms. Williams commented,

I think it helps them understand better, especially the science-type parts of it. One of them [a student], she’s a sophomore, and sophomore year students take biology, so I really just reinforce a lot of what she is having in biology. I think the active participation ends up helping her learn it a lot better.

### **Time Commitments**

Along with questioning beginning SBAE teachers about the potential benefits of CASE training and implementation in secondary programs, we also asked about the challenges they faced when adopting the CASE curriculum. One challenge, which all teachers who were interviewed mentioned, was the time commitment associated with becoming CASE certified. Ms. Johnson commented, “It was a lot of information and a lot of long days.” Ms. Williams added, “the training was a little long. That is two weeks of just straight-up activities. I mean activities are great, but we did them from what eight to four or eight to five every day for two straight weeks.” She finished her statement by saying “when [CASE CIs] are two weeks long, then that is two weeks out of your summer that you have to try and coordinate around.” Ms. Miller stated, “If I could change anything, I would make it shorter. I know they have the fast track once you are familiar with CASE, but the two weeks was a long time.” Ms. Moore also mentioned, “The time commitment was a challenge, it was necessary though.”

### **Resource Availability**

Aside from time commitments, the beginning teachers also specified resource availability as a challenge for adopting the CASE curriculum into their local programs. The resources mentioned by the teachers included financial concerns about the cost of attending the CASE Institute as well as the material availability needed to facilitate CASE activities, projects, and problem-based exercises (APP).

***Financial Funding***

While discussing the availability of resources, Mr. Smith said, “A challenge faced was being able to afford to become certified.” Ms. Moore faced a similar challenge, “A challenge for me was money to pay for the institute. We have received the [STATE] Grant, but it would be hard to find funding without it.” While Mr. Smith and Ms. Moore faced funding issues when trying to be able to register for CASE, Ms. Williams faced funding problems on a personal level. Ms. Williams explained, in her situation, how this problem manifested.

I had to work in the summer, so that is two weeks that I have to take off work, that I am now not getting paid for, and end up spending as much as I would have made trying to travel to the CASE Institute.

***Material Availability Issues***

The beginning teachers also faced the challenge of securing materials to facilitate AFNR activities, projects, and problems (APP) while attempting to implement the curriculum. Ms. Miller explained this in detail.

I would say the big thing is finding the funding, grants, and things. The other thing is yes you can find money to go to trainings, but then you also have to find money to buy all of the supplies, so that can be a challenge too. For example, we are a low-income school, which we are fortunate to get a certain amount of money because we have such a great amount of diversity, but it is also a struggle because you don't have the money to purchase everything you want, especially consumables and things.

Issues noted by Ms. Miller and Ms. Williams who teach in a low-income school in a small town with students from low socioeconomic status (SES) backgrounds and struggles to secure the needed supplies and materials to teach the AFNR Curriculum. Ms. Williams commented on this tension.

I mean CASE is awesome, it has all of the things that you need, but when you are in a small, rural school that doesn't have a ton of money it can be really hard to finance. Granted, we can use Perkins funding on some of it, but that funding has to be shared with other people. I wouldn't receive all the Perkins funding for my program.... A lot of those consumable materials I just buy out of my own pocket or if I have some at home I will just bring it from home. In the end, it is a lot of money out of my own pocket.

Being a beginning teacher at the school, Ms. Johnson faced challenges feeling comfortable asking for resources. Ms. Johnson reflected on the barriers she faced with the availability of materials to teach CASE APPs:

My biggest downfall with implementing CASE AFNR is all of the materials that you need and having to order it ahead of time. I hate having to go to the principal and keeping having to ask to have more money to pay for more materials. No one wants to be costing the school a bunch of money to be able to teach.

In agreement with the sentiment of the other teachers, Mr. Smith noted a challenge he faced when implementing CASE AFNR was “making sure I had all of the equipment that I needed to effectively implement the curriculum.” When the funding is too much of a challenge, it was indicated by several of the participants that the areas lacking resources were the areas that ended up getting skipped over. Ms. Williams commented on these areas.

I do have to skip some things. For example, unit I believe 6 that you need the circuit board for. I don't have them so I either have to track down teachers in my school that have access to them or something similar to it. Or I will end up just having to skip over it because I can't get them.

The biggest hurdle for participants included having the financial resources and access to grants to assist in purchasing the necessary materials. Having available resources for the APPs would allow teachers to implement the curriculum more easily and thoroughly within their classrooms.

### **Curriculum**

A key focus of this study was to identify perceptions beginning teachers have of the CASE AFNR curriculum. Commonalities found throughout the participant's interviews included observations regarding the student's interactions with the curriculum, as well as the impact of varying access to the curriculum for beginning teachers. When considering the students' experiences, commonalities included the cohesiveness of the curriculum regarding an introduction to all agricultural content areas and the motivation students had when working on completing the course. When considering the curriculum from the beginning teacher's standpoint, participants mentioned gaining confidence as a benefit to teach the curriculum and the access to preplanned lessons throughout the course.

### **Comprehensive Introductory Course**

Most of the SBAE teachers felt that it was beneficial to have coursework that encompasses all areas of agricultural education. Ms. Johnson noted, "I like how the CASE AFNR curriculum is pretty broad. It has a little bit of everything ranging from mechanics, plant, animal, and communications leading to more specific coursework." Ms. Williams agreed with Ms. Johnson.

AFNR is one of those courses that I like because it is an intro course and it gives them a little bit of everything. From there they can pick what things they like the most from that class and follow those classes further. If they really like the animal part they can take animal science, if they really like the plant part of it they can take horticulture. I really like [the curriculum] from that aspect.

Also related to curriculum, Ms. Jones enjoyed CASE AFNR's curricular changes.

Right now, our Ag 1 is strictly animal science, so I am excited to incorporate all of AFNR into our Ag 1 because it has a little bit of plant science, a little bit of animal science, really everything introductory to agriculture. I am also excited that it ties to science for the kids that may not really want to be in an ag class.

In describing her excitement about the CASE AFNR curriculum, Ms. Moore reported she had found few desired changes to make within the content and said, "The content is easy to gauge student understanding and is overall really good content." Ms. Miller liked the structure of CASE so much that she wishes to incorporate similar aspects into her other coursework.

I would like to try to implement more of a CASE style into my other classes. I want to try to make it so that you can learn information, do an activity or project, then go back to learn information. So, I think the process is really good.

### **Coursework Planning**

The SBAE teachers mentioned that the comprehensive nature of the CASE curriculum provided a great resource for developing daily and unit instructional plans. Ms. Moore noted the CASE curriculum made it easier to plan for lessons and sub plans. Mr. Smith agreed, "A big benefit was the already prepared lesson plans! It has saved me a ton of time." Ms. Johnson commented, "I like having it so that I can push it kind of on the back burner and focus on planning for my other courses." Ms. Jones found, "I really enjoyed that everything is planned out for you; yes you have to do the lab prep, but you knew what you were teaching the next day, even if you didn't lesson plan."

The SBAE teachers were grateful for the development of the curriculum, which provided flexibility in leaving the lesson plans for substitutes. It also assisted teachers in reducing the amount of preparation time for teaching the class when it came to the actual planning of lessons.

### ***Gaining Confidence***

When considering a benefit to the curriculum availability, beginning teachers indicated using the curriculum bolstered their perceived confidence in teaching the course material. Ms. Jones mentioned she did not initially see this benefit when she was in the CASE training because she “hadn’t student taught yet, so it was hard to tell what I was going to do in the classroom.” Ms. Miller found a benefit of having the CASE AFNR curriculum was having the opportunity to think about the content and pedagogy associated with teaching each lesson. Ms. Miller said:

Being able to have a little bit of a background in the curriculum before beginning teaching. Even though we had the methods courses, I don’t think they fully prepared us for what creating curriculum and what actual curriculum is about. So, what interested me in CASE in the first place was that at least I would have somewhere to get my feet wet.

Ms. Williams had similar thoughts when asked if there was a possibility of becoming certified in a different CASE content area:

I would be certified in NRE because it is the area that I am the least confident teaching. Right now, I am using all materials from another teacher, which is fine, but it would be nice to have CASE that I could use to become more confident in it.

### ***Student Motivation***

Along with the benefits of the curriculum, the beginning SBAE teachers also mentioned some challenges they faced with implementing the CASE curriculum. Mr. Smith mentioned, “A challenge with the curriculum was the motivation to get the students to be engaged the entire time.” Ms. Jones agreed, “The only challenge I see with the CASE AFNR curriculum is that sometimes kids get tired of CASE in general, so it can be hard to get them excited when it says CASE at the top of the worksheet.” Ms. Johnson found a similar situation as Ms. Jones, mentioning, “The students said that it was boring. The first couple of units aren’t very exciting and it was hard to motivate them with all of the worksheets.” Ms. Moore indicated she struggled to motivate her students to fully engage in all aspects of the curriculum. She stated she had a hard time getting her students “to read and understand the instructions that were in the packet and pushing them to think independently instead of asking me to check their answers before committing.” Implementing the curriculum can be a huge undertaking to change the culture within the classroom. The cultural shift within the classroom takes time and can mark a shift for students in their learning too.

The beginning SBAE teachers offered some reasons why they believe students lack motivation associated with engaging in CASE coursework. Ms. Jones commented the AFNR curriculum “is very science-heavy and I feel like that could turn some kids off that maybe don’t enjoy science.” Ms. Miller had a similar perception of science content in CASE AFNR and wished there was other content included with the science-based education. She stated, “I think if they added more skills along with the physics and sciences behind everything that would be very helpful.”

### **Conclusions / Implications / Recommendations**

The purpose of this study was to describe beginning teachers' experiences associated with engaging in a CASE AFNR institute and to describe the implementation of the curriculum in their SBAE programs. Results of this study are not generalizable to the entirety of the beginning SBAE teacher population and caution should be taken when attempting to generalize these findings beyond the beginning SBAE teachers who were interviewed for this study. Participants reported a major benefit to becoming certified within CASE AFNR was the chance to actively engage with the content in each lesson. This increased their ability to implement the curriculum themselves, looking back at their CASE Institute examples. Beginning teachers also identified challenges with becoming CASE certified. One significant challenge was the personal time commitment associated with attending the CASE Institute. It was also a challenge to find funding to pay for attendance. In fact, the teachers' struggle to secure funding to enroll in the CASE AFNR Institute was mentioned as a barrier for seeking further CASE certifications. Additionally, the beginning teachers felt the CASE Institute training was too long and were overwhelmed by the amount of information shared within a short time frame.

Concerning CASE AFNR implementation in their programs, the teachers perceived the active learning experiences for the students enrolled in the coursework to be beneficial. Their positive experiences with teaching the CASE AFNR curriculum ignited some teachers' desires to redesign other courses they taught similarly. Beginning teachers found it challenging to implement the curriculum into their classrooms in terms of resources. If they could not ensure they had all the resources to be able to teach the coursework properly, they would sometimes skip over activities where they were lacking the resources.

Themes emerged from the data analysis process which focused on the benefits of becoming certified in the CASE AFNR Institute. With no prior experience with the CASE curriculum throughout their educational careers, participants struggled using the curriculum during their student teaching experiences, relying heavily on cooperating teachers to coach them to be able to successfully teach the CASE AFNR curriculum for themselves. The beginning teachers, once immersed in the CASE AFNR Institute experience, benefited from actively working with the curriculum, as well as working with experienced lead teachers. Active, hands-on participation with the curriculum helped beginning teachers engage in mastery experiences with the content, enabling them to successfully complete the activities within the curriculum before teaching it in their classrooms (Bandura, 1997).

Participants' preference for active engagement with content aligns with findings from Desimone, et al. (2002), which indicated active engagement in professional development opportunities positively influenced professional development because they were able to experience curriculum in the same way students would. The beginning teachers also felt the CASE training was beneficial because they were able to visually see how the APPs were meant to be facilitated. This aspect of the CASE Institute provided active learning experiences for the teachers—potentially bolstering their self-efficacy associated with teaching CASE themselves. Interactions with experienced teachers during the CASE AFNR Institute benefited participants through the availability of guidance, expert opinions, and providing authentic classroom feedback, embodying Bandura's (1997) social persuasion source of teacher self-efficacy. Support and relationships from others were found in previous literature to significantly impact beginning teachers' sense of self-efficacy (Hasselquist et al., 2017).

The beginning SBAE teachers found the CASE Institutes to be professionally enriching, although they were not pleased with the duration (i.e., two-week training and full days) and intensity of the professional development event. The teachers' concerns surrounding the length of the CASE

Institutes might have implications for their ability and willingness to attend CASE Institutes in the future. Even though this aspect served as a challenge for the teachers, previous research lends support to the organization and design of the CASE institutes. According to Darling-Hammond and Richardson (2009), long durations of professional development are the most effective. To address this issue, CASE leaders (i.e., members on advisory and executive committees), university-based teacher educators, and CASE site hosts need to further explore the pros and cons of augmenting the length of these professional development events. Aside from the traditional two-week institutes, CASE offers fast-track institutes; a few teacher preparation programs also offer semester-long CASE courses, which lead to full certification. According to CASE (2018), teachers who have already obtained a previous CASE certification are eligible to sign up for a fast-track course. This option might mitigate the duration of time a teacher is required to spend at an institute, but the intensity of the professional development appears to be comparable with the traditional certification route. The fast track institutes require teachers to complete pre-institute homework and “the hours to complete a fast track institute will be similar to the hours at a standard institute” (CASE, 2018, p. 1). Future studies should be conducted to examine teachers’ perceptions of the various CASE Institute formats (i.e., traditional, fast track, or pre-service). This investigation will shed light on the perceived benefits and challenges associated with each training format and improve understanding of teachers’ preferences associated with professional development design.

Participants benefited from implementing the inquiry-based learning experiences of the CASE AFNR curriculum into their classrooms. Inquiry-based learning was a benefit for beginning teachers both when becoming CASE AFNR certified and when implementing the curriculum within their classrooms. Students enjoy having hands-on experiments and activities inside the classrooms. Beginning teachers found that the hands-on learning-by-doing curriculum style within inquiry-based instruction aided students that were struggling with the same content in other courses. Modeling of inquiry-based learning has a positive impact on the creative intelligence as well as practical intelligence of the students compared to curriculum founded on the direct instruction approach.

Whittington (2005) found that it is expected SBAE teachers have a foundation of content knowledge strong enough to reach students’ needs within all these pursuits. A major stressor found in the agricultural education profession is the educator’s perceived credibility as a content teacher (Rice & Kitchel, 2017). In this study, beginning teachers found having a set curriculum available to them boosted their confidence in that content area. Presumably, this acts as a positive force of teacher self-efficacy by means of the physiological and emotional state sources (Bandura, 1997). Beginning SBAE teachers gained mastery experience by successfully teaching the CASE curriculum. The increase in the teacher-self efficacy alleviates some of the doubts beginning teachers face when teaching the curriculum to their students in the future, which positively impacts their physiological and emotional states (Bandura, 1997). This confidence boost in teaching the content area is driving beginning teachers in this study to seek certification in different content areas.

Smalley and Smith (2017) found SBAE teachers have indicated a need for course planning and curriculum, as these are obstacles to overcome when entering the classroom. Participants identified the availability of pre-planned lessons as a major benefit. Having one class with pre-planned lessons allows the beginning teachers to focus their efforts on other courses requiring more intensive preps.

Recommendations for future studies would include replicating the current study with a greater range of participant populations, in addition to conducting observations of the teacher’s instruction to measure a change in self-efficacy. Future studies could use participants coming from different CI locations or draw from CIs in different content areas (e.g., animal science, plant science, agricultural

business, food science). A future study could explore communications among universities hosting similar CASE Institutes and consider the possibility for collaboration of preparation. Consideration should also be taken to the design and layout of a preservice CASE institute for preservice students if the completion of a semester-based institute versus a condensed 8-day professional development institute differs.

### References

- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman and Company.
- Bird, T., & Rice, A. (2021). The influence of CASE on agriculture teachers' use of inquiry-based methods. *Journal of Agricultural Education*, 62(1), 260-275.  
<http://doi.org/10.5032/jae.2021.01260>
- Bong, M. (2006). Asking the right question. How confident are you that you could successfully perform these tasks? In F. Pajares & T. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 287-305). Information Age.
- Bong, M., & Skaalvik, E. M. (2003). Academic self-concept and self-efficacy: How different are they really? *Educational Psychology Review*, 15(1), 1-40. <https://doi.org/10.1023/A:102130240>
- Bonwell, C. C., & Eison, J. A. (1991). Active learning: Creating excitement in the classroom. ERIC Digest. <https://eric.ed.gov/?id=ED340272>
- Boyatzis, R. E. (1998). *Transforming qualitative information: Thematic analysis and code development*. Sage.
- Cannon, J. G., Kitchel, A., & Duncan, D. W. (2012). Perceived teaching and learning professional development needs of Idaho secondary career and technical education teachers. *The Researcher*, 24(1), 43-54. <https://www.nrmera.org/wp-content/uploads/2016/02/Researcherv24n1Cannon.pdf>
- Claycomb, D. M., & Petty, G. C. (1983). A three-year longitudinal study of the perceived needs for assistance as ranked by vocational agriculture instructors. *Journal of the American Association of Teacher Educators in Agriculture*, 42(4), 28-33.  
<https://eric.ed.gov/?id=EJ290926>
- Curriculum for Agricultural Science Education. (2021). *CASE certified teachers map*. Case4Learning. <https://viewer.mapme.com/case4learning/>
- Curriculum for Agricultural Science Education. (2018). *CASE institutes*. <https://www.case4learning.org/index.php/professional-development/case-institute/case-institute-offerings>
- Curriculum for Agricultural Science Education (2011). *CASE mission and purpose*. <http://www.case4learning.org/>

- Darling-Hammond, L., & Richardson, N. (2009). Teacher learning: What matters? *Educational Leadership*, 66(5), 46-53. <http://www.ascd.org/publications/educational-leadership/feb09/vol66/num05/Teacher-Learning@-What-Matters%C2%A2.aspx>
- Desimone, L. M., Porter, A. C., Garet, M. S., Yoon, K. S., & Birman, B. F. (2002). Effects of professional development on teachers' instruction: Results from a three-year longitudinal study. *Educational Evaluation and Policy Analysis*, 24(2), 81-112. <https://doi.org/10.3102/01623737024002081>
- DiBenedetto, C. A., Easterly, R. E., & Myers, B. E. (2015). Can scientific reasoning scores predict the likelihood of SBAE students' intent to pursue a STEM career, a career in agriculture, or plan to attend college? *Journal of Agricultural Education*, 56(1), 103-115. <https://doi.org/10.5032/jae.2015.01103>
- Dobbs, R., Madgavkar, A., Barton, D., Labaye, E., Manyika, J., Lund, S., & Madhav, S., (2012). *The world at work; Jobs, pay, and skills for 3.5 billion people* (Report No. 91). McKinsey Global Institute. <https://www.voced.edu.au/content/ngv:53010>
- Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal*, 38(4), 915-945. <https://doi.org/10.3102/00028312038004915>
- Hasselquist, L., Herndon, K., & Kitchel, T. (2017). School culture's influence on beginning agriculture teachers' job satisfaction and teacher self-efficacy. *Journal of Agricultural Education*, 58(1), 267-279. <https://doi.org/10.5032/jae.2017.01267>
- Joerger, R. M. (2002). A comparison of the inservice education needs of two cohorts of beginning Minnesota agricultural education teachers. *Journal of Agricultural Education*, 43(3), 11-24. <https://doi.org/10.5032/jae.2002.03011>
- Johnson, D., Lindhardt, R., & Stewart, R. (1989). Priorities of first and second year teachers of agriculture in Missouri. *Journal of Agricultural Education*, 30(2), 55-61. <https://doi.org/10.5032/jae.1989.02055>
- Knox, S., & Burkard, A. W. (2009). Qualitative research interviews. *Psychotherapy Research*, 19(4-5), 566-575. <https://doi.org/10.1080/10503300802702105>
- Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part 4: trustworthiness and publishing. *European Journal of General Practice*, 24(1), 120-124. <https://doi.org/10.1080/13814788.2017.1375092>
- Lambert, M. D., Velez, J. J., & Elliott, K. M. (2014). What are the teachers' experiences when implementing the Curriculum for Agricultural Science Education? *Journal of Agricultural Education*, 55(4), 100-115. <https://doi.org/10.5032/jae.2014.04100>
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry*. Sage Publications.

- McKim, A. J., & Velez, J. J. (2016). An evaluation of the self-efficacy theory in agricultural education. *Journal of Agricultural Education, 57*(1), 73-90. <https://doi.org/10.5032/jae.2016.01073>
- Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation*. Jossey-Bass.
- Myers, B. E., Dyer, J. E., & Washburn, S. G. (2005). Problems of beginning agriculture teachers. *Journal of Agricultural Education, 46*(3), 47-55. <https://doi.org/10.5032/jae.2005.03047>
- Noonan, R. (2017). *STEM jobs: 2017 update* (Issue Brief No. 02-17). U. S. Department of Commerce, Office of the Chief Economist, Economics and Statistics Administration. <https://www.commerce.gov/data-and-reports/reports/2017/03/stem-jobs-2017-update>
- Pajares, F. (1997). Current directions in self-efficacy research. In H. W. Marsh, R. G. Craven & D. M. McInerney (Eds.), *International advances in self research* (pp. 1-49). Information Age.
- Pauley, C. M., McKim, A. J., Curry Jr., K. W., McKendree, R. B., & Sorensen, T. J. (2019). Evaluating interdisciplinary teaching: Curriculum for agricultural science education. *Journal of Agricultural Education, 60*(1), 158-171. <https://doi.org/10.5032/jae.2019.01157>
- Rayfield, J. S., McKim, B. R., Smith, K. L., & Lawrence, S. G. (2014). Analyzing Moir's curve: A quantitative look at attitudinal changes in induction-year agricultural educators. *Journal of Agricultural Education, 55*(3), 147-161. <https://doi.org/10.5032/jae.2014.03147>
- Rice, A. H., & Kitchel, T. (2015). The relationship between agriculture knowledge bases for teaching and sources of knowledge. *Journal of Agricultural Education, 56*(4), 153-168. <https://doi.org/10.5032/jae.2015.04153>
- Rice, A., & Kitchel, T. (2017). Teachers' beliefs about the purpose of agricultural education and its influence on their pedagogical content knowledge. *Journal of Agricultural Education, 58*(2), 198-213. <https://doi.org/10.5032/jae.2017.02198>
- Roberts, K., Dowell, A., & Nie, J. B. (2019). Attempting rigour and replicability in thematic analysis of qualitative research data; A case study of codebook development. *BMC medical research methodology, 19*(1), 1-8. <https://doi.org/10.1186/s12874-019-0707-y>
- Ruhland, S. K., & Bremer, C. D. (2002). Professional development needs of novice career and technical education teachers. *Journal of Career and Technical Education, 19*(1), 18-31. <https://eric.ed.gov/?id=EJ660464>
- Skaalvik, E. M., & Skaalvik, S. (2007). Dimensions of teacher self-efficacy and relations with strain factors, perceived collective teacher efficacy, and teacher burnout. *Journal of educational psychology, 99*(3), 611-625. <https://doi.org/10.1037/0022-0663.99.3.611>
- Smalley, S., & Smith, A. (2017). Professional development needs of mid-career agriculture teachers. *Journal of Agricultural Education, 58*(4), 282-290. <https://doi.org/10.5032/jae.2017.04283>

- Stair, K. S., Warner, W. J., & Moore, G. E. (2012). Identifying concerns of preservice and in-service teachers in agricultural education. *Journal of Agricultural Education*, 53(2), 153-164. <https://doi.org/10.5032/jae.2012.02153>
- Stripling, C. T., & Ricketts, J. C. (2016). Research priority 3: Sufficient Scientific and Professional Workforce That Addresses the Challenges of the 21<sup>st</sup> Century. In T. G. Roberts, A. Harder, & M. T. Brashears. (Eds.), *American Association for Agricultural Education national research agenda: 2016-2020*. Gainesville, FL: Department of Agricultural Education and Communication.
- Touchstone, A. J. L. (2015). Professional development needs of beginning agricultural education teachers in Idaho. *Journal of Agricultural Education*, 56(2), 170-187. <https://doi.org/10.5032/jae.2015.02170>
- Ulmer, J. D., Velez, J. J., Lambert, M. D., Thompson, G. W., Burris, S., & Witt, P. A. (2013). Exploring science teaching efficacy of CASE curriculum teachers: A post-then-pre assessment. *Journal of Agricultural Education*, 54(4), 121-133. <https://doi.org/10.5032/jae.2013.04121>
- Vilorio, D. (2014). STEM 101: Intro to tomorrow's jobs. *Occupational Outlook Quarterly*, 58(1), 2-12. <https://www.bls.gov/careeroutlook/2014/spring/art01.pdf>
- Wells, T., Hainline, M., & Smalley, S. (2019). Identifying challenges pre-service teachers encountered when teaching curriculum for agricultural science education (CASE) coursework during student teaching. *Journal of Agricultural Education*, 60(3), 128-140. <https://doi.org/10.5032/jae.2019.03128>
- Wells, T., Matthews, J., Caudle, L., Lunceford, C., Clement, B., & Anderson, R. (2015). The infusion of inquiry-based learning into school-based agricultural education: A review of literature. *Journal of Agricultural Education*, 56(4), 169-181. <https://doi.org/10.5032/jae.2015.04170>
- Whittington, S. M. (2005). The presidential address to the Association for Career and Technical Education Research. *Career and Technical Education Research*, 30(2), 88-99. <https://scholar.lib.vt.edu/ejournals/CTER/v30n2/pdf/whittington.pdf>
- Williams, M., & Moser, T. (2019). The art of coding and thematic exploration in qualitative research. *International Management Review*, 15(1), 45-55. <http://www.imrjournal.org/uploads/1/4/2/8/14286482/imr-v15n1art4.pdf>
- Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). Sage publications.
- Zimmerman, B. J., & Cleary, T. J. (2006). Adolescents' development of personal agency. The role of self-efficacy beliefs and self-regulatory skills. In F. Pajares & T. Urda (Eds.), *Self-efficacy beliefs of adolescents* (pp. 45-69). Information Age.