Measuring Effective Teaching Components of School-Based Agricultural Education Teaching Aspirants During the COVID-19 Pandemic

Christopher J. Eck
Clemson University
eck@clemson.edu

Jessica M. Toombs
California State University, Chico
jmtoombs@csuchico.edu

J. Shane Robinson
Oklahoma State University
shane.robinson@okstate.edu

Research Type: Quantitative
Research Priority Area: Teacher education and school-based ag education

Measuring Effective Teaching Components of School-Based Agricultural Education Teaching Aspirants During the COVID-19 Pandemic

Abstract

Defining, identifying, and evaluating teaching effectiveness is a difficult proposition; however, measuring the effectiveness of school-based agricultural education (SBAE) teachers is even more difficult considering the diversity of programs nationwide. Faculty in the agricultural education teacher preparation program at Oklahoma State University sought to measure the effective characteristics developed during the Spring 2020 semester, using the effective teaching model as a frame for this study in conjunction with the Effective Teaching Instrument for SBAE Teachers (ETI-SBAE). This approach allowed the research team an opportunity to further investigate the preparedness of SBAE teacher aspirants during the ongoing COVID-19 pandemic. A descriptive research design was implemented with SBAE teacher aspirants at Oklahoma State University with a junior- or senior-level classification (N = 72). The SBAE pre-service teachers at Oklahoma State University identified a high sense of effectiveness based on the ETI-SBAE instrument. In this group of pre-service teachers, all participants scored an overall teaching effectiveness score of strong to very strong, with the overwhelming majority (79.2%) planning to enter the teaching profession. Additionally, there was a relationship between intention to teach and teaching effectiveness scores, with those who intend to teach reporting higher teaching effectiveness scores. The ETI-SBAE holds utility for SBAE teacher preparation programs.

Introduction

Multiple perspectives exist regarding the design and implementation of school-based agricultural education (SBAE) teacher preparation programs (Darling-Hammond et al., 2002). Some have suggested teacher candidates must receive additional coursework or experiences focusing on the development of personal qualities (Roberts & Dyer, 2004), while others have recommended the essential skills for teaching effectiveness revolve around instructional planning (Phipps et al., 2008).

> During their college years, students make the pivotal decision to focus their energy and attention on a major program that will shape their future. In turn, these programs provide direction and requirements intended to help students achieve their academic goals. (Kohn, 2018, p. 1)

Regardless, students come to "each new task or problem [with] a set of skills, performance standards, and values" (Krumboltz et al., 1976, p. 73); although, for this discourse to be effective, students must engage in the learning environment, "which incorporates behavioral, emotional, and cognitive aspects" (Marx et al., 2016, p. 213).

Although numerous scholars have attempted to define effective teaching throughout the decades, it has been referred to as "an elusive concept" (Hayes, 2006, p. 43). Rosenshine and Furst (1971) found that effective teachers are those who are clear, infuse a variety of teaching methods and media, are enthusiastic about teaching their subjects, remain on-task throughout the duration of

the lesson, and provide students ample opportunities to apply their learning, to name a few. Steele (2010) identified effective teachers as those who exhibit servant leadership, a strong sense of personal self-efficacy, and nonverbal communication skills. Farrell (2015) suggested that effective teachers must be "multidimensional" in their ability to teach students. Despite the rich amount of scholarship and literature devoted to and written on effective teaching, various opinions exist regarding the competencies teachers need to possess to be deemed effective at their profession (Hayes, 2006).

When considering the uniqueness of SBAE teachers, the problem becomes even more difficult due to the added expectations of the complete program (i.e., Classroom and Laboratory Instruction, Supervised Agricultural Experiences, and the FFA) outlined by the National FFA Organization (2015). SBAE teachers are expected to be effective in community relations, marketing, professionalism, program planning, and possess the personal qualities necessary to perform the job well (Roberts & Dyer, 2004). In addition, SBAE teachers should be effective in leading classroom instruction, maintain a proper work-life balance, and focus on diversity and inclusion of all students in their programs (Eck et al., 2019).

Defining SBAE teacher effectiveness is a challenging proposition, but evaluating the effectiveness of SBAE teachers is perhaps even more difficult due to the diversity of programs nationwide (Enns et al., 2016; Roberts & Dyer, 2004). In light of these variations and challenges, SBAE teacher preparation programs must continually consider how teacher aspirants are prepared for a successful career in agricultural education.

The semester in which this study was conducted was Spring 2020, which had its own set of challenges due to the onset of the COVID-19 pandemic. Educators across the country scrambled to quickly overhaul and restructure their course delivery to virtual learning platforms (Daniel, 2020), leading Hodges et al. (2020) to coin the term: *Emergency Remote Teaching*. At Oklahoma State University, educators were forced to overhaul their classes to a complete online delivery of instruction in one week. Although some teacher educators at Oklahoma State University had experience delivering instruction online, the circumstances were vastly different among the faculty. The change in instructional delivery certainly added a challenge to preparing SBAE teacher aspirants for their future careers. Considering the implications of the COVID-19 pandemic, along with the multitude of developmental needs of SBAE teacher aspirants, a need existed to determine the essential components of an SBAE teacher developed during the Spring 2020 semester at Oklahoma State University. Understanding the deficiencies in perceived competence of these teacher aspirants as a result of the COVID-19 pandemic is imperative for us to know if and what types of professional development may be needed for these teachers in the future.

Theoretical/Conceptual Framework

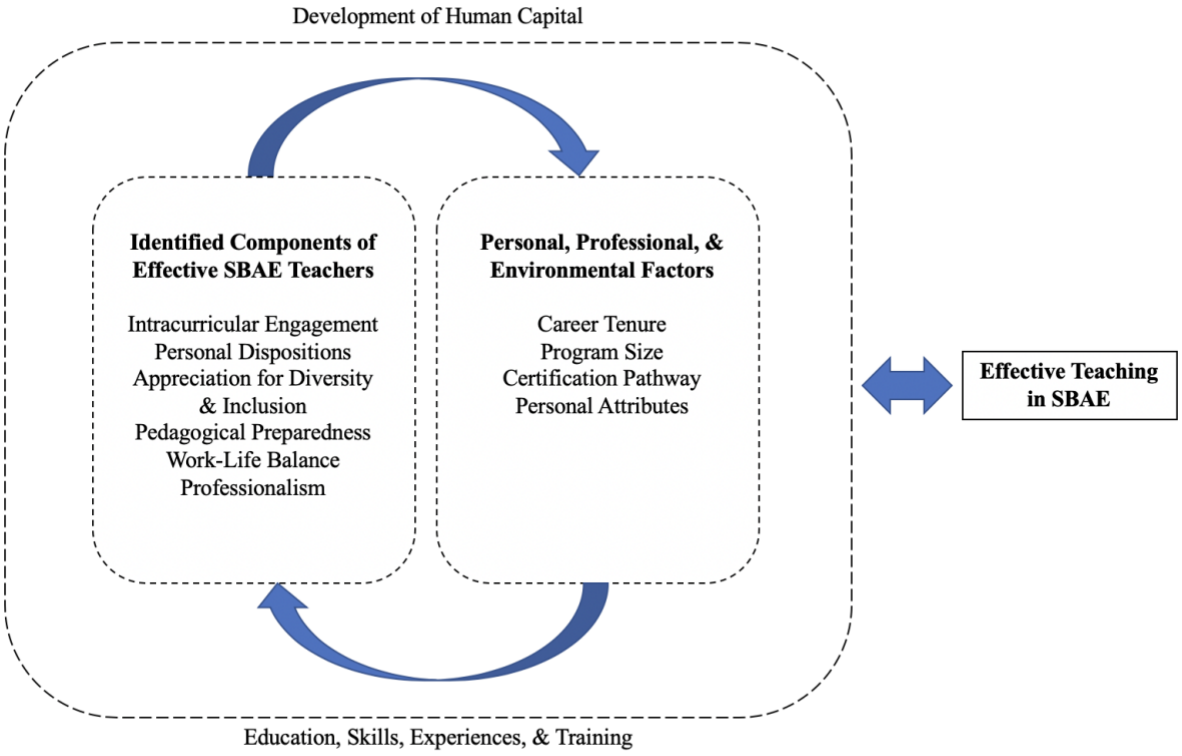
The human capital theory was used to frame this study, as human capital evaluates education, training, and skills obtained related to future employment (Becker, 1964). In the case of this study, the education, training, and skill acquisition is related to SBAE teacher aspirants' enrollment in the agricultural education teacher preparation program at Oklahoma State University. The human capital development of SBAE teachers begins at Oklahoma State

University with specific skills embedded in our teacher preparation program in the areas of teaching, supervising, and advising, and are continued and enhanced during the clinical teaching internship (NCATE, 2010). The human capital students acquire assists them in their future employment (Robinson & Baker, 2013). Human capital can also impact student success, as Pil and Leana (2009) connected teachers' application of their human capital to a positive impact on student outcomes.

Although similarities exist in preparation of SBAE teacher aspirants across the U.S., the demands placed on SBAE teachers once they enter the classroom vary greatly (Roberts & Dyer, 2004). Therefore, specific evaluation metrics appropriate for SBAE teachers and their human capital development are necessary. To that end, the effective teaching model for SBAE teachers (Blinded for Review) was implemented to help frame the development of effective teaching components in SBAE teacher aspirants (Figure 1).

Figure 1

The Effective Teaching Model for SBAE Teachers



As SBAE teachers represent such a diverse landscape (Roberts & Dyer, 2004), there is no one-size-fits-all formula for the preparation, support, and evaluation of effective teachers (Steele, 2010). Using the effective teaching model (Figure 1) as a frame for this study in conjunction

with the Effective Teaching Instrument for SBAE Teachers (ETI-SBAE) developed by Eck et al. (2020) allows us the opportunity to further investigate the preparedness of SBAE teacher aspirants at Oklahoma State University during the ongoing COVID-19 pandemic.

Purpose of the Study

The purpose of the study was to measure the development of effective teaching principles in SBAE teacher aspirants at Oklahoma State University. Four research questions guided this study:

1. Identify the effective teaching principles developed by SBAE teacher aspirants at Oklahoma State University during the Spring 2020 semester,
2. Determine the teaching effectiveness score for SBAE teacher aspirants,
3. Determine SBAE teacher aspirants' intent to teach SBAE after graduation, and
4. Identify the impact of career intent on SBAE teacher aspirants teaching effectiveness.

Methods and Procedures

A descriptive research design was implemented for this non-experimental study, as there were no circumstances being manipulated within the population of interest (Gay et al., 2012). The population of interest was all SBAE teacher aspirants at Oklahoma State University with a junior- or senior-level classification (N = 72) during the Spring 2020 semester. Therefore, these students were either enrolled in AGED 3203 (n = 45) or were actively encountering their clinical teaching experience in a secondary agricultural education program (n = 27). Due to the COVID-19 pandemic, data collection occurred virtually using dedicated time during a scheduled Zoom meeting to allow participants to follow a weblink or scan a quick response (QR) code to complete the instrument via the Qualtrics data collection form. As the SBAE teacher aspirants were a captive audience during this meeting, this study resulted in a 100% response rate, as all 72 teacher aspirants participated.

The instrument used in this study was the (ETI-SBAE) developed by Eck et al. (2020). The 26-item instrument spans six components including intracurricular engagement, personal dispositions, appreciation for diversity and inclusion, pedagogical preparedness, work-life balance, and professionalism (Eck et al., 2020) as detailed in Table 1.

Table 1

Effective Teaching Components and Item Descriptions (26 items)

Component Title	Item	Corresponding Item Description
1. Intracurricular Engagement	IE_1	I instruct students through FFA.
	IE_2	I advise the FFA officers.
	IE_3	I advise the FFA chapter.
	IE_4	I facilitate record keeping for degrees and awards.
	IE_5	I am passionate about FFA.

	IE_6	I instruct students through SAEs.
	IE_7	I use the complete agricultural education 3-component model as a guide to programmatic decisions.
2. Personal Dispositions	PD_1	I am trustworthy.
	PD_2	I am responsible.
	PD_3	I am dependable.
	PD_4	I am honest.
	PD_5	I show integrity.
	PD_6	I am a hard worker.
3. Appreciation for Diversity and Inclusion	AD_1	I value students regardless of economic status.
	AD_2	I value students of all ethnic/racial groups.
	AD_3	I value students regardless of sex.
	AD_4	I care about all students.
	AD_5	I understand there is not an award for all students, but that does not mean they are not valuable.
4. Pedagogical Preparedness	PP_1	I demonstrate classroom management.
	PP_2	I demonstrate sound educational practices.
	PP_3	I am prepared for every class.
5. Work-Life Balance	B_1	I have the ability to say no.
	B_2	I lead a balanced life.
	B_3	I am never afraid to ask for help.
6. Professionalism	P_1	I have patience.
	P_2	I show empathy.

With any psychometric design, validity and reliability are important considerations (Privitera, 2017). To determine validity and reliability of the ETI-SBAE, a national census study was conducted using the instrument developed from the findings of a nationwide Delphi study which identified the key components of an effective SBAE teacher (Eck et al., 2019; 2020; 2021). The results deemed the instrument to be reliable (Blinded for Review) with an acceptable Cronbach's alpha of 0.87 (Nunnally, 1978). This instrument included a four-point Likert-type scale (i.e., 1 = very weak; 2 = somewhat weak; 3 = somewhat strong; 4 = very strong) for the SBAE teacher aspirants to self-assess their preparedness to be a SBAE teacher after graduation. In addition to the ETI-SBAE, aspirants were asked to identify their intent to enter the SBAE teaching profession, in which they were asked to select: Yes, No, or Undecided.

Data were analyzed using SPSS Version 26 for descriptive statistics for the first three research questions and the analysis of variance (ANOVA) included in the final research question. In

addition to SPSS, Microsoft Excel was used to calculate the overall effectiveness scores of each of the 72 SBAE teacher aspirants at Oklahoma State University, as the 26-items were evaluated on a four-point Likert-type scale, providing a potential effectiveness score range from 26 (very weak) to 104 (very strong). The calculated effectiveness score was then used in the ANOVA to compare teacher aspirants' effectiveness based on their career intent (i.e., Yes, No, or Undecided).

Although the research team of this study served as instructors and university supervisors for SBAE teacher aspirants at Oklahoma State University, the completion of the ETI-SBAE was not connected to any course grade or evaluation score. Participants were asked to consider the instrument as a measure of growth as an agricultural education student at Oklahoma State University and their preparedness as a future SBAE teacher.

Findings

Research Question 1: Determine the effective teaching principles developed by SBAE teacher aspirants at Oklahoma State University during the Spring 2020 semester

The ETI-SBAE was distributed for self-evaluation to pre-service SBAE teachers at the end of the Spring 2020 semester during online instruction due to the COVID-19 pandemic. SBAE teacher aspirants identified themselves as least prepared to instruct students through the FFA, advise the FFA chapter, facilitate record keeping for degrees and awards, demonstrating classroom management, being prepared to teach every class, having the ability to say no, leading a balanced life, not being afraid to ask for help, and having patience based on the frequency of participants marking very weak or somewhat weak (Table 2). These nine items resulted in mean scores ranging from 3.03 to 3.39, with the lowest mean score (3.03) resulting from the item related to leading a balanced life as an SBAE teacher aspirant. Mean and standard deviation scores of all 26-items from the ETI-SBAE are displayed in Table 2.

Table 2

Effective Teaching Results for SBAE Teacher Aspirants at Oklahoma State University (N = 72)

Component	Item Description	μ	σ
Intracurricular Engagement	I instruct students through FFA.	3.38	.57
	I advise the FFA officers.	3.44	.58
	I advise the FFA chapter.	3.39	.57
	I facilitate record keeping for degrees and awards.	3.14	.68
	I am passionate about FFA.	3.89	.32
	I instruct students through SAEs.	3.57	.55

	I use the complete agricultural education 3-component model as a guide to programmatic decisions.	3.56	.50
Personal Dispositions	I am trustworthy.	3.96	.20
	I am responsible.	3.86	.35
	I am dependable.	3.89	.32
	I am honest.	3.93	.26
	I show integrity.	3.93	.26
	I am a hard worker.	3.97	.17
Appreciation for Diversity and Inclusion	I value students regardless of economic status.	3.96	.20
	I value students of all ethnic/racial groups.	3.96	.20
	I value students regardless of sex.	3.97	.17
	I care about all students.	4.00	.00
	I understand there is not an award for all students, but that does not mean they are not valuable.	3.96	.20
Pedagogical Preparedness	I demonstrate classroom management.	3.38	.64
	I demonstrate sound educational practices.	3.60	.52
	I am prepared for every class.	3.39	.72
Work-Life Balance	I have the ability to say no.	3.17	.80
	I lead a balanced life.	3.03	.75
	I am never afraid to ask for help.	3.14	.89
Professionalism	I have patience.	3.38	.64
	I show empathy.	3.57	.58

Note. 1 = very weak; 2 = somewhat weak; 3 = somewhat strong; 4 = very strong

Research Question 2: Determine a teaching effectiveness score for SBAE teacher aspirants

The 26-items associated with the ETI-SBAE (Eck et al., 2020) were evaluated on a four-point Likert-type scale, with a perfect effectiveness score of 104 (very strong) and a minimum effectiveness score of 26 (very weak). Effectiveness scores for SBAE teacher aspirants at Oklahoma State University ranged from 79 to 104 with a mean of 94.28 (*SD* = 5.98). Therefore, participants considered themselves to be strong to very strong in terms of their preparedness to be an effective SBAE teacher. SBAE teacher aspirants deemed themselves most effective in their appreciation for diversity and inclusion, followed by their personal dispositions. Work-life

balance, on the other hand, received the lowest average effectiveness score from the SBAE teacher aspirants.

Research Question 3: Determine SBAE teacher aspirants' intent to teach SBAE after graduation

The majority (79.2%) of SBAE teacher aspirants at Oklahoma State University selected "Yes" regarding their intent to become a SBAE teacher after graduation. Table 3 outlines the aspirants' intentions related to becoming an SBAE teacher after graduation (i.e., Yes, No, or Undecided).

Table 3

Oklahoma State University SBAE Teacher Aspirants' Intention to Enter the SBAE Profession (N = 72)

Intention	***f***	%
Yes	57	79.2
No	3	4.2
Undecided	12	16.6

Research Question 4: Determine the impact of career intent on SBAE teacher aspirants' teaching effectiveness

To consider the impact of career intent on teaching effectiveness, participants' response to the question: "Do you intend to become a SBAE teacher after graduation?" was used as the independent variable with answer choices of Yes, No, or Undecided. The dependent variable was the composite effectiveness score (ranging from 79 to 104) of SBAE teacher aspirants. Normality and homogeneity of variance were assessed with all responses being normally distributed and a non-statistically significant ($p > .05$) Levene's test statistic. Therefore, a one-way ANOVA was conducted in SPSS, which resulted in a statistically significant difference based on composite effectiveness scores $F\ (2, 65) = 4.66$, $p < .05$. To further understand the statistical significance of the ANOVA output, a post-hoc analysis was conducted. Based on the ability to control for Type I error, a Bonferroni post-hoc analysis (Field, 2009) was used. A 95% confidence interval for the post-hoc analysis resulted in a statistically significant difference based on the SBAE teacher aspirants' intent to enter the SBAE teaching profession (Table 4).

Table 4

Multiple Comparisons Mean Differences of SBAE Teacher Aspirant Effectiveness Based on Intent to Become an SBAE Teacher (N = 72)

Career Intent	Yes	No	Undecided

Yes	-		
No	-8.61*	-	
Undecided	-4.04	4.58	-

Note. * = $p < .05$. Values identify the mean difference between groups.

Conclusions

The SBAE teacher aspirants at Oklahoma State University identified a high sense of effectiveness based on the ETI-SBAE instrument. The mean score for each item ranged between the somewhat strong (3) to very strong (4) scale. Each participant rated the item, *I care about all students,* as very strong in their capacity to be an effective teacher. The components of, *Appreciation for Diversity and Inclusion*, as well as, *Personal Dispositions*, received the highest scores of perceived effectiveness in this group of teacher aspirants. These findings resonate with today's generation of college students who are among the most diverse populations in history and express greater appreciations of diversity and inclusion than previous generations (Sanchez et al., 2018). Personal dispositions such as work ethic and trustworthiness are largely developed in childhood and adolescence (Syed et al., 2020). Therefore, the teacher aspirants in this study likely possessed these characteristics prior to their enrollment in the SBAE teacher preparation program at Oklahoma State University. Regardless, Darling-Hammond and Bransford (2005) stated that diversity and inclusion and personal dispositions should be highlighted by teacher preparation programs. Fortunately, the SBAE teacher preparation program at Oklahoma State University emphasizes diversity and inclusion through its international agriculture, special education, and adolescent psychology course requirements. Such opportunities for students to experience, learn, and practice such characteristics should continue.

SBAE teacher aspirants rated record keeping, exhibiting patience, pedagogical preparedness, and work-life balance with a greater frequency of very weak (1) and somewhat weak (2). This conclusion aligns with work by Toombs and Ramsey (2020) and Toombs et al. (2020) that also found a lack of confidence in keeping financial records for Supervised Agricultural Experience (SAE) projects in SBAE pre-service teachers. Some of the teacher aspirants in this study identified a lack of patience in their professionalism component. This may be contributed to Generation Z's scarcity of patience in their digital native world (National Retail Federation, 2017). It is possible a shortage of clinical and preclinical experiences may have contributed to the reported lack of confidence in pedagogical preparedness, specifically as it relates to classroom management and class preparation, as 62.5% (n = 45) of the teacher aspirants were still one or more semesters away from their clinical teaching experience. Additionally, the teacher aspirants encountering their student teaching experience (n = 27) were removed from their internship sites early due to the COVID-19 pandemic. These experiences are vital to developing mastery and vicarious experiences to build teacher self-efficacy in managing student behavior and preparing instruction (Bandura, 1997; Smalley & Retallick, 2012). Some of the study's participants questioned their ability to maintain a work-life balance before they had entered the teaching profession. All three items in this component, *ability to say no, leading a balanced life,* and *willingness to ask for help* were rated as very weak (1) or somewhat weak (2) by a significant portion of individuals. This may be problematic regarding the retention of these

future SBAE teachers (Crutchfield et al., 2013). Though the mean scores were high for each item, frequency of low effectiveness responses should not be ignored.

The teaching effectiveness score was calculated by adding together the participants' effectiveness score for each of the 26 items, with a maximum possible effectiveness score of 104. In this group of teacher aspirants, all participants scored an overall teaching effectiveness score of strong to very strong (i.e., ranging from 79 to 104) indicating these future SBAE teachers are confident in their ability as they near entrance into the teaching profession. The aforementioned responses of very weak and somewhat weak were not sufficient to reflect a low teaching effectiveness score for any participant. A person's positive view of his or her own ability is important in career choice and early career self-efficacy (Bandura, 1997). These neophyte teachers may be more resilient with a greater likelihood of being retained in the teaching profession than their less confident peers (Redman, 2015).

The extreme score of 104 on the ETI-SBAE is worth mentioning. Two possible explanations exist for this data point. It is possible this individual is very confident in their ability to be an effective SBAE instructor. It is also possible this individual could have reported a very strong (4) sense of effectiveness to each item with little to no regard to the item in question. Still, Liu et al. (2017) found extreme cases to have little impact to their overall findings.

Of the 72 SBAE teacher aspirants who participated in this study, only three (4.2%) reported they did not intend to teach SBAE. Even with another 12 (16.6%) being undecided, the overwhelming majority (79.2%) plan to enter the SBAE teaching profession, which surpasses national data from 2018 that found 77% of agricultural education graduates entered the teaching profession (National Association of Agricultural Educators, 2019) and from 2001 that found only 59% of graduates were entering the teaching ranks (Camp et al., 2002). It also surpasses research conducted by Eck and Edwards (2019) who found that six out of ten SBAE teacher aspirants who encountered a teacher preparation program actually entered the teaching profession. Even in the midst of a global pandemic, mandated distance learning, and a shortened student teaching internship, most SBAE teacher aspirants envisioned a future as a SBAE teacher. Considering a SBAE teacher shortage across the nation, SBAE graduates who are interested in teaching jobs are likely to be hired as an SBAE instructor (Camp et al., 2002).

In comparing teaching effectiveness scores across intention to teach groups, a statistically significant difference was found in the one-way ANOVA. Post-hoc analysis revealed statistically significant differences between those who intend to teach and those who do not. Uneven group sizes (Yes = 57, No = 3) were mitigated by homogeneity of variance within the groups. No statistically significant differences were found relating to the undecided group. Therefore, a relationship exists between intention to teach and teaching effectiveness scores, with those who intend to teach reporting higher teaching effectiveness scores than those who do not. This finding corroborates with Bandura's (1997) theory of self-efficacy and the connection of higher self-reverent beliefs and motivation.

Recommendations

The ETI-SBAE holds utility for SBAE teacher preparation programs. Peer institutions are encouraged to conduct similar survey research studies of their own teacher aspirants to compare populations across institutions. The same instrument could be used to assess the efficacy beliefs on entrance to the teacher preparation program, at the completion of pre-clinical experiences, and again after the conclusion of the student teaching internship to track human capital development throughout the SBAE teacher preparation program. Participants also could be followed into the novice years of their SBAE teaching careers. Additional qualitative data would add context to explain participants' rankings of their efficacy beliefs and ability. The findings of such research could impact course content, delivery, and pacing within SBAE teacher preparation programs.

Specific to the agricultural education teacher preparation program at Oklahoma State University, teacher educators should analyze existing instruction relating to the area's participants marked as somewhat weak and very weak. Specifically, topics of record keeping, maintaining patience, pedagogical preparedness, and work-life balance need to be emphasized and reinforced in the curriculum. Perhaps current in-service SBAE teachers could be recruited as guest speakers to speak on record keeping systems and work-life balance. Further, teacher aspirants should have the opportunity to prepare and present lessons from various agricultural pathways before student teaching but specifically in regard to record keeping (i.e., data management). This mastery experience could be designed to build pre-service teachers' confidence in teaching in a variety of agricultural classes (Bandura, 1997) and build human capital in all areas of the SBAE curriculum.

To better interpret extreme responses in future studies, one or more items on the instrument could be reverse coded (Liu et al., 2017). This would eliminate the confusion on the true state of self-reverent beliefs in relation to teaching effectiveness. Although these teacher aspirants held a high sense of their ability to be effective SBAE teachers, they had yet to test their true abilities as a practicing SBAE teacher. Still, this belief in their ability to be successful should be fostered by teacher educators (Clark & Newberry, 2018). A positive self-perception of a person's ability to be successful is a necessary ingredient to sustained motivation (Bandura, 1997).

Discussion

Despite the Spring 2020 semester rapidly changing due to the onset of the COVID-19 pandemic, SBAE teacher aspirants at Oklahoma State University developed the necessary human capital based on the results of the ETI-SBAE. Oklahoma State University faculty worked diligently to provide effective and timely instruction throughout the pandemic, even as they were forced to quickly restructure their course delivery to virtual learning platforms (Daniel, 2020), which may have led to this positive development of necessary human capital skills. Considering the implications of the COVID-19 pandemic, along with the multitude of developmental needs of SBAE teacher aspirants, the data tend to be favorable despite the circumstances.

The clinical teaching experience has been referred to as one of the greatest benefits of a traditional teacher preparation program (National Council for Accreditation of Teacher Education, 2010). Fortunately for some of the teacher aspirants, they were able to continue delivering content through online modules, live class meetings using synchronous learning platforms, or sending homework packets to their students each week. All of these opportunities

allowed for essential human capital development as it relates to preparedness for establishing teaching effectiveness. Some teacher aspirants had the opportunity to hold synchronous meetings with FFA officers, prepare career development teams, and host chapter meetings and banquets using online platforms. Unfortunately, for others, the clinical teaching experience ended as school districts failed to have the necessary resources to provide virtual instruction or offer other distant delivery methods. Although the SBAE teacher aspirants deemed themselves effective based on the ETI-SBAE, how should professional development opportunities for these first-year teachers be developed to offset the potential gap that was left at the beginning of the pandemic? As the COVID-19 pandemic continues, how should SBAE teacher preparation programs change to best prepare future teachers? Perhaps it is time to consider preparing teacher aspirants to become familiar with and use various online learning management systems, such as Google Classroom, Canvas, Moodle, and Docebo, to teach and deliver content, advise student learning, and supervise student projects, as other studies have identified (Eck, 2021). Maybe teacher preparation programs need to include training on teaching curriculum using a hybridized and flexible delivery system (i.e., synchronous and asynchronous teaching strategies). Although this study identified the SBAE teacher aspirants' self-perceived effectiveness as being strong to very strong, agricultural education teacher preparation faculty need to consider the future effectiveness of this group and others as they enter an everchanging education system.

References

Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman and Company.

Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis with special reference to education.* National Bureau of Economic Research.

Camp, W. G., Broyles, T., & Skelton, N. S. (2002). *A national study of the supply and demand for teachers of agricultural education in 1999-2001*. Agricultural Education Division of the Association for Career and Technical Education. https://www.naae.org/teachag/1999%20-%202001%20Supply%20Demand%20Study%20.pdf

Clark, S., & Newberry, M. (2018). Are we building preservice teacher self-efficacy? A large-scale study examining teacher education experiences. *Asia-Pacific Journal of Teacher Education, 47*(1), 32–47. https://doi.org/10.1080/1359866X.2018.1487772

Crutchfield, N., Ritz, R., & Burris, S. (2012). Why agricultural educators remain in the classroom. *Journal of Agricultural Education, 54*(2), 1–14. https://doi.org/10.5032/jae.2013.02001

Daniel, S. J. (2020). Education and the COVID-19 pandemic. *Prospects*, 1–6. https://doi.org 10.1007/s11125-020-09464-3

Darling-Hammond, L. & Bransford, J. D. (Eds.). (2005). *Preparing teachers for a changing world: What teachers should learn and be able to do*. Jossey-Bass.

Darling-Hammond, L., Chung, R., & Frelow, F. (2002). How well do different pathways prepare teachers to teach? *Journal of Teacher Education, 53*(*4*), 286–302. https://doi:10.1177/0022487102053004002

Eck, C. J. (2021) Implications of the COVID-19 pandemic on school-based agricultural education teachers in South Carolina. *Advancements in Agricultural Development, 2*(2), 25–35. https://doi.org/10.37433/aad.v2i2.117

Eck, C. J., & Edwards, M. C. (2019). Teacher shortage in school-based, agricultural education (SBAE): A historical review. *Journal of Agricultural Education, 60*(4), 223–239. https://doi.org/10.5032/jae.2019.04223

Eck, C. J., Robinson, J. S., Cole, K. L., Terry Jr., R., Ramsey, J. W. (2020). Validation of the effective teaching instrument for school-based agricultural education teachers. *Journal of Agricultural Education, 61*(4), 229-248. http://doi.org/10.5032/jae.2020.04229

Eck, C. J., Robinson, J. S., Cole, K. L., Terry Jr., R., & Ramsey, J. W. (2021). Identifying the characteristics of effective school-based agricultural education teachers: A national

census study. *Journal of Agricultural Education, 62*(3), 292-309. *https://doi.org/10.5032/jae.2021.03292*

Eck, C. J., Robinson, J. S., Ramsey, J. W., & Cole. K. L. (2019). Identifying the characteristics of an effective agricultural education teacher: A national study. *Journal of Agricultural Education, 60*(4), 1–18. https://doi.org/10.5032/jae.2019.04001

Enns, K., Martin, M., & Spielmaker, D. (2016). Research priority 1: Public and policy maker understanding of agriculture and natural resources. In T. G. Roberts, A. Harder, & M. T. Brashears (Eds). *American Association for Agricultural Education national research agenda: 2016-2020.* (pp. 13-18). Department of Agricultural Education and Communication.

Farrell, T. S. C. (2015). It's not who you are! It's how you teach! Critical competencies associated with effective teaching. *RELC Journal, 46*(1), 79–88. https://doi.org/10.1177/0033688214568096

Hayes, D. (2006). Effective teaching: An elusive concept. *Teacher Development, 10*(1), 43–54. https://doi:10.1080/13664530600587196

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. *EDUCAUSE Review*. https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

Kohn, K. P. (2018). *Connecting chemistry and biology: Exploring students' perceptions of college courses*, ProQuest Dissertations and Theses. https://search.proquest.com/openview/30cbf5651ae19018419d5c36c501a95d/1?pq-origsite=gscholar&cbl=18750&diss=y

Krumboltz, J. D., Mitchell, A. M., & Jones, B. (1976). A social learning theory of career selection. *The Counseling Psychologist, 6*(1), 71–81. https://doi.org/10.1177/001100007600600117

Liu, M., Harbaugh, A. G., Harring, J. R., & Hancock, G. R. (2017). The effect of extreme response and non-extreme response styles on testing measurement invariance. *Frontiers in Psychology, 8*. https://doi.org/10.3389/fpsyg.2017.00726

Marx, A. A., Simonsen, J. C., & Kitchel, T. (2016). Undergraduate student course engagement and the influence of student, contextual, and teacher variables. *Journal of Agricultural Education, 57*(1), 212–228. https://doi.org/10.5032/jae.2016.01212

National Association of Agricultural Educators. *2019 agriculture teacher supply and demand overview nationwide*. https://www.naae.org/teachag/2019%20Nationwide%20Profile.pdf

National Council for the Accreditation of Teacher Education (NCATE). (2010). *The CAEP standards*. https://www.ncate.org/standards/introduction

National FFA Organization. (2015). *Agricultural education.* Author. https://www.ffa.org/agricultural-education/

National Retail Foundation (2017). *Uniquely Gen Z*. https://cdn.nrf.com/sites/default/files/2018-10/Uniquely-Gen-Z_Jan2017.pdf

Pil, F. K., & Leana, C. (2009). Applying organizational research to public school reform: The effects of teacher human and social capital on student performance. *Academy of Management Journal, 52*(6), 1101–1124. https://doi.org/10.5465/amj.2009.47084647

Phipps, L. J., Osborne, E. W., Dyer, J. E., & Ball, A. (2008). *Handbook on agricultural education in public schools* (6th ed.). Thomson Delmar Learning.

Privitera, G. J. (2017). *Research methods for the behavioral sciences* (2nd ed.). Sage.

Redman, S. F. (2015). *Self-efficacy and teacher retention: Perception of novice teachers on job preparation, job support, and job satisfaction* [Doctoral dissertation, East Tennessee State University]. Digital Commons at East Tennessee State University. https://dc.etsu.edu/cgi/viewcontent.cgi?article=3986&context=etd

Roberts, T. G., & Dyer, J. E. (2004). Characteristics of effective agriculture teachers. *Journal of Agricultural Education, 45*(4), 82–95. https://doi.org/10.5032/jae.2004.04082

Robinson, J. S., & Baker, M. A. (2013). The effect of human capital on principals' decisions to interview candidates in agricultural education: Implications for pre-service teachers. *Journal of Agricultural Education*, *54*(1), 140–152. https://doi:10.5032/jae.2013.01140

Rosenshine, B., & Furst, N. (1971). Research on teacher performance criteria. In B. O. Smith (ed.), *Research in Teacher Education – A Symposium* (pp. 37–72). Prentice Hall.

Sanchez, J. E., DeFlorio, L., Wiest, L. R., & Oikonomidoy, E. (2018). Student perceptions of inclusiveness in a college of education with respect to diversity. *College Student Journal, 52*(3), 397–409. http://argo.library.okstate.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=slh&AN=132341827&site=ehost-live

Smalley, S. W., & Retallick, M. S. (2012). Agricultural education early field experience through the lens of the EFE model. *Journal of Agricultural Education, 53*(2), 99–109. https://doi.org/10.5032/jae.2012.02099

Steele, N. A. (2010). Three characteristics of effective teachers. *MENC: The National Association for Music Education, 27*(2), 71–78. https://doi.org/10.1177/8755123310361769

Syed, M., Eriksson, P. L., Frisén, Hwang, C. P., & Lamb, M. E. (2020). Personality development from age 2 to 33: Stability and change in ego resiliency and ego control and associations with adult adaptation. *Developmental Psychology*, *56*(4), 815–832. https://dx.doi.org/10.1037/dev0000895

Toombs, J. M., Eck, C. J., & Robinson, J. S. (2020). *Preservice teacher SAE self-efficacy* [Paper presentation]. Western Region American Association for Agricultural Education (AAAE) Research Conference.

Toombs, J. M., & Ramsey, J. W. (2020). *SBAE student teachers' sense of importance and competence per selected National Quality Program Standards indicators: A then-now Borich needs assessment* [Paper presentation]. American Association for Agricultural Education (AAAE) Annual National Research Conference.