

**Prioritizing the Professional Development Needs of First-Year School-Based Agricultural  
Education Teachers Regarding Career Development Events**

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### **Abstract**

*Identification of the professional development needs of secondary school teachers is critical to improve teacher capacity. Inservice and preservice school-based agricultural education (SBAE) teachers need a broad spectrum of professional development to be prepared for the variety of duties and expectations demanded of the position. This study used the Borich needs assessment model to identify and prioritize the professional development needs of first-year SBAE teachers in Oklahoma regarding their interest in and competence to train students in the various state-specific career development events (CDEs). Thirty-seven first-year SBAE teachers in Oklahoma participated in the study. The findings revealed that the teachers deemed all 27 CDEs to be important; although, they were not necessarily interested in teaching them all. The CDEs with the highest priority included Livestock Evaluation, Veterinary Science, Meats Evaluation and Technology, Food Science and Technology, and Agricultural Sales. As the agricultural industry and the educational sphere continue to change, so too must those who endeavor to serve in communities and teach agricultural education. As such, identifying, prioritizing, and ultimately addressing the needs of SBAE teachers must be ongoing and sustained over time.*

### **Introduction**

Identifying the professional development needs of secondary school teachers is critical for a multitude of reasons (National Council for the Accreditation of Teacher Education [NCATE], 2010). The identification of needs can improve the capacity of inservice teachers and empower teacher preparation programs to improve future teacher readiness (NCATE, 2010). The same is true for SBAE teachers. Shultz et al. (2014) recognized the need to provide a broad spectrum of skill and knowledge development for both inservice and preservice SBAE teachers due to the vast array of duties and expectations associated with the position (Eck, Robinson, Ramsey, & Cole, 2019; Roberts & Dyer, 2004). Terry and Briers (2010) indicated 21 different roles associated with being a SBAE teacher in addition to the three components identified by the National FFA Organization (2015), i.e., classroom/laboratory instruction, FFA, and supervised agricultural experiences (SAE). These various roles help to provide career awareness to secondary students while also preparing them for their future (Wardlow & Osborne, 2010).

“Agricultural education prepares students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber, and natural resources systems [AFNR]” (The National Council for Agricultural Education, 2012, para. 3). To help facilitate this mission, national AFNR content standards (The National Council for Agricultural Education, 2015) were developed to provide rigorous curricular focus associated with the eight career clusters. These standards were not only intended for classroom instruction but instead were designed to impact all components of a complete program (The National Council for Agricultural Education, 2015).

SBAE exists, in part, to educate and develop students for careers in the agricultural industry (Roberts & Ball, 2009). Fortunately, SBAE teachers can expose students to various agricultural careers through the FFA (Lundry et al., 2015). In particular, SBAE teachers prepare

students in a variety of career development events (CDEs), which allow students to take the learning acquired in the classroom and apply it in a competitive setting (Croom et al., 2009; National FFA Organization, 2019). Therefore, assessing teachers' ability to prepare students in CDEs is an important component worthy of investigation (Terry & Briers, 2010).

CDEs “develop college and career readiness skills” (National FFA Organization, 2019, para. 1) and provide students with an opportunity to apply practical knowledge learned through classroom instruction in challenging, real-world situations (Beekley & Moody, 2002). In addition to content knowledge, critical thinking and problem-solving skills are developed through the preparation and participation in CDEs (Phipps et al., 2008). The development of these additional skills and opportunities presented through CDE participation can ultimately lead to students making better, more informed decisions about their future careers (Talbert & Balschweid, 2006), which can lead to gainful employability (Connors & Mundt, 2001).

For CDEs to be transformative, however, SBAE teachers must be able to provide the necessary training to prepare students for such events. In Oklahoma, the majority of SBAE teachers typically prepare five or fewer teams; although, some prepare as many as 10 teams for the Oklahoma interscholastic event (Lundry Ramsey, Edwards, & Robinson, 2015). Regardless of the number of teams trained, the majority of SBAE teachers prepared teams for CDEs in which they had previous experience (Lundry et al., 2015). Therefore, understanding the degree to which SBAE teachers acquire the knowledge and skills necessary to prepare CDE teams is imperative.

Multiple opportunities exist for SBAE teachers to develop the knowledge and skills necessary to prepare students for CDEs. Traditional teacher preparation programs, which include coursework relative to teaching and learning, content area specific courses, and a student teaching internship (NCATE, 2010), are one way to obtain the expertise necessary to prepare students to compete across a wide variety of CDEs. Traditionally prepared SBAE teachers, who have completed an agricultural education degree through a bachelor's or master's degree program along with student teaching, commonly have the advantage of agricultural content-specific coursework, unlike teachers who are *alternatively* certified (Robinson & Edwards, 2012). However, research suggests teachers who are alternatively certified can be valuable assets to the school, bringing extensive professional experience into the classroom (Ballou, & Podgursky, 1998; Johnson et al., 2005).

Teachers also develop their knowledge and skills by participating in professional development programs. Roberts and Dyer (2004) identified SBAE teachers have an elevated need for professional development in CDEs regardless of certification pathway. Additionally, Clemons et al. (2018) stated, “the need for focused professional development is vital to the continued success of [SBAE] and teacher growth” (p. 87). Ideally, SBAE teachers should be assessed early and often to determine their learning needs and deficiencies (Birkenholz & Harbstreit, 1987). Unfortunately, however, professional development frequently relies on a presenter telling people what they should know or do (Sharma, 2016) instead of identifying the needs of the audience.

The majority of FFA chapters in Oklahoma participate in CDEs (Lundry et al., 2015). The state-level CDE competition is held during the Oklahoma State University (OSU) interscholastic event each Spring semester on the campus of OSU. In 2019, 428 teams participated in 27 different CDEs (Oklahoma Interscholastics, 2019). CDEs range from single-member events to seven-person teams (National FFA Organization, 2019). The number of Oklahoma teams that participated in each event in 2019 are identified in Table 1 in descending order.

Table 1

*Participation for the 2019 OSU Interscholastic Career Development Events (N = 428 Teams)*

Event	<i>n</i>
Livestock Evaluation	62
Land Judging	36
Veterinary science	31
Agricultural Communications	28
Food Science and Technology	27
Agricultural Technology and Mechanical Systems	26
Floriculture	23
Meats Evaluation and Technology	20
Farm and Agribusiness Management	19
Milk Quality and Products	18
Entomology	15
Agronomy	15
Dairy Cattle Evaluation and Management	14
Electricity	14
Horse Evaluation	12
Environmental and Natural Resources	11
Nursery/Landscape	11
Soil and Water Conservation	10
Employment Skills	10
Rangeland Judging	9
Homesite Judging	8
Poultry Evaluation	7
Turfgrass Management	7
Forestry	3
Agricultural Issues Forum	3
Marketing Plan	3
Agricultural Sales	2

CDEs “serve as an outgrowth of instruction in the agricultural education classroom for FFA members in grades 7 to 12” (National FFA Organization, 2019, para. 1) and align with the National Agricultural, Food, and Natural Resources (AFNR) Career Cluster Content Standards (National FFA Organization, 2019). Eight career clusters make up the AFNR Content Standards, i.e., power, structural and technical systems, plant systems, natural resource systems, food

products and processing systems, environmental service systems, biotechnology systems, animal systems, and agribusiness systems (The National Council for Agricultural Education, 2015). Ultimately, CDEs are aligned and implemented in SBAE programs to further the agricultural education mission which states, “Agricultural education prepares students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber, and natural resources systems” (The National Council for Agricultural Education, 2012, para. 3).

CDEs serve as a vehicle for the development of critical thinking skills and collaboration while furthering students’ interest in AFNR careers (National FFA Organization, 2019). For SBAE to continue to strive to meet its demand (Roberts & Ball, 2009), SBAE teachers must be prepared and ready to rise to the challenge, preparing students for college and careers. Therefore, understanding SBAE teachers' deficiencies related to preparing students for CDEs is a crucial task. This task becomes more daunting, considering the diverse needs of SBAE teachers based on the pathway to certification. In particular, because first-year SBAE teachers have been known as needing the greatest amount of professional development (Layfield & Dobbins, 2002), they served as the target population for this study.

### **Theoretical/Conceptual Framework**

The theoretical framework for this study was based on the concept of teacher self-efficacy (Bandura, 1977). Self-efficacy refers to an individual’s belief associated with achieving a desired goal or task (Bandura, 1997). Bandura (1977) identified four types of experiences impacting self-efficacy, with the greatest predictor being mastery experiences. Therefore, SBAE teachers who have experience in a given CDE might feel more efficacious in preparing students to compete in the same event than those without experience. In this study, first-year SBAE teachers in Oklahoma provided their self-perceived competency as it relates to preparing students for each CDE. Unfortunately, novice teachers have very few, if any, mastery experiences related to making students for a CDE. Therefore, they commonly rely on vicarious experiences (Bandura, 1977), which are the second greatest predictor of self-efficacy and refer to the observation of a specific skill or behavior (Bandura, 1977). Influenced by the work of Bandura (1977), teacher self-efficacy refers to an individuals’ ability to engage students in the learning environment and improve their learning outcomes (Tschannen-Moran et al., 1998). Students who learn from teachers high in teacher self-efficacy have been shown to outperform those who learn from teachers lower in teacher self-efficacy (Henson, 2001). Teacher self-efficacy is linked to increased teacher performance and career sustainability (Tschannen-Moran et al., 1998), leading to the importance of this line of inquiry with first-year SBAE teachers, as recruitment and retention continue to be a challenge (Eck & Edwards, 2019).

### **Purpose of the Study**

The purpose of this study was to identify the CDEs in greatest need of professional development according to first-year SBAE teachers in Oklahoma. Four research objectives guided the study:

1. Describe the personal and professional characteristics (i.e., sex, gender, pathway to certification, highest degree earned, size of program and past CDE experience) of first-year SBAE teachers in Oklahoma,
2. Identify first-year SBAE teacher's competency for each of the Oklahoma CDEs,
3. Identify SBAE teachers' interest to prepare teams for each of the CDEs, and
4. Prioritize the CDEs, according to first-year SBAE teachers, in need of professional development using the Borich needs assessment model.

## **Methods and Procedures**

The population of interest for this descriptive pilot study was first-year SBAE teachers in Oklahoma ( $N = 40$ ) during the 2019 to 2020 school year. A time and place sampling method (Oliver & Hinkle, 1982) was employed during a required new teacher training workshop for SBAE teachers, hosted by Oklahoma Career and Technical Education staff. All ( $N = 40$ ) first-year SBAE teachers in Oklahoma were required to attend the workshop. Of the 40 first-year SBAE teachers in Oklahoma, 39 were present, and 37 completed the instrument by successfully responding to all questions, resulting in a 92.5% response rate. The instrument was designed to assess SBAE teachers' competency and interest of the 27 CDEs in Oklahoma following the Borich Needs Assessment Model (Borich, 1980). "The needs assessment model is essentially a self-evaluative procedure which relies on teachers' judgements about their own performances" (Borich, 1980, p. 42). The model allows researchers to determine if a discrepancy exists between the two poles indicated in the instrument (Borich, 1980). This study sought to determine the discrepancy between teachers' self-perceived interest and competency to train students in various CDEs. The resulting score will be used to identify professional development opportunities for first-year SBAE teachers in Oklahoma, as discrepancy scores with the greatest positive rank identify the highest priority for professional development (Borich, 1980). The model was utilized to measure the teachers' interest and competence in preparing students for CDEs and preparing them for careers. To determine where deficiencies existed, Borich's (1980) mean weighted discrepancy scores (MWDS) was employed. Specifically, the mean weighted competence rating was subtracted from the mean weighted importance rating to determine a discrepancy score. Then, every discrepancy score was multiplied by the mean importance rating to produce a weighted discrepancy score. Finally, the weighted discrepancy scores were totaled and divided by the number of respondents ( $n = 37$ ) to produce a mean weighted discrepancy score (MWDS). Finally, all MWDS of each item was ranked from high to low to determine the CDEs in greatest need of professional development.

Although Oklahoma FFA conducts 29 state CDEs, only 27 were chosen for this study. The two CDEs omitted (Agricultural Education and the Freshman Agriscience Quiz Bowl) were excluded from the study due to not containing specific content knowledge related to agricultural, food, and natural resource (AFNR) standards. The 27 CDEs included in the instrument were: Agricultural Communications, Agricultural Issues Forum, Agricultural Technology and Mechanical Systems, Agricultural Sales, Agronomy, Dairy Cattle Evaluation and Management, Electricity, Employment Skills, Entomology, Environmental and Natural Resources, Farm and Agribusiness Management, Floriculture, Food Science and Technology, Forestry, Homesite Judging, Horse Evaluation, Land Judging, Livestock Evaluation, Marketing Plan, Meats Evaluation and Technology, Milk Quality and Products, Nursery/Landscape, Poultry Evaluation,

Soil and Water Conservation, Rangeland Judging, Turfgrass Management, and Veterinary Science. In addition to the 27 competency and interest assessments of CDEs, participants were asked to identify their intent to prepare teams for each of the 27 CDEs, along with six demographic questions aimed to describe the participants (i.e., sex, age, pathway to certification, highest degree earned, program size, and past experiences related to CDEs). Ultimately, the population of interest for this instrument includes all SBAE teachers; therefore, the sample of first-year SBAE teachers served as an appropriate pilot group.

The instrument was developed in Qualtrics and distributed electronically to first-year SBAE teachers during their new teacher inservice at the state career and technical education office in [City] on August [add date]. Before delivery of the instrument, the research team, consisting of two faculty members and one graduate student in the [Department], evaluated the instrument for face and content validity. The team has more than 50 years of experience teaching agricultural education at the secondary (which included preparing students participating in CDEs) and higher education levels, and each helps prepare students to teach in SBAE programs. Also, all team members have conducted numerous quantitative studies, and two of the team members have used the Borich (1980) model extensively in previous research, qualifying the team as able to assess the face and content validity of the instrument. After review, the instrument was deemed acceptable for the pilot stage of this study.

The instrument complexity, length, and mobile device compatibility were assessed based on the recommendations of Dillman, Smyth, and Christian (2014). The purpose of the study was explained to the participating teachers before they were provided informed consent forms, a QR code, and a weblink to participate on their devices.

After data collection was completed, data were transferred from Qualtrics to the Statistical Program for Social Sciences (SPSS), Version 23, and Microsoft Excel for analysis. Personal and professional characteristics were analyzed in SPSS using descriptive statistics to explain the composition of first-year SBAE teachers in Oklahoma. Mean scores were calculated for interest and competence on each of the 27 CDEs to determine the overall rating from participants. Interest was measured on a four-point scale, where 1 = extremely uninterested, 2 = somewhat uninterested, 3 = somewhat interested, and 4 = extremely interested. Similarly, competence was measured on a four-point scale, where 1 = extremely incompetent, 2 = somewhat incompetent, 3 = somewhat competent, and 4 = extremely competent. For the MWDS analysis, the Excel MWDS calculator developed by McKim and Saucier (2011) was used to determine the professional development needs of first-year SBAE teachers in Oklahoma.

## **Findings**

The first research objective sought to describe the personal and professional characteristics of first-year SBAE teachers in Oklahoma. Table 2 displays those characteristics including sex, age, pathway to certification, highest degree earned, program size, and past experiences related to CDEs. First-year SBAE teachers for the 2019 to 2020 school year in Oklahoma ranged in age from 21 to 61 years old, with just over one-half being female (51.4%). Over one-third ( $f = 14$ , 37%) entered the profession through a non-traditional certification route; however, 62.2% ( $f = 23$ ) were traditionally certified, indicating they had completed an agricultural education

bachelor's or master's degree program. Nearly 92% ( $f=34$ ) of the participants had previous experience (i.e., competed as a student in 4H or FFA, prepared a team, participated in professional development, or completed coursework) related to livestock evaluation. More than one-half ( $f=19$ , 51%) had experiences in agricultural communications (see Table 2).

Table 2

*Personal and Professional Characteristics of First-Year SBAE Teachers in Oklahoma (n = 37)*

Characteristic		<i>f</i>	%
Sex	Male	17	45.9
	Female	19	51.4
	Did not respond	1	2.7
Age	21 to 25	18	48.6
	26 to 30	3	8.1
	31 to 35	5	13.5
	36 to 40	3	8.1
	41 to 50	5	13.5
	51 to 60	1	2.7
	60 +	1	2.7
	Did not respond	1	2.7
Certification Pathway	AgEd BS	19	51.4
	AgEd MS	4	10.8
	Alternatively Certified	9	24.3
	Emergency Certified	4	10.8
	Not Certified	1	2.7
Highest Degree Earned	Bachelor's Degree	28	75.7
	Master's Degree	9	24.3
	Doctoral Degree	0	0.0
Program Size (# of students)	1 to 20	0	0.0
	21 to 40	8	21.6
	41 to 60	11	29.7
	61 to 80	2	5.4
	81 to 100	7	18.9
	100 to 150	3	8.1
	151 to 200	1	2.7
	201 to 250	2	5.4
	Unknown	1	2.7
	Did not respond	2	5.4
	Past CDE Experience	Livestock Evaluation	34
Agricultural Communications		19	51.4

Agricultural Sales	16	43.2
Agricultural Technology and Mechanical Systems	14	37.8
Land Judging	13	35.1
Meats Evaluation and Technology	12	32.4
Veterinary Science	12	32.4
Horse Evaluation	11	29.7
Dairy Cattle Evaluation and Management	10	27.0
Floriculture	10	27.0
Food Science and Technology	10	27.0
Milk Quality and Products	10	27.0
Electricity	9	24.3
Employment Skills	9	24.3
Agricultural Issues Forum	8	21.6
Farm and Agribusiness Management	8	21.6
Entomology	7	18.9
Environmental and Natural Resources	7	18.9
Poultry Evaluation	7	18.9
Soil and Water Conservation	7	18.9
Forestry	5	13.5
Marketing Plan	5	13.5
Nursery/Landscape	5	13.5
Rangeland Judging	5	13.5
Agronomy	3	8.1
Homesite Judging	2	5.4
Turfgrass Management	2	5.4

Additionally, first-year SBAE teachers in Oklahoma were asked to identify their intent to prepare a team for each of the 27 CDEs during the 2019 to 2020 school year. These intentions are displayed in Table 3 in order of the highest intended participation. Livestock Evaluation ( $f=28$ ), Agricultural Communications ( $f=19$ ), Veterinary Science ( $n=15$ ), Land Judging ( $f=13$ ), and Agricultural Technology and Mechanical Systems ( $f=10$ ) were the top five CDEs for which first-year teachers intended to train. None of the teachers intended to prepare a Homesite Evaluation or Soil and Water Conservation team (see Table 3).

Table 3

*First Year Oklahoma SBAE Teachers Intent to Prepare CDE Teams (n = 37)*

<i>CDE</i>	<i>f</i>	<i>%</i>
Livestock Evaluation	28	75.7
Agricultural Communications	19	51.4
Veterinary Science	15	40.5
Land Judging	13	35.1
Agricultural Technology and Mechanical Systems	10	27.0
Floriculture	9	24.3

Food Science and Technology	9	24.3
Meats Evaluation and Technology	9	24.3
Agricultural Issues Forum	7	18.9
Agricultural Sales	7	18.9
Environmental and Natural Resources	7	18.9
Employment Skills	6	16.2
Poultry Evaluation	6	16.2
Rangeland Judging	6	16.2
Agronomy	5	13.5
Dairy Cattle Evaluation and Management	5	13.5
Farm and Agribusiness Management	5	13.5
Horse Evaluation	5	13.5
Milk Quality and Products	5	13.5
Marketing Plan	4	10.8
Nursery/Landscape	4	10.8
Electricity	3	8.1
Turfgrass Management	3	8.1
Entomology	2	5.4
Forestry	2	5.4
Homesite Judging	0	0.0
Soil and Water Conservation	0	0.0

The second and third research questions sought to determine the interest and competency levels of first-year SBAE teachers in Oklahoma on a four-point scale of agreement. Livestock Evaluation resulted in the highest mean score for both CDE interest and competency of first-year SBAE teachers, and the Homesite CDE received the lowest mean scores in both areas (see Table 4). Participants deemed they were somewhat interested in Livestock Evaluation and Agricultural Communications, as evidenced by a mean score of 3.0 or greater. The remaining 25 CDEs were in the somewhat uninterested range. Regarding their competence, first-year SBAE teachers perceived themselves to be somewhat to extremely incompetent in all CDE areas except for livestock evaluation ( $M = 3.07$ ,  $SD = .79$ ), where they deemed themselves somewhat competent.

The fourth research question sought to prioritize the CDEs, as perceived by first-year teachers, in need of professional development using the Borich (1980) needs assessment model. Livestock Evaluation (MWDS = 3.73) was the CDE possessing the greatest need for professional development (see Table 4). Three other CDEs had an MWDS exceeding 3.0, including Veterinary Science (MWDS = 3.62), Meats Evaluation and Technology (MWDS = 3.34), and Food Science and Technology (MWDS = 3.16). In contrast, two CDEs, Dairy Cattle Evaluation and Management (MWDS = .98) and Electricity (MWDS = .96), had MWDS scores less than 1.0.

Table 4

*CDE interest, Competency, and Mean Weighted Discrepancy Scores of First-Year SBAE Teachers in Oklahoma (n = 37)*

CDE	Interest <sup>a</sup>		Competency <sup>b</sup>		MWDS <sup>c</sup>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Livestock Evaluation	3.54	.61	3.07	.79	3.73
Veterinary Science	2.97	1.04	2.17	.91	3.62
Meats Evaluation and Technology	2.81	.78	2.07	.96	3.34
Food Science and Technology	2.82	.93	2.03	.85	3.16
Agricultural Sales	2.84	.93	2.34	.97	2.84
Farm and Agribusiness Management	2.73	.96	2.20	1.03	2.58
Employment Skills	2.92	.97	2.59	.91	2.50
Agricultural Issues Forum	2.62	1.06	2.07	.98	2.48
Agricultural Communications	3.03	.83	2.83	.83	2.21
Environmental and Natural Resources	2.46	1.04	1.93	.91	2.19
Milk Quality and Products	2.68	.92	2.30	.88	2.17
Marketing Plan	2.57	.87	2.13	.94	2.15
Land Judging	2.46	.96	2.03	.85	1.99
Agricultural Technology and Mechanical Systems	2.53	1.06	2.17	.95	1.83
Floriculture	2.51	.99	2.20	1.10	1.83
Rangeland Judging	2.14	1.11	1.63	.93	1.73
Turfgrass Management	2.14	.98	1.67	.92	1.67
Soil and Water Conservation	2.19	1.05	1.77	1.01	1.66
Agronomy	2.19	.95	1.86	.85	1.65
Forestry	2.24	1.04	1.87	.90	1.64
Poultry Evaluation	2.16	1.07	1.73	.83	1.64
Horse Evaluation	2.33	1.12	1.97	1.22	1.62
Entomology	2.25	1.05	1.90	1.03	1.50
Nursery/Landscape	2.19	1.02	1.90	.96	1.42
Homesite Judging	1.78	.95	1.52	.79	1.06
Dairy Cattle Evaluation and Management	2.27	.99	2.27	1.08	.98
Electricity	2.08	.92	2.00	.95	.96

*Note.* <sup>a</sup>Interest items were on a 4-point scale of agreement, where 1 = Extremely uninterested, 2 = Somewhat uninterested, 3 = Somewhat interested, 4 = Extremely interested. <sup>b</sup>Competency items were on a 4-point scale of agreement, where 1 = Extremely incompetent, 2 = Somewhat incompetent, 3 = Somewhat competent, 4 = Extremely competent. <sup>c</sup>MWDS = Mean Weighted Discrepancy Score.

## Conclusions

This study sought to identify the professional development needs of first-year SBAE teachers in Oklahoma, based on their interest and competence as it relates to preparing students for CDEs. The findings of this study resulted in multiple conclusions. Based on the positive MWDS, first-year SBAE teachers in Oklahoma deem all 27 CDEs to be of value; although, they were not necessarily interested in preparing student teams for all the CDEs. As the majority of SBAE teachers in Oklahoma typically prepare five or fewer teams (Lundry et al., 2015), teachers not having an interest in preparing students for all CDEs is realistic.

First-year teachers' interest in CDEs exceeds their self-perceived competence to prepare students for them. Except for Dairy Cattle Evaluation and Management, which had the same ratings ( $M = 2.27$ ) for interest and competence, first-year teachers rated 26 of the 27 CDEs higher on the interest scale than on the competence scale. This finding is consistent with previous research using Borich's (1980) needs assessment model (Radhakrishna & Bruening, 1994; Robinson et al., 2007).

The CDEs with the greatest MWDS are the highest priority (Borich, 1980) for first-year SBAE teachers in Oklahoma, including Livestock Evaluation, Veterinary Science, Meats Evaluation and Technology, Food Science and Technology, and Agricultural Sales. Regarding the teachers' past CDE experiences, these five were some of the highest regarding their participation. Specifically, 92% of these teachers had participated in the Livestock Evaluation CDE, giving support to teachers' perceived mastery and vicarious experiences (Bandura, 1977; Tschannen-Moran et al., 1998). Such experiences play a significant role in motivating teachers to continue learning about these content areas and preparing students to participate in them. Ultimately, these five CDEs should be given the highest priority for future professional development offerings for SBAE teachers in Oklahoma.

Professional development related to CDEs in Oklahoma based on the findings of this study provides SBAE teachers an opportunity to increase their self-efficacy through mastery and vicarious experiences (Bandura, 1977). This investment in additional purposeful professional development aims to improve the individual's teacher self-efficacy for performing tasks related to and within these CDEs. Additionally, CDE participation is intended to align with AFNR Career Cluster Content Standards being taught within the SBAE program (The National Council for Agricultural Education, 2015); therefore, the increased self-efficacy serves the teacher in multiple capacities. Teachers have the opportunity to enhance their ability to prepare students for CDEs and careers while also providing students an opportunity to acquire over 20 additional workplace skills through CDE participation (Lundry et al., 2015).

### **Recommendations**

Agricultural education faculty at OSU should look for ways to incorporate the top five CDEs (i.e., Livestock Evaluation, Veterinary Science, Meats Evaluation and Technology, Food Science and Technology, and Agricultural Sales) into the existing curriculum and plan of study. In particular, the findings should be shared with faculty who teach courses in these areas, and attempts should be made to highlight these CDEs in classes with students whenever possible. Also, students should be encouraged to volunteer for the Oklahoma FFA Interscholastic Event

held at Oklahoma University each Spring by participating in a CDE area in which they lack competence and experience.

The findings of this study should also be shared with Career and Technical Education supervisors and other interested personnel who provide professional development to first-year SBAE teachers. Specifically, those delivering professional development sessions should be encouraged to focus first on the content areas involving Livestock Evaluation, Veterinary Science, and Meat Evaluation and Technology; these CDEs had the highest MWDS and therefore demand the greatest attention related to professional development in Oklahoma. Further, additional professional development for first-year teachers in Oklahoma should be considered for the remaining CDEs with elevated MWDS once the top five have been satisfied. Additions to pre-service agricultural education teacher preparation coursework focused on commonly identified CDE needs of SBAE teachers would help to further the self-efficacy of pre-service teachers as they prepare to enter the profession. These professional development opportunities could occur as ongoing workshops facilitated by content experts (i.e., university faculty or in-service SBAE teachers).

Considering recommendations for research, this study should be replicated for all SBAE teachers in Oklahoma ( $N = 454$ ) (Oklahoma Career Tech, 2019), as the use of first-year SBAE teachers was intended as a pilot group for the instrument. Agricultural education faculty in other states should consider replicating this study to determine the professional development needs of their SBAE teachers related to CDEs. Replication of this study should be conducted with pre-service teachers to determine their CDE deficiencies. Understanding these gaps might allow teacher educators to advise students differently regarding their plans of study or include pertinent content related to CDEs in their existing courses and agricultural education teacher preparation programs.

## **Discussion**

The needs of SBAE teachers are diverse when considering career tenure and pathway to certification. Therefore, the demand to increase the development of teacher self-efficacy is pertinent (Eck et al., 2019; Roberts & Dyer, 2004; Shultz et al., 2014). Identifying and meeting the needs of SBAE teachers must be ongoing and sustained over time. Although Livestock Evaluation was identified as the CDE in which respondents had the most previous experience, it was still considered as the highest priority for first-year SBAE teachers in Oklahoma. Additionally, Livestock Evaluation had the greatest number of teams participate in a given year at the Oklahoma State FFA CDE Interscholastic (see Table 1) (Oklahoma Interscholastics, 2019). Furthering the understanding of first-year SBAE teachers in Oklahoma provides stakeholders an opportunity to meet the imperative task of preparing them to meet the demand highlighted by Roberts and Ball (2009) who advocated for developing students for positions within the agricultural industry, with AFNR career exploration through CDEs at the state and national levels (National FFA Organization, 2019). The development of purposeful professional development will allow SBAE teachers an opportunity to increase their self-efficacy (Bandura, 1977), as their participation in such programs serves as an investment in their education, leading to improved competence in preparing students for CDEs.

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