

SBAE Induction-Year Teachers' Self-Perceived Professional Development Needs: A Mixed Methods Study

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Abstract

School-based agricultural education (SBAE), like many other subject areas, suffers from a critical teacher shortage. Many states have chosen to combat this shortage by offering temporary emergency teaching certifications with minimal qualifications and no requirements for professional development. Retention is also needed to stem the flow of novice teachers exiting the profession. Induction support through professional development is a necessary component to teacher retention. The purpose of this study was to explore the self-perceived professional development needs of Oklahoma SBAE induction-year teachers using mixed methodologies. Using a convergent parallel model, preexisting instruments were used to gather Oklahoma induction-year SBAE teachers' (N = 29) sense of self-efficacy. From this population, five case study participants were selected for the qualitative phase. Interview transcripts were collected during two site visits to each case study participant. The areas of professional development needs varied widely between individuals. Personal, environmental, and behavioral factors played a part in determining the professional development needs for each SBAE induction-year teacher. Therefore, it is recommended professional development be tailored to the individual induction-year teacher. Mentoring and online resource banks have the potential to provide the necessary individualized professional development support of SBAE induction-year teachers.

Introduction and Literature Review

An estimated 3,000,000 teaching jobs were left unfilled by highly qualified applicants in the 2021-2022 school year (Franfo & Patrick, 2023). Rural and low-income schools bear a disproportionately large percentage of this teacher shortage (Addressing Teacher Shortages Act, 2019), contributing to an educational disadvantage for their students (Carver-Thomas & Darling-Hammond, 2019). School-based agricultural education (SBAE) is no exception to this problem (Smith et al., 2018). In fact, teacher shortages

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have been a chief concern for SBAE professionals since the federal inception of vocational agriculture courses in secondary schools over a century ago (Eck & Edwards, 2019). Considering the 741 full time SBAE teaching positions unfilled by qualified candidates and an average student-to-teacher ratio of 77:1, approximately 57,000 students nationwide were left without a fully certified SBAE teacher in 2023 (Smith et al., 2024).

To combat this shortage, all 50 states have developed contingency certification pathways to broaden the teacher pool (Ingersoll, 2002; Ludlow, 2011). In addition to fast-tracking individuals to become educators, alternative certification seeks to diversify the teaching population (Evans, 2014) and recruit high achieving individuals (Straubhaar, 2019). Alternative certification, broadly defined, is often considered any and all certification pathways other than those obtained through a teacher preparation program offered through a four-year institution of higher education and culminating in a student teaching internship experience (Bowling & Ball, 2018; Ruhland & Bremer, 2002a). Great variations exist between states' qualifications for alternative certification as well as the entrance requirements between various alternative certification programs within each state (Foote et al., 2011). Ruhland and Bremer (2002a) assessed alternative certifications nationwide and identified nine classes of alternative certification, from a highly structured teacher in residence format to minimal temporary certification with no professional development requirements. Of special interest in this study, emergency certifications fall into the latter category and provides individuals the opportunity to teach for up to three years (Oklahoma State Department of Education, 2024). This diversity in teacher preparedness and qualifications present difficulties for administrators, researchers, and policy makers in supporting alternatively certified teachers (Darling-Hammond, 2009).

Induction-year teachers, those who have been in the profession for less than a year, are expected to complete the same tasks with the same competency as their more experienced peers (Moore & Swan, 2008). Such expectations can lead to stressful situations for these novice teachers (Moir, 1999). Mundt (1991) connected positive experiences and support, or lack thereof, to their likelihood of induction-year teachers to be retained in the profession. Approximately 20% of all teacher attrition is accounted for in induction-year teachers not returning to the classroom for a second year (Taie & O'Rear, 2015). This teacher retention issue must be addressed before SBAE will be able to address the teacher shortage (Guarino et al., 2006; Smith et al., 2019). Targeted, specific, and ongoing professional development for induction-year teachers has been shown to decrease teacher attrition (Smith & Ingersoll, 2004).

In addition to an alternative certification allowing individuals to teach as they are earning certification through accredited programs, Oklahoma grants emergency teacher certificates (Oklahoma State Department of Education, 2020). These are the least restrictive type of alternative certifications (Gunderson & Karge, 1992). As outlined by the Oklahoma State Department of Education (2020), emergency certification requires a bachelor's degree in any field and a clean background check. These teachers are not associated with any teacher preparation program and have no professional development requirements associated with their certification (Oklahoma State Department of Education, 2020).

The number of teachers with alternative certification has grown at an exponential rate, accounting for more than 30% of teachers nationwide (García & Weiss, 2019). From 2014 to 2017, the number of induction-year alternatively or emergency certified SBAE teachers increased more than 150% nationwide (Foster et al., 2015; Smith et al., 2018). A similar trend is evident in Oklahoma SBAE induction-year teachers, with emergency certifications for SBAE teacher tripling from 2017 to 2019 (NAAE, 2019).

Still, recruitment is only part of the solution to teacher shortages (Guarino et al., 2006). With 50% of teachers leaving the profession within five years, teacher retention must be addressed to staff America's classrooms with highly qualified educators (Haj-Broussard et al., 2016). Induction programs for novice teachers are a promising solution to bolster teacher retention (Smith & Ingersoll, 2004). Teacher induction

programs designed to orientate novice teachers into the profession often include mentoring, workshops, collaboration opportunities, and administrative support (Beam, 2009). Like alternative certification programs, induction programs vary greatly with most programs lasting from one to three years (Smith & Ingersoll, 2004).

The induction-year requires the most support of any teacher career stage (Katz, 1972). No matter the depth or intensity of teacher preparation, induction-year teachers require additional training to adequately perform job duties (Moore & Swan, 2008). Across subject areas and grade levels, induction-year teachers commonly report needs in curriculum, classroom management, and pedagogy (Kennedy & Clinton, 2009). In addition to the common professional development needs of curriculum, classroom management, and pedagogy for induction-year teachers across subject areas (Kennedy & Clinton, 2009), SBAE teachers have professional development needs in differentiated instruction (Ruhland & Bremer, 2002b) and agricultural content knowledge (Smalley et al., 2019). Management of FFA and SAE programs introduce additional professional development needs for induction-year SBAE teachers (Moore & Swan, 2008), including topics such as SAE supervision (Sorensen et al., 2014), alumni support (Joerger, 2002; Myers et al., 2005), planning chapter events (Myers et al., 2005), SAE record keeping (Sorensen et al., 2014), and student motivation (Smalley et al., 2019). This professional development is commonly delivered through mentoring, induction programming, and seminar-like sessions (Moore & Swan, 2008; Shaha et al., 2015).

The delivery of professional development has a strong influence on its effectiveness (Shaha et al., 2015). Qablan (2019) suggested teacher professional development be grounded in andragogy, the science of teaching adult learners. Additionally, Chaudhuri et al. (2019) found effective professional development can serve as a mastery experience in proper instruction of content. Active learning, standards-based, reflective, and collaborative activities over several regular intervals as part of a coherent program have been shown to produce effective professional learning in teachers (Darling-Hammond et al., 2017; Garet et al., 2001; Smith et al., 2020).

In addition to formal professional development, mentoring can provide vital informal training (Darling-Hammond, 2010). These professional relationships typically occur between a novice and more experienced member of an organization or profession (Joerger, 2003). Mentoring can consist of assigned pairings or groups or be more organically chosen relationships (Mukeredzi, 2017). Self-chosen mentors may result in stronger personal relationships but can suffer from lower quality mentoring while assigning mentors can result in personality differences (Moore & Swan, 2008). A structured mentoring program includes required tasks for mentor and protégé to complete (Joerger, 2003). These tasks vary from program to program but often include in-person meetings as well as weekly, or as needed, check-ins (Peiter et al., 2005). Mentoring, as part of an induction program, has been correlated with greater novice teacher retention and effectiveness (Foor & Cano, 2012; Smith & Ingersoll, 2004; Solomonson et al., 2018). Mentors can be equitable, effective models for novice teachers (Jnah et al., 2015). Their vicarious experiences and verbal persuasion have the potential to build novice teachers' self-efficacy (Bandura, 1997). Mentors can provide important reflection and emotional support for novice SBAE teachers (Peiter et al., 2005; Toombs & Ramsey, 2020).

A needs assessment is vital to properly plan and implement professional development opportunities such as induction programs (Beam, 2009; Borich, 1980; Garton & Chung, 1996; Joerger, 2002). Much of this research is conducted through survey procedures reliant on self-report data (Koziol & Burns, 1986). Commonly, SBAE research related to induction-year teachers' needs include researcher designed survey instruments listing multiple topics for professional development which ask participants to rate their perceived need for instruction in that area (Garton & Chung, 1996; Roberts & Dyer, 2004; Sorensen et al., 2014). These self-reported data are useful to identify areas of interest but may not report true professional development needs (Koziol & Burns, 1986). Professional development needs are also commonly identified through areas of low teacher self-efficacy (Bray-Clark & Bates, 2003; Wolf, 2008).

Does the additional teacher preparation prepare traditionally certified SBAE teachers better for these challenges, or do induction-year teachers require similar professional development across certification pathways? Although literature has been devoted to this topic, findings are inconsistent among studies (Bowling & Ball, 2018; Darling-Hammond et al., 2005). Roberts and Dyer (2004) found teachers with traditional certification reported higher self-perceived needs than those with alternative certifications. They proposed alternatively certified teachers may teach a narrower range of courses and “lack sufficient professional knowledge to accurately indicate their deficiencies” (Roberts & Dyer, 2004, p. 68). Another study found no statistically significant differences between self-reported professional development needs of traditionally and alternatively certified SBAE teachers (Swafford & Friedel, 2010). Stair et al. (2019) found no statistically significant differences between traditionally and alternatively certified teachers in all areas but program management where traditionally certified teachers reported a greater need for training.

Other studies debate the importance of relevant experience in the content areas. Alternatively certified teachers are more likely to have work experience in their content field than recent college graduates with a traditional certification (Evans, 2015). For career and technical education instructors in particular, some educational professionals believe this experience is vital to effective teaching (Evans, 2014). Therefore, traditionally certified SBAE teachers may need professional development in agricultural content areas (Smalley et al., 2019).

Conceptual Foundation

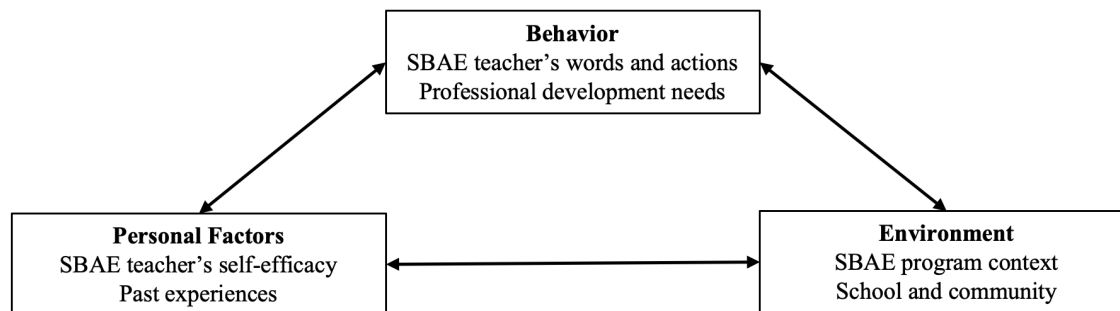
The theory of reciprocal determinism provided the conceptual framework of this study. Grounded in social learning theory (Bandura, 1978), reciprocal determinism describes the interconnectedness of personal factors, environment, and behavior (Bandura, 1997). These factors work together in a causal relationship with each influencing the other (Bandura, 1997). Personal characteristics, such as self-efficacy and affective states, are translated into behaviors which again impact personal characteristics (Maher et al., 2019). A person’s behavior will influence their chosen environment, be that the physical and/or personnel surroundings (Salvador & Burciaga, 2017). Behaviors can be a result of the environment as people behave differently in various environments (Stewart et al., 1999). Lastly, environments may influence personal characteristics and vice versa (Wu et al., 2020).

Reciprocal determinism has been used to explain the connection between teacher self-efficacy, teacher behaviors, and student outcomes (Hivner et al., 2019). According to Bandura (1997), efficacious people are quick to take advantage of opportunity structures and figure out ways to circumvent institutional constraints or change them by collective action. Conversely, inefficacious people are less apt to exploit the enabling opportunities provided by the social system and are easily discouraged by institutional impediments (p. 6). Grad (2020) found this theory in practice with teachers who were more technologically literate also had higher rates of technology implementation. Smith (2005) theorized mentors could impact the behavioral and environmental factors of reciprocal determinism to change a preservice teacher’s self-efficacy. A student’s behavior and learning outcomes can be impacted by the teacher’s behavior which is a part of the student’s environmental factor (Apter, 2016).

Figure 1 contains a visual representation of the conceptual framework for this study. Behavior was defined as observed SBAE teachers’ words and actions as well as their self-identified and observed professional development needs. Personal factors included their teacher self-efficacy gathered through the quantitative instrument and any relevant past experiences they divulged during interviews. Lastly, the environment was considered to be the SBAE program context including facilities, teaching partner(s), and students. The employing school district and community were also included in the environment factor. The interaction of these forces was studied in depth to develop support for induction-year teachers.

Figure 1

Conceptual Framework (Bandura, 1978; 1997)



Purpose and Research Questions

The purpose of this study was to explore the self-perceived professional development needs of Oklahoma SBAE induction-year teachers using mixed methodologies. Three research questions guided the study.

1. What professional development needs were self-identified through low self-efficacy scores?
2. What professional development needs were reported in the qualitative interviews?
3. How did quantitative and qualitative data points converge?

Methodology

A convergent parallel mixed methods study was designed to meet the purpose and research questions listed above, see Figure 2 (Creswell & Plano Clark, 2018). The population of interest for this study was induction-year SBAE teachers in Oklahoma during the 2020-2021 school year ($N = 29$). These individuals were in their first semester of teaching at the time of data collection. A list of new teachers was obtained from the Agricultural Education Division of the Oklahoma Department of Career and Technology Education (CareerTech). The list was vetted to ensure members had not taught any subject in any state before the 2020-2021 school year. This population frame was then used to make initial contact with all induction-year SBAE teachers.

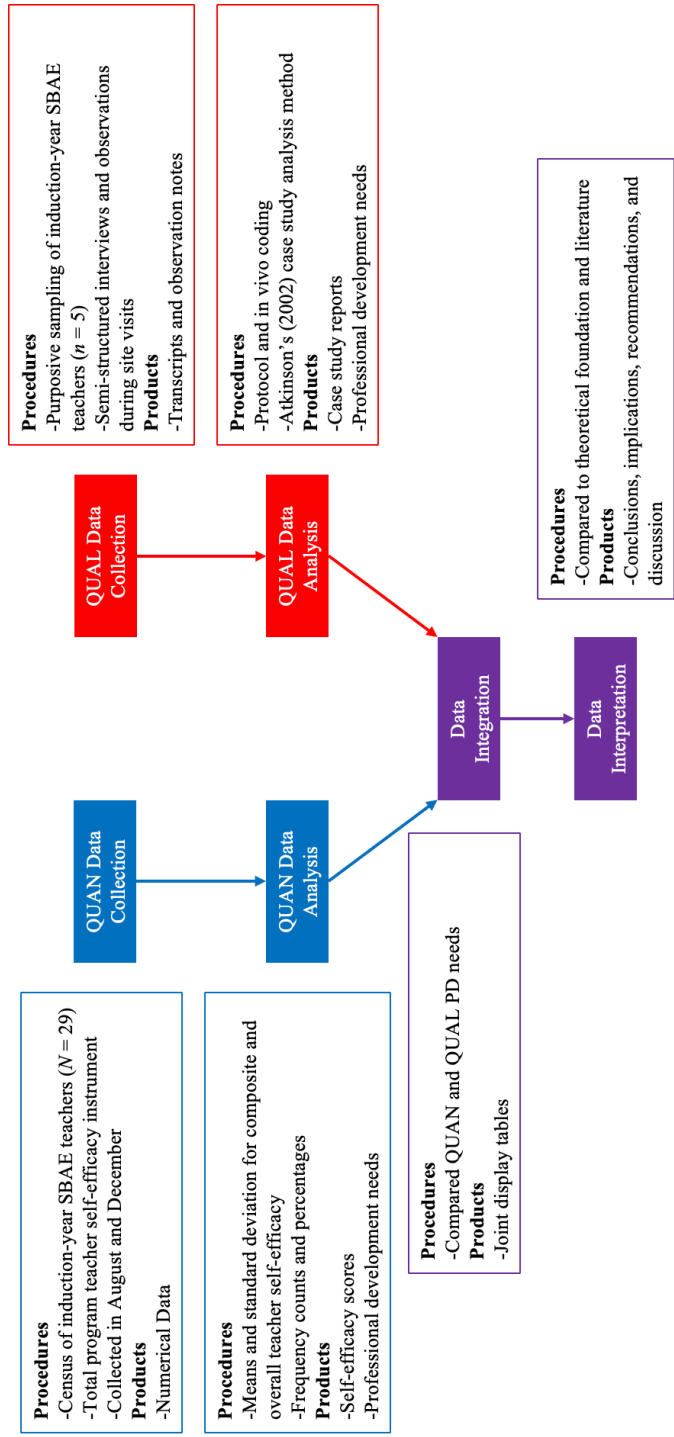
Phase 1 included quantitative measures with preexisting instruments. Wolf's (2011) and Rubenstein et al.'s (2014) instruments which measure teacher self-efficacy in the three-ring model of agricultural education were combined and modified to fit the purpose study of the study. The resulting instrument included 60 items on a 9-point Likert-type scale. Post-hoc reliability tests resulted in Cronbach's alpha of 0.86 for instruction items, 0.96 for FFA items, and 0.96 for SAE items, indicating a reliable instrument (Warmbrod, 2014). Face and content validity were addressed by a panel of four SBAE experts. Together they represented more than 80 years of experience within the SBAE profession. Quantitative data collection occurred in two rounds, first in August and again in December as induction-year teachers tend to be consumed with present tasks and may struggle to project future professional development needs (Katz, 1972). Initial data collection resulted in 24 complete responses that equated to an 82.76% response rate. Following recommendations from Lindner et al. (2001) to account for non-response bias, the responses were split in half with the first 12 participants to respond representing early responders and the last 12 labeled as late responders. No statistically significant differences, $t(22) = .40$, $p > .05$, Cohen's $d = 0.16$, were detected between early and late responders on total teacher self-efficacy scores. Therefore, it was determined findings were representative of the population (Johnson & Shoulders, 2017). Items in which participants scored their self-efficacy as 3 (very little capability) or less were recorded as professional development needs (Bray-Clark & Bates, 2003; Rubenstein et al., 2014; Wolf, 2011).

Phase 2 comprised of a case study design. All Oklahoma induction-year SBAE teachers were invited to participate and enticed with a monetary compensation for their time. From those who volunteered, participants were chosen based on teacher certification route and proximity to the lead author. Five participants, two emergency certified and three traditionally certified, completed all parts of the study. Two site visits were conducted to each participant (Yin, 2018). Semi-structured interviews were conducted during each site visit with a protocol focused on induction-year teachers' experiences with challenges and successes within the SBAE program. Interview protocols were established with a base in the quantitative research questions of this study. A panel of experts in SBAE and qualitative research reviewed the protocols for trustworthiness and ethical concerns. All interviews were audio recorded and transcribed by hand. Artifacts were collected during site visits. Photos were taken of the learning environments, instructional aids, curriculum examples, bulletin boards, and other various important physical components of the program. Memos were created with a detailed description of each photo. When appropriate, artifacts were triangulated in the interview transcripts. Data were analyzed using Atkinson's (2002) steps to analyze case study data. Cases were first analyzed separately, then compared across individual cases. The quantitative survey items served as a base for protocol codes (Atkinson, 2002; Saldaña, 2016) with in vivo coding used to address areas not reflected in the protocol codes (Saldaña, 2016). Trustworthiness was built into qualitative measures using Yin's (2018) case study approach. Construct validity, member checking, chain of evidence, theoretical foundation, and bracketing of researchers' past experiences improved the trustworthiness of this phase (Yin, 2018).

Once quantitative and qualitative data were analyzed separately, a joint display of both data forms was developed to assess areas of convergence and divergence between the two data sets. Legitimation, validity checks mixed methods, was addressed using inside-outside legitimation, weakness minimization legitimation, and multiple validities legitimation (Onwuegbuzie & Johnson, 2006). Member checking and peer audits increase the likelihood insiders and outsiders of the study will reach the same conclusions give the data collected (Onwuegbuzie & Johnson, 2006; Tashakkori & Teddlie, 2003). Weakness minimization legitimation uses the strengths of quantitative methodologies to mitigate the weaknesses of qualitative methodologies and vice versa (Onwuegbuzie & Johnson, 2006). Multiple validities accounts for the validity, reliability, and/or trustworthiness of the parts of a mixed methods study to account for the legitimacy of the whole (Onwuegbuzie & Johnson, 2006).

Figure 2.

Convergent Parallel Design



Reflexivity Statement

The lead author was traditionally certified to teach SBAE and did so for seven years. At the time of this study, the lead author had worked in teacher preparation in a traditional certification program for nearly three years. Therefore, personal background and experiences were carefully bracketed throughout the procedures to avoid potential bias.

Findings

Research Question 1 sought to report professional development needs from the quantitative survey instrument. Overall SBAE teacher self-efficacy was found to be high in both traditionally and emergency certified teachers in the population, see Table 1.

Table 1

Teacher Self-Efficacy of Oklahoma Induction-Year SBAE Teachers

	Initial (n = 24)		Final (n = 21)	
	M	SD	M	SD
Instruction Teacher Self-Efficacy	6.75	0.75	6.73	0.92
FFA Teacher Self-Efficacy	6.94	1.21	6.98	1.29
SAE Teacher Self-Efficacy	7.31	0.88	7.36	1.00
Total Teacher Self-Efficacy	7.00	0.82	6.96	1.01

Note. Likert-type scale of 1 (no capability) to 9 (great deal of capability)

Responses from participants who completed all parts of the study were studied in detail. In both quantitative data collections, Participants 1, 2, and 3 reported no professional development needs. Participant 4 reported two needs in the areas of *assist FFA members in preparing proficiency applications* and *manage a horticulture laboratory/greenhouse*. Participant 5 reported three needs in the areas of *evaluate student learning*, *utilize a program advisory board*, and *utilize the FFA Alumni and Supporters*. Each of these areas were rated as no to very little capability by the respective participant.

The second research question examined professional development needs mentioned in qualitative interviews. Emergency certified participants reported a total of eight professional development needs during interview sessions. Participant 1 came to teaching as a second career after closing her agribusiness. Teaching in a small and supportive community, Participant 1 obtained an emergency certification after the school was unable to fill their open agricultural education position. Participant 1 stated, “we’re just learning as we go” (Interview 2, Line 275) in relation to *assist FFA members in preparing degree applications* and *assist students completing a record of the financial transactions in their SAE project*. During the second visit, Participant 1 reflected on her ability to *coach Leadership Development Events*, “We did a few activities this fall, what was offered anyway... They did alright. I thought they could do better” (Interview 2, Line 266-267). Participant 1 expressed concern and discouragement in *motivating students to learn* through her statements of “I just don’t understand why students wouldn’t want to work” (Interview 1, Line 409) and “I have the kids who want to show [exhibit livestock] and they want to work and be active... and the others, man, they’re just not doing anything” (Interview 2, Lines 246 & 248).

Participant 2 was emergency certified and recognized four areas of professional development needs in interviews. Graduating with a degree in animal science, Participant 2 accepted a teaching position from a motivation to continue an involvement with the livestock show industry. After describing a reoccurring issue with students’ SAE projects, *clearly communicate the procedures of SAE projects with parents* and *coordinate communication between a student, parent, and SBAE teacher* emerged as professional development needs. In relation to *managing a horticulture laboratory/greenhouse*, Participant 2 remarked,

"I don't really know what to have them [greenhouse management class] do," he said (Interview 2, Line 143). Lastly, Participant 2 noted a need to *recruit new FFA members*. "I'd like to see more students become involved. We're a small school, but there's lots of room to grow" (Interview 2, Line 96). "It's been tough to do much. With distance learning and events canceled cause of the 'Rona" (Interview 2, 180).

Participant 3 was traditionally certified and described six professional development needs in interviews. Teaching in a multiple teacher department, Participant 3 taught a variety of agriscience, agricultural communication, and plant science classes. She expressed discomfort in supervising various SAE projects (Interview 1, Line 43), leading to professional development needs in *identify SAE projects that connect to agriculture curriculum* and *provide students meaningful supervision during their SAE project*. *Recruiting new FFA members* was a struggle for Participant 3, partly due to distance learning and decreased FFA calendar (Interview 2, Line 64). In discussing *utilizing the FFA Alumni and Supporters*, Participant 3 noted of her local organization, "I'm a female. I'm new and I think those are all things that are just different here... new factors that really contributed to maybe my acceptance here" (Interview 1, Lines 109-111). Participant 3 described difficulty in *managing a horticulture laboratory/greenhouse* and *managing student behavior*, especially in relation to the horticulture class. "I was a deer in headlights. I didn't necessarily know what to do with them" (Interview 1, Lines 136-137). "They're my most difficult students by far... most days with them are a struggle from the word go" (Interview 2, Lines 104 & 106).

Participant 4, a traditionally certified SBAE teacher, described three professional development needs during interview sessions. Participant 4 was employed by a SBAE program of approximately 100 students with an active FFA chapter. This participant seemed to struggle to *build positive relationships with administrators* by describing ongoing issues with the principal and superintendent. "(Principal) just goes along with (Superintendent) and (School Board Member)... (Administrators) haven't been any help really" (Interview 2, Lines 550, 552). "We just get told what we're doing wrong, not 'Good job for this' or 'Thanks for that'" (Interview 2, Line 554). Participant 4 complained about the workload and regularly working 50 to 60 hours each week, "(the extra hours) have changed me in a lot of ways... It wears on you" (Interview 2, Line 436). Yet Participant 4 did not *utilize the FFA Alumni and Supporters* or *program advisory board*. "No, we don't have any kind of (advisory board)" (Interview 1, Line 202).

Participant 5 was traditionally certified and qualitatively expressed three professional development needs. This participant held a variety of agriculturally-related positions during a brief intermission between graduation and entering the classroom. In an economically depressed area, Participant 5 was concerned with *assisting students acquiring necessary resources to complete an SAE project*, "(students) don't have much... for them, show animals are not an option" (Interview 1, Lines 103 & 107). Participant 5 indicated he was unable to *coach LDEs* in a sufficient matter to be prepared for contests (Interview 2, Line 45). *Training an FFA chapter officer team* was difficult for Participant 5. Issues in this area emerged from the beginning of the semester, "They're not the team I would have picked," (Interview 1, Lines 163-164) and continued to plague Participant 5 (Interview 2, Line 53).

The third research question sought to describe where the quantitative and qualitative data converged and diverged to describe self-perceived professional development needs of Oklahoma induction-year SBAE teachers. As shown in Table 2, there were no areas of convergence between survey and interview data. Participants 1, 2, and 3 reported no needs on the quantitative survey. Each participant reported professional development needs in the interviews, but none matched what they had reported on the survey instrument. Emergency certified participants each reported four professional development needs while traditionally certified participants reported five to six professional development needs.

Table 2.

Joint Display of Quantitatively and Qualitatively Reported Professional Development Needs

Professional Development Needs	Participants				
	1*	2*	3+	4+	5+
Assist FFA members in preparing degree applications	Qual				
Assist FFA members in preparing proficiency applications				Quant	
Assist students completing a record of the financial transactions in their SAE project	Qual				
Assist students in acquiring necessary resources to complete an SAE project					Qual
Build positive relationships with administrators				Qual	
Clearly communicate the procedures of SAE projects with parents and employers		Qual			
Coach Leadership Development Events (speaking, parliamentary procedures, etc.)	Qual				Qual
Coordinate communication between a student, parent, employer, and myself		Qual			
Evaluate student learning					Quant
Identify SAE projects that connect to agriculture curriculum			Qual		
Manage a horticulture laboratory/greenhouse		Qual	Qual	Quant	
Manage student behavior			Qual		
Motivate students to learn	Qual				
Provide students meaningful supervision during their SAE project			Qual		
Recruit new FFA members		Qual	Qual		
Train a chapter officer team					Qual
Utilize a program advisory board				Qual	Quant
Utilize the FFA Alumni and Supporters			Qual	Qual	Quant

Note. * Indicates an emergency certified participant. + Indicates a traditionally certified participant. Qual = PD need identified in interview. Quant = PD need identified in survey.

Conclusions, Implications, and Recommendations

Discrepancies were found in reported professional development needs for these induction-year SBAE teachers acquired through quantitative and qualitative means. Participants reported a high sense of teacher self-efficacy through the quantitative instrument yet expressed multiple concerns in their abilities in qualitative instruments. Environmental influences may attribute to the differences in quantitative and qualitative responses (Moeller et al., 2015). Survey instruments and interviews were conducted at different times. As induction-year teachers are in survival mode with a near sighted focus on present challenges (Katz, 1972), these participants may have been reporting what they saw as a present problem, rather than reflecting on past issues or future obstacles. Future research in which surveys and interviews are collected in the same day may reduce this discrepancy. Though data was collected in-person during the COVID-19 pandemic, Participant 2 was the only individual to call out “the ‘Rona” as a particular challenge of his induction year experience. Other participants took the implications of the pandemic in stride with the greater trials of first year teachers.

Research comparing self-reported professional development needs of emergency (or alternatively) certified and traditionally certified SBAE teachers yields conflicting conclusions. Roberts and Dyer (2004) found traditionally certified teachers reported more professional development needs than alternatively certified teachers. Conversely, Swafford and Friedel (2010) and Stair et al. (2019) noted no statistically significant differences in professional development needs between traditionally and alternatively certified SBAE teachers. The diverse professional development needs identified by these traditionally certified teachers mirror the findings of Sorensen et al. (2014). In addition to their classroom instruction responsibilities, induction-year SBAE teachers are required to manage the total SBAE program including FFA advisement and SAE supervision (DiBenedetto, et al., 2018). Therefore, professional development offerings should represent all areas of the three-circle agricultural education model and occur at regular intervals with topics arranged to meet the demands of teachers' schedules and topics of interest.

Emerging professional development needs were highly individualistic. Bandura's (1978) theory of reciprocal determinism may help explain these differences. In his model, Bandura (1978) proposed environment both influences and is influenced by personal characteristics and behaviors. The differing environments (SBAE programs) and personal characteristics (teacher self-efficacy) influenced the various professional development needs emerging from each case participant (Greiman et al., 2005; Katz, 1972; Smith & Ingersoll, 2004). To best maximize the resources of Oklahoma SBAE staff, teacher educators, administrators, and teacher professional development providers, induction-year teachers should be provided a mentor to individualize induction-year support (Smith & Ingersoll, 2004). This mentor-protégé relationship is likely to increase reflective skills, improve SBAE program management, and retain novice teachers (Toombs & Ramsey, 2020). By addressing the professional development needs listed above, Oklahoma induction-year SBAE teachers are likely to increase their teacher self-efficacy and improve the retention rate of novice professional (Bandura, 1997).

The difference in self-reported professional development needs across data type may indicate potential pitfalls in the use of a single research methodology in conducting professional development needs analyses, especially regarding induction-year teachers. Most of these studies are done with a single quantitative survey (Di Benedetto et al., 2018). As in the case of this study, qualitative data may provide additional areas of concern for induction-year teachers they were not able to express in a quantitative matter. Therefore, it is recommended professional development providers consider conducting needs analyses using mixed methodologies.

Discussion

The findings of this study indicate induction-year SBAE teachers in Oklahoma require professional development, regardless of their awareness of their needs. The focus of those needs varied greatly between individuals. Therefore, it is imperative induction-year teachers are provided personalized, easily accessible professional development resources. Traditional professional development, unfortunately, is commonly neither personalized nor easily accessible when needed (Clarke & Hollingsworth, 2002). The typical workshop-type offerings are often expensive and ineffective (Shaha et al., 2015).

Oklahoma SBAE induction-year teachers need additional support. This study recommends implementation of an induction program based on mentoring and on-demand resources. A mentor can provide personalized reflection and feedback and positively impact student outcomes (Smith & Ingersoll, 2004). Mentoring can take various forms, from organic relationships between SBAE teachers to structured programs with assigned mentor-protégés groupings (Hudson & Hudson, 2018). The spontaneous mentoring relationships built between induction-year and experienced teachers can be very fruitful for both parties (Mukeredzi, 2017) and was identified by four of the five case study participants. However, these relationships are sometimes limited by the appropriateness of mentor choice (Toombs & Ramsey, 2020). Assigned mentors are more able to ensure quality advice (Peiter et al., 2005) but are highly influenced by

the relationship between mentor and protégé (Hudson & Hudson, 2018). Mukeredzi (2017) suggested mentoring cohorts with two to three induction-year teachers grouped with one or two experienced teachers to mitigate interpersonal issues that can plague assigned mentoring relationships. As a previous Oklahoma state-wide mandated induction mentoring program was defunded by the state budget cuts (McKean, 2013), financial support for a new mentoring program should come from more stable resources, including Oklahoma CareerTech, Oklahoma SBAE teacher education programs, Oklahoma FFA Association, and Oklahoma SBAE teacher associations.

In addition to an assigned mentor, Oklahoma induction-year SBAE teachers need easily accessible information resources. An on-demand professional development model in the form of online resource banks have been effective in recent years (Shaha et al., 2015). Shaha and Ellsworth (2013) studied this just-in-time technique of delivering professional development and found a positive correlation between teacher engagement in the professional development and student outcomes. A no-cost, searchable, comprehensive, and engaging platform to serve as an online research bank for SBAE teachers does not yet exist. Its creation would serve as a valuable tool for both novice and experienced SBAE teachers. This database would require continuous updating as new resources become available (Shohel & Banks, 2012). Additionally, items must be vetted to ensure quality and usability of the resources (Ferman, 2002). Oklahoma teacher certification programs would be in a position to serve these roles. To promote use of the resource bank by novice and experienced SBAE teachers, professional certificates could be issued for a set number of modules or hours completed. Induction-year teachers should have mandated use of the bank with certain modules required and a set number of elective modules to be set by Oklahoma teacher educators and CareerTech staff. The investment in Oklahoma's induction-year SBAE teachers, both emergency and traditionally certified, by the state department of education, Oklahoma CareerTech, SBAE teacher educators, inservice SBAE teachers, and the Oklahoma FFA Association will pay dividend in teacher retention and student learning for years to come.

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