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Identifying Challenges Pre-service Teachers Encountered When Teaching Curriculum for Agricultural Science Education (CASE) Coursework during Student Teaching

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Abstract

Student teaching is the capstone experience in an agricultural teacher preparation program (Edgar, Roberts, & Murphy, 2011). During student teaching, pre-service teachers work with cooperating teachers to learn to effectively deliver instruction (Feiman-Nemser & Buchmann, 1987) on topics such as agriscience, agricultural mechanics, horticultural science, and so forth, to secondary students. School-based agricultural education (SBAE) also includes instruction in applied academic content (Stubbs & Myers, 2015). Curriculum for Agricultural Science Education (CASE) has emerged in recent years to provide engaging, academically-reinforced coursework for SBAE teachers and students across the United States (CASE, n.d.a). Thus, it is reasonable to expect pre-service teachers may be responsible for teaching CASE coursework at their student teaching placement sites. We sought to identify challenges that pre-service teachers may encounter when teaching CASE coursework. Through two face-to-face focus group interviews conducted at both the mid-semester and end-of-semester student teacher meetings, we identified three primary themes: 1) accessibility to resources; 2) influence of cooperating teachers; and 3) applicability of coursework based on local needs. We concluded these pre-service teachers encountered both positive and negative experiences related to teaching CASE coursework and recommended that pre-service teachers be adequately prepared to engage in CASE coursework prior to student teaching.

Keywords: pre-service teachers; CASE; student teaching; experiences

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Introduction and Conceptual Framework

Positive experiences are an important component of the educational process (Baker, Culbertson, Robinson, & Ramsey, 2017; Dewey, 1938; Rank & Smalley, 2017; Wells, Smalley, & Rank, 2018). The use of experiences as a tool throughout the educational process can positively impact an individual's long-term development and should be used to help guide future growth (Dewey, 1938; Wells et al., 2018). Moreover, experiences can expose individuals to numerous circumstances, both positive and negative, that can challenge preconceived notions, ideas, or concepts and provide a medium to critically evaluate such things (Baker et al., 2017). This can be particularly powerful in the context of experiential learning theory, which is rooted in learning through a process focused on

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experience with, and subsequent reflection on, a given topic, ultimately guiding change (Baker, Robinson, & Kolb, 2012; Kolb, 2015). Serving as the conceptual framework for the present study, experiential learning theory has long been incorporated into school-based agricultural education (SBAE) settings and has taken many shapes and forms, such as through student teaching (Baker et al., 2012; Roberts, 2006).

The agricultural teacher preparation process is focused on providing opportunities, such as technical agriculture coursework, SBAE program observations, early field experiences (EFEs), and student teaching experiences, that serve to develop pre-service teachers' abilities to successfully lead SBAE programs as in-service teachers (Whittington, 2005). Designed to serve as the capstone portion of a teacher preparation program, student teaching experiences allow pre-service teachers the opportunity to apply the knowledge and skills acquired throughout the duration of their teacher preparation program within a school setting under the supervision of an experienced cooperating teacher (Feiman-Nemser & Buchmann, 1987). More specifically, Feiman-Nemser and Buchmann (1987) characterized student teaching as "experiential; that is, it offers the chance to teach under guidance, to watch an experienced teacher close up… to discover what it 'feels like' to be in charge of a class" (p. 256). The student teaching experience can positively contribute to helping develop pre-service teachers' self-efficacy (Al-Awidi & Alghazo, 2012) in an area of teaching (e.g., working with instructional technology, performing non-teaching responsibilities, etc.). Designed as a final stage in the agricultural teacher preparation process (Whittington, 2005), student teaching allows pre-service teachers to essentially practice becoming effective SBAE teachers while engaged in the learning process themselves.

As noted by Edgar, Roberts, and Murphy (2011), "[t]he capstone experience of student teaching is a critical period for future professionals in agricultural education" (p. 15). In the context of SBAE, the student teaching experience has been studied quite extensively with differing foci. In their studies of student teaching activity relevance, Smalley, Retallick, and Paulsen (2015a) determined that student teachers believe many activities, such as teaching in laboratory-based settings, developing and implementing appropriate learning experiences, and so forth, are relevant to their development in the capstone portion of their teacher preparation programs. Likewise, Smalley, Retallick, and Paulsen (2015b) also found cooperating teachers' beliefs about student teaching activities' relevance echoed those of student teachers, thus indicating a congruence of thought between the two groups. Edwards and Briers (2001) noted cooperating teachers perceived the use of "[d]aily (systematic) classroom and/or laboratory instruction" (p. 36) was an important component of student teaching experiences.

In terms of teaching style, Stripling, Thoron, and Estepp (2014) noted student teachers often "used student-centered activities with the greatest frequency" (p. 158), thus indicating that student teaching offers the opportunity for student teachers "to follow through with their preferred method and extend student-centered lessons into the authentic experience - their student teaching internship" (p. 158). Interestingly, Stripling et al. (2014) also found student teachers often do not feel prepared to teach science-oriented technical agriculture content such as food science, biotechnology, and veterinary science after completing their student teaching experience. Moreover, as detailed by Krysher, Robinson, Montgomery, and Edwards (2012), student teachers can recognize challenges and successes during the student teaching experience. Perhaps teaching academically-oriented SBAE coursework, such as Curriculum for Agricultural Science Education (CASE) courses, can present its own challenges and rewards.

Roberts and Dyer (2004) noted effective SBAE teachers work to proactively, contextually teach academic content (i.e., science, mathematics, language arts, etc.) within their curricula. Moreover, as pushes for the contextual teaching of academic content through SBAE coursework have occurred in recent decades, SBAE teachers have been expected to respond appropriately and proactively (McKim,

Sorensen, & Velez, 2016). As noted by Ulmer et al. (2013), school administrators appear to hold value toward contextually teaching academic content through SBAE coursework. Thompson and Warnick (2007) noted secondary science teachers tend to value SBAE curricula as a source for contextually teaching science-based content. Further, SBAE teachers generally have positive attitudes toward teaching science content within their curricula (Balschweid & Thompson, 2002).

Considering these ideas, one response has been the development and implementation of CASE courses in SBAE programs nationwide. Initiated in 2007 by the National Council for Agricultural Education, "CASE provides purposeful enhancement of science, mathematics, and English language understanding" (CASE, n.d.b, ¶ 2). Since its initial development, CASE course adoption has occurred in SBAE programs across the United States, with over 1,800 teachers spread across over 40 states and the Virgin Islands incorporating CASE into their programming (CASE, n.d.a). Further, CASE (n.d.a) estimated that "61,600 agricultural education students will be taught through a CASE course in the 2018-2019 school year" (¶ 1), indicating that CASE coursework has direct and immediate impacts on many secondary students. As detailed by Lambert, Velez, and Elliott (2014) in their study of teachers' experiences implementing CASE in SBAE programs, CASE can be a useful, student-centered, and practical method to teach and emphasize pragmatic academic knowledge and skills via a technical agriculture context. Lambert et al. (2014) also acknowledged that incorporating CASE courses can present its own issues, can be complex and challenging, and can be rewarding and beneficial for SBAE stakeholders.

Through interviews with SBAE teachers, Stubbs and Myers (2015) found that the contextual teaching of academic content can positively impact secondary students without sacrificing technical agriculture knowledge and skill development. Baker, Bunch, and Kelsey (2015) opined that contextually teaching academic content "can occur in what may appear as a very traditional agricultural education program" (p. 232), further emphasizing that planning for such a blending of academic and technical agriculture content must be proactive and purposeful. What is more, pre-service teachers have recognized that there exists value in emphasizing the academic content inherently found within SBAE content, as documented by Haynes, Gill, Chumbley, and Slater (2014). Examining these concepts through the lens of teacher education, it is interesting to postulate that as pre-service teachers matriculate through teacher preparation programs, they may likely encounter SBAE teachers who teach CASE courses in their programs, particularly during student teaching.

Lambert et al. (2014) documented the positive and negative experiences of SBAE teachers who taught CASE coursework; yet, what of the pre-service teachers who engage in the same coursework under the guidance of cooperating teachers? The use of experiences in a context can be beneficial to better understanding a topic (Lambert et al., 2014; Wells et al., 2018). Further, as Lambert et al. (2014) noted, in-service teachers have questions about "the readiness of pre-service teachers to understand and implement the [CASE] curriculum as first year teachers. Further research should examine the[ir] readiness… to actively engage with the CASE curriculum and implement it in the classroom during their first year" (p. 112). To help prepare pre-service teachers to teach CASE courses during and after student teaching, CASE (n.d.c) currently offers certifications for pre-service teachers in the Introduction to Agriculture, Food, and Natural Resources (AFNR) and Principles of Agricultural Science - Animal (ASA) courses. However, despite these certifications offered by CASE, it is still reasonable to expect that pre-service teachers will have varying experiences with CASE during student teaching, particularly if CASE certification was not obtained prior to student teaching. Perhaps studying pre-service teachers' experiences with teaching CASE coursework during their student teaching semesters could be beneficial to understanding how to engage pre-service and early-career teachers in enhancing the academic rigor of SBAE programs. Moreover, how would these experiences impact pre-service teachers' student teaching experiences?

Research Questions and Purpose

Based upon the preceding literature and the application of experiential learning theory in SBAE settings (Roberts, 2006), two central research questions emerged that guided our study:

1. What challenges do pre-service teachers experience when teaching CASE coursework during their student teaching experiences?
2. How do pre-service teachers overcome these challenges?

Rooted in these questions, the purpose of our study was to identify the challenges pre-service teachers encountered when teaching CASE coursework during their student teaching experiences. The present study aligned with Research Priority 5 of the National Research Agenda (NRA) of the American Association for Agricultural Education (AAAE): Efficient and Effective Agricultural Education Programs (Thoron, Myers, & Barrick, 2016). Student teaching is a capstone experience for pre-service teachers (Edgar et al., 2011) and is thus the application of the entirety of the agricultural teacher preparation process within the confines of a school-based placement site (Whittington, 2005). Cooperating teachers work with student teachers to facilitate practical knowledge and skill development in actual SBAE settings (Smalley et al., 2015b). The ever-increasing complexities and diversities associated with teaching and learning necessitate that future in-service teachers will face no shortage of issues related to technical and academic knowledge and skill development (Thoron et al., 2016).

Preparing pre-service teachers via high-quality, effective student teaching experiences provide needed professional development is paramount to the sustainability of SBAE (Edgar et al., 2011), as the need for well-prepared agricultural education practitioners is critical (Thoron et al., 2016). As part of addressing and understanding the needs for adequate professional development for student teachers via exposure to and immersion within CASE coursework, we sought to explore the challenges that pre-service teachers faced when teaching CASE coursework throughout their student teaching experiences. We hope that identifying any such challenges will help to better position the profession to assist pre-service teachers via implementing effective and proactive preparation procedures for these forthcoming professionals.

Methods

The present study was initiated upon university Institutional Review Board (IRB) approval. We conducted this study with six pre-service teachers whose student teaching experiences were conducted at various SBAE programs across the state. To protect the identities of each pre-service teacher, we assigned him or her a pseudonym. The typical SBAE program in which the pre-service teachers completed their student teaching experiences was located in a rural setting, included at least one CASE course annually within its programming, and was a single-teacher program. The typical pre-service teacher included in the present study was female (n = 4), was completing her student teaching experience during her undergraduate degree program, had not been enrolled in a CASE course while she was a high school student, and taught at least one CASE course during her student teaching experience. Five of the pre-service teachers were certified in the CASE AFNR curriculum prior to their student teaching experiences.

Regarding coursework responsibilities, there was quite a bit of variance in each pre-service teacher's course load. **Anna** taught coursework in precision agriculture, agronomy (Principles of Agricultural Science – Plant [ASP] curriculum), agricultural mechanics, and ninth-grade introductory- and eighth- grade exploratory-level courses (AFNR curriculum). **Olga** taught two introductory-level courses (AFNR curriculum), two plant science courses (ASP curriculum), an animal science courses (ASA curriculum), all of which used CASE curricula, as well as an agricultural business and an eighth-

grade exploratory course that did not incorporate CASE. **Lars** taught an introductory-level course (AFNR curriculum), soil and welding course, a horticultural science course (ASP curriculum), and a community college dual-enrollment animal science course. **Chris** taught four welding courses, two animal science courses (ASA curriculum), and an introductory-level course for ninth-grade students (AFNR curriculum). **Haley** taught three ninth-grade introductory courses (AFNR curriculum), an agronomy course, an eighth-grade exploratory course, and a natural resources management course. **Kara** taught an animal science course, a plant and soil science course, an applied agriculture course, a biotechnology course, a food science course, an independent studies course, and an exploratory-level course that was focused on animal science.

Data were collected via two focus group sessions conducted during two on-campus meetings with all six of the pre-service teachers. Each pre-service teacher was required to sign and return an informed consent form to us prior to engaging in our study. Each focus group session was audio- and video-recorded. The first meeting and focus group session were conducted during the mid-point of the university's semester, which was approximately eight weeks into their student teaching experiences, while the second meeting and focus group session were conducted during the final week of the university's semester. To guide each focus group session, we developed and used a written list of items (see Table 1).

Table 1

Interview Items Used During Each Focus Group Session

	Interview Items
1	Describe how teaching CASE coursework has gone this semester.
2	Describe how working with a CASE certified cooperating teacher has been.
3	Describe your procedures for preparing to teach CASE coursework.
4	Describe the teaching approaches that you have used when teaching CASE coursework.
5	Describe any challenges you have experienced when teaching CASE coursework.
6	Describe the fidelity of the CASE coursework as you have implemented it thus far.
7	Describe your post-student teaching plans regarding CASE coursework.
8	Based on your experiences thus far, describe any changes to your professional practice that you plan to make or would like to make.

In addition to the items listed in Table 1, probing questions were also used. Both focus group sessions were moderated by one of us. In addition, one of us also took observation notes during each focus group session. After the conclusion of each focus group session, we met to debrief and discuss the events of each one. Each focus group session was subsequently transcribed and re-checked for accuracy.

This study used a qualitative approach defined by Merriam (2009). Once data were collected, constant comparative methods of data analysis were used along with content analysis to identify themes (Merriam, 2009). Using open coding procedures, data were coded and themes were delineated to provide validation of analysis. We reviewed the observation notes taken during each focus group session. We also independently reviewed data and developed themes before collectively comparing notes. We used qualitative research practices to establish trustworthiness of the results. Trustworthiness and reliability of data were established using a research log, peer review of data analysis, and member checks as recommended by Lincoln and Guba (1985). Member checks were used following the transcription process. To promote reliability and trustworthiness of the data coding, multiple researchers coded the data. In accordance with Merriam (2009), we also strengthened the trustworthiness of our study by discussing bracketing to identify potential personal biases that may

have emerged based on our own experiences prior to this study. As researchers coding for the study, we each have differing and overlapping experiences regarding teaching and learning in SBAE settings, as we each formerly taught SBAE coursework, are all currently involved in the agricultural teacher preparation process in different capacities at the university, and are each actively engaged in SBAE in numerous settings and ways across the state. Two of us have several CASE certifications and have previously facilitated professional development training for pre-service and in-service teachers.

Results

Three themes emerged from the data and included: 1) accessibility to resources; 2) influence of cooperating teachers; and 3) applicability of curriculum. Each theme is discussed in detail below.

Accessibility to Resources

When the pre-service teachers were asked about challenges they faced while implementing CASE coursework during their student teaching experience, many pre-service teachers indicated accessibility to resources to teach the curriculum served as a barrier to teaching CASE materials. Of the six pre-service teachers who engaged in the focus group, only five were certified to teach the CASE AFNR curriculum. As part of their student teaching experience, some of the pre-service teachers were tasked with teaching various CASE curricula (e.g., ASP and ASA) which they were not certified in. Although the cooperating teachers were certified to teach the CASE curricula used in the various programs and had access to the curricula and supplies, some of the pre-service teachers struggled to gain access to appropriate CASE resources needed to prepare for and implement the CASE lessons. Aside from Chris, who received a copy of each curriculum from his cooperating teacher, Anna and Olga had limited access to the CASE curricula.

Anna had to borrow her cooperating teacher's laptop computer (on which a downloaded copy of the curriculum was stored) in order to prepare for lessons. After receiving the laptop, her cooperating teacher would watch her closely and constantly ask her if she was "almost done." After reflecting on these experiences, Anna stated that she "would probably use CASE more if I had the curriculum, but he only lets me use it off his computer." Similar to Anna's predicament, Olga indicated that her limited access to the CASE ASA curriculum hampered her ability to secure the necessary recourses she needed to effectively plan for each lesson. Olga noted that preparing for CASE AFNR lessons was easier because she was certified in the curriculum and she knew what was going on and could make appropriate preparations. Conversely, she had a much different experience when preparing for areas she was not certified in (i.e., ASA and ASP). When reflecting on her experiences, Olga stated, "It is frustrating to teach something that I am not certified in because my cooperating teacher won't let me know what [supplies] we need to order."

Chris indicated he had numerous positive experiences when planning and locating supplies for each CASE AFNR lesson. Since he had copies of each CASE curriculum he taught in his student teaching experience (i.e., AFNR and ASA), he was able to plan for each lesson at least one week in advance. His cooperating teacher already had a majority of the supplies for each lesson and he was able to organize lesson plans, gather needed supplies, and print off worksheets during his planning period.

When the pre-service teachers were discussing their lack of access to curriculum, one issue that arose was the legality associated with cooperating teachers (who were certified CASE teachers) sharing their copies of the curricula with pre-service teachers (who were not certified CASE teachers). Lars, Olga, and Anna were under the impression that it was illegal to share a curriculum which was copyrighted, although none of the pre-service teachers reported that he or she had a deep understanding

of the laws, regulations, and/or stipulations associated with the guided dissemination of CASE curricula.

Influence of Cooperating Teachers

The pre-service teachers discussed the experiences they had when teaching CASE curricula in their student teaching experience and how their cooperating teachers had an impact on the use of the curriculum and their overall perceptions of CASE. The pre-service teachers noted their cooperating teachers held an authoritative role when determining how much of the CASE curricula should be used in their SBAE program. When asked about the percentage of CASE used in their student teaching courses, most of the pre-service teachers reported they used less than 10% of the available curriculum in each course (i.e., AFNR, ASA, and/or ASP). Haley, Lars, Anna, and Kara each reported that they used less than 10%, while Olga reported that she used approximately 30% of the available curricula. Chris reported using in excess of 90% of the available curricula.

When describing her cooperating teacher's perceptions of CASE, Anna said her "cooperating teacher [is only certified in] AFNR, and he hates CASE and I kind of feel the same way." She went on to say that she believed it was lazy teaching and that she and her cooperating teacher have only used a handful of CASE lessons. Haley shared a similar sentiment when discussing her cooperating teacher's perceptions of CASE. She offered that her "cooperating teacher does not believe in CASE. He thinks it is stupid because he has been teaching the same way for 20 years." Moreover, Haley believed that she was not going to be able to change the way her cooperating teacher teaches nor alter his perceptions of CASE curricula.

In contrast to Anna and Haley's negative perceptions of CASE brought about by their respective cooperating teachers, Chris's cooperating teacher had a positive perception of CASE. Chris explained that his cooperating teacher was entirely on-board with CASE and instead of just handing out CASE packets for the students to work on, he was highly engaged with the students throughout the process. Chris described a method of teaching with CASE that was student-centered whereas he and his cooperating teacher took the roles of active learners. Based on his experience with CASE during student teaching, he has a positive attitude toward CASE and has aspirations to pursue further CASE certifications. Chris emphasized the importance of keeping a positive attitude toward CASE and explained, "If you have the right attitude about [CASE lessons], it will go well, but if you don't, it is probably going to fail."

Although Chris had a positive attitude toward CASE and valued his cooperating teacher's zeal for the curricula, he did note his cooperating teacher made all the decisions when it came to the way CASE was implemented. For example, when Chris mentioned he wanted to tweak a couple of things in a CASE lesson, his cooperating teacher was not accepting of the changes and wanted to keep it the same. Chris further indicated his cooperating teacher would skip the CASE lessons that he did not like but Chris reported he did not have the same academic freedom. Anna had a similar experience in regard to her cooperating teacher who dictated the use of CASE in her student teaching placement. She mentioned when she wanted to use a CASE lesson in one of her units, her cooperating teacher would act like it was a hassle, which made her shy away from using the lessons. Anna shared when she has her own SBAE program she will enjoy having the freedom to use CASE curricula as she sees fit.

Applicability of Coursework

The pre-service teachers noted a challenge they faced when implementing the CASE curricula was augmenting the curricula to fit their local program needs and facilitate applicable learning for their students. Some of the pre-service teachers indicated CASE curricula were too advanced for the

secondary students in their classrooms. For example, Lars noted most of the students in his program in the southern region of the state are not going to go into higher education and might not need the heavy science-based curriculum. In agreement with Lars, Anna said, "Out of all of my seniors, only three are going to college. That is just how it is." Olga believed that some of the AFNR curriculum was worthwhile, but noted that her students shut down when they figured out they were going to be engaging in a CASE lesson. She also thought that the lessons were too intense for her students and had too many conclusion questions at the end of the lesson. Olga stated, "Some kids can't write complete sentences, so it is hard for them to do the conclusion questions." To mitigate the intensity of the lesson, she would just pick one conclusion question and would use it as a quiz grade.

Haley reported it was hard to engage her students in CASE lessons because they already had bad experiences with the curricula. She said that her biotechnology course students would become unruly anytime they saw the CASE logo. She attempted to explain how the CASE activities were hands-on but her students would argue back and say the CASE curricula were designed for graduate students. Based on the pre-service teachers' comments, it appears as if they understood the value of the curricula but believed that it might be too advanced for many of the students they were teaching.

The pre-service teachers also believed CASE curricula were not directly applicable to their local programs. Some of the pre-service teachers (i.e., Olga, Haley, and Lars) indicated that the CASE curricula were not production agriculture-focused enough to be applicable for the students in their areas. Olga noted most of her kids are going to be going back to the farm after graduation and their production-oriented learning needs were not addressed by the CASE curricula. In agreement with Olga, Haley offered that when she taught the AFNR curriculum during her student teaching experience, the curriculum only related back to the agricultural industry one or two times.

Anna indicated that she had a difficult time fitting the curricula into her cooperating teacher's local program because the school she student taught at used standards-based grading. Anna explained that she struggled to assign standards to certain parts of the CASE lessons and indicated, "I just feel like CASE is hard because I would have to make a million rubrics for them to use CASE." While she was frustrated with the applicability of the curricula based on the assessment of student work, she agreed that the curricula provide a suitable foundation upon which to adapt lessons. Kara and Chris also expressed the same feelings regarding how they would restructure the curriculum to fit their programs. As an example of adapting the curricula to fit local needs, Kara explained when she taught a CASE lesson on calculating yields she took all her students out to her cooperating teacher's corn and soybean fields. Kara indicated she held class out in the field for about a week and then came back to the classroom to calculate the yields from each crop field.

Regarding the augmentation of lessons to fit local program needs, Chris noted some CASE AFNR lessons were not feasible in his program, so he and his cooperating teacher had to tweak the assignments. For example, during the lesson where the students were assigned to seek out and interview someone in an industry they aspired to be in, Chris indicated that he and his cooperating teacher understood that this would be an unrealistic expectation for many of their students. Chris mentioned when he teaches the topic in the future he will modify it to where the students will research a career they want to pursue and have guest speakers come in and talk about their careers instead of skipping the lesson entirely. Further, Chris added he normally taught the CASE lessons and then he would spend time connecting the content of the lesson to the "real world."

Conclusions, Discussion, Recommendations, and Implications

The pre-service teachers identified several challenges in teaching CASE coursework during their student teaching experiences. These challenges fit into three broad themes including: 1)

accessibility to resources; 2) influence of cooperating teachers; and 3) applicability of coursework based on local needs. We concluded that some of these challenges were through no fault of the pre-service teachers; rather, these challenges were more restricted to their individual placement sites' characteristics (e.g., local industry presence, student demographics, etc.) and cooperating teachers' actions, attitudes, and motives, while some challenges were related to the pre-service teachers' attitudes toward CASE coursework. Our results highlight the need for high-quality experiences in placements that are suitable for enriching pre-service teachers' experiences (Wells et al., 2018).

Student teaching is the capstone portion of the agricultural teacher preparation process and should consequently be used as a tool for enriching abilities and self-efficacies for developing into professional educators (Edgar et al., 2011). As the day-to-day leaders and facilitators for student teachers, cooperating teachers serve to help guide them as they transition into these new professional identities (Smalley et al., 2015b). Good, positive experiences are effective for teaching and learning, as expressed by Dewey (1938), and can serve to ensure student teachers are being exposed to ideas and concepts which will positively shape their own practices as future in-service teachers. Through applying concepts of experiential learning theory (Kolb, 2015), we hope that allowing pre-service teachers to reflect upon their experiences (i.e., identifying challenges associated with teaching CASE courses during student teaching) at differing points throughout their student teaching experiences will help them to better understand their professional practice needs and desires moving forward.

Considering CASE adoption is widespread across the United States (CASE, n.d.a), we believe an opportunity to study how pre-service teachers who were engaged in their student teaching experiences interacted with CASE was of importance and relevance. Moreover, the identification of challenges associated with teaching CASE coursework helps the profession to develop strategies to better prepare pre-service teachers to engage in teaching CASE courses during their student teaching experiences. We suggest agricultural teacher educators work closely with CASE personnel and other SBAE stakeholders to ensure pre-service teachers receive substantial, high-quality, and meaningful exposure to CASE coursework via pre-service teacher institutes and other avenues at some point prior to student teaching. CASE certification is currently offered for pre-service teachers at several agricultural teacher preparation programs throughout the country (CASE, n.d.c). This approach could be a practical solution to ensuring that pre-service teachers are ready to teach CASE coursework prior to student teaching. Additionally, while not all pre-service teachers will lead CASE coursework during their student teaching experiences, the exposure to CASE coursework could help to influence decisions about whether to consider adopting CASE in their own SBAE programs.

The pre-service teachers were concerned with the legality of teaching a curriculum without proper certification. Teacher educators should inform pre-service teachers and cooperating teachers about CASE's student teacher placement policy. Specifically:

> In the event of a CASE certified teacher serving as a cooperating teacher to a pre-service teacher, student teacher access is permitted. Student teachers may access and teach CASE curricula under the mentorship and supervision of the CASE certified teacher during their student teaching placement. However, student teachers cannot teach or utilize any CASE curricula after completing student teaching unless they complete a CASE certification. All copies of the CASE curricula must be removed from the student teacher's possession upon the completion of student teaching, including any files in their computer program files. (CASE, n.d.)

Lambert et al. (2014) highlighted experienced teachers' notations which perhaps pre-service teachers lack the requisite experience and maturity to properly and proactively implement CASE coursework during their early-career teaching practices. The pre-service teachers in the present study cited lack of experience as a barrier to teaching CASE coursework, even after undergoing pre-service

teacher-focused CASE training. Stressful and frustrating factors are commonplace for teachers (Solomonson, Korte, Thieman, Retallick, & Keating, 2018) and we question if some pre-service teachers were stressed about their student teaching experience in general and could have expressed any broader issues within their student teaching experiences during the CASE focus group sessions. As such, perhaps their challenges were not simply about teaching CASE coursework during their student teaching experiences but were about other things they experienced.

We found it interesting some pre-service teachers believed teaching CASE coursework in many SBAE programs may undercut the production agriculture focus of SBAE programs in local communities. Moreover, some pre-service teachers also noted their beliefs that CASE coursework is too academically-advanced for many students, thus leading to frustrations on the SBAE students' parts. This should be of cause for concern, especially since SBAE has worked to transform itself from vocational agriculture with a focus on production-oriented content to more modern, academically-oriented coursework called for by the National Research Council (1988). While SBAE programs are designed to be locally-focused and oriented to address local needs (Phipps, Osborne, Dyer, & Ball, 2008), they must remain effective on multiple fronts (e.g., appealing to multiple types of learners to encourage and sustain enrollment and progress over the long term) (Thoron et al., 2016). As noted by Baker et al. (2015), a blend of academically-enhanced content can co-exist in traditional, production-oriented SBAE programs when purpose and planning are applied.

We do emphasize that readers should interpret our results carefully and bear in mind that our findings are not generalizable to a broader audience beyond the present group of pre-service teachers. The CASE courses could prove valuable to developing high-quality SBAE programs that will help to fulfill a broader mission of effectiveness of programming (Thoron et al., 2016). As the need for academically-robust SBAE programs becomes greater and for SBAE teachers to heed these calls (McKim et al., 2016), SBAE stakeholders must be prepared to practice and implement habits that make them effective (Roberts & Dyer, 2004). Pre-service teachers see that there is value in enhancing the academic rigor of SBAE (Haynes et al., 2014). Moreover, the enhancement of academic content in SBAE programs does not necessarily mean traditional activities associated with SBAE, such as exhibiting livestock, building trailers in an agricultural mechanics laboratory, and so forth, are replaced or phased out; rather, such activities can be supplemented with academically-enhanced activities which help to enrich the SBAE experience for all involved parties (Baker et al., 2015).

Meaningful, practical research efforts should be undertaken to better understand the broader range of experiences pre-service teachers have when teaching CASE coursework at their respective student teaching sites. Moreover, we believe that such efforts should be extended to include early-career teachers as well. Both qualitative and quantitative research designs could be useful. Such scholarship could serve to guide the profession and its stakeholders forward as we work to enhance the impact of quality SBAE and agricultural teacher preparation programs. As effective teachers will continue to be responsible for bringing SBAE programs into the 21st century, preparation and engagement in professional trends must occur (Roberts & Dyer, 2004).

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