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Insights from the Frontlines: Evaluating Recent Teacher Preparation Graduates' Satisfaction with their Pedagogical Content Knowledge

Emily Garcia[1]
William Norris[2]

Abstract

The lack of educator retention is one of the most significant threats to agricultural education's impact. With approximately 41% of educators exiting the profession in their first five years of employment, many agricultural educators report experiencing difficulty teaching agriculture curriculum. Furthermore, many agricultural educators report difficulty taking the content knowledge they have developed and incorporating it into their instruction. This study aimed to assess early-career agricultural educator's satisfaction with the pedagogical content knowledge they developed through their teacher preparation program. We utilized a phenomenological case study design to describe the lived experiences of the participating educators. We conducted fifteen semi-structured interviews with early-career educators to execute the study's research objective. Upon the completion of the interviews, we believed that saturation had been met. We used an inductive coding process followed by open, axial, and theoretical coding to develop the themes and subthemes of this study. Overall, we found that the participating educators were satisfied with the pedagogical content knowledge they received from their teacher preparation program but felt they could have benefited from improvements to the curriculum. The main suggestions were to incorporate courses to help preservice teachers develop more pedagogical content knowledge, utilize FFA and SAE as teaching tools, and evaluate teacher preparation degree plans to ensure they meet students' needs. Additionally, the participants recommended incorporating more early field experiences into the required degree plan to facilitate growth. We also recommend conducting qualitative and quantitative studies to further evaluate the pedagogical content knowledge development of preservice and early-career educators.

Review of Literature

Over the last several decades, agricultural education's most significant issue has been recruiting and retaining highly qualified educators (Lemons et al., 2015). With approximately 41% of educators leaving the profession in their first five years, retaining quality teachers significantly threatens agricultural education's impact (Ingersoll et al., 2014). School-based agricultural education's (SBAE's) goal is to "teach individuals about the agriculture, food, and natural resources (ANFR) industry and to provide students with the essential skills to achieve success in related career pathways and/or post-secondary education" (Snider et al., 2021, p. 35). If strategies are not implemented to retain agricultural educators effectively, the profession is threatened to reduce SBAE's impact on students. While numerous factors contribute to teacher attrition, one of the primary motivators is a lack of confidence in their content knowledge (McKim et al., 2017). Solomonson et al. (2018) determined that a "Lack of Confidence to Teach the Curriculum" and a "Lack of Confidence in Ability to Teach Students" were two of the top five reasons educators leave the profession (p. 331). Agricultural educators are often certified to teach courses in numerous areas of the

[1] Emily Garcia is a Graduate of the Department of Agricultural and Extension Education at New Mexico State University, PO Box 30003 MSC 3501 Las Cruces, NM 88003, eas0097@nmsu.edu.
[2] William Norris is an Assistant Professor of Agricultural Education in the Department of Agricultural and Extension Education at New Mexico State University, PO Box 30003 MSC 3501 Las Cruces, NM 88003, wnorris1@nmsu.edu. https://orcid.org/0000-0002-0336-370X

agricultural industry, as outlined by the Agricultural, Food, and Natural Resources (AFNR) Standards (National Council for Agricultural Education [NCAE], 2015). While content knowledge refers to a teacher's understanding of the subject matter, many educators report not possessing enough pedagogical content knowledge, which involves knowing how to teach the content effectively, including strategies to make it comprehensible and engaging for diverse learners (Wood et al., 2024). Possessing an appropriate amount of pedagogical content knowledge in all areas of agriculture is difficult and is often a source of stress for many educators (Solomonson et al., 2018; Wood et al., 2024).

During the 2022-2023 academic year, teacher attrition resulted in the loss of 86.5 educator positions and the closure of 48 SBAE programs nationally due to a lack of qualified applicants (Smith et al., 2023). Furthermore, 26 states reported a loss of SBAE programs or positions during the 2022-2023 school year (Smith et al., 2023). In addition to educators leaving the classroom, many preservice teachers never enter the classroom to begin their career as agricultural educators once completing their teacher preparation program (Igo & Perry, 2019). Smith et al. (2023) reported 869 license-eligible graduates from teacher preparation programs in 2022, with approximately 78.8% entering the SBAE profession. While teacher attrition threatens agricultural education's impact, it has been an issue since SBAE's inception (Eck & Edwards, 2019). Additionally, there is a great deal of positive growth among SBAE, including a net increase in agricultural teachers, with 13,827 nationally in 2018 (Smith et al., 2018) and 14,516 teachers in 2022 (Smith et al., 2023). This expansion of educators suggests that agricultural education is growing, and its impact will continue.

Solomonson et al. (2018) suggested that a lack of confidence in educating students and a lack of knowledge of the AFNR curriculum were some of the most significant factors contributing to agricultural educators leaving the profession. Norris et al. (2024) found that "working with motivated students," "confidence in educating students," and "confidence in instruction" were some of the main factors causing educators to remain in the profession. This suggests that while teachers are passionate about educating their students, the instructional process can be difficult to navigate (Norris et al., 2024; Solomonson et al., 2018). This lack of confidence in instruction often stems from poor pedagogical content knowledge development (McKim et al., 2017). If the expectation of an agriculture teacher is to be familiar with their field, future educators in agricultural teacher preparation programs need to receive preparation in each of the AFNR pathways to meet the curricular expectations set forth by the AFNR standards (Snider et al., 2021). This lack of confidence from preservice teachers is particularly concerning for teacher educators because the teacher preparation program is the primary source of pedagogical content knowledge for preservice and early career educators (Rice & Kitchel, 2015). Unfortunately, many preservice educators are unsatisfied with the quality, quantity, and transferability of the pedagogical content knowledge received from their teacher preparation program (Rice & Kitchel, 2015). Snider et al. (2021) determined that student teachers placed high importance on teaching the eight AFNR pathways, but their self-perceived competence in doing so was significantly low in comparison (Snider et al., 2021). Houck and Kitchel (2010) stated,

> Beyond accreditation and convention, teachers should understand the content which they teach for numerous reasons, including (a) better response to student questions, (b) interpretation of student comments, and (c) use of a variety of teaching methods when the first does not work with all students (p. 29).

Furthermore, Houck and Kitchel (2010) stated, "many teacher preparation programs keep content and teaching methods separate" (p. 30), thus creating a gap between the content courses and their pedagogical applications. While these quotes consider the concept of pursuing pedagogical content knowledge, it is recognized that content knowledge itself must be developed first (Houck & Kitchel, 2010). Houck and Kitchel (2010) acknowledged a seemingly weak connection between content in the teacher preparation curriculum and the application of the content in the classroom. Wood et al. (2024) suggested that knowledge of content-specific topics, curriculum development, and strategies to facilitate student engagement were

among educators' top professional development needs. Additionally, Wood et al. (2024) found that 32.9% of educators were either neutral, disagreed, or strongly disagreed that their teacher preparation program had a "great impact on [their] ability to be effective at teaching" (p. 62). Wood et al.'s (2024) result indicates the need to assess agricultural teacher preparation in the AFNR pathways.

Purpose and Objectives

This study sought to evaluate recent graduates' perceptions of the pedagogical content knowledge they received from their teacher preparation training. The following research objective guided this study:

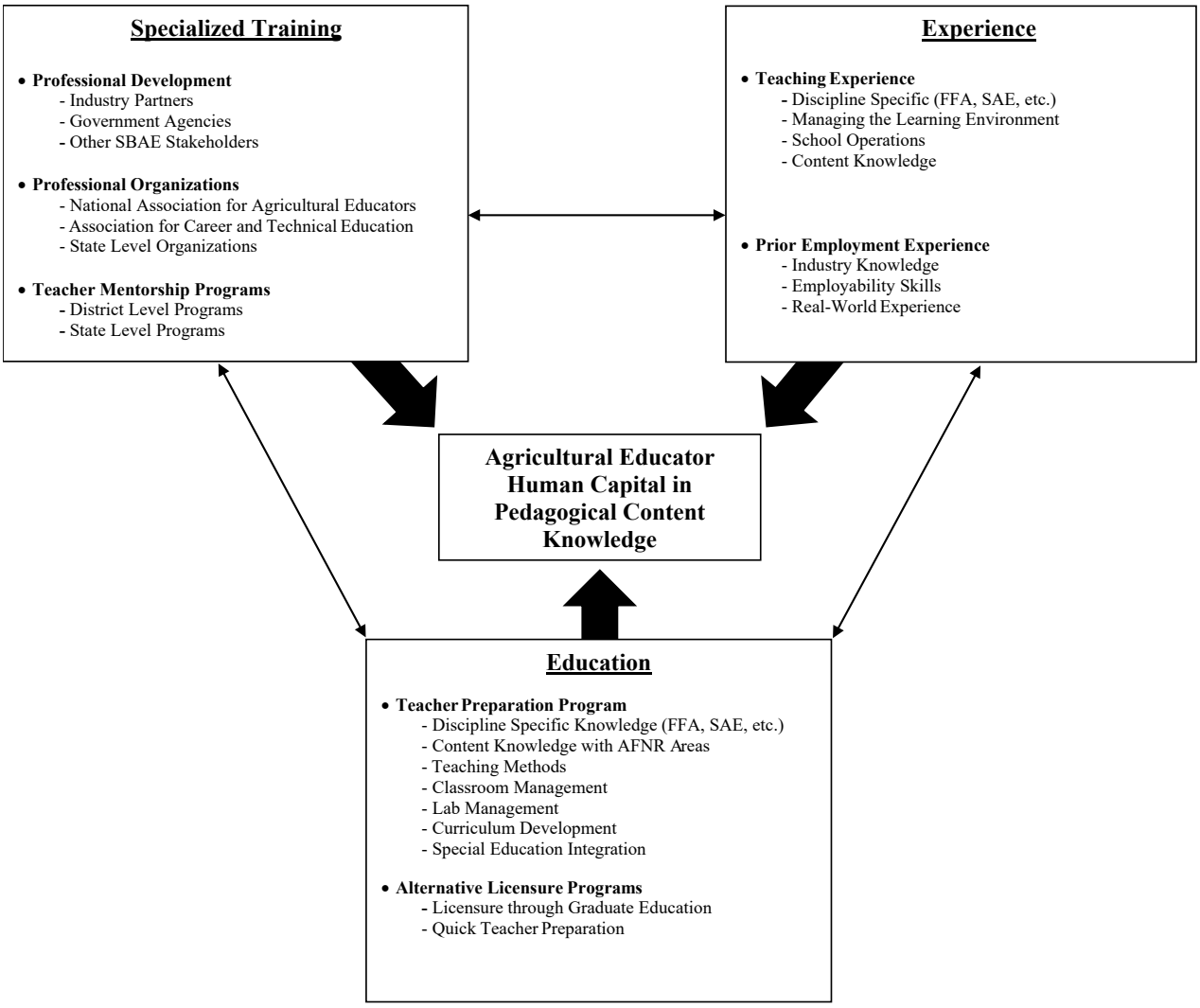
1.) Describe early-career educator's satisfaction with the pedagogical content knowledge they received from their teacher preparation program.

Theoretical Framework

The human capital theory (HCT) guided this study's research objective (Becker, 1993). Becker (1993) suggested that an individual's professional competence will increase as education, experience, and specialized training increase. Wood et al. (2024) determined that educators need additional professional development to increase their pedagogical content knowledge and, ultimately, their human capital. Ford and Lambert (2023) determined that professional organizations (e.g., National Association for Agricultural Educators [NAAE], Association for Career and Technical Education [ACTE], state-level professional organizations, etc.) provided significant specialized training for agricultural educators. Furthermore, teacher mentorship programs provide an excellent source of development for educators (Lambert et al., 2010). Lambert et al. (2010) found that when Ohio educators participated in a mentorship program as a protégé or a mentor, they were satisfied with the outcome and agreed it helped progress them professionally. Moreover, Wood et al. (2024) found that 92.5% of educators cited their teaching experience, while 73.5% highlighted their previous employment as key contributors to their professional growth. While other sources of pedagogical content knowledge are significant, the purpose of the teacher preparation program is to train educators for success in the classroom (Houck & Kitchel, 2010). This study sought to evaluate recent graduates' satisfaction with the pedagogical content knowledge received during their teacher preparation training. Rice and Kitchel (2015) determined that some preservice educators are unsatisfied with their pedagogical content knowledge. If teacher preparation programs can improve the quality, quantity, and transferability of the content knowledge presented to preservice educators, it could increase their pedagogical content knowledge and human capital, ultimately reducing teacher attrition (Becker, 1993; see Figure 1).

Figure 1

Human Capital Interaction with Agricultural Educator Pedagogical Content Knowledge



Note. Adapted from Becker (1993).

Methodology

To address its research objective, this study utilized a hermeneutic qualitative phenomenological case study design (Groenewald, 2004; Merriam & Tisdell, 2016; Sloan & Bowe, 2014). We chose a phenomenological case study design to understand the lived experiences of early-career educators better (Creswell & Poth, 2018). The study allowed the participants to describe their personal experiences with pedagogical content knowledge.

Population

The population for this study was agricultural educators with less than five years of experience who recently graduated from a teacher preparation program in the United States. Agricultural education department heads were solicited for a list of recent program graduates and their email. We emailed those

recent graduates and asked for their participation in a 30-minute semi-structured interview (Merriam & Tisdell, 2016). Additionally, our professional connections were leveraged to identify other potential participants. This population was purposively selected because of their unique perspective on teacher preparation due to their relevant professional experience as educators and the recency of their graduation from a teacher preparation program. Each participant was given a pseudonym to protect their anonymity (Allen & Wiles, 2015). Guided by a naturalistic approach (Lincoln & Guba, 1985), fifteen (n = 15) 30-minute semi-structured Zoom interviews were conducted with eight participants from Alabama, two from Montana, one from Alabama, one from Minnesota, one from Oklahoma, one from North Carolina, and one from Maryland (see Table 1).

Table 1

Demographics of Interview Participants

Identifier	Gender	Race/Ethnicity	Level of Education	State of Residency	Years of Teaching Experience
M1 - James	Male	Caucasian	Some Master's	New Mexico	2
M2 - Alex	Male	Hispanic/Latino	Master's Degree	New Mexico	2
F1 - Mia	Female	Hispanic/Latino	Master's Degree	New Mexico	4
M3 - Ben	Male	Caucasian	Bachelor's Degree	Montana	1
M4 - Daniel	Male	Caucasian	Educational Specialist	Alabama	4
F2 - Grace	Female	Caucasian	Bachelor's Degree	Minnesota	3
F3 - Sophia	Female	Caucasian	Some Master's	New Mexico	2
F4 - Liz	Female	Caucasian	Master's Degree	New Mexico	3
M5 - John	Male	Caucasian	Bachelor's Degree	New Mexico	3
F5 - Maddie	Female	Caucasian	Bachelor's Degree	Oklahoma	1
F6 - Abby	Female	Caucasian	Master's Degree	Maryland	1
F7 - Natalie	Female	Caucasian	Master's Degree	North Carolina	1
F8 - Anna	Female	Caucasian	Bachelor's Degree	New Mexico	1
M6 - Matt	Male	Caucasian	Master's Degree	New Mexico	3
M7 - Ryan	Male	Caucasian	Bachelor's Degree	Montana	1

Note. n = 15

Data Collection

The data for this study were collected using 30-minute semi-structured Zoom interviews with fifteen participants. Bryman (2016) suggests that semi-structured interviews are valuable tools in qualitative exploratory research and provide participants with an avenue to describe their lived experiences. We recorded each interview to assist in the transcription and coding processes. One of the researchers served as the moderator for each interview and underwent moderator training based on Bryman (2016) to ensure there was no moderator influence on the participant's answers. The questions that guided this study are listed in Table 2. Additionally, this study gained IRB approval in the Spring of 2024.

Table 2

Semi-Structured Interview Questions

Questions
1.) Upon entering the classroom, which agricultural content area did you feel the most confident to teach and why? Were your courses in this area effectively building your pedagogical content knowledge?
2.) Upon entering the classroom, which agricultural content area did you feel the least confident to teach and why? Were your courses in this area effectively building your pedagogical content knowledge?
3.) In your preparation program, were there any content classes you felt were ineffective in building your pedagogical content knowledge?
4.) As a new teacher, how often do you reference pedagogical content knowledge developed from your college coursework?
5.) If you could provide one piece of advice to your department head to improve their preparation program's ability to assist students in developing pedagogical content knowledge, what would it be and why?

Note. Because we used a semi-structured process, we asked follow-up questions when further explanation was warranted.

Data Analysis

Using the constant comparative method suggested by Glaser (1965), we used an inductive coding process with open and axial coding followed by theoretical coding (Charmaz, 2006) to analyze the data once saturation was met (Bryman, 2016). Exemplary statements made by participants were utilized to support each theme (Bryman, 2016). To further improve trustworthiness, data triangulation occurred by analyzing field notes, a reflexive journal, and interview transcriptions (Nowell et al., 2017). The interviews were transcribed using Microsoft Word, and we conducted member checking by sending the transcript to each participant to improve confirmability and trustworthiness (Birt et al., 2016). The fifteen interviews provided thick, rich descriptions that met saturation (Bryman, 2016) and allowed us to identify themes and subthemes.

Limitations and Reflexivity

A limitation of qualitative research is the lack of generalizability of the results. This study intends not to generalize its results to all recent agricultural teacher preparation graduates but rather to describe the lived experiences of the participating individuals. In qualitative research, the researcher is part of the process, and the researcher's relevant background and experiences should be acknowledged. The two researchers conducting this study have a background in agricultural education, which could influence this study.

Results

Research Objective 1: Describe early-career educator's satisfaction with the pedagogical content knowledge they received from their teacher preparation program.

The research objective that guided this study was to describe the satisfaction of early-career educators with the pedagogical content knowledge they received from their teacher preparation program's curriculum. Three subthemes emerged that supported this research objective, including recent graduates' curricular strengths and weaknesses, adapting content courses to meet preservice teachers' needs, and evaluating teacher preparation program's strengths and weaknesses.

Curricular Strengths and Weaknesses of Recent Graduates

When participants were asked about the most effective sources for developing their pedagogical content knowledge, the reoccurring response included their prior experiences and the coursework they completed through their teacher preparation program. The animal and plant science pathways were often selected as a curricular strength because of the participants' personal backgrounds in these areas and their focus on the post-secondary level. Sophia (F3) shared that plant science was her most natural content strength because she does not come from a production agriculture background and could easily connect to the content. She stated, "I think my most confident is plant science just because that was like what I grew up on, and like I grew up gardening… so I had a lot of knowledge previously before I went into the classroom" (F3). Ben (M3) came from a production agriculture background, having grown up on a ranch. He shared that his background in animal systems allowed him to develop content knowledge at a young age, which, combined with his college coursework, allowed him to thoroughly comprehend the content. Natalie (F7) shared that the source of her self-perceived strength was her concentration in animal science during her degree program. She stated, "That was my concentration in my major of agricultural education, and I had a minor in animal science, so that was the area I was most interested in. Because of that, I felt most confident teaching that area" (F7). In Natalie's (F7) case, she stated that her prior experience in animal systems was not the driving factor behind her success in the animal science classroom but that her post-secondary coursework was instrumental in developing pedagogical content knowledge. Two participants (e.g., F4, F5) shared that they felt the most confident teaching an introductory course rather than one specific content area because the course design covers the basics of multiple agricultural subjects, primarily targeting content they learned in their post-secondary coursework.

Some participants (e.g., F3, F7, M2) expressed that their post-secondary coursework was critical to developing their pedagogical content knowledge, while some expressed that they did not receive enough in certain areas. The consensus of why these novice agricultural educators felt lacking in some AFNR pathways was due to their lack of coursework and experiences in those areas. Alex (M2) stated, "I only took the prerequisite classes I needed for my teacher preparation program… I didn't have as much of a background in animal sciences, and I've definitely relied a lot on different curriculum and trying to learn alongside my students…". Alex (M2) further shared that due to his lack of background in animal systems, he avoided taking courses in that pathway because he felt intimidated by his lack of experience (M2). Admittedly, some self-perceived deficits could be due to factors outside the teacher preparation program's control. The participants' self-reported curricular strengths (see Table 3) and weaknesses (see Table 4) are listed below.

Table 3

Curricular Strengths of Recent Graduates

Animal Systems	Plant Systems	Power, Structural, and Technical Systems
F6 – Abby	F1 – Mia	M1 – James
F7 – Natalie	F2 – Grace	M4 – Daniel
F8 – Anna	F3 – Sophia	M6 – Matt
M3 – Ben	F4– Liz	
M5 – John	F5– Maddie	
M7 – Ryan	M2 – Alex	

Note. Two participants did not provide a clear answer to their curricular strengths and were not included in Table 3.

Table 4

Curricular Weaknesses of Recent Graduates

Agribusiness Systems	Animal Systems	Food Products and Processing Systems	Natural Resource Systems	Plant Systems	Power, Structural, and Technical Systems
F8 – Anna	F3 – Sophia F5 – Maddie M2 – Alex M6 – Matt	M1 – James	M5- John M7 – Ryan	M3 – Ben M4 – Daniel	F1 – Mia F2 – Grace F4 – Liz F6 – Abby F7 – Natalie

Note. Curricular weaknesses may suggest a lack of content knowledge or pedagogical content knowledge.

Adapting Content Courses to Meet Preservice Teachers' Needs

Interviewees (e.g., M1, M2, M3, M5, M6, F2, F3, F6, F7) identified different areas of improvement so that teacher preparation programs would be more effective at facilitating pedagogical content knowledge development in their students. While some participants (e.g., M3, M6, F6, F7) felt that the content they learned in college was adequate, they expressed concerns about being able to apply and share that knowledge in their instruction. Others (e.g., M1, M2, M5, F2, F3) believed that preservice educators could benefit from building more in-depth knowledge in different content areas. James (M1) shared that he has noticed heightened confidence, almost to a fault, in peers coming out of their preparation program, despite many struggling with content in the classroom. Grace (F2) corroborated James' (M1) identification of a knowledge gap in their peers and agreed that there is a need for more effective strategies to develop pedagogical content knowledge for preservice teachers. Grace (F2) also noted that her preparation program knew of their weaknesses in agricultural mechanics but could not immediately change their curriculum, thus leaving her feeling unprepared in this area. Alex (M2) shared that he only took a few content courses in each AFNR area, and as a result, animal science is one of his curricular weaknesses, and that teaching in this area intimidates him. Ben (M3), Matt (M6), Sophia (F3), and Abby (F6) each individually suggested changes to content courses to include "teach-the-teacher" courses. Their suggestion includes utilizing the content courses already in place but adding additional courses that focus solely on the pedagogy of the content previously learned. Ben (M3) noted that while some of his courses went in-depth into the content, he felt that "it was kind of a little less learning for the sake of this is what you can turn around and practice with. It was more learning for the sake of here's the knowledge". Similarly, Sophia (F3) shared, "I don't feel like I really took very many content courses like I think it was just very general." She proceeded to corroborate the feelings of her peers about the need for "teach-the-teacher" courses by stating, "…I think it needed to be like here's how you teach animal science. Here's how you teach plant science, or so on, or like whatever it may be, they need to be more about how to teach the content".

Teacher Preparation Strengths and Weaknesses

Overall, most of the participants agreed that their teacher preparation program helped develop their pedagogical content knowledge. Ryan (M7) noted that he references his post-secondary coursework frequently but that he was a double major. Ryan (M7) said, "I reference my agricultural business degree a lot… especially, you know, in like my principles of ag class, we do spend a unit on agricultural business." Ryan (M7) discussed that possessing some business knowledge is critical for his students regardless of whether they pursue a career in agriculture. James (M1) said he references "a bunch of old type old school

technology textbooks" instead of his post-secondary coursework. John (M5) stated that he relies more on fellow agricultural educators with previous experience than he has on his previous coursework because the interactions help him with the teaching applications of the content. John (M5) stated, "I'm not saying to not reference the college standards by any means, but call somebody that's been in the field, and they're actually doing stuff and how they apply it into their lessons…".

Several participants (e.g., M3, M7, F3, F5, F6, F7) stated that entering the classroom earlier and obtaining more hands-on experiences in their teacher preparation program would have benefitted their pedagogical content knowledge development. Several participants (e.g., M1, F1, F3, F6, F7) included that they participated in an early field experience program. Abby (F6), who was required to complete 20 hours of observation for her degree program, stated that many students were sent to schools that may not have represented a good SBAE program. Abby (F6) stated that she wished her faculty had more opportunities for structured reflection because "…you can watch people all day. That doesn't mean that you can teach…". Similar to Abby (F6), both Mia (F1) and Sophia (F3) shared that they were also required to complete an observation course, but they were assigned who to observe. Mia (F1) indicated that unlike Abby (F6), her observation period was more structured, thus leading to robust discussion among her peers and providing a positive and meaningful experience.

Multiple participants expressed concern about their abilities to utilize FFA and SAE as teaching tools, which they deemed an area of pedagogical content knowledge (e.g., F1, F4, F8, M3, M4, M5, M7). Some participants (e.g., F1, F4, F8, M5) cited concerns about their ability to implement the Agricultural Experience Tracker (AET) and a Program of Activities (POA) into professional practice. Mia (F1) shared that the biggest challenge she faced throughout her first year of teaching was submitting the POA for her FFA chapter, and she stated, "I was super familiar with AET from being in high school with FFA and everything, but I never saw a POA till this year, so that was super hard" (F1). Similarly, Liz (F4) stated "we didn't touch a lot on like AET and how that works" (F4). Liz (F4) also mentioned that they now complete most FFA paperwork in AET, even the POA. Liz (F4) stated she would have benefited from covering more information about the POA and AET in her preservice education. Similarly, Daniel (M4) stated, "…I would really like to know how AET works because Lord knows we did not get any AET knowledge whatsoever… and that would have been very beneficial because I'm lost when it comes to AET." John (M5) stated he was the least confident in "the AET record book. That thing is a monster". John (M5) referenced AET as an area of content rather than just a program and shared that he feels less confident in guiding and teaching students to use it than he does with the AFNR standards. Although John (M5) was the only individual to refer to AET in this manner, he was not the only participant to express concerns about using the program as a teaching tool, further solidifying its implementation as an area of pedagogical content knowledge.

Conclusions and Implications

Overall, it can be concluded that despite feeling underprepared in various areas when entering the classroom, all interview participants expressed that they were at least moderately satisfied with their teacher preparation program. Additionally, it can be determined that recent graduates recognize that teacher preparation programs are not all-encompassing and that seeking knowledge through other sources to fulfill the role of an agricultural educator better is critical. Some participants (e.g., M2, F8) shared plans for future professional development to help them fill their knowledge gaps, while others pursued higher degrees within agricultural education or reached out to fellow educators for guidance in their areas of weakness. These additional avenues of professional growth will help increase their human capital and ultimately improve their professional competence (Becker, 1993). While many of the participants noted a content knowledge gap (e.g., F5, F6, M3, M4, M6, M7), as a whole, interviewees were optimistic about their pedagogical content knowledge. The suggested areas of improvement included increasing strategies to improve pedagogical practices, providing more hands-on interactions with the agricultural content, increasing early field experiences, and teaching how to utilize FFA and SAE as teaching tools. Furthermore,

the participant's perceptions align with the findings of Wooditch et al. (2018), who found that after students enrolled in a greenhouse course designed for future teachers, they still lacked the pedagogical connections to turn their experience into pedagogical content knowledge. The participant's responses suggest that the teacher preparation curriculum needs further evaluation to maximize a focus on pedagogical content knowledge.

The participants noted that several pathways have more in-depth curricular standards than others (e.g., animal science, agricultural mechanics). The participants shared that it was not the number of courses but rather the thoroughness of the courses that contributed to their self-perceived competency in each area. Some participants (e.g., F2, F6, M3, M4, M5, M7) revealed that several courses they took were insufficient in building their content knowledge, and they resorted to relying on their background experiences rather than what they learned in the classroom. These claims are supported by Rice and Kitchel (2015), who found that many preservice educators are unsatisfied with the pedagogical content knowledge they retained in their teacher preparation program. Several interview participants in this study noted that despite their upbringing in heavy production agriculture settings, they could not rely solely on their background knowledge to teach the content required in their classroom and that the teacher preparation program helped close that gap. They did express that using their background knowledge to supplement their previous coursework and sharing experiences during instruction is beneficial. However, they still noted that their pedagogical content knowledge needed to come from sources other than the teacher preparation program. The findings of this study support Snider et al. (2021), who determined that student teachers felt that teaching each of the AFNR pathways was important but expressed comparatively low self-perceived competence in teaching each area. In Snider et al.'s (2021) study, student teachers called for teacher preparation curriculum enhancement within the AFNR pathways. The findings of this study support Snider et al.'s (2021) recommendation.

The agricultural teacher preparation program curriculum could benefit from a thorough review of the required coursework to ensure it meets the needs of students. However, there are barriers to modifying the curriculum. Many universities are reducing content area requirements to include core courses required for an undergraduate degree. Rankin and Edwards (2024) found that the number of agricultural mechanics course requirements has been reduced nationally over the last few decades. Three students shared that, while their program curriculum could have been more efficient in some areas, the content courses they took fit their geographic region, although some participants (e.g., F6, M3, M6, M7) suggested that being well-versed beyond their region could improve their instruction. Albritton and Roberts (2020) suggested that teacher educators evaluate their curriculum to ensure that necessary skill development is provided to graduating preservice educators. The results of this study complement Albritton and Roberts' (2020) recommendation.

Recommendations for Future Practice

The results of this study suggest that while the participants were satisfied with their teacher preparation programs, they did feel there were gaps in their knowledge upon graduation. We recommend evaluating the teacher preparation program curriculum to ensure that it reflects modern agricultural education and, ultimately, serves the needs of students. The factors that should be considered when evaluating the curriculum should include adding coursework in all AFNR areas, assisting students in developing pedagogical content knowledge, utilizing FFA and SAE as teaching tools, and increasing early field-based experiences. Furthermore, a robust analysis should determine the best strategies to adjust these items since every teacher preparation program differs slightly. This will ensure that the program's curriculum best fits the needs of its geographic region while providing students with opportunities to expand their agricultural horizons. Additionally, decision-makers should keep student success at the forefront when conducting these curriculum evaluations.

Several participants (e.g., F3, M1, M4) suggested that coursework in some AFNR areas was not required in their teacher preparation programs (e.g., Food Science, Ag Mechanics, etc.). If universities do not require coursework in all AFNR areas, they should consider adding it to their degree plan. It is recommended that these programs reference and collaborate with peer institutions to determine how these areas may best fit their program of study. Additionally, by collaborating with peer institutions, programs can create cohesion within teacher preparation and reduce the chance of a content knowledge gap among recent graduates. Additionally, approximately a third of the participants noted their weakness was in the power, structural, and technical systems pathway, with their primary concern being how to teach the content. While this content area seemingly has fewer courses offered (Rankin & Edwards, 2024), it seems that pedagogical content knowledge is the issue rather than content knowledge. If universities add coursework to develop pedagogical content knowledge, it could improve graduate preparedness to enter the classroom.

Recommendations for Research

The results of this study provide opportunities for additional scholarly inquiry into this phenomenon. While this study provided a robust analysis of the participant's satisfaction with their teacher preparation program, it is limited to only these participants. A national quantitative analysis should be conducted to evaluate the satisfaction of recent graduates across the U.S. Additionally, the participants in this study reported feeling unprepared to utilize FFA and SAE as teaching tools. Norris et al. (2023) found that educators reported that professional development in FFA competitions, sources of funding for FFA, FFA officer development, recruiting members, and utilizing AET would be moderately to strongly impactful to their professional practice. While Norris et al.'s (2023) study was conducted with practicing educators, an additional study assessing the needs of preservice educators regarding FFA and SAE would provide implications for teacher preparation program evaluation. Additionally, the participants in this study suggested they had experienced difficulty converting the content knowledge they learned into pedagogical content knowledge. If teacher preparation programs incorporate coursework specifically for developing pedagogical content knowledge into their required degree plans, evaluating their impact could provide insight into their effectiveness. Wooditch et al. (2018) implemented a greenhouse course for preservice teachers to gain pedagogical content knowledge, but the students still reported difficulty teaching the content. If these courses are ineffective, research into more efficient methods of developing pedagogical content knowledge should be explored. The participants in this study also recommended that early field experiences be incorporated into the teacher preparation program early and often. Rank and Smalley (2017) noted the importance of early field experiences to the professional development of preservice teachers. Furthermore, additional research on the best practices for implementing early field experiences, including strategies to facilitate meaningful reflection and determining the optimum number of observation hours versus active engagement in the program, should be conducted to maximize impact.

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