

Describing the Deficiencies in Agricultural Teacher Preparation as Reported by Agricultural Educators in Different Career Phases



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Abstract

The shortage of secondary teachers has plagued the agricultural education profession for decades. Traditionally, the agricultural teacher preparation program has been the most fruitful source of qualified agricultural educators. While the goal of the agricultural teacher preparation program has been to produce competent graduates, many preservice and induction phase educators who attended a teacher preparation program have reported that they were unprepared to implement various duties of an agricultural educator. This study sought to assess how agricultural educators in different career stages who had successfully completed a teacher preparation program perceived their level of preparedness during their induction phase. This study utilized an electronic survey and received 129 responses. There were no statistical differences between the perceptions of agricultural educators in the induction and non-induction phases within the FFA/SAE, program management, and instructional constructs. It was also determined that the participating educators felt inadequately prepared to implement SAE-based programming and special education mandates. The results also suggested that agricultural educators felt very prepared in their attitudes toward students. Overall, it is recommended that agricultural education stakeholders bolster the instruction and professional development on SAE implementation and how to properly educate students with special needs. These strategies could be impactful in improving implementation in these areas of need.

Keywords: School-Based Agricultural Education (SBAE), agricultural teacher education, teacher preparation, career phase

Traditionally, the post-secondary agricultural teacher preparation program has been the most fruitful source of highly qualified educators to fill open positions at the secondary level (Ingram et al., 2018; Smith et al., 2022). In 2021, 789 students graduated from an agricultural teacher preparation program, with 586 entering an agricultural education classroom (Smith et al., 2022). Ensuring that graduates of agricultural teacher preparation programs feel confident in their ability to enter the profession successfully is critical, considering that over 50% of educators leave within the first five years of service (Solomonson et al., 2019). Agricultural education's three-component model suggests that agricultural educators should be competent in managing work-based learning opportunities for students through Supervised Agricultural Experiences (SAE), instructing secondary students on agricultural topics in the classroom/ laboratory, and managing the FFA chapter, which is an agriculturally based youth leadership organization (Croom, 2008). While teacher preparation programs are intended to prepare students for the profession, many preservice teachers and induction phase educators report feeling unprepared for various aspects of the classroom (Albritton & Roberts, 2020; Conner et al., 2020; Eck, Whisenhunt, et al., 2020; Figland et al., 2019; Ryu et al., 2019).

In Frost et al.'s (2018) study, the allocation of time in preservice agricultural educator's clinical experience was examined, and it was determined that an average of 281.7 hours were dedicated to serving as the FFA chapter advisor. In total, this encompassed 39.5% of the preservice educator's time and is juxtaposed to 271.1 hours spent on instructional activities, 130.5 hours on college course duties, and 30.5 hours on other administrative responsibilities (Frost et al., 2018). The FFA/SAE duties that students reported spending the most hours on included FFA activities above the chapter level, SAE observations, and local FFA activities (Frost et al., 2018). Smalley and Rank (2019) found that preservice

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educators enrolled in an early field experience course admired their cooperating teachers' dedication to their FFA chapters, but they admitted that the responsibilities could be overwhelming. Furthermore, Ingram et al. (2018) found that prior experiences in the FFA were a strong motivator for student's desire to teach agricultural education. While preservice educators value managing an FFA chapter, Ricketts et al. (2005) determined that preservice educators did not feel confident managing certain aspects of FFA and SAE, such as FFA applications and SAE management.

The instructional aspects of agricultural education can also be difficult for preservice and induction phase educators (Rice & Kitchel, 2015; Snider et al., 2021). Rice and Kitchel (2015) examined preservice agricultural educator's satisfaction with their pedagogical content knowledge and determined that many students are not satisfied with the quality, quantity, and transferability of their content knowledge. Furthermore, Snider et al. (2021) found that preservice agricultural educators felt 'very little competence' to 'quite a bit of competence' in teaching among the eight Agriculture, Food, and Natural Resource (AFNR) pathways. In addition, many preservice agricultural educators report being unconfident in specific areas of agricultural education (Albritton & Roberts, 2020; Conner et al., 2020; Eck, Whisenhunt, et al., 2020; Figland et al., 2019; Ryu et al., 2019). According to Snider et al. (2021), preservice educators felt the least prepared to teach content in the Agribusiness Systems pathway, the Power, Structural, and Technical Systems pathway, and the Biotechnology Systems pathway. Furthermore, earlycareer educators felt unprepared in areas of curricular and instructional management, teaching in a laboratory, modifying instruction for students with special needs, and motivating students to learn (Smalley et al., 2019; Thornton et al., 2020). Blackburn et al. (2015), conducted a longitudinal study that evaluated preservice agricultural educators enrolled in a welding course on their knowledge of metal fabrication. It was determined that the students did not feel confident in their ability to teach welding, and "... not one preservice teacher in any semester perceived an excellent ability in performing the welding-related skills" during the seven-year study (p. 172). Flower et al. (2016) found that many early-career educators did not feel that their teacher education programs prepared them to manage the behavioral issues their students may present. This lack of classroom management strategies may cause disruption among the students and reduce learning (Flower et al., 2016). McKim and Velez (2015) determined that confidence in classroom management strategies significantly predicts career commitment in early career educators. Furthermore, Ramage et al. (2021) found that preservice agricultural educators struggled to modify curriculum for students with special needs and provide the appropriate accommodations to ensure these students' success. A lack of effectiveness in classroom management and providing students with special needs the proper accommodations could lead to decreased student achievement and potentially increased legal exposure for the educator (Hainline et

al., 2019; Rothstein & Johnson, 2009).

While some preservice agricultural educators do not feel prepared for certain aspects of the classroom, the teacher preparation program and the student teaching experience are critical to developing an effective educator (Sorensen et al., 2018). While the goal of teacher educators is to produce effective professionals, it is critical to examine the deficiencies of preservice and early-career educators to determine the gaps in teacher preparation programs (McClean & Camp, 2000; Smalley et al., 2019; Thornton et al., 2020). These insufficiencies in the knowledge and skills of preservice and early-career agricultural educators can be seen in the challenges faced by teacher preparation programs (McClean & Camp, 2000; Stair et al., 2012). McClean and Camp (2000) and Stair et al. (2012) documented the challenges of agricultural teacher preparation programs which included a lack of common courses for lesson planning as well as training and implementing the experiential components of agricultural education programs.

While it is the duty of teacher educators and agricultural teacher preparation programs to ensure that graduates are prepared for the challenges of an educator, deficiencies in the program can lead to a lack of confidence in many preservice and early-career educators (McClean & Camp, 2000; Snider et al., 2021; Stair et al., 2012). When analyzing agricultural education preparation programs to determine if they meet the needs of pre-service teachers, consideration of the standards and expectations of such preparation programs is imperative. Stripling and Barrick (2013) reviewed industry textbooks and journals to determine all the competencies needed by beginning agricultural educators. It was determined that a knowledge of learners and their development, a broad knowledge of agricultural subject matter, and a knowledge of teaching were essential for beginning teachers (Stripling & Barrick, 2013). Presumably, agricultural teacher preparation programs should focus their instruction on the critical competencies needed by beginning agricultural educators (Stripling & Barrick, 2013). A lack of confidence or ability in these areas can contribute to a lack of self-efficacy in early-career educators (Albritton & Roberts, 2020; Conner et al., 2020; Eck, Whisenhunt, et al., 2020; Figland et al., 2019; Ryu et al., 2019; Stripling et al., 2008). Evaluating the deficiencies in agricultural teacher preparation will allow agricultural education stakeholders to identify gaps in preparation and make curricular adjustments to better support preservice educators.

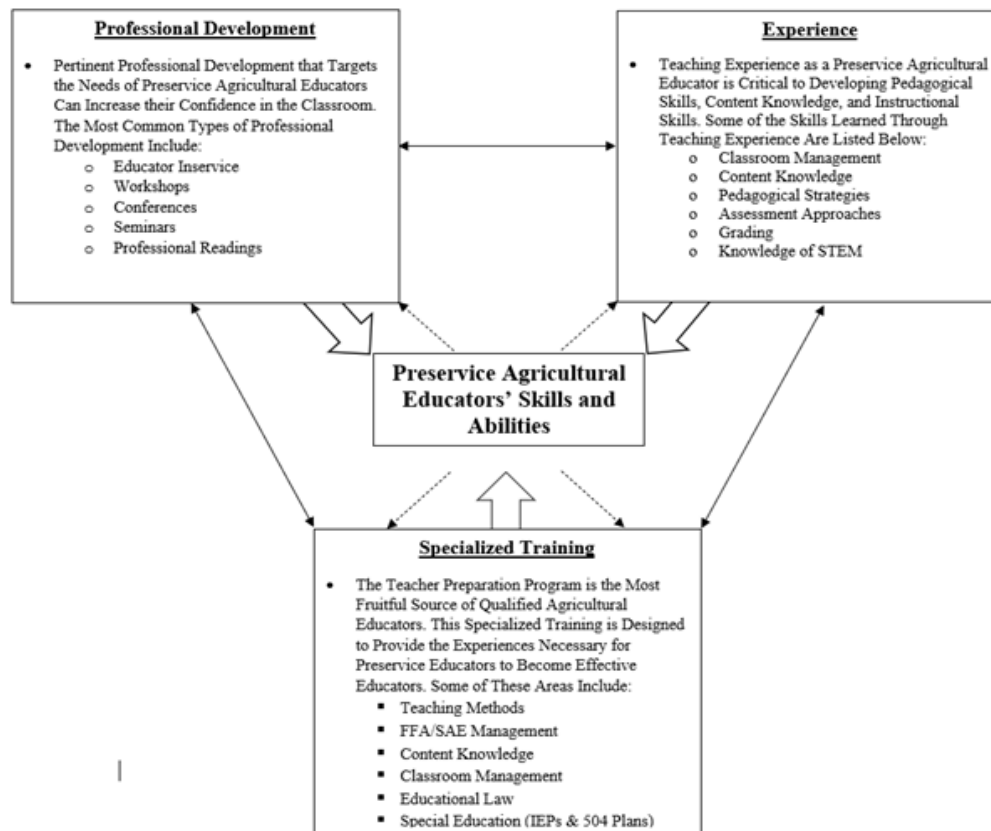
Theoretical Framework

Human capital theory (HCT) is the theoretical framework that guided this study (Becker, 1993). The HCT purports that as an individual increases their education, specialized training, and professional experience, their skills, knowledge, and abilities are strengthened (Becker, 1993). The agricultural teacher preparation program is designed to increase students' human capital through education in content knowledge,

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Figure 1

Influence of Human Capital Theory on the Development of Preservice Agricultural Educators



pedagogical strategies, and other areas critical to the success of an agricultural educator (Whittington, 2005). In many cases, induction phase agricultural educators feel that their teacher preparation programs did not adequately prepare them for the classroom (Albritton & Roberts, 2020; Figland et al., 2019; McKim & Velez, 2015; Traini et al., 2020), and they have not gained enough human capital through education, specialized training, and experience to be a successful educator. Huberman (1989) described induction phase educators as having 0–6 years of experience and non-induction phase teachers as having 7 or more years of experience. The HCT posits that as human capital increases, the individual becomes more effective within their profession (Becker, 1993). Many studies have shown that an effective educator is one of the leading indicators of student achievement (Eck et al., 2021; Eck, Robinson, et al., 2020; Rosenshine & Furst, 1971). If induction phase educators have not acquired enough human capital to be effective in the classroom (Eck et al., 2021; Eck, Robinson, et al., 2020; McKim & Velez, 2015; Rosenshine & Furst, 1971; Traini et al., 2020), this could lead to decreased student achievement within agricultural education. Assessing how educators in different career stages who have completed a teacher preparation program perceive their level of preparedness during their first year as an educator could provide insight into deficiencies in teacher preparation programs.

Purpose and Objectives

This study aimed to assess how agricultural educators in different career stages who have completed a teacher preparation program perceived their level of preparedness during their first year of teaching. Educators in both the induction and non-induction phases reported on their level of preparedness for implementing the various duties of a teacher when they were first year educators. Therefore, the following research objectives were evaluated:

1. Evaluate any statistical differences between the FFA/SAE, program management, and instructional knowledge constructs based on participating agricultural educators' perceived level of preparedness to implement various duties of an agricultural educator when they were first-year educators.
2. Evaluate any differences in the individual factors of each construct and report the frequency of implementation of each factor during participating agricultural educators' first year of teaching.

Methods

Participants and Research Design

The participants in this study consisted of agricultural educators in four states: Tennessee, Utah, North Da-

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kota, and Illinois. The study's frame contained viable email addresses for 349 agricultural educators in Tennessee, 159 in Utah, 64 in North Dakota, and 503 in Illinois ($N = 1,075$). In this study, a response rate of 12.00% ($n = 129$) was achieved. A total of ($n = 12$) partial responses were retained for the analysis. In addition, a total of 23 respondents reported not completing a teacher preparation program. These responses were removed from the analysis, and a total of $n = 106$ responses were utilized. Of the $n = 106$ usable responses, $n = 11$ came from Tennessee, $n = 30$ came from Utah, $n = 7$ came from North Dakota, $n = 46$ came from Illinois, and $n = 12$ did not report their state because of the retention of partial responses. The participants were recruited by email to participate in the study. The researchers used open-access agricultural educator listservs to contact the teachers and ask for their participation.

The researchers used a descriptive correlational research design to collect data on the perceptions of participating agricultural educators regarding their preparation levels as first year educators within the areas of FFA/SAE, program management, and instructional knowledge. Agricultural educators from all career phases were asked to reflect on their preparation levels as first-year educators.

Instrumentation

The FFA/SAE section of the instrument was modified from King et al. (2013), the program management section of the instrument was modified from Solomonson et al. (2021) and Smalley et al. (2019), and the instructional knowledge section of the instrument was modified from Voges et al. (2020). The instrument evaluated a total of 44 factors within the three constructs and had six demographic questions including gender, race, number of agriculture teachers in school, length of teaching contract, highest degree earned, relationship status, and if the teacher teaches other subjects besides agriculture. Preparation levels of agricultural educators were evaluated utilizing a five-point Likert-type scale ranging from 1 = *Not Prepared at All*; 2 = *Somewhat Prepared*; 3 = *Moderately Prepared*; 4 = *Very Prepared*; 5 = *Extremely Prepared*.

The instrument reliability was assessed post hoc using Cronbach's alpha. The reliability coefficient for the FFA/SAE construct was .94, the program management construct was .95, and the instructional construct was .93. According to Ary et al. (2010), a reliability coefficient of .9 or higher is considered an acceptable level of reliability. A panel of two faculty at New Mexico State University was assembled to assess the face, content, and construct validity of the instrument. The reliability and validity analysis suggests there are no issues with the instrument.

Data Collection and Analysis

To measure a broad geographical representation of states, the researchers purposively sampled

one state from each National FFA region (National FFA Organization, 2023). Each state had an accessible online listserv that allowed the researchers to invite participants to the study via email in the Fall of 2022. To further delineate the data, the participating agricultural educators were split into the induction (0-6 Years) and non-induction (7+ Years) career phases to gauge the quality of novice teacher preparation levels over time. Huberman (1989) suggested that educators could remain in the induction career phase for up to six years, depending on the development of the educator.

To assess non-response bias, an independent samples t-test using the three constructs was completed to assess statistical differences between early and late responders (Lindner et al., 2001). Dillman et al. (2014) recommended sending an introductory email followed by three reminder emails when conducting online survey research. To assess non-response bias, early responders were defined as participants whose response was stimulated from the first email ($f = 38$), and late responders were defined as participants whose response was stimulated from the last three reminder emails ($f = 68$). In the analysis, no statistical differences were found in the FFA/SAE Construct $t(104) = -.57, p = .57$, Program Management Construct $t(104) = .51, p = .61$, or the Instructional Construct $t(104) = .81, p = .81$, suggesting no non-response bias is present (Table 1).

To effectively analyze Likert scale data with parametric statistics, five or more items must be combined to form constructs (Johnson & Creech, 1983; Norman, 2010; Sullivan & Artino, 2013; Zumbo & Zimmerman, 1993). An independent samples t-test was used to analyze research objective one, and central tendencies were used to analyze research objective two.

Limitations

The findings of this study should not be generalized beyond the agricultural educators who participated because of the limited response rate (12.0%). Additionally, while the instrument utilized in this study was robust, it is unlikely that it evaluated every possible duty of an agricultural educator that an induction phase educator may have felt unprepared to implement. The scope of this study is also limited to educators who completed a teacher preparation program and does not assess the preparation levels of nontraditionally certified educators. Finally, the data was collected using self-reported preparation levels therefore, the data could be skewed based on the self-identified perceptions of educators.

Demographics of the Participants

The demographics of the participating agricultural educators are listed in Table 2.

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Table 1

Results from *t*-test Assessing Non-Response Bias

Constructs	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>
Early Responder	38	2.53	.71				
FFA/SAE Construct							
Late Responder	68	2.61	.73				
Early Responder	38	2.90	.80				
Program Management Construct							
Late Responder	68	2.99	.83				
Early Responder	38	3.18	.89				
Instructional Construct							
Late Responder	68	3.14	.79				

Note. $\alpha = .05$. The *n* may vary due to the retention of partial responses.

Table 2

Personal Demographics of Agricultural Educators

		<i>f</i>	%
Gender	Female	67	54.9
	Male	55	45.1
Race	White	119	97.6
	African American	1	0.8
	Other	2	1.
Highest Degree Earned	No Degree	1	0.8
	Associates	3	2.5
	Bachelors	64	52.9
	Masters	48	39.7
	Specialist	1	0.8
	Doctoral	4	3.3
Agriculture Department Size	1 Teacher	62	51.2
	2 Teachers	40	33.1
	3 Teachers	13	10.7
	4+ Teachers	6	5.0
Relationship Status	Married	82	67.8
	Relationship but not Married	12	9.9
	Divorced/Widowed	7	5.8
	Single	20	16.5
Length of Teaching Contract (With State Sponsored Days)	9 Month	12	9.9
	10 Month	15	12.4
	11 Month	9	7.4
	12 Month	79	65.3
	12 Month +	6	5.0
Teach Other Subjects Besides Agriculture	Yes	31	25.6
	No	90	74.4

Note. Partial Responses May Cause the *n* to Vary on Various Demographic Categories. Table reports the demographics of all respondents including those that did not complete a teacher preparation program.

Results

Research Objective #1

Agricultural education is a rapidly changing profession that requires a great deal of innovation to ensure its effectiveness. In the data collection, agricultural educators from all career phases were asked to reflect on their preparation levels as induction phase educators. Huberman (1989) suggested that educators could remain in the induction career phase for up to six years, depending on the development of the educator. An independent samples t-test assessed statistical differences in the preparation levels of induction and non-induction phase educators. Educators in both career phases were asked to reflect on their first year of teaching and report their preparation levels after exiting a teacher preparation program (Table 3).

by evaluating each individual factor by career phase in research objective two. This delineation of each factor within the constructs by career phase is presented in Table 4. Furthermore, the frequency of implementation of these factors as induction phase educators is depicted in Table 5.

Research objective two evaluated the individual factors of each construct based on the perceptions of agricultural educators in different career phases who completed a teacher preparation program regarding their preparation to implement various duties of an agricultural educator while in the induction phase of their careers. The frequency in which educators implemented these duties during their induction phase was also assessed. Since no statistical differences were found between the preparation levels of agricultural educators in the induction phase and the noninduction phase, the researchers chose to delineate the data further by evaluating each individual factor by career phase in research objective two. This delineation of each factor

Table 3

Results from t-test for Preparation Levels of Agricultural Educators by Career Phase

Constructs	n	M	SD	t	df	p	Cohen's d
Induction Phase	42	2.70	.72				
FFA/SAE Construct				1.15	96	.25	.24
Non-Induction Phase	56	2.53	.75				
Induction Phase	42	3.11	.82				
Program Management Construct				1.61	96	.11	.33
Non-Induction Phase	56	2.84	.79				
Induction Phase	42	3.30	.95				
Instructional Construct				1.43	96	.16	.29
Non-Induction Phase	56	3.06	.72				

Note. $\alpha = .05$. The n may vary due to the retention of partial responses.

Overall, no statistical differences between the FFA/SAE construct $t(96) = 1.15, p = .25$, the program management construct $t(96) = 1.61, p = .11$, and the instructional construct $t(96) = 1.43, p = .16$ were found.

Research Objective #2

Research objective two evaluated the individual factors of each construct based on the perceptions of agricultural educators in different career phases who completed a teacher preparation program regarding their preparation to implement various duties of an agricultural educator while in the induction phase of their careers. The frequency in which educators implemented these duties during their induction phase was also assessed. Since no statistical differences were found between the preparation levels of agricultural educators in the induction phase and the noninduction phase, the researchers chose to delineate the data further

within the constructs by career phase is presented in Table 4. Furthermore, the frequency of implementation of these factors as induction phase educators is depicted in Table 5.

Within the FFA/SAE construct, induction phase and non-induction phase educators both had supervising students on field trips (Induction, $M = 3.52, SD = .94$; NonInduction, $M = 3.32, SD = 1.08$) and implementing field trips (Induction, $M = 3.19, SD = 1.13$; Non-Induction, $M = 3.30, SD = 1.08$) as the two highest ranked factors. In addition, both career phases had SAE-related factors such as SAE grants (Induction, $M = 2.02, SD = .90$; Non-Induction, $M = 1.79, SD = 1.00$), Agricultural Experience Tracker (AET; Induction, $M = 2.55, SD = 1.23$; Non-Induction, $M = 1.68, SD = 1.01$), other record keeping systems for SAE's (Induction, $M = 1.90, SD = 1.03$; Non-Induction, $M = 2.21, SD = 1.07$), SAE development (Induction, $M = 2.31, SD = .95$; NonInduction, $M = 2.20, SD = 1.00$), SAE-based awards such as proficiency awards (Induction, $M = 2.31, SD = 1.07$; Non-Induction, $M = 2.25,$

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$SD = 1.01$) and agriscience fair (Induction, $M = 2.26$, $SD = .99$; Non-Induction, $M = 2.11$, $SD = 1.12$) ranked among the lowest within all three constructs. Overall, educators reported feeling Somewhat Prepared to implement these factors as induction phase educators. Presumably due to their lack of preparedness, the majority of agricultural educators reported either never implementing or only occasionally implementing several of these factors in their classroom as induction phase educators, including SAE grants (93.4%), agriscience fair (83.1%), showing livestock (83.0%), proficiency awards (75.5%), and SAE visits (60.4%).

Participating agricultural educators in the induction and non-induction phases claimed they felt Moderately Prepared to implement the factors in the program management construct. Factors that involve educators' perceptions of students ranked the highest such as attitude towards students (Induction, $M = 3.79$, $SD = .95$; Non-Induction, $M = 3.48$, $SD = 1.06$), working with motivated students (Induction, $M = 3.60$, $SD = .96$; Non-Induction, $M = 3.59$, $SD = 1.02$), confidence in educating students (Induction, $M = 3.38$, $SD = 1.08$; Non-Induction, $M = 3.36$, $SD = .98$), confidence in instruction (Induction, $M = 3.43$, $SD = 1.02$; Non-Induction, $M = 3.25$, $SD = 1.03$), and student engagement (Induction, $M = 3.43$, $SD = .86$; Non-Induction, $M = 3.16$, $SD = .83$). It was determined that most participants claimed to implement many of these factors daily as induction phase educators including attitude towards students (92.5%), student engagement (90.6%), working with motivated students (80.2%), confidence in instruction (84.0%), and confidence in educating students (83.0%). Furthermore, factors such as special education implementation (e.g., IEPs) (Induction, $M = 2.64$, $SD = .98$; Non-Induction, $M = 2.29$, $SD = .91$), implementing 504 Plans (Induction, $M = 2.64$, $SD = 1.12$; Non-Induction, $M = 2.18$, $SD = 1.03$), managing bullying situations (Induction, $M = 2.69$, $SD = 1.24$; Non-Induction, $M = 2.52$, $SD = 1.10$), and managing distractions to instruction (Induction, $M = 2.88$, $SD = 1.09$; Non-Induction, $M = 2.41$, $SD = 1.11$) were ranked the lowest. Participating agricultural educators claimed to be *Somewhat Prepared to Moderately Prepared* to implement these factors as induction phase educators. In addition, the majority of participating agricultural educators claimed to implement many of these factors on a daily or weekly basis as induction phase educators, including managing distractions to instruction (97.2%), implementing IEPs (84.9%) and 504 Plans (84.9%), and managing bullying situations (55.7%).

The instructional construct suggests that during their induction phase, participating agricultural educators felt Moderately Prepared to Very Prepared to implement factors such as taking attendance (Induction, $M = 3.88$, $SD = .97$; Non-Induction, $M = 3.75$, $SD = .98$), utilizing lecture as a teaching method (Induction, $M = 3.76$, $SD = 1.08$; Non-Induction, $M = 3.66$, $SD = .96$), and utilizing demonstration as a teaching method (Induction, $M = 3.69$, $SD = 1.16$; Non-Induction, $M = 3.34$, $SD = .92$). Overall, educators reported feeling relatively prepared to implement taking attendance daily (98.2%). Additionally, educators claimed to implement lecture as a teaching method (97.2%) and demonstration

as a teaching method (94.4%) on a daily or weekly basis as induction phase educators. The lowest ranked factors in the instructional construct included managing grades (Induction, $M = 3.17$, $SD = .96$; Non-Induction, $M = 3.11$, $SD = .99$), utilizing independent study as a teaching method (Induction, $M = 3.02$, $SD = 1.42$; Non-Induction, $M = 2.73$, $SD = 1.10$), implementing WorkBased Learning (WBL) as a teaching method (Induction, $M = 2.76$, $SD = 1.25$; Non-Induction, $M = 2.57$, $SD = 1.08$), and utilizing gamification as a teaching method (Induction, $M = 2.62$, $SD = 1.34$; Non-Induction, $M = 2.04$, $SD = 1.03$). In addition, most participating educators claimed to implement managing grades (98.1%) and independent study (67.9%) daily or weekly as induction phase educators. Of the two lowest factors in the instructional construct, participating agricultural educators claimed to either never implement or implement occasionally WBL as a teaching method (40.6%) and gamification as a teaching method (31.1%) during their induction phase.

Conclusions

The first research objective aimed to assess statistical differences between agricultural educators in different career phases who completed a teacher preparation program and their preparation levels as first year educators. The individual factors in the instrument were divided into three constructs that were assessed utilizing an independent samples *t*-test. The agricultural educators were further delineated into two career phases, including the induction phase (0–6 years) and the non-induction phase (7+ years). The results of the *t*-test found no statistical differences between any of the three constructs, which suggests that more experienced agricultural educators did not feel more prepared as first year educators than less experienced agricultural educators.

The non-significant finding in objective one suggests that induction phase educators and non-induction phase educators both lacked confidence in their abilities to manage certain aspects of agricultural education as first year educators. This suggests that post-secondary agricultural teacher preparation programs have been unsuccessful at consistently providing effective instruction in these areas for decades. Additionally, the finding of no significant differences between the career phases is consistent with the conclusions of other published literature (Sorensen et al., 2014; Thornton et al., 2020). Sorensen et al. (2014), assessed differences in the professional development needs of induction phase and non-induction phase agricultural educators and determined that they reported many of the same needs. While many of the professional development needs of agricultural educators remained consistent over the two career phases, some items changed significantly over time including various aspects of operating an FFA chapter, teaching agricultural mechanics, and operating a greenhouse which shows significant development in human capital through experience. Thornton et al. (2020) found some similarities between the professional development needs of agricultural educators in different career phases. Modifying instruction for students with special needs, using experiments in teaching, and motivating students were all in the top ten choices of

agricultural educators in the early, mid, and late career phases. Preservice agricultural educators also reported that they felt unprepared for similar aspects of the profession including implementing special education mandates (Ramage et al., 2021), implementing Work Based Learning (e.g., SAE) into agricultural education (Toombs et al., 2022), and operating an FFA chapter (Roberts & Robinson, 2018). This is particularly concerning considering student teachers spend more time operating and managing the FFA chapter than any other duty (Frost et al., 2018).

To further evaluate the data, research objective two assessed each individual factor within the constructs by the agricultural educators' career phase. Within the FFA/SAE construct, the lowest ranked factors among induction and non-induction phase educators included SAE-based activities such as SAE Grants, Agricultural Experience Tracker, other recording keeping systems for SAE's, SAE development, and SAE-based awards such as proficiency awards and agriscience fair. While educators only reported feeling Somewhat Prepared to implement SAE and varying teaching methods in their instructional practice, many educators reported implementing these items weekly or monthly. These results are consistent with other studies that found a decline in SAE implementation (Leising & Zilbert, 1985; Retallick, 2010; Roberts & Harlin, 2007; Rubenstein & Thoron, 2015; Wilson & Moore, 2007).

Rubenstein and Thoron (2015), Osborne (1988), and Swortzel (1996) purport that agricultural educators are the main factor determining the quality of SAE implementation in school-based agricultural education (SBAE). In addition, Rubenstein and Thoron (2015), state that agricultural teacher education programs are educators' main source of knowledge on SAE and that effective instruction on SAE implementation is critical to quality SAE application in SBAE programs. The results of this study suggest that agricultural educators in different career phases did not feel adequately prepared to implement SAE as first year educators.

Additionally, research objective two found that factors related to a passion for educating students were ranked among the top work tasks that participating agricultural educators felt prepared to implement in the early stages of their careers. This result is similar to findings from Solomonson et al. (2021), who found that agricultural educators' main motivations for remaining in the classroom are related to a passion for students. Furthermore, areas regarding special education implementation were ranked relatively low in this study. Ramage et al., (2022, 2023), also found that agricultural educators are unconfident in their ability to educate students with special needs.

Leveraging high impact instruction on the post-secondary level will assist in developing preservice and in-service agricultural educators' human capital. This strategy should include instruction in deficient areas by targeting pertinent professional development, special training, and experience. These areas have proven to be successful at developing human capital in agricultural educators and improving effectiveness as an educator (Easterly III & Myers, 2019; Hainline & Smalley, 2023; Norris et al., 2023; Stair et al., 2012; Thornton et al., 2020).

Recommendations for Practice

The results of this study have implications for the improvement of post-secondary agricultural teacher preparation programs. The data suggests that induction phase and noninduction phase educators were not confident in their abilities to manage SAE programs as a first-year educator. With SAE being a major component of agricultural education and multiple SAE-based factors ranking among the lowest items in the study, teacher preparation programs need to focus on SAE by integrating coursework on record keeping (e.g., AET), SAE management, and SAE promotion (e.g., SAE Grants, Agriscience Fair, Proficiency Awards, etc.). Many of the teaching method factors also ranked among the bottom of the study. Traditionally, novice educators struggle with varying their teaching methods in their instructional practice (Smalley et al., 2019; Thornton et al., 2020). Expanding on induction phase educator's teaching methods repertoire through improved instruction on the post-secondary level could improve their teaching effectiveness and therefore increase student achievement. Furthermore, it is recommended that teacher preparation programs conduct a needs assessment of preservice educators to differentiate instruction and tailor curricula to ensure students are trained in areas in which they feel unprepared. Additionally, stakeholders of SBAE should provide effective professional development to practicing agricultural educators during their induction phase to build human capital.

Recommendations for Future Research

With various aspects of SAE management and some teaching methods being ranked towards the bottom of the study, determining the quality and frequency of instruction on the 390 post-secondary level would assist in further identifying deficiencies in agricultural teacher preparation programs. In addition, evaluating the knowledge and skills of university faculty on SAE management and teaching methods would provide more insight into post-secondary teacher preparation flaws. A better understanding of the teaching methods used by teacher preparation programs to teach these items could provide insight into best practices and expose why some recent graduates feel unprepared. Furthermore, assessing the current professional development needs of agricultural educators in these areas would allow stakeholders to provide pertinent professional development and improve the knowledge and skills of educators.

Table 4

Descriptive Statistics for Factors by Career Phase

Factors	Induction Phase		Non-Induction Phase		Total	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
FFA/SAE Construct	2.70	1.09	2.53	1.07	2.60	1.09
Supervising Students on Field Trips	3.52	.94	3.32	1.08	3.41	1.02
Planning and Implementing Field Trips	3.19	1.13	3.30	1.08	3.26	1.10
Selecting Chapter Officers	3.31	1.12	2.84	1.08	3.04	1.11
Managing Fundraisers	2.88	1.09	2.88	1.16	2.88	1.12
Managing FFA Funding	2.98	1.22	2.86	1.21	2.91	1.21
Chapter Officer Development	3.07	1.14	2.75	.96	2.89	1.04
Recruiting Membership	3.05	1.01	2.84	1.01	2.93	1.01
Career Development Events	2.90	1.03	2.68	.97	2.78	1.00
Leadership Development Events	2.93	1.07	2.71	.99	2.81	1.02
Conducting SAE Visits	2.71	1.09	2.82	1.05	2.78	1.06
Showing Livestock	2.74	1.56	2.75	1.42	2.74	1.47
Preparing State Officer Candidates	2.50	1.17	2.41	1.02	2.45	1.09
Entering Membership into FFA.org	2.60	1.08	2.29	1.20	2.42	1.16
Proficiency Awards	2.31	1.07	2.25	1.01	2.28	1.03
SAE Development	2.31	.95	2.20	1.00	2.24	.98
Agriscience Fair Projects	2.26	.99	2.11	1.12	2.17	1.07
Other Record Book Systems for SAEs	1.90	1.03	2.21	1.07	2.08	1.06
Agricultural Experience Tracker (AET)	2.55	1.23	1.68	1.01	2.05	1.19
Other Grants/Alternative Sources of Funding	2.26	1.06	1.84	.93	2.02	1.01
SAE Grants	2.02	.90	1.79	1.00	1.89	.96
Program Management Construct	3.11	1.05	2.84	1.01	2.95	1.03
Attitude Towards Students	3.79	.95	3.48	1.06	3.61	1.02
Working With Motivated Students	3.60	.96	3.59	1.02	3.59	.99
Confidence in Educating Students	3.38	1.08	3.36	.98	3.37	1.02
Confidence in Instruction	3.43	1.02	3.25	1.03	3.33	1.02
Student Engagement	3.43	.86	3.16	.83	3.28	.85
Developing Curriculum	3.31	1.07	3.00	.97	3.13	1.02
Managing Student Behavior	2.98	1.09	2.66	1.01	2.80	1.06
Differentiating Instruction	2.93	1.05	2.54	.97	2.70	1.02
Managing Distractions to Instruction	2.88	1.09	2.41	1.11	2.61	1.12
Managing Parent Communication	2.67	1.20	2.52	1.06	2.58	1.12
Managing Bullying Situations	2.69	1.24	2.52	1.10	2.59	1.16
Implementing Individualized Education Plans	2.64	.98	2.29	.91	2.44	.95
Implementing 504 Plans	2.64	1.12	2.18	1.03	2.38	1.09

Table 4

Continued

Factors	Induction Phase		Non-Induction Phase		Total	
	M	SD	M	SD	M	SD
Instructional Construct	3.25	1.20	3.01	1.01	3.11	1.10
Taking Attendance	3.88	.97	3.75	.98	3.81	.97
Lecture as a Teaching Method	3.76	1.08	3.66	.96	3.70	1.01
Demonstration as a Teaching Method	3.69	1.16	3.34	.92	3.49	1.04
Improving Content Knowledge with PD	3.48	1.13	3.29	1.02	3.37	1.07
Discussion as a Teaching Method	3.40	1.23	3.20	1.07	3.29	1.14
Field Trips as a Teaching Method	3.19	1.25	3.16	.95	3.17	1.08
Experiments as a Teaching Method	3.40	1.19	2.95	.96	3.14	1.08
Managing Grading	3.17	.96	3.11	.99	3.13	.97
Independent Study as a Method	3.02	1.42	2.73	1.10	2.86	1.25
Work-Based Learning (WBL) as a Method	2.76	1.25	2.57	1.08	2.65	1.15
Gamification as a Teaching Method	2.62	1.34	2.04	1.03	2.29	1.20

Note. 1 = Not Prepared at All; 2 = Somewhat Prepared; 3 = Moderately Prepared; 4 = Very Prepared; 5 = Extremely Prepared.

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Table 5

Agricultural Educator's Frequency of Implementation of Various Factors

Factors	Daily	Weekly	Monthly	Occasionally	Never
FFA/SAE Factors					
Supervising Students on Trips	0(0.0%)	15(14.1%)	51(48.1%)	36(34.0%)	4(3.8%)
Implementing Field Trips	0(0.0%)	16(15.1%)	46(43.4%)	39(36.8%)	5(4.7%)
Selecting Chapter Officers	1(0.9%)	1(0.9%)	6(5.7%)	92(86.8%)	6(5.7%)
Managing FFA Funding	18(17.0%)	27(25.5%)	41(38.6%)	15(14.2%)	5(4.7%)
Managing Fundraisers	4(3.8%)	13(12.3%)	29(27.3%)	52(49.1%)	8(7.5%)
Chapter Officer Development	7(6.6%)	32(30.2%)	30(28.3%)	31(29.2%)	6(5.7%)
Recruiting Membership	12(11.3%)	26(24.5%)	31(29.3%)	33(31.1%)	4(3.8%)
Showing Livestock	2(1.9%)	4(3.8%)	12(11.3%)	55(51.9%)	33(31.1%)
Career Development Events	7(6.6%)	49(46.2%)	26(24.6%)	23(21.7%)	1(0.9%)
Leadership Dev. Events	4(3.8%)	41(38.7%)	27(25.4%)	30(28.3%)	4(3.8%)
Conducting SAE Visits	1(0.9%)	8(7.5%)	33(31.2%)	51(48.1%)	13(12.3%)
FFA Roster Management	1(0.9%)	6(5.7%)	6(5.7%)	88(83.0%)	5(4.7%)
Preparing State Officers Ca(StatDistrict, Area, etc)	4(3.8%)	12(11.3%)	28(26.4%)	42(39.6%)	20(18.9%)
Proficiency Awards	1(0.9%)	2(1.9%)	23(21.7%)	62(58.5%)	18(17.0%)
Agriscience Fair Projects	1(0.9%)	7(6.6%)	10(9.4%)	43(40.6%)	45(42.5%)
SAE Development	2(1.9%)	20(18.9%)	37(34.9%)	37(34.9%)	10(9.4%)
Other Record Systems for SAE	0(0.0%)	4(3.8%)	13(12.2%)	20(18.9%)	69(65.1%)
Ag. Experience Tracker (AET) (AET)	10(9.4%)	28(26.4%)	37(34.9%)	19(18.0%)	12(11.3%)
Grants/Alt. Sources of Funding Activities	0(0.0%)	9(8.5%)	19(17.9%)	50(47.2%)	28(26.4%)
SAE Grants	0(0.0%)	2(1.9%)	5(4.7%)	53(50.0%)	46(43.4%)
Program Management Factors					
Attitude Towards Students	98(92.5%)	7(6.6%)	1(0.9%)	0(0.0%)	0(0.0%)
Working w/ Motivated Stu.	85(80.2%)	15(14.2%)	2(1.9%)	4(3.7%)	0(0.0%)
Confidence in Edu. Students	88(83.0%)	17(16.1%)	0(0.0%)	0(0.0%)	1(0.9%)
Confidence in Instruction	89(84.0%)	16(15.1%)	0(0.0%)	0(0.0%)	1(0.9%)
Student Engagement	96(90.6%)	8(7.5%)	2(1.9%)	0(0.0%)	0(0.0%)
Developing Curriculum	35(33.0%)	44(41.5%)	16(15.1%)	11(10.4%)	0(0.0%)
Managing Student Behavior	97(91.5%)	7(6.6%)	2(1.9%)	0(0.0%)	0(0.0%)
Differentiating Instruction	75(70.8%)	20(18.9%)	7(6.6%)	3(2.8%)	1(0.9%)
Manage Parent Communication	23(21.7%)	43(40.6%)	33(31.1%)	7(6.6%)	0(0.0%)
Manage Instru. Distractions	91(85.8%)	12(11.4%)	2(1.9%)	0(0.0%)	1(0.9%)
Manage Bullying Situations	30(28.3%)	29(27.4%)	24(22.6%)	21(19.8%)	2(1.9%)
Implementing IEPs	67(63.2%)	23(21.7%)	8(7.6%)	5(4.7%)	3(2.8%)
Implementing 504 Plans	70(66.0%)	20(18.9%)	5(4.8%)	8(7.5%)	3(2.8%)

Table 5

Continued

Factors	Daily	Weekly	Monthly	Occasionally	Never
Instructional Factors					
Taking Attendance	104(98.2%)	1(0.9%)	0(0.0%)	1(0.9%)	0(0.0%)
Lecture as a Teaching Method	42(39.7%)	61(57.5%)	2(1.9%)	0(0.0%)	1(0.9%)
Demo. as a Teaching Method	51(48.2%)	49(46.2%)	3(2.8%)	3(2.8%)	0(0.0%)
Improving Knowledge w/ PD	17(16.0%)	20(18.9%)	30(28.3%)	39(36.8%)	0(0.0%)
Discussion as a Teaching Method	52(49.1%)	49(46.2%)	4(3.8%)	1(0.9%)	0(0.0%)
Field Trips as a Teaching Method	8(7.5%)	11(10.4%)	38(35.8%)	45(42.5%)	4(3.8%)
Experimentation as a Method	22(20.8%)	44(41.5%)	27(25.5%)	12(11.3%)	1(0.9%)
Managing Grades	55(51.9%)	49(46.2%)	2(1.9%)	0(0.0%)	0(0.0%)
Ind. Study as a Teaching Method	28(26.4%)	44(41.5%)	15(14.2%)	12(11.3%)	7(6.6%)
WBL as a Teaching Method	15(14.2%)	28(26.4%)	19(17.9%)	30(28.3%)	14(13.2%)
Gamification as a Method	9(8.5%)	24(22.6%)	29(27.4%)	23(21.7%)	21(19.8%)

Note. The scales are listed by *f*(%). The *n* may vary between factors due to the retention of partial responses.

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