Journal of Agricultural Education, 65(1), 346-360
https://doi.org/10.5032/jae.v65i2.90

Describing Instructional Method Use for Early, Middle, and Late Career Stage School-based Agricultural Education Teachers

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Abstract

Instructional methods are the cornerstone of all teaching and learning strategies. This study explored instructional method use by early, middle, and later career agricultural education teachers. One-hundred nine teachers responded to an online questionnaire and were evenly split in terms of gender. Cooperative learning, demonstration, and lecture were reported as the most frequently used instructional methods across the career stages. Demonstration, discussion, and lecture were the instructional methods in which teachers reported having the most training. Teachers in this study were most confident in using demonstration and least confident in using role play. Demonstration and role play both held the top and bottom spots when teachers were asked about effectiveness related to their instructional methods. Several moderate to strong relationships exist between perceived confidence in using instructional methods and the effectiveness of the given instructional method. Framing instructional method use as a line of inquiry is important within the agricultural education discipline as we continue to see shifts in demographic makeup of teachers entering the profession and as a lens to study changes in agricultural education teachers throughout their careers.

Keywords: career stage; teaching methods; instructional methods

Introduction

School-based agricultural education (SBAE) teachers have numerous responsibilities including providing classroom and laboratory instruction, advising a local FFA chapter, supervising agricultural experiences, and many others (Phipps et al., 2008; Talbert et al., 2022). Arguably, providing classroom and laboratory instruction is one of the most important roles of an effective SBAE teacher (Roberts & Dyer, 2004). Directly related to providing instruction is the task of selecting a teaching or instructional method to deliver technical content to students. Furthermore, the American Association for Agricultural Education (2017) lists pedagogical content knowledge as their first standard in the standards for SBAE teacher preparation programs. One of the performance indicators for this standard is demonstration of a variety of teaching methods, providing the focus for this study (American Association for Agricultural Education, 2017).

A teaching or instructional method is the information dissemination tool a teacher chooses to use to guide students through a learning experience or deliver subject matter content (Newcomb et al., 2004). According to Rosenshine and Furst (1971), one of the fundamental characteristics of an effective teacher is the ability to provide variability in instructional methods. Likewise, it has been recommended SBAE teachers diversify and use a variety of instructional methods in their classrooms, including group and individualized methods, to reach higher levels of achievement (Newcomb et al., 2004; Rayfield et al., 2011). Similarly, Phipps et al. (2008) suggested when teachers use a variety of instructional methods, both group and individual student success increases. From the student perspective, using differing instructional

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methods can be one of the strongest factors influencing attention, learning, and retention (Dean et al., 2012; Sallee et al., 2013).

Concerning specific teaching methods, studies in agricultural education have shown student-centered instructional methods can result in higher levels of creativity, practical scores, knowledge gain, and argumentation skill, particularly with experiential learning and inquiry-based approaches (Baker & Robinson, 2016; Thoron & Myers, 2011; 2012). This seems intuitive as the use of experiential learning and hands-on learning have long been recommended and used in agricultural education (Phipps et al., 2008). Other studies have shown teacher-centered approaches such as demonstration can be effective as well, increasing student interest and knowledge, particularly for students with high tinkering self-efficacy (Sallee et al., 2013). Studies recommending specific teaching methods in agricultural education have had mixed results due to differences in the subject matter being taught, classroom learning environments, and individual student learning preferences (Dyer & Osborne, 1996). While there are many factors influencing the success of each particular teaching method, Sallee et al. (2013) recommended educators choose methods of instruction aligning with the preferred methods of students, indicating there is no one method that should always be used, but rather a variety based on individual circumstances.

While use of varying instructional methods is an important characteristic from both student and teacher perspectives, researchers have indicated practicing SBAE teachers continue to need professional development in this area, even after completing certification through their teacher preparation program (DiBenedetto et al., 2018; Duncan et al., 2006; Thornton et al., 2020). Smith and Smalley (2018) found teachers perceived to have a moderate level of stress related to providing instruction, further indicating this is an area in which teachers may need help.

When examining professional development needs of SBAE teachers, we know needs can vary depending on the career stage of the teacher (Smalley & Smith, 2017; Sorensen et al., 2014; Thornton et al., 2020). In fact, the National Association of Agricultural Educators (2016) has recommended tailoring professional development for early, middle, and late career SBAE teachers to better meet their individual needs. This sentiment was echoed in a study recommending a variety of professional development opportunities be designed and provided for SBAE teachers based on their level of experience (DiBenedetto et al., 2018). Continuing professional development for all career stages has the potential to increase resiliency and decrease burnout for SBAE teachers (Smith & Smalley, 2018).

Several studies have described how SBAE teachers use various instructional methods, however they have been limited in their context to particular groups or career stages of teachers (Colclasure et al., 2022; Smith et al., 2015; Voges et al., 2020). The identification of specific topics and curricular areas of weakness has been recommended along with the identification of professional development needs for SBAE teachers with different levels of experience (Easterly & Myers, 2017; Solomonson et al., 2021). However, before a formal needs assessment is conducted, a general description of instructional method use by SBAE teacher career stage is necessary, giving rise to the need for this study.

Theoretical Framework and Literature Review

The theoretical framework that guided this study was the application of Bandura's (1997) perceived self-efficacy theory to Huberman's (1989) professional life cycle of teachers. Self-efficacy can be defined as one's beliefs in their ability to organize and implement actions to learn or perform behaviors (Bandura, 1997). Self-efficacy beliefs can affect behaviors such as choice of tasks, effort expenditure, and skill attainment (Schunk, 1991). In our study, the behavior would be the use of a particular instructional method. Research has shown higher levels of perceived self-efficacy toward instructional methods can lead to more successful use of those methods (Caprara et al., 2006; Smith et al., 2015). However, the relationship

between self-efficacy and behavior can be reciprocal since effective teaching behaviors can influence teachers' self-efficacy beliefs (Bandura, 1997; Klassen & Chiu, 2011).

Research indicates self-efficacy can wane over time or over an individual's career (Bandura, 1997). This leads to the use of Huberman's professional life cycle of teachers. Huberman's (1989) model divides teachers into three career stages: novice, mid-career, and late-career. According to Huberman, teachers in the novice career stage have a focus on survival followed by concentration on teaching and impacting students. Mid-career teachers are characterized more by stabilization in their career, experimentation in the classroom, and taking stock and sometimes having self-doubt in their own work. Late-career teachers can experience serenity or disengagement with the approach of retirement (Huberman, 1989). Huberman loosely tied each career stage to years of experience, as have others. For the purposes of this study, we defined SBAE teachers with one to five years of experience as early careers teachers, those with six to 15 years of experience were considered middle-career, and those with 16 or more years of experience were considered late career teachers (Roberts et al, 2020; Solomonson et al., 2021).

When examining the literature on teacher career stages and perceived self-efficacy, a general trend of increasing self-efficacy during the early career stage is followed by peak self-efficacy during the middle career stage (Klassen & Chiu, 2010; Klassen & Chiu, 2011; McKim & Velez, 2015). Declines in teacher self-efficacy are then observed during the late career stage (Klassen & Chiu, 2010; McKim & Velez, 2015). The decline in self-efficacy has not only been observed in teachers but in business management employees as well (Lawrence, 1988). To help improve self-efficacy, it has been recommended professional development continue throughout all career stages (Guthrie & Schwoerer, 1996; Klassen & Chui, 2011). However, this is not always well received by those in late career stages, as they may not believe they can succeed in the training or that new training will not be useful (Guthrie & Schwoerer, 1996). Continued confidence in teaching is important at all career stages because higher levels of self-efficacy in teaching is linked to higher career commitment (Solomonson et al., 2021; Whittington et al., 2006).

Literature related to self-efficacy in teaching and career stages in SBAE is limited. However, Solomonson et al. (2021) reported early career teachers lacked teaching confidence while later career teachers were confident in their teaching ability. Smith and Smalley (2018) reported mid-career teachers were more confident in using various instructional methods. Similarly, professional development needs related to pedagogy and classroom instruction have been identified for early and middle career teachers with higher needs in the early career stage (Roberts et al., 2020; Smalley & Smith, 2017; Sorensen et al., 2014).

Specific instructional methods used by SBAE teachers have been documented by researchers, however information on this topic specific to career stage is sparse. Colclasure et al. (2022) concluded age was not related to the quantity of time instructional methods were used. However, reported confidence in using specific instructional methods was related to higher perceived effectiveness of those instructional methods. Higher perceived effectiveness of instructional methods was also associated with higher quantities of time using the instructional methods (Colclasure et al., 2022). According to Smith et al. (2015), differences in perceived effectiveness was observed between male and female teachers with males ranking supervised study higher than females and female teachers ranking role play higher than their male counterparts.

Literature on instructional method use among SBAE teachers indicated, lecture was reported as being used most often by all career stages combined, while role play was reported as being used least (Colclasure et al., 2022; Smith et al., 2015). A study of early career teachers found demonstration was used the most and guest speakers were used the least (Voges et al., 2020). Teachers in the early career stage and all career stages combined reported highest perceived effectiveness for demonstration and lowest for role play (Colclasure et al., 2022; Voges et al., 2022). Early career teachers reported having the highest confidence in using demonstration while all career stages had the most confidence in lecture (Smith et al.,

2015; Voges et al., 2020). By examining the results of these studies, it can be concluded there may be differences in use, confidence, and perceived effectiveness of instructional methods based on career stage.

In summary, SBAE teachers spend the largest portion of time in classroom and laboratory teaching activities when compared to all other duties (Torres et al., 2008). This has been observed in greater amounts for late career SBAE teachers compared to early career SBAE teachers (Smith & Smalley, 2018). However, specific information related to how SBAE teachers use and perceive specific instructional methods by career stage is lacking. To explore how professional development can be structured for each career stage, this information is needed.

Purpose and Objectives

The purpose of this study was to describe instructional method practices, perceptions, and confidence of SBAE teachers in early, middle, and late career stages. The objectives that guided this study were:

1. Determine training received for various instructional methods according to career stage.
2. Describe time spent using various instructional methods according to career stage.
3. Describe confidence in using various instructional methods according to career stage.
4. Describe perceived effectiveness of using various instructional methods according to career stage.
5. Describe relationships between time spent using instructional methods, perceived confidence, and perceived effectiveness for various instructional methods by career stage.

Methods

To accomplish the purpose and objectives of this study, we employed a descriptive survey design. According to Fraenkel et al. (2023), quantitative, descriptive surveys are used to summarize characteristics of individuals or groups. The groups we sought to describe were early, middle, and late career SBAE teachers in Texas. Our accessible population was all SBAE teachers who were members of the state agriculture teachers association (N = 2,172). According to Krejcie and Morgan (1970), a sample of 326 teachers was needed to describe the population. However, due to anticipated low response rates, this number was doubled (n = 652) for sample selection. Using the directory from the state agriculture teachers association, simple random sampling was used to select participants and create an email contact list.

The questionnaire used for this study was replicated with permission from authors of previous studies (Smith et al., 2015; Voges et al., 2020). Their questionnaire assessed training received, usage, confidence, and perceived effectiveness for 10 instructional methods identified from Newcomb et al. (2004). To assess training received, participants were asked if they had received training through their certification program on each instructional method with the opportunity for a yes/no response (10 items). Data for time spent using each instructional method were collected by asking participants to use a slider to estimate the percentage of class time per year that each instructional method was used (10 items). The sliders automatically totaled 100% for all 10 instructional methods combined. Confidence in using each instructional method was rated on a scale of 1 = *Very Low Confidence* to 5 = *Very High Confidence* (10 items). Perceived effectiveness of each instructional method was rated on a scale of 1 = *Very Ineffective* to 5 = *Very Effective* (10 items). Six demographic questions were included at the end of the questionnaire for a total of 46 items. With the exception of the demographic section, definitions adapted from Newcomb et al. (2004) were provided for the 10 instructional methods for each of the four main sections of the questionnaire. Definitions are presented in Table 1.

Table 1

Definitions of Instructional Methods Provided to Participants

Method	Definition

Cooperative Learning	Learner-centered instruction in which groups of 3-5 students work together on a well-defined learning task.
Demonstration	Teacher-led instruction of hands-on skills or activities.
Discussion	Two-way communication about a pre-defined topic conducted with the entire class or smaller groups of students.
Experiments	Students using the scientific method to form hypotheses, test theory, and formulate conclusions on a given topic.
Field Trips	Students taken away from traditional classroom setting for real-world experience in a content area.
Guest Speakers	Guests with particular expertise are brought in to instruct about a specific concept or topic.
Independent Study	Students are engaged in self-directed learning of a topic specific to their interests.
Lecture	Teacher-led instruction for disseminating information, may be guided through multimedia presentation.
Role Play (skits)	Class participants play or portray a given role to illustrate a concept.
Supervised Study	Given a well-defined question or prompt, students use resource materials to find answers themselves.

Researchers from previous studies using the questionnaire determined it to be valid and reliable (Smith et al., 2015; Voges et al., 2020). However, two professors of agriculture teacher education with experience in teaching courses in instructional methods reviewed the questionnaire for content validity. Based on the purpose and objectives of this study, they believed items in the questionnaire would accurately measure the information we wanted to collect. The questionnaire was administered to the same population within two years of the Voges et al. (2020) study and in a similar context. We also did not expect how people respond to specific questions on the instrument to change over this time period, therefore a pilot test was not conducted and their reported reliability of .80 was deemed acceptable (Field, 2018). Furthermore, a *post hoc* reliability of .86 was calculated using responses from participants in this study, confirming instrument reliability was acceptable.

After Institutional Review Board (IRB) approval was obtained in mid-May, an initial email requesting participation was distributed to participants through Qualtrics with a link provided to the online questionnaire. Following Dillman's tailored design method, four reminder emails were sent soliciting response (Dillman et al., 2014). Reminder emails were sent at one-week intervals with varying messages tailored to maximize response. Data collection was concluded in late-June with a total of 109 completed questionnaires for a 16.72% response rate.

To test for nonresponse bias, a comparison of early to late respondents was conducted for each scale item (Lindner et al., 2001). After responses were received from the initial email, no other reminder email or combination of the four reminder emails resulted in a wave of 30 participants needed for comparing early to later respondents. In this case "If a wave of 30 respondents cannot be defined by successive stimuli, then we recommend that late respondents be defined operationally and arbitrarily as the later 50% of the

respondents" (Lindner et al., 2001, p. 52). Therefore, early respondents (n = 55) were defined as the early 50% and late respondents (n = 54) were defined as the later 50% of respondents as indicated by date and time of response from Qualtrics meta-data. After conducting independent samples t-tests on each scale item, no significant differences were found. Even so, based on the low response rate, we recommend readers exercise caution when attempting to generalize results beyond the sample of respondents in this study. All data collected through the Qualtrics survey platform were exported into a Microsoft Excel spreadsheet. Data were analyzed in SPSS version 28.0. Basic descriptive statistics such as frequencies, percentages, means, standard deviations, and correlations were calculated to meet the objectives of this study.

Findings

Of the 109 teachers responding to the survey, 30 teachers were considered to be in the early career stage, 36 teachers were in the middle career stage, and 43 teachers were in the late career stage. When describing the demographic characteristics of our study participants, the overall average age was 38.73 (SD = 11.43) years. More specifically, respondents in the early career stage had an average age of 27.13 (SD = 4.65) years, those in the middle career stage had an average age of 36.61 (SD = 7.75) years, and late career teachers had an average age of 48.60 years (SD = 8.44). There were nearly equal numbers of male (n = 54, 49.54%) and female (n = 52, 47.71%) respondents. Further breakdown of reported gender of respondents is presented by career stage in Table 2.

Table 2

Gender Breakdown of Participants by Career Stage (N = 109)

	Early (n = 30)		Middle (n = 36)		Late (n = 43)		Overall (N = 109)	
	f	%	*f*	%	*f*	%	*f*	%
Male	12	40.00	11	30.56	31	72.09	54	49.54
Female	17	56.67	24	66.67	11	25.58	52	47.71

Note. Percentages may not total to 100% due to item nonresponse.

Objective 1

The first objective of this study was to determine training received for instructional methods according to career stage SBAE teachers. Early career teachers most frequently reported receiving training through their teacher preparation program for demonstration, discussion, and lecture (f = 29, 96.67%). Middle career teachers reported receiving training in cooperative learning, demonstration, and lecture most frequently (f = 44, 94.44%). Training for lecture (f = 42, 97.67%) and discussion (f = 40, 93.02%) was reported most frequently for late career teachers. Training for using the role play instructional method had the lowest frequency for teachers in all three career stages. Refer to Table 3 for further information on training received for instructional methods broken down by career stage.

Table 3

Frequency of Training Received for Instructional Methods by Career Stage (N = 109)

Instructional Method	Early (n = 30)		Middle (n = 36)		Late (n = 43)	
	f	%	*f*	%	*f*	%
Cooperative Learning	28	93.33	34	94.44	34	79.07
Demonstration	29	96.67	34	94.44	38	88.37
Discussion	29	96.67	33	91.67	40	93.02
Experiments	22	73.33	23	63.89	28	65.12
Field Trips	19	63.33	14	38.89	26	60.47

Guest Speakers	22	73.33	19	52.78	27	62.79
Independent Study	24	80.00	25	69.44	27	62.79
Lecture	29	96.67	34	94.44	42	97.67
Role Play	17	56.67	13	36.11	18	41.86
Supervised Study	23	76.67	20	55.56	31	72.09

Note. Percentages are based on total number of respondents in each career stage.

Objective 2

Objective two was to describe time spent using various instructional methods according to career stage. This was an estimate of the percentage of time spent using each method for all courses taught over a school year and is summarized in Table 4. Early and late career teachers reported using cooperative learning the most with an average of 20.00% (SD = 13.12) and 27.88% (SD = 21.86) respectively. Middle career teachers spent the most time using lecture (M = 20.47, SD = 13.78). Role play was used least by all three career stage groups.

Table 4

Average Time Spent Using Instructional Methods by Career Stage (N = 109)

Instructional Method	Early (n = 30)		Middle (n = 36)		Late (n = 43)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Cooperative Learning	20.00	13.12	18.86	11.18	27.88	21.86
Demonstration	17.97	11.44	17.53	11.44	23.05	13.55
Discussion	14.57	7.75	11.94	7.82	12.47	8.66
Experiments	6.57	7.99	7.17	7.74	5.21	5.43
Field Trips	2.30	5.40	3.14	5.85	2.02	3.27
Guest Speakers	1.60	3.95	1.64	2.55	2.12	2.83
Independent Study	7.13	7.36	9.33	8.81	5.65	8.65
Lecture	19.07	12.01	20.47	13.78	15.21	13.49
Role Play	0.83	2.07	1.00	2.44	0.79	1.81
Supervised Study	9.97	10.28	8.92	8.66	5.60	7.58

Note. Average time spent using teaching methods is based on estimated percentages of the school year.

Objective 3

The third objective of this study was to describe confidence in using various instructional methods according to career stage. Early and late career stage teachers reported the highest average confidence in using the demonstration instructional method with a mean of 4.32 (SD = 0.66) and 4.43 (SD = 0.58) respectively. Middle career teachers were most confident in using lecture (M = 4.29, SD = 0.70). Teachers had the least confidence in using role play for all three career groups. Refer to Table 5 for a complete breakdown on confidence in using instructional methods by each of the three career stages.

Table 5

Confidence in Using Instructional Methods by Career Stage (N = 109)

Instructional Method	Early (n = 30)		Middle (n = 36)		Late (n = 43)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Cooperative Learning	3.95	0.96	4.00	0.85	4.18	0.78
Demonstration	4.32	0.66	4.21	0.56	4.43	0.58
Discussion	4.12	0.78	3.92	0.83	4.00	0.67

Experiments	3.33	1.03	3.21	0.94	3.38	0.95
Field Trips	3.30	1.10	3.64	0.89	3.43	1.14
Guest Speakers	3.32	1.09	3.64	0.81	3.42	1.23
Independent Study	3.44	1.00	3.29	1.16	3.38	1.21
Lecture	4.11	0.72	4.29	0.70	4.00	0.84
Role Play	2.18	1.10	3.00	1.13	2.60	1.24
Supervised Study	3.47	1.04	3.50	1.05	3.67	0.84

Note. Scale: 1 = *Very Low Confidence* to 5 = *Very High Confidence.*

Objective 4

For the fourth objective, teachers described their perceived effectiveness of each instructional method. Teachers in all three career stages viewed demonstration as the most effective instructional method and role play as the least effective instructional method. Table 6 provides a summary of perceived effectives for the 10 instructional methods by teacher career stage.

Table 6

Perceived Effectiveness of Instructional Methods by Career Stage (N = 109)

Instructional Method	Early (n = 30)		Middle (n = 36)		Late (n = 43)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Cooperative Learning	4.03	0.73	3.69	0.82	4.10	0.88
Demonstration	4.17	0.71	4.14	0.76	4.31	0.69
Discussion	3.75	0.65	3.67	0.69	3.82	0.79
Experiments	3.79	0.82	3.61	0.96	3.79	0.83
Field Trips	3.52	1.12	3.47	1.05	3.41	1.04
Guest Speakers	3.10	1.11	2.94	1.07	3.18	0.85
Independent Study	3.03	0.94	2.97	0.81	3.33	1.06
Lecture	3.31	0.60	3.17	0.88	3.26	1.04
Role Play	2.69	0.85	2.39	1.20	2.82	1.12
Supervised Study	3.38	1.01	3.28	0.81	3.67	0.93

Note. Scale: 1 = *Very Ineffective* to 5 = *Very Effective.*

Objective 5

The final objective of this study was to describe relationships between time spent using instructional methods, perceived confidence, and perceived effectiveness for each instructional method by career stage. Table 7 presents correlations between time spent using each instructional method and perceived confidence in using the methods by career stage. Correlations were negligible to substantial (Davis, 1971) for early and middle career teachers and negligible to moderate for late career teachers. Early career teachers had substantial correlations between perceived confidence and time spent using cooperative learning (r = .58) and supervised study (r = .55). Middle career teachers had substantial correlations between perceived confidence and time spent using experiments (r = .51) and cooperative learning (r = .50).

Table 7

Correlations Between Time Spent and Perceived Confidence of Methods (N = 109)

Instructional Method	Early (r)	Middle (r)	Late (r)
Cooperative Learning	.58	.50	.45
Demonstration	.29	.26	-.04

Discussion	.03	.48	.15
Experiments	.47	.51	.14
Field Trips	.42	.30	.25
Guest Speakers	.38	.01	.38
Independent Study	.25	.28	.45
Lecture	.42	.38	.10
Role Play	.38	.49	.28
Supervised Study	.55	.44	.37

Relationships between perceived effectiveness and time spent using each method revealed substantial correlations for early career teachers with supervised study (r = .65) and cooperative learning (r = .56). For middle career teachers, a substantial correlation was found for discussion (r = .64). All correlations for late career teachers we negligible to moderate. This information is summarized in Table 8.

Table 8

Correlations Between Time Spent and Perceived Effectiveness of Methods (N = 109)

Instructional Method	Early (r)	Middle (r)	Late (r)
Cooperative Learning	.56	.32	.48
Demonstration	.40	.25	.18
Discussion	.04	.64	.02
Experiments	.35	.37	.18
Field Trips	.27	.28	.25
Guest Speakers	.22	-.03	.26
Independent Study	.49	.26	.29
Lecture	.14	.46	.41
Role Play	-.12	.47	.31
Supervised Study	.65	.27	.40

Finally, correlations between perceived confidence and perceived effectiveness yielded moderate to very strong associations for all career stages and all instructional methods with the exception of role play (r = .23) for early career teachers and supervised study (r = .28) for middle career teachers. The strongest relationship between confidence and perceived effectiveness for early career teachers was with supervised study (r = .71), role play (r = .77) for middle career teachers, and guest speakers (r = .79) for late career teachers. Table 9 presents a complete summary of correlations between perceived confidence and effectiveness for each instructional method.

Table 9

Correlations Between Perceived Confidence and Effectiveness of Methods (N = 109)

Instructional Method	Early (r)	Middle (r)	Late (r)
Cooperative Learning	.45	.62	.69
Demonstration	.30	.56	.52
Discussion	.25	.69	.41
Experiments	.31	.46	.69
Field Trips	.34	.61	.78
Guest Speakers	.30	.64	.79
Independent Study	.30	.21	.62
Lecture	.44	.53	.37
Role Play	.23	.77	.67

Supervised Study	.71	.28	.53

Conclusions, Implications, and Recommendations

The purpose of this study was to describe instructional method practices, perceptions, and confidence of SBAE teachers in early, middle, and late career stages. Respondent group sizes were similar for each career stage and overall reported gender demographics indicated near equal amounts of male and female teachers, reflecting population demographics in Texas. Readers attempting to generalize the conclusions, implications, and recommendations below to SBAE teachers beyond those who responded in this study should use caution due to the relatively small sample size.

Objective 1

Data from the first objective described training received for using instructional methods by career stage. Training was reported more frequently for eight of the 10 instructional methods for early career teachers when compared to late career teachers. Although, middle and late career stage teachers are further removed from the original training in their teacher preparation program making it more difficult to remember if specific training was received. Over 90% of early and middle career teachers received training in cooperative learning, demonstration, discussion, and lecture however, participants consistently reported receiving training on field trips and role play less frequently compared to the other teaching methods in all three career stages. This finding aligns with results from the Voges et al. (2020) study, indicating it is a persisting phenomenon with this population.

Based on these findings, teacher preparation programs should continue providing instruction on a wide variety of teaching methods for preservice teachers, including field trips and role play. While we recognize the limited applications of these methods, they do provide benefits. For example, field trips allow students to observe and participate in real-world situations that are not possible at the school and can help students develop a better frame of reference for unfamiliar contexts, leading to a deeper understanding of concepts being studied (Newcomb et al., 2004). The use of role play has been recommended as useful for teaching concepts involving relationships and can be used to teach students how to interact with others, leadership skills, and basic sales abilities (Newcomb et al., 2004). Based on the findings from this study related to training deficits by career stage, teacher preparation programs should possibly offer refresher training for middle and late career teachers when possible.

Objective 2

For the second objective, instructional method use was described for each career stage. Teachers from each career stage in this sample reported using experiments, field trips, guest speakers, independent study, role play, and supervised study less than 10% of the time. This aligns with findings of previous studies on the same methods (Smith et al., 2015; Voges et al., 2020). Early career and late career teachers reported using cooperative learning for the greatest percentage of time while middle career teachers used lecture most often. This finding differs from those of previous studies where lecture was used most often, indicating teachers at different career stages may use instructional methods with differing frequencies (Colclasure et al., 2022; Smith et al., 2015). For all career stages, the use of role play was reported least often followed by either guest speakers or field trips highlighting the continued low use of these methods (Colclasure et al., 2022; Smith et al., 2015; Voges et al., 2020). Perhaps professional development on how to use these instructional methods for teachers in all career phases should be offered. This could be accomplished by modeling how to use each method at annual professional development events while highlighting the benefits of the methods. When providing professional development on instructional methods, consideration should be given to career stage (National Association of Agricultural Educators, 2016). For instance, if teachers from one career stage use a method more often than teachers in the other

career stages, maybe they could be selected to model the effective use of that method for the other career stages.

Objective 3

Findings on confidence in using instructional methods by career stage revealed middle career teachers in this sample were only more confident than early and later career teachers in their ability to use field trips, guest speakers, lecture, and role play. This differed from expectations based on previous self-efficacy studies related to career phases where mid-career teachers had higher self-efficacy than those in early and late career stages (Klassen & Chiu, 2010; Klassen & Chiu, 2011; McKim & Velez, 2015). Given this finding, self-efficacy in using certain instructional methods may peak at different times and is not necessarily related to age (Colclasure et al., 2022). The highest confidence reported was with late career teachers using demonstration while the second highest was also with demonstration but with early career teachers. Moderate to high confidence was reported for all instructional methods and by all career stages with the exception of role play where low confidence was reported for both early and late career teachers, aligning with findings of previous studies (Colclasure et al., 2022; Voges et al., 2020). To meet teachers where they are, we should refer to self-efficacy data to tailor professional development opportunities more effectively for teachers in each career stage. Teachers who are confident in their ability to use different instructional methods may serve as a good example to teachers within their own career stage for how to use them. Additionally, it may be beneficial to gather lesson ideas from teachers with high self-efficacy in each of the teaching methods to serve as a repository for others to use.

Objective 4

The fourth objective described perceived effectiveness of each instructional method by career stage. Teachers in this sample reported highest perceived effectiveness for demonstration and least for role play across all career stages, coinciding with previous findings (Colclasure et al., 2022; Voges et al., 2020). A finding of note was that late career teachers viewed all instructional methods as being more effective than their early and middle career counterparts with the exception of field trips and lecture. Middle career teachers reported the lowest perceived effectiveness scores for every method except field trips when compared to other career stages. The decrease in perceived effectiveness reported by middle career teachers seems to align with the characteristics of middle career teachers described by Huberman (1989) where teachers take stock and sometimes have self-doubt in their own work, although this is likely closely tied to their self-efficacy as reported in objective three.

Objective 5

With the final objective, correlations were used to describe relationships between time spent, confidence, and perceived effectiveness of each instructional method by career stage. When examining time spent and confidence in using each method, late career teachers in this sample had weaker correlations in seven of the ten instructional areas, indicating the two variables are not as strongly tied to each other during the late career stage. This would not be expected according to Schunk (1991) where higher self-efficacy beliefs can affect choice of task. Although, moderate correlations with time and confidence were generally observed for each instructional method for early and middle career SBAE teachers. While beyond the scope of this study, lower correlations between these variables may be a sign of disengagement described by Huberman (1989) for late career teachers.

Correlations between time spent using instructional methods and perceived effectiveness had mixed results based on career stage. Substantial correlations were found for early career teachers in using cooperative learning and supervised study, while middle career teachers had a substantial correlation for discussion. Generally, correlations were low to moderate between time spent using instructional methods

and their perceived effectiveness. While these variables were related for this sample, there does not appear to be any notable differences based on career stage.

When examining correlations between perceived confidence and effectiveness of instructional methods, over half the relationships were substantial or strongly associated, aligning with findings of Colclasure et al. (2022). Also, all but one of the substantial and strong associations were with middle and later career teachers. This may indicate that as teachers progress through their career, beliefs about each teaching methods become more solidified. This is supported by Huberman's (1989) model where stabilization occurs during the middle career stage. Associations between confidence and effectiveness were generally lower for early career teachers with the exception of supervised study. The supervised study instructional method is a hands-off approach and may be easier for early career teachers to use when they are focusing on survival. The positive relationship between perceived confidence and perceived effectiveness of instructional methods seems intuitive. If a teacher thinks they are confident in using a particular method, it is likely because they believe they can successfully deliver the lesson based on experience. While this study did not seek to establish cause and effect, perhaps encouraging teachers to try to use the less popular teaching methods more often would lead to greater self-efficacy and perceived effectiveness, especially if their teaching experiences were positive with these methods.

Recommendations for Further Research

A limitation of this study was the small sample size. Future studies should obtain a more generalizable sample and go a step further to identify predictors of instructional method use. Perceived effectiveness and confidence do not necessarily relate to the use of particular instructional methods as shown in the findings of this study. However, this relationship is reciprocal, and one variable does not necessarily cause the other (Bandura, 1997). Other variables are likely influencing the decision to use each instructional method. It also seems instructional method beliefs became more solidified with age. Given this information, future studies may identify ways to influence these beliefs in the early to middle career stages so that a wider variety of instructional methods is used more often. Finally, future studies should continue to identify the needs of SBAE teachers through the lens of career stage so teachers can be better supported over a full career.

Due to its unique content and context, agricultural education is ripe for using a wide range of instructional methods. We should continue to emphasize the importance of varying teaching methods so we may realize the benefits highlighted in the literature. This area of inquiry should continue to be explored through the lens of teacher career stages. Perhaps after further exploration, recommendations could be made to help teachers in each career stage feel more confident, improving their job satisfaction. There is also opportunity for collaboration across career stages, possibly leading to mentor-mentee relationships, further strengthening the collegiality of SBAE teachers across the profession.

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