

# Leadership Learning Opportunities in Agriculture, Food, and Natural Resources Education: The Role of the Teacher

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## Abstract

*Learning environments combining agriculture, food, natural resources, and leadership knowledge and skills are increasingly essential in preparing students for future success. School-based agricultural education offers a premier context in which to teach leadership within agriculture, food, and natural resources curriculum. However, providing students with learning experiences in agriculture, food, natural resources, and leadership requires willing and able teachers. In the current national study, the theory of planned behavior was operationalized to understand the role of school-based agriculture teachers in teaching leadership within agriculture, food, and natural resources curriculum. Teachers held a positive attitude toward the behavior, favorable subjective norms, confident perceptions of behavioral control, and knowledge of leadership. On average, school-based agricultural education teachers intended to teach leadership content in 28.49% of curriculum. Structural equation modeling was used to analyze a model of leadership teaching intentions in which attitude toward the behavior and subjective norms were statistically significant, positive predictors of intentions to teach leadership. Recommendations for research and application of findings are addressed.*

**Keywords:** leadership; attitude toward the behavior; subjective norms; perceived behavioral control; leadership knowledge; interdisciplinary teaching

## Introduction

Informing and improving educational practices requires considering the knowledge and skills students of today need to address the challenges of tomorrow. While the future is uncertain, two trends illuminate expectations and challenges in which current educational practices should be preparing students. First, workplaces are becoming increasingly team-based, transforming the required attributes of new employees from technical knowledge to a pairing of leadership skills (e.g., communication, collaboration, ethics) and technical knowledge (Bennis & Nanus, 1985; Hora, Benbow, & Oleson, 2015; Kagay, Marx, & Simonsen, 2015; Komives, Lucas, & McMahon, 2007; Kouzes & Posner, 2007; National Association of Colleges and Employers, 2014). Second, an increasingly complex network of ecological and social challenges (e.g., food security, climate change, land degradation, malnourishment, clean water access) require a society of individuals

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empowered to identify and implement sustainable solutions to increasingly wicked problems (Foley et al., 2011; International Assessment of Agricultural Knowledge, Science, and Technology for Development, 2009; West et al., 2014).

The ever-increasing demand for leadership skills in the workplace and in addressing wicked problems require transformed learning environments. More specifically, learning environments must provide interdisciplinary opportunities in which students can co-develop leadership and technical knowledge, especially in agriculture, food, and natural resources (AFNR; International Assessment of Agricultural Knowledge, Science, and Technology for Development, 2009). School-based agricultural education (SBAE) offers a premier context to engage students in co-developing AFNR and leadership knowledge (Connors & Swan, 2006; Morgan, Fuhrman, King, Flanders, & Rudd, 2013; Morgan & Rudd, 2006).

Realizing the potential for interdisciplinary AFNR and leadership learning within SBAE requires teachers willing and able to teach leadership within AFNR curriculum (McKim, Lambert, Sorensen, & Velez, 2015; McKim, Sorensen, & Velez, 2016; McKim & Velez, 2015; Morgan & Rudd, 2006). The role of SBAE teachers in offering leadership learning opportunities has been inadequately explored, with only one known study (i.e., Morgan & Rudd, 2006). The purpose of the current research was to expand existing understandings by modeling the intentions of SBAE teachers to teach leadership within AFNR using a combination of previously evaluated variables (i.e., attitude toward the behavior and leadership knowledge) as well as previously unevaluated variables (i.e., subjective norms and perceived behavioral control).

### **Theoretical Framework**

The theory of planned behavior (Ajzen, 1985, 2011) served as the framework for studying the intentions of SBAE teachers to teach leadership within AFNR curriculum. The theory of planned behavior was selected because it has risen to the top as one of the “most frequently cited and influential models for the prediction of human social behavior” (Ajzen, 2011, p. 1113). Included in the theory are three predictors of behavioral intentions: (a) attitude toward the behavior – operationalized as the negative or positive perceptions of the SBAE teacher toward teaching leadership in AFNR curriculum, (b) subjective norms – operationalized as the attitudes of external stakeholders (e.g., school administrators, community supporters) perceived by the SBAE teacher regarding teaching leadership in AFNR curriculum, and (c) perceived behavioral control – operationalized as the level of control the SBAE teacher perceives over the positive and/or negative factors which influence teaching leadership within AFNR curriculum (see Figure 1; Ajzen, 1985). As an operationalization of the theory of planned behavior, leadership knowledge was included as a potential predictor. The addition of leadership knowledge was informed by research detailing the importance of teacher knowledge in interdisciplinary teaching (Darling-Hammond & Bransford, 2005; Gattie & Wicklein, 2007; Johnson, 2013; Scales, Terry, & Torres, 2009; Wang, Moore, Roehrig, & Sun Park, 2011).

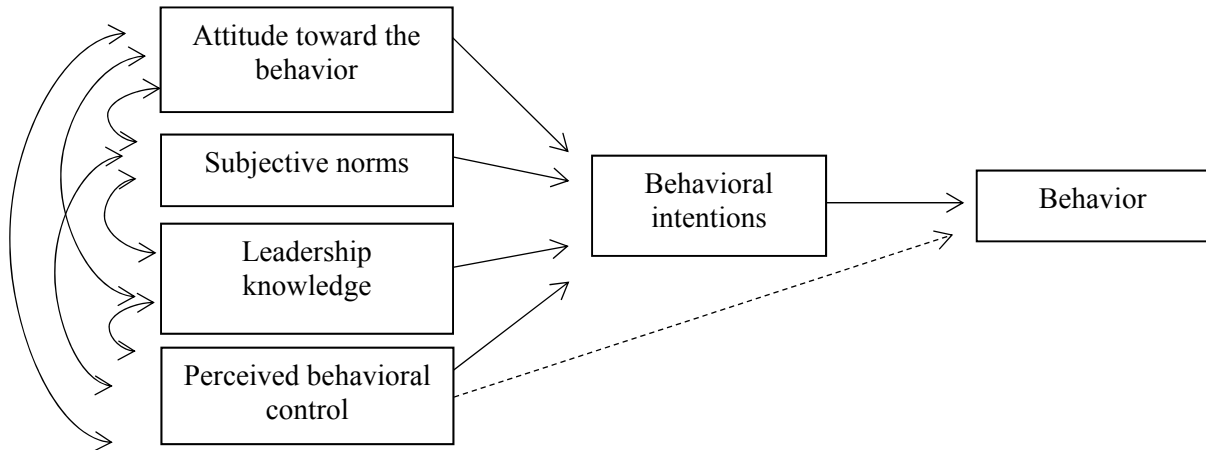


Figure 1. Model of the theory of planned behavior with the addition of leadership knowledge.

### Literature Review

In alignment with the theoretical framework, including the addition of leadership knowledge, the literature review details existing literature on the attitudes, subjective norms, knowledge, and perceived behavioral control of SBAE teachers toward teaching leadership within AFNR curriculum. Additionally, existing research on the intentions of SBAE teachers to teach leadership within AFNR curriculum was analyzed.

#### Attitude toward the Behavior

Within the theory of planned behavior, a more positive attitude toward the behavior is associated with stronger intentions to enact the behavior (Ajzen, 1985, 2001; Montano & Kasprzyk, 2006). Only one study in SBAE has evaluated the attitudes of teachers toward teaching leadership in AFNR curriculum. Morgan and Rudd (2006) found teachers averaged a 65 out of 72 on an attitudinal assessment of teaching leadership. The results provide evidence indicating SBAE teachers support teaching leadership. Additionally, the research completed by Morgan and Rudd found a significant, positive relationship between attitudes and leadership teaching behavior. The current study also evaluated attitude toward leadership as well as the relationship between attitudes and intentions to teach leadership within AFNR curriculum. However, the current study extends existing understanding by modeling intentions to teach leadership using attitudes in conjunction with subjective norms, perceived behavioral control, and leadership knowledge.

#### Subjective Norms

According to the theory of planned behavior, an individual with more positive subjective norms (i.e., perceives stakeholders support the behavior) will be more likely to enact the identified behavior (Ajzen, 1987; Ajzen & Sheikh, 2013). Unfortunately, in SBAE literature, the subjective norms of teachers regarding teaching leadership have not been explored. The current study sought to address the identified gap in the literature by describing the subjective norms of SBAE teachers regarding teaching leadership within AFNR curriculum. Furthermore, the current study analyzed the relationship between subjective norms and the intentions of SBAE teachers to teach leadership.

#### Perceived Behavioral Control

The theory of planned behavior posits a positive relationship between perceived behavioral control and behavioral intentions (Ajzen, 1985; Montano & Kasprzyk, 2006). For example, a SBAE teacher who perceives him or herself better able to control the internal and external factors associated with teaching leadership would be more likely to teach leadership within AFNR curriculum. SBAE research has not explicitly analyzed the behavior control perceived by teachers; however, leadership teaching self-efficacy has been analyzed. Self-efficacy is, in part, the ability an individual perceives in him or herself to overcome obstacles to accomplishing an identified behavior (Bandura, 1977), a similar construct to perceived behavioral control. Therefore, research detailing the leadership teaching self-efficacy of SBAE teachers offered insight into the perceived behavioral control of teachers. Research suggests SBAE teachers perceive high levels of leadership teaching self-efficacy (McKim et al., 2016; McKim & Velez, 2015). However, existing research is limited to one region, does not consider the relationship between self-efficacy and intentions to teach leadership, and has not explicitly measured perceived behavioral control. The current study sought to address the identified gaps in the literature by analyzing the perceived behavioral control of a national sample of SBAE teachers in addition to the relationship between perceived behavioral control and intentions to teach leadership.

### **Leadership Knowledge**

The theory of planned behavior provides a solid foundation for understanding human behavior; however, “the theory of planned behavior is, in principle, open to the inclusion of additional predictors” (Ajzen, 1991, p. 199). The current study combined the potential for additional predictors within the theory of planned behavior with research detailing the importance of teacher knowledge in incorporating external content (Darling-Hammond & Bransford, 2005; Gattie & Wicklein, 2007; Johnson, 2013; Scales et al., 2009; Wang et al., 2011) to justify the addition of leadership knowledge as a potential predictor of the intentions of SBAE teachers to teach leadership. Within SBAE research, only one identified study had evaluated leadership knowledge among teachers. Morgan and Rudd (2006) found teachers were knowledgeable about leadership, correctly answering an average of 90% of leadership knowledge questions. Additionally, Morgan and Rudd found a statistically insignificant, negative correlation between leadership knowledge and leadership teaching behaviors. The current study extends past research by modeling intentions to teach leadership using leadership knowledge in conjunction with attitudes, subjective norms, and perceived behavioral control.

### **Teaching Leadership within AFNR Curriculum**

The outcome of interest within the current study is the intentions of SBAE teachers to teach leadership. Importantly, past research notes leadership learning within SBAE is not limited to classroom courses, highlighting Supervised Agricultural Experiences (SAE) and FFA (i.e., student leadership organization associated with SBAE) as critical contexts to engage students in leadership (Hillison & Bryant, 2001; Hoover, Scholl, Dunigan, & Mamontova, 2007; Morgan et al., 2013; Morgan & Rudd, 2006). Historically, FFA experiences have received the most attention regarding leadership learning in SBAE (Morgan & Rudd, 2006). In fact, a variety of FFA experiences (e.g., public speaking events, judging contests, chapter banquets, leadership camps, parliamentary procedure contests) have been noted as developing leadership skills (Connors, 2013; Connors, Falk, & Epps, 2010; Connors & Velez, 2008; Hughes & Barrick, 1993; Morgan & Rudd, 2006). Furthermore, research suggests FFA involvement is associated with increased leadership competencies, life skill development, and transformational leadership skills (Dormody & Seever, 1995; Ricketts & Newcomb, 1984; Rosch, Simonsen, & Velez, 2015; Rutherford, Townsend, Briers, Cummins, & Conrad, 2002; Townsend & Carter, 1983; Wingenbach, 1995; Wingenbach & Kahler, 1997).

The volume of literature evaluating leadership learning within SBAE decreases when looking at classroom courses and SAE. Only one identified study, Morgan and Rudd (2006), detailed the scope of leadership taught across SBAE teachers, finding a large majority (i.e., 92%) of teachers taught leadership principles; however, research has not addressed leadership teaching variations across specific courses, FFA, or SAE. Realizing the potential for SBAE to engage students in AFNR and leadership learning requires foundational research into the amount of leadership intended across curricular experiences. The current study sought to address the identified need for research by evaluating the intentions of SBAE teachers to teach leadership within a range of courses as well as FFA and SAE experiences.

Existing literature highlights an opportunity to expand current understanding via a comprehensive model of the intentions of SBAE teachers to teach leadership. Furthermore, past research highlights gaps in understanding the social norms, perceived behavioral control, and level of leadership intended across the complete spectrum of SBAE curriculum. In the current study, identified gaps were addressed by modeling the intentions of SBAE teachers to teach leadership within a range of curricular experiences. Furthermore, modeling intentions to teach leadership provides valuable insights into the strengths and opportunities for growth to support interdisciplinary learning of AFNR and leadership within SBAE.

### **Purpose and Research Objectives**

The purpose of the current study was to model the intentions of SBAE teachers to teach leadership within AFNR curriculum. Operationalization of the theory of planned behavior elucidated three research objectives to guide the development and execution of the current study: (1) describe the attitudes, subjective norms, perceived behavioral control, and leadership knowledge of SBAE teachers, (2) describe the leadership teaching intentions of SBAE teachers, and (3) model the intentions of SBAE teachers to teach leadership within AFNR curriculum.

### **Methods**

The current study used survey methodology, which permitted collection from a large, national sample of SBAE teachers in a timely and inexpensive fashion (Ary, Jacobs, Razavieh, & Sorensen, 2006). Data collected via surveys were used to accomplish the identified research objectives.

### **Population, Sample, and Data Collection**

The target population included all SBAE teachers in the United States during the 2015-2016 school year. Requirements of structural equation modeling, the statistical analysis for research objective three, were used to identify an appropriate sample size. Kline (2005) suggested a 5:1 respondent to parameter ratio for structural equation modeling. In the current study, the structural model included 32 parameters (i.e., 10 factor loadings, four latent variance estimates, four interfactor covariances, and 14 error variances); therefore, the number of respondents needed to exceed 160 (Kline, 2005). A simple random sample of 950 SBAE teachers was received from the National FFA Organization, ensuring a 20% response rate would achieve the minimum number of responses (Kline, 2005; MacCallum, Browne, & Sugawara, 1996).

Data were collected using Dillman's (2007) tailored design method from November 2015 to December 2015. Due to frame error, the list of potential respondents was reduced from 950 to 828. A total of 212 useable responses were received for a 25.60% response rate ( $n = 212$ ). Per methods described by Lindner, Murphy, and Briers (2001), late responders ( $n = 44$ ) were compared

to on-time respondents ( $n = 168$ ) in the variables of interest. Analyses revealed no statistically significant differences (i.e.,  $p$ -values  $> .05$ ) between on-time and late responders; therefore, no evidence of non-response bias was found (Lindner et al., 2001; Miller & Smith, 1983).

### **Instrumentation**

The survey used in the current study included five constructs (i.e., attitude toward the behavior, subjective norms, perceived behavioral control, leadership knowledge, and intentions to teach leadership). Attitude toward the behavior included four questions (e.g., “as an agriculture teacher, I enjoy integrating leadership content in the curriculum I teach”), modified from Davis, Ajzen, Saunders, and Williams (2002). Subjective norms were measured using three questions (e.g., “stakeholders to my agriculture program support the integration of leadership content in my agriculture curriculum”), adapted from Cheon, Lee, Crooks, and Song (2012). Perceived behavioral control included four questions (e.g., “I have complete control over the level at which I integrate leadership content in my agriculture curriculum”) also adapted from Cheon et al. (2012). Attitude toward the behavior, subjective norms, and perceived behavioral control items were measured on six-point scales ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Leadership knowledge was measured using self-reported methods. Leadership knowledge included three elements of leadership (i.e., leadership styles, creating a vision, and conflict management; Northouse, 2012). Respondents indicated knowledge of the three items using a four-point scale ranging from 1 (*not knowledgeable*) to 4 (*very knowledgeable*), a method modeled after research from Diamond, Maerten-Rivera, Rohrer, and Lee (2013).

The outcome variable (i.e., intentions to teach leadership in AFNR curriculum) was measured using a researcher developed construct. First, courses familiar to respondents were identified by teachers indicating courses previously taught, currently teaching, or courses respondents planned to teach. Only courses respondents had taught, were teaching, or planned to teach were used to calculate leadership teaching intentions. Leadership teaching intentions were measured by respondents identifying the percentage of curriculum in which leadership content would be taught (e.g., “in what percentage of Agribusiness Systems curriculum would you plan to include leadership content?”). Additionally, all respondents were asked to report the percentage of leadership content intended for FFA and SAE, as all respondents were assumed to be familiar with FFA and SAE. Intentions to teach leadership within AFNR was calculated as the mean intended percentage of leadership content across curricular offerings.

### **Validity and Reliability**

Face and content validity were established by a panel of experts, which included faculty in SBAE, leadership education, science education, and math education. Feedback from the panel of experts was utilized throughout the development and refinement of the research instrument. Additionally, a pilot test of the identified constructs was completed using student teachers from Oregon State University and Utah State University. Due to traditionally low reliabilities found among theory of planned behavior constructs (Ajzen, 2011), a comparatively low Cronbach’s alpha (i.e., 0.60) was selected *a priori* (Creswell, 2008; Robinson, Shaver, & Wrightsman, 1991). Pilot test results showed attitude toward the behavior (i.e., Cronbach’s alpha = 0.89), subjective norms (i.e., Cronbach’s alpha = 0.87), and leadership knowledge (i.e., Cronbach’s alpha = 0.93) met the established threshold for reliability estimation. However, perceived behavioral control (i.e., Cronbach’s alpha = 0.46) did not. Consultation with the panel of experts suggested variance among student teachers (e.g., differing student teaching timeline, variable university expectations, unique curricular control exerted by cooperating teacher) negatively influenced the reliability estimate. Therefore, perceived behavioral control was used as constructed among the population of interest.

Post-hoc estimates (i.e., Cronbach's alpha = 0.77) indicated the perceived behavioral control construct was reliable among the population of interest. Additionally, confirmatory factor analysis, completed during structural equation modeling, provided additional support for use of the perceived behavioral control construct.

### Data Assumptions and Analysis

Evaluating the assumptions of structural equation modeling (i.e., multivariate normality, absence of outliers, linearity, absence of multicollinearity, and complete data) revealed attitude toward the behavior was skewed left and leptokurtic (Kline, 2005). Therefore, a robust structural equation modeling procedure (i.e., asymptotically distribution free) was utilized (Bentler & Yuan, 1999). Additionally, intentions to teach leadership within AFNR contained statistical outliers, which were replaced by the value of the most extreme response, not identified as an outlier (Guttman & Smith, 1969; Moyer & Geissler, 1991). Research objectives one and two were accomplished using means and standard deviations. Research objective three was accomplished using structural equation modeling.

Structural equation modeling requires three stages: (a) model identification, (b) model estimation, and (c) model evaluation. Model identification ensures the number of distinct elements exceeds the number of estimated parameters within the model (Ullman, 2013). Distinct elements are determined by calculating  $p[p + 1]/2$ , where  $p$  is the number of measured variables. Fifteen measured variables were included in the model (i.e., four items measuring attitude toward the behavior, three items measuring subjective norms, four items measuring perceived behavioral control, three items measuring leadership knowledge, and one item measuring intentions to teach leadership). Thus, the model contained 120 distinct elements, which exceeded the 32 parameters (i.e., the model was overidentified), a requirement for structural equation modeling (Bowen & Guo, 2012; Ullman, 2013).

Model estimation entails comparing the covariance matrixes implied within the conceptual framework to the population covariance matrixes estimated by collected data (Bowen & Guo, 2012). The comparison was completed using chi-squared analysis, with an appropriately estimated model being statistically similar (i.e.,  $p$ -value > .05) to the conceptual framework (Bowen & Guo, 2012; Byrne, 2010; Ullman, 2013). Due to the non-normality of attitude toward the behavior, an Asymptotically Free Distribution technique was used for model estimation (Bentler & Yuan, 1999).

Model evaluation, the final step in structural equation modeling analysis, gauges how well the estimated model fits the conceptual framework (Ullman, 2013). In the current study, confirmatory fit index (CFI; Bentler & Yuan, 1999) and root mean square error of approximation (RMSEA; Ullman, 2013) were used to analyze model fit. Acceptable fit for CFI was indicated by values exceeding .90 (Blunch, 2013; Hooper, Coughlan, & Mullen, 2008; Hu & Bentler, 1999) and values below .08 for RMSEA (Blunch, 2013; Hooper et al., 2008).

### Findings

Prior to reviewing the research objectives, a brief summary of respondents is provided to offer background and context to readers. Respondents included 52.70% ( $f = 106$ ) males and 47.30% ( $f = 95$ ) females ranging from 22 to 70 years old with an average age of 39.21. SBAE teachers from 40 states and Puerto Rico responded to the survey. Just over half the respondents (50.70%;  $f = 102$ ) held a Master's degree at the time of data collection, with remaining teachers indicating Bachelor's degrees (27.40%;  $f = 55$ ), some graduate work (18.40%;  $f = 18.40\%$ ), or a Ph.D. (2.50%;  $f = 5$ ).

Research objective one sought to describe the attitudes, subjective norms, perceived behavioral control, and leadership knowledge of responding SBAE teachers (see Table 1). Overall, respondents reported positive attitudes toward teaching leadership ( $M = 5.60$ ;  $SD = 0.65$ ), favorable subjective norms ( $M = 5.19$ ;  $SD = 0.82$ ), high perceived control teaching leadership ( $M = 5.03$ ;  $SD = 0.77$ ), and knowledge of leadership ( $M = 3.23$ ;  $SD = 0.65$ ).

Table 1

*Attitudes, Subjective Norms, Perceived Behavioral Control, and Leadership Knowledge of Respondents*

	Minimum	Maximum	<i>M</i>	<i>SD</i>
Attitude toward the Behavior	1.00	6.00	5.60	0.65
Subjective Norms	1.00	6.00	5.19	0.82
Perceived behavioral control	1.00	6.00	5.03	0.77
Leadership Knowledge	1.00	4.00	3.23	0.65

*Note.* Items measuring attitude toward the behavior, subjective norms, and perceived behavioral control were scaled from 1 (*strongly disagree*) to 6 (*strongly agree*). Items measuring leadership knowledge were scaled from 1 (*not knowledgeable*) to 4 (*very knowledgeable*).

Research objective two sought to describe the intentions of SBAE teachers to teach leadership within AFNR curriculum (see Table 2). Respondents indicated intentions to teach leadership in an average of just over one quarter of AFNR curriculum ( $M = 28.49\%$ ;  $SD = 14.03\%$ ). The two curricular opportunities typically occurring outside classroom coursework (i.e., SAE and FFA) contained the highest leadership teaching intentions (FFA:  $M = 65.40\%$ ,  $SD = 27.60\%$ ; SAE:  $M = 37.54\%$ ,  $SD = 23.68\%$ ). Within traditional classroom subjects, General Agriculture ( $M = 27.25\%$ ;  $SD = 16.62\%$ ) had the highest amount of leadership teaching intentions while Food Products and Processing Systems ( $M = 15.25\%$ ;  $SD = 9.86\%$ ) had the lowest. Furthermore, teachers intended to teach leadership in less than 20% of the curriculum for seven of the eleven curricular offerings (i.e., Environmental Service Systems  $M = 17.35\%$ ;  $SD = 15.58\%$ ; Plant Systems  $M = 16.78\%$ ;  $SD = 13.79\%$ ; Animal Systems  $M = 16.70\%$ ;  $SD = 12.20\%$ ; Natural Resources Systems  $M = 16.52\%$ ;  $SD = 11.31\%$ ; Power, Structure, and Technology  $M = 16.00\%$ ;  $SD = 13.55\%$ ; Biotechnology Systems  $M = 15.72\%$ ;  $SD = 11.32\%$ ; and Food Products and Processing Systems  $M = 15.25\%$ ;  $SD = 9.86\%$ ).



Table 2

*Intentions to Teach Leadership in AFNR Curriculum*

	<i>f</i>	Minimum	Maximum	<i>M</i>	<i>SD</i>
FFA	198	0.00	100.00	65.40	27.60
SAE: Supervised Agricultural Experience	197	0.00	100.00	37.54	23.68
General Agriculture	191	0.00	100.00	27.25	16.62
Agribusiness Systems	139	0.00	100.00	26.78	18.51
Environmental Service Systems	97	0.00	75.00	17.35	15.58
Plant Systems	165	0.00	100.00	16.78	13.79
Animal Systems	178	0.00	100.00	16.70	12.20
Natural Resource Systems	137	0.00	75.00	16.52	11.31
Power, Structure, and Technology Systems	143	0.00	100.00	16.00	13.55
Biotechnology Systems	83	0.00	75.00	15.72	11.32
Food Products and Processing Systems	92	0.00	50.00	15.25	9.86
Total	212	4.00	81.25	28.49	14.03

*Note.* Respondents were asked to report the percentage of leadership content intended for courses previously taught, currently teaching, and/or courses respondents planned to teach. Intentions to teach leadership were defined for respondents as “the purposeful inclusion of grade appropriate leadership (e.g., conflict management, citizenship, and team leadership) concepts and/or practices in the agricultural curriculum you teach.”

Research objective three sought to model the intentions of SBAE teachers to teach leadership in AFNR curriculum (see Table 3). Confirmatory factor analysis yielded statistically significant individual factor loadings ranging from .47 to .96, providing evidence of sound construct measurement. Additionally, the observed model (i.e., collected data) was statistically similar to the hypothetical model suggested within the conceptual framework ( $\chi^2 = 91.26$ ,  $df = 72$ ,  $p$ -value = .062), a requirement for model estimation. Additionally, fit indices (CFI = .96; RMSEA = .04) indicated the final model met the criterion for model evaluation (Blunch, 2013; Hooper et al., 2008; Hu & Bentler, 1999).

Table 3

*Model of Leadership Teaching Intentions in AFNR*

	Dependent variable: Leadership Teaching Intentions					
	Zero-order correlation (r)	p-value	B	SEB	$\gamma$	p-value
Attitude toward the Behavior	.114	.098	4.10	1.56	.16	.009
Subjective Norms	.114	.102	3.09	1.17	.14	.009
Perceived behavioral control	.115	.102	4.71	2.81	.17	.094
Leadership Knowledge	.153	.031	-2.13	2.50	-.08	.395

*Note.* Based on Asymptotically Distribution-Free Estimates;  $\chi^2 = 91.26$  (df = 72)  $p$ -value = .062;  $R^2 = .11$ ; CFI = .96; RMSEA = .04.

In combination, the four predictors accounted for 11% of the variance in intentions to teach leadership ( $R^2 = .11$ ). Two predictors, attitude toward the behavior ( $\gamma = .16$ ,  $p$ -value = .009) and subjective norms ( $\gamma = .14$ ,  $p$ -value = .009), were statistically significant, positive predictors of intentions to teach leadership in AFNR. Alternatively, perceived behavioral control ( $\gamma = .17$ ,  $p$ -value = .094) and leadership knowledge ( $\gamma = -.08$ ,  $p$ -value = .395) were statistically insignificant predictors of the intentions of SBAE teachers to teach leadership in AFNR curriculum

### Conclusions, Implications, and Recommendations

The purpose of the current study was to model the intentions of SBAE teachers to teach leadership within AFNR curriculum. Using data collected from a national sample of SBAE teachers, analyzed in part by structural equation modeling, the identified objectives were completed. In the following discussion, salient implications and recommendations are explored which emerged from the findings of the completed objectives.

SBAE teachers held positive attitudes, favorable subjective norms, confident perceptions of behavioral control, and knowledge of leadership. Positive attitudes toward leadership teaching within AFNR as well as high perceived knowledge of leadership are consistent with existing research in SBAE (Morgan & Rudd, 2006). Furthermore, confident perceptions of behavioral control align with research illustrating SBAE teachers possess high leadership teaching self-efficacy (McKim et al., 2016; McKim & Velez, 2015). Additionally, finding teachers possess favorable subjective norms adds to existing literature on leadership teaching within AFNR. In total, the consistent support for leadership teaching was promising considering the positive relationships between identified behavioral predictors and behavioral intentions described within the theory of planned behavior (Ajzen, 1985, 2011). Furthermore, findings outline a foundation of support in which to continue building SBAE into an exemplar for interdisciplinary leadership teaching and learning at the secondary school level.

In addition to predictors within the model, findings identified the intentions of SBAE teachers to teach leadership within AFNR curriculum. Intentions to teach leadership were highest in FFA, in which respondents intended to teach leadership in over 65% of FFA experiences. While past research supports FFA as the primary context for leadership learning within SBAE (Kagay et

al., 2015; Morgan et al., 2013), the extent of FFA curricula in which teachers intended leadership concepts be taught was previously unknown. Additionally, SBAE literature had not explored the scope of leadership teaching within curricular experiences outside FFA. Findings illuminate leadership teaching intentions appear stronger in foundational AFNR courses (i.e., General Agriculture) as opposed to specialized agricultural courses (i.e., Food Products and Processing Systems, Biotechnology Systems), indicating an opportunity to increase leadership teaching intentions within specialized, typically advanced, SBAE courses.

Leadership learning is not only valuable in foundational AFNR courses and FFA; in fact, one could argue advanced SBAE courses should balance both technical and leadership content to reflect the same balance needed within professional settings (Bennis & Nanus, 1985; Hora et al., 2015; Kagay et al., 2015; Komives et al., 2007; Kouzes & Posner, 2007; National Association of Colleges and Employers, 2014). To illuminate a path to enhance the leadership teaching intentions of SBAE teachers across curricular areas, research is recommended exploring how SBAE teachers are currently teaching leadership within AFNR curriculum. Research exploring current practices can provide insight into how teachers conceptualize leadership learning in SBAE, develop a foundation to evaluate the efficacy of leadership teaching in SBAE, as well as provide a template of best practices for teaching leadership across experiences in SBAE.

In the final research objective, the intentions of SBAE teachers to teach leadership within AFNR curriculum were modeled. Statistically significant findings indicated a one unit increase in attitude was related to an average increase of 4.10% leadership content intended across curricular experiences. The positive relationship between attitude and leadership teaching is consistent with past research (Morgan & Rudd, 2006). From a teacher education standpoint, the positive relationship between attitude and leadership teaching intentions suggests teacher educators should seek to improve the attitudes of SBAE teachers regarding teaching leadership content. Increasing awareness of the critical role leadership learning will play in developing successful professionals and sustainable problem solvers (Bennis & Nanus, 1985; Hora et al., 2015; Kagay et al., 2015; Komives et al., 2007; Kouzes & Posner, 2007; National Association of Colleges and Employers, 2014) may serve as a practical approach to increasing the attitudes of SBAE teachers toward teaching leadership within AFNR.

In addition to attitude, statistically significant findings indicated a one unit increase in subjective norms was related to an average increase of 3.09% leadership content intended across curricular experiences. Previously unexplored, the significant, positive relationship between subjective norms and intentions to teach leadership within AFNR offers a new avenue to enhance interdisciplinary leadership learning in SBAE. Importantly, the question arises of how to increase the subjective norms of SBAE teachers. The theory of planned behavior offers guidance for variables influential to subjective norms. Specifically, subjective norms are comprised of three normative beliefs: (a) the external individual from whom the social pressure is being perceived, (b) whether the external individual supports or does not support the behavior, and (c) the motivation of the actor to comply with the external individual (Ajzen, 1985). The statistically significant relationship between subjective norms and intentions to teach leadership justifies more in-depth research into normative beliefs. Furthermore, research evaluating normative beliefs may illuminate salient stakeholders to focus marketing and educational efforts to increase the support for leadership teaching within AFNR curriculum.

The two statistically significant predictors of intentions to teach leadership within AFNR curriculum (i.e., attitude toward the behavior and subjective norms) provide guidance into future research and practice to support student learning of leadership and AFNR. However, the two statistically insignificant predictors are also worth discussing from a theoretical and practical

perspective. Perceived behavioral control was a statistically insignificant, positive predictor of intentions to teach leadership. While not meeting the threshold for statistical significance, the estimate of the unstandardized beta indicated a one unit increase in perceived behavioral control was related to an average increase of 4.71% leadership content across curricular experiences. The positive relationship between perceived behavioral control and intentions to teach leadership supports hypothesized relationships within the theory of planned behavior (Ajzen, 1985; 2011). Additionally, the increase in intentions to teach leadership associated with perceived behavioral control exceeded the increase estimated for attitudes and subjective norms, hinting toward the practical significance of perceived behavioral control. Importantly, the theory of planned behavior informs efforts to enhance perceived behavioral control, which should minimize barriers perceived to an identified action (Ajzen, 1987). Therefore, foundational research is needed to identify barriers perceived to teaching leadership among SBAE teachers.

In addition to perceived behavioral control, leadership knowledge was identified as a statistically insignificant predictor of intentions to teach leadership. However, leadership knowledge was estimated as a negative predictor. Specifically, findings suggest a one unit increase in self-reported leadership knowledge was related to an average *decrease* of 2.13% leadership content across curricular offerings. The unique relationship between knowledge and leadership teaching is consistent with past research, also finding a statistically insignificant, negative relationship between knowledge and leadership teaching (Morgan & Rudd, 2006). The lack of statistical significance limits generalizability; however, the consistent negative relationship between leadership knowledge and leadership teaching warrants deeper analysis, using qualitative methods, into how teachers manifest knowledge of leadership within AFNR curriculum.

The success of students tomorrow depends, in part, on the curricular choices of teachers today. Success is increasingly reliant on a combination of leadership and technical knowledge and skills, especially in AFNR. In the current study, the curricular intentions of SBAE teachers were modeled using a national sample of teachers. Readers are encouraged to implement the recommendations for research and practice to empower current and future SBAE teachers to create more interdisciplinary leadership learning opportunities for students.

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