

A Description of the Professional Identities of Arkansas Agriculture Teachers

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Abstract

After decades of research in agricultural education on teacher knowledge, needs, behaviors, satisfaction, and attrition, calls for additional research and reform have remained fairly consistent. One potential factor influencing the rate at which these challenges are overcome is teacher professional identity, which shapes how teachers interpret and respond to knowledge delivered through professional development. Shoulders and Myers (2011) suggested the unique circumstances of agricultural education lead teachers to maintain a professional identity different than that of other educators, but little research has been conducted with regard to the professional identities of agriculture teachers. Using the theories of constructivism and planned behavior, this study utilized a researcher-adapted survey to describe the professional identities of Arkansas agriculture teachers. Findings indicated teachers identified as agriculture teachers more so than agriculturalists or educators, the professional identity of the agricultural educator was significantly different than that of the educator or the agriculturalist, and length of teaching experience was not related to professional identity score. We recommend teacher educators include the development of professional identity as a component of all professional development experiences. Recommendations for further research include qualitative investigation into the ways in which agriculture teachers' professional identities manifest in the agriculture program.

Keywords: professional identity, agriculture teachers, professional development

Introduction

Just as is the case within any profession, continuous improvement is a common thread among all those working within agricultural education. Agriculture teachers work to improve their knowledge in subject matter expertise and pedagogical content in an effort to improve student success (Barrick & Garton, 2010; National Research Council, 2010; Rice & Kitchel, 2017). Administrators offer opportunities and resources for agriculture teachers to attend professional development events and foster collaborations that can help them gain the tools needed to positively impact student learning while maintaining successful careers (Anderson, Barrick, & Hughes, 1992). Agricultural educators within postsecondary institutions frequently create professional development events and examine methods through which they can maximize the impact these events can have on teachers' behaviors in the classroom (Anderson et al., 1992). However, after decades of research on teacher knowledge, needs, behaviors, satisfaction, and attrition, calls for additional research and reform have remained fairly consistent. The profession has been facing a shortage of qualified teachers since the 1960s (Camp, 2000), with the most recent supply and demand report stating a national shortage leading to 769.5 open agricultural education teaching positions (Smith, Lawver, & Foster, 2017). The integration of science, technology, engineering, and math (STEM) into agriculture classes was announced as a high priority by the National Research Council in 1998, and continued to receive print space within the American Association

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for Agricultural Education's National Research Agenda for 2016 through 2020 within its priority for efficient and effective agricultural education programs (Thoron, Myers, & Barrick, 2016). Research on teaching methods, such as inquiry based instruction (Blythe, DiBenedetto, & Myers, 2015; Myers, Thoron, & Thompson, 2009; Parr & Edwards, 2004), and on professional development opportunities, such as the National Agriscience Teacher Ambassadors Academy (Blythe et al., 2015; Myers et al., 2009) and CASE (Ulmer, Velez, Lambert, Thompson, Burris, & Witt, 2013; Witt, Ulmer, Brashears, & Burley, 2014), have continued as the call for STEM integration has been echoed by researchers and educators throughout the decades. The collective voice appears to put forth one resounding message: we are improving, but there is more to be done.

Professional development opportunities are offered by individual K-12 school districts, university agricultural educators and scientists, professional organizations, and technical specialists within agricultural companies. These events can focus on technical content or pedagogical content, all with the common goal of improving the teaching and learning occurring within K-12 agriculture classrooms. While not all professional development events are created to intentionally align with data-supported professional development characteristics, theories are available to assist deliverers in ensuring the impact of their event.

Richardson (1996) noted that effective constructivist professional development programs include the following six characteristics:

1. The participating teachers' beliefs and understandings are a major element of the content of the staff development process.
2. The goal of the process is not to introduce a specific method or curriculum to be implemented by the teachers. Instead the goal is to facilitate conversations that allow the participants to understand their own beliefs and practices, consider alternatives, and experiment with new beliefs and practices.
3. Conversations about beliefs and practices are brought together with considerations of the moral dimensions of teaching and schooling.
4. During the course of the process, the discussions among staff developer and teachers move away from the domination by the staff developer toward teacher control of the agenda, process, and content.
5. The staff developer is knowledgeable about the current research and practice; however, he or she is not seen as the only "expert". A collaborative process is facilitated that allows the teachers to recognize and value their own expertise.
6. The staff development process is long term, and it is expected that teachers change at very different rates. (p. 113)

Congruently, Desimone (2011) stated research supports the five following characteristics as necessary for effective professional development:

1. Content focus: Professional development activities should focus on subject matter content and how students learn that content.
2. Active learning: Teachers should have opportunities to get involved, such as observing and receiving feedback, analyzing student work, or making presentations, as opposed to passively sitting through lectures.
3. Coherence: What teachers learn in any professional development activity should be consistent with other professional development, with their knowledge and beliefs, and with school, district, and state reforms and policies.
4. Duration: Professional development activities should be spread over a semester and should include 20 hours or more of contact time.

5. Collective participation: Groups of teachers from the same grade, subject, or school should participate in professional development activities together to build an interactive learning community. (p. 69)

Within both of these lists is the notion that the teacher's previous beliefs and values are taken into consideration within the professional development. Beliefs and values, along with individual and social factors such as background characteristics and socially established attitudes in specific contexts, make up one's professional identity (Simonneaus, 2000). It is through their professional identity that teachers interpret and decide how to act upon knowledge learned in professional development (Desimone, 2011). Shoulders and Myers (2011) suggested the unique circumstances of agricultural education lead teachers to maintain a professional identity different than that of other educators. Because professional identity is displayed within social contexts pertaining to the profession, it can influence teachers' receptiveness to and motivation to adopt behaviors promoted within professional development (Desimone, 2011; Shoulders & Myers, 2011). Therefore, the professional identity of agriculture teachers could interact with their professional development experiences, particularly within Desimone's (2011) listed realms of coherence and collective participation. Shoulders and Myers (2011) identified agriculture teacher professional identity as "an unexplored area that holds potential solutions to increasing changes in teacher behavior" (p. 106), and recommended researchers investigate the role professional identity plays within agricultural education and teacher professional development. This study responds to their call by examining the professional identities of agriculture teachers in Arkansas.

Theoretical and Conceptual Frameworks

This study was guided by the theories of constructivism and planned behavior (Ajzen, 1991). Constructivism is founded on the premise that knowledge is developed alongside experience, and the two cannot be separated (Keiny, 1994). Because knowledge is only known through experience, teachers in professional development knit an unending tapestry of understanding that combines their previous experiences and knowledge with the information delivered through the current professional development.

Within the theory of planned behavior, the constructivist notion of knowledge development is woven within an individual's attitude toward a behavior, the subjective norm regarding the behavior, and the individual's perceived control over the behavior. A teachers' attitude toward a behavior is influenced by his or her previous knowledge and experience, combined with the shared knowledge developed through social experiences (including previous professional development) (Doolittle & Camp, 1999). Professional identities are created through these social experiences, and are therefore also displayed in the settings shared by these individuals (Shoulders & Myers, 2011). This study was guided by the notion that professional identities influence the professional development experiences of teachers, thereby impacting their behavioral intentions.

Teachers make professional decisions, such as those within instruction, classroom management, and teacher collaboration, through the identity that they develop within the social and internal contexts of their discipline, school, and background characteristics (Peressini, Borko, Romagnano, Knuth, & Willis, 2004; Simonneaus, 2000). Established features of professional identity include the following:

1. Professional identity is an ongoing process of interpretation and re-interpretation of experiences;
2. Professional identity implies both person and context. A teacher's professional identity is not entirely unique.

3. A teacher's professional identity consists of sub-identities that more or less harmonize. The notion of sub-identities relates to teachers' different contexts and relationships. The more central a sub-identity is, the more costly it is to change or lose that identity.
4. Agency is an important element of professional identity, meaning that teachers have to be active in the process of professional development. (Beijaard, Meijer, & Verloop, 2004, p. 122)

Shoulders and Myers (2011) compiled research identifying several characteristics of agriculture teachers that could cause them to develop a professional identity different than that of other teachers, leading them to experience professional development differently as well. They noted that agriculture teachers often enter the profession out of a love for and previous experience within the agriculture industry, whereas other teachers enter the profession with little experience within an industry directly related to their discipline. The traditionally male-dominated nature of agricultural education can also cause separation between the professional identity of agriculture teachers and other teachers, as other educational contexts have employed female teachers more frequently. Also potentially contributing to a unique professional identity among agriculture teachers are the conflict between previously developed core sub-identities related to production-oriented agriculture challenged by educational reform focused on STEM integration and modern agriculture. Differences in teaching methods and agricultural education's unique pride in delivering "hands on learning" and rooted societal beliefs about the values and practices of the agricultural education program can also further the divide between the identities of agriculture teachers and other teachers (Shoulders & Myers, 2011).

While professional identity has remained a little-explored topic within agricultural education, researchers have focused on teacher professional identity within other contexts. Conducting a qualitative analysis of student teacher portfolios, Antonek, McCormick, and Donato (1997) found that the reflection occurring through the portfolio guided the development of two foreign language preservice teachers' professional identities. In 1994, Goodson and Cole analyzed the life history interviews of seven teachers, concluding that teachers' development of professional identity depends on their notions of the professional community in which they work, and therefore, institutions should facilitate teachers' personal and professional development. Beijaard, Verloop, and Vermunt (2000) administered a survey to 80 secondary school teachers to describe teachers' perceptions of how their professional identities are formed. They concluded that teachers perceive their professional identities differently from one another based on the discipline in which they taught, teachers' professional identities had changed from when they were beginning teachers, and professional identity changes were dependent on the subject area in which the teachers were employed. Supporting Desimone's (2011) and Richardson's (1996) recommendations, Pennington and Richards (2016) concluded language teacher education should address teacher identity to guide language educators in the development of their professional identities as they construct knowledge to ensure the two are congruent with one another.

The established differences between agriculture teachers and teachers of other subjects led to Shoulders and Myers' (2011) call for research investigating agriculture teachers' professional identities. Professional development is viewed through the identities of teachers, and these events are frequently delivered to groups of teachers representing a variety of disciplines. Knowledge regarding the professional identity of agriculture teachers, and how it may differ from those of other teachers, could provide professional development deliverers information necessary to maximize behavioral change following professional development, allowing these efforts to lead to greater impact on long-standing calls for educational change.

Purpose and Objectives

The purpose of this study was to determine the professional identities of Arkansas agriculture teachers. To meet this purpose, the following objectives were created:

1. to describe Arkansas agriculture teachers' professional identities as educators, agriculturalists, and agricultural educators;
2. to determine the difference between teachers' professional identities as educators, agriculturalists, and agricultural educators; and
3. to describe the correlation between length of teaching experience and professional identity.

Methods

This study utilized a descriptive design to meet the aforementioned objectives. Agriculture teachers employed in Arkansas were recruited to complete a researcher-adapted survey to examine their professional identities. Details regarding the design and methods of the study are provided below.

Instrument

We developed a questionnaire, referred to here as the Professional Identity Scale in Agricultural Education (PISAE), through the adaptation of Woo's (2013) Professional Identity Scale in Counseling (PISC). The 54-item PISC evaluates the professional identities of counselors based on six sub-constructs, which were developed through a literature review: Engagement Behaviors (14 items), Knowledge of the Profession (11 items), Professional Roles and Expertise (nine items), Attitude (nine items), Philosophy of the Profession (seven items), and Professional Values (four items). The instrument utilizes a subject-centered scale to "reflect differences among the subjects in terms of their standing along the scale's dimension" (Dawis, 1987, p. 481). Respondents indicate their agreement to items on the PISC using a six-point Likert-type scale, with anchors at the ends (*not at all in agreement* and *totally in agreement*) and the midpoint (*neutral/uncertain*). Internal consistency calculations on the original instrument yielded Cronbach's alpha scores above 0.7 on all sub-constructs, with the exception of Professional Values ($\alpha = 0.44$). Convergent validity was established by comparing scores with the Professional Identity and Values Scale (Healey, 2009), yielding moderate and high positive correlations within each of the sub-constructs (Woo, 2013). Divergent validity was established by comparing scores with the Marlowe-Crowne (20) (Strahan & Gerbasi, 1972), an instrument designed to "detect socially desirable response distortions" (Woo, 2013, p. 56). Resulting low and nonsignificant correlations with between the two scales indicated the PISC was resistant to the risk of respondents answering items in a socially desirable manner.

For this study, the PISC (referred to herein as the PISAE to reflect adaptations) was altered to measure respondents' professional identities as educators, agriculturalists, and agricultural educators (PISAE). Within the electronic survey, respondents were asked to indicate their agreement with each item three times, one for each of the aforementioned professional identities (see Figure 1).

Please use the drop-down menus to select the options that best represent your opinions regarding the following statements as an educator, as an agriculturalist, and as an agricultural educator.

Remember:

The profession of Education is described as employing those within the K-12 school system. (ex - teacher; school counselor)

The profession of Agriculture is described as employing those within the agricultural, foods, and natural resources industries. (ex - cattle farmer; food scientist)

The profession of Agricultural Education is described as employing agriculture teachers in the K-12 school system. (ex - agriculture teacher)

	As an educator:	As an agriculturalist:	As an agricultural educator:
I know the origins of the profession.	<input type="text"/>	<input type="text"/>	<input type="text"/>
I am knowledgeable of the important events and milestones in the profession.	<input type="text"/>	<input type="text"/>	<input type="text"/>
I am knowledgeable about ethical guidelines within the profession.	<input type="text"/>	<input type="text"/>	<input type="text"/>

Figure 1. Sample PISAE survey screen.

Reference to counseling or counselors was replaced with the term “profession” so teachers could respond to the item for the three separate professional identities (see Figure 1). While some items did not require any adaptation (for example, “I engage in certification/licensure renewal processes”), others included terms requiring adaptation (for example, in the item “I know the origins of the counseling profession,” the term “counseling” was removed). In order to enhance face validity of the PISAE, a drop-down, 5-point Likert-type scale was used for each question, allowing participants to respond quickly to an item for all three identities on one screen.

Three cognitive interviews were conducted with former agriculture teachers, two being researchers within agricultural teacher education, with differing lengths of teaching experience to ensure face and content validity. A pilot test including the Spring 2017 preservice teachers entering their final semester at the University of Arkansas ($N = 7$) was conducted to evaluate the PISAE’s internal consistency within each sub-construct for each professional identity (see Table 1). Scores indicated all sub-constructs were reliable.

Table 1.

Pilot Test Cronbach's α Scores for Each Sub-construct and Professional Identity

Sub-construct and Professional Identity	α
Knowledge of the Profession	
Educator	0.788
Agriculturalist	0.979
Agricultural Educator	0.989
Philosophy of the Profession	
Educator	0.649
Agriculturalist	1.000
Agricultural Educator	1.000
Professional Roles and Expertise	
Educator	0.724
Agriculturalist	1.000
Agricultural Educator	0.971
Attitude	
Educator	0.855
Agriculturalist	1.000
Agricultural Educator	0.994
Engagement Behaviors	
Educator	0.783
Agriculturalist	1.000
Agricultural Educator	1.000
Interaction	
Educator	0.686
Agriculturalist	1.000
Agricultural Educator	1.000

Participants

The population for this study included all school based agriculture teachers employed in Arkansas ($N = 227$). The electronic instrument was sent via an emailed invitation and link distributed through the Arkansas agricultural education listserv. Reminders were sent once per week for one month. A total of 72 responses were received, yielding a 31.7% response rate. In order to control for nonresponse error, we performed demographic comparisons (including gender, length of teaching experience, and geographical region of employment) between respondents and nonrespondents (Lindner, Murphy, & Briers, 2001; Miller & Smith, 1983). Fifty-three respondents

were male, while 19 were female. A chi-square goodness of fit test was conducted to determine whether gender proportions among respondents were representative of the population. The minimum expected frequency was 18. The chi-square goodness of fit test indicated that the two genders were similarly distributed in the respondents as in the general population ($\chi^2(1) = .07, p = .79$). A one-sample *t*-test was run to determine whether length of teaching experience in the respondents was different from that in the population. There were no outliers in the data, as assessed by inspection of a boxplot. Mean number of years teaching in the sample ($M = 15.39, SD = 10.92$) was not significantly different than in the population, $t(64) = 1.09, p = .28$. Of the 72 respondents, 23 taught in the Eastern District, 30 taught in the Northwest District, and 19 taught in the Southern District. A chi-square goodness of fit test was conducted to determine whether respondents taught in districts at the same proportion as those in the general population. The minimum expected frequency was 19.6. The test indicated that the teaching districts were similarly distributed among respondents as in the population ($\chi^2(2) = .34, p = .84$). Because no demographic differences were found between respondents and nonrespondents, we determined findings were generalizable to the population.

Data Analysis

Data was collected using Qualtrics and analyzed in SPSS v.23. To meet Objective 1, descriptive statistics including means and standard deviations were used. Additionally, frequencies were used to describe teachers' primary professional identities. Objective 2 was met via a one-way repeated measures ANOVA. Objective 3 was met via Pearson's correlations.

Findings

Objective 1 sought to describe Arkansas agriculture teachers' professional identities as educators, agriculturalists, and agricultural educators. Table 2 displays means and standard deviations for each sub-construct for each professional identity, as well as the total mean scores for each professional identity. Because not all respondents completed each section of the instrument, the number of respondents for each section is also included.

Table 2.

Respondents' Mean Scores for Each Sub-Construct for each Professional Identity

	Educator Professional Identity			Agriculturalist Professional Identity			Agricultural Educator Professional Identity		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Knowledge	64	27.86	4.50	64	29.05	3.66	72	31.21	3.12
Philosophy	62	16.84	2.15	61	16.82	2.17	67	17.30	2.73
Roles	56	25.66	3.38	55	25.69	2.73	63	26.95	2.61
Attitude	54	45.52	4.92	53	49.19	3.19	60	49.10	3.22
Engagement	52	38.12	6.48	51	41.57	4.79	58	43.22	4.82
Interaction	47	24.85	5.24	46	26.00	4.02	53	27.57	4.38
Total	72	177.88	20.38	72	186.06	15.74	72	192.68	16.60

Respondents displayed the highest mean score for the agricultural educator professional identity and the lowest mean score for the educator professional identity. With the exception of Attitude, the agricultural educator identity received the highest mean scores in each sub-construct as well. The agriculturalist identity yielded a mean score of just 0.09 points higher than the agricultural educator identity in the Attitude sub-construct. It should be noted that respondents also completed the agricultural educator questions most frequently.

Because the original instrument was developed to determine the professional identity of counselors via total score, with higher scores aligning with a more developed professional identity, teachers' primary professional identities were determined by identifying each respondent's highest scoring identity. Questions not completed were given a score of 0, as we assumed nonresponse was the result of teachers not identifying with that identity enough to be motivated to complete the questions within. Those with equal scores for more than one identity were counted in all categories in which they yielded top scores; therefore the n of primary professional identities is higher than 72. The majority of teachers identified as agricultural educators ($n = 64$). Eighteen respondents identified as agriculturalists, while seven identified as educators.

Finally, teachers were asked to list the career they would pursue if they were not currently employed in agricultural education. Responses were coded by the researcher into three categories: education-related, agriculture-related, and other. Forty-eight teachers responded to this survey item; 40 indicated they would pursue an agriculture-related career, while six indicated they would pursue employment outside of both agriculture and education. Only two respondents indicated they would continue teaching in a discipline other than agriculture.

Objective 2 sought to determine the difference between teachers' professional identities as educators, agriculturalists, and agricultural educators. A one-way repeated measures ANOVA was employed. Outliers were removed, leading to an n of 49. Professional identity was normally distributed for each profession, as assessed by a Shapiro-Wilk's test ($p > .05$). Mauchly's test of sphericity indicated that the assumption of sphericity had been violated, $\chi^2(2) = .72$, $p = .001$. Therefore, a Huynh-Feldt correction was used. Epsilon was .81. Professional identity was statistically different for the three professions, $F(1.61, 77.34) = 32.77$, $p = .0005$, $\eta^2 = .41$. Teachers identified significantly more as agriculturalists ($M = 186.06$) than as educators ($M = 177.88$). The mean difference was 8.18 (95% confidence interval, 3.17 to 13.20), $p = <.005$. Teachers' agricultural educator identities were 14.80 +/- 2.09 points higher than their educator identities (95% confidence interval, 9.61 to 19.99), a statistically significant difference, $p = <.0005$. Their agricultural educator identities were also significantly higher than their agriculturalist identities, displaying a mean difference of 6.61 points (95% confidence interval, 3.45 to 9.75).

Objective 3 sought to describe the correlation between length of teaching experience and professional identity. Pearson's correlation data was linear with no outliers, as was determined by a scatter plot. All variables were normally distributed, as assessed by a Shapiro-Wilk's test ($p > .05$). No significant correlations were found between number of years teaching agriculture or any other subject and any of the professional identities.

Conclusions, Implications, and Recommendations

This study described the educator, agriculturalist, and agricultural educator professional identities of Arkansas agriculture teachers. Findings indicated the professional identity of the agriculture teacher is different than that of the educator or the agriculturalist. Agriculture teachers in Arkansas identified as agriculture teachers more so than they did the other two professions. The significant differences found between teachers' mean scores for each of the professional identities

supports Shoulders and Myers' (2011) position that agriculture teachers develop and maintain professional identities that are different from those of other educators. These findings also support research identifying educational discipline as a factor influencing professional identity (Beijaard et al., 2000; Peressini et al., 2004; Simonneaus, 2000), and extends those conclusions to include agricultural education. Because of the valuable role professional identity plays in teachers' interpretations of professional development experiences, we recommend teacher educators plan professional development in a way that facilitates the acknowledgement of differing professional identities within groups of teachers from diverse disciplines. This recommendation follows similar calls made in other disciplines (Goodson & Cole, 1994; Pennington & Richards, 2016). Further, in professional development events planned specifically for agriculture teachers, teacher educators should assist teachers in understanding how the knowledge delivered aligns with their own professional identities as agriculture teachers, as well as how they can frame that knowledge to be accepted by teachers and administrators within their own schools. Desimone (2011), Beijaard et al. (2004), and Richardson (1996) each offered guiding characteristics of professional development and professional identity that can assist those planning professional development in including professional identity as a key component of their educational plans.

The findings herein also suggest that agriculture teachers hold professional identities different from those held by agriculturalists, a notion somewhat contradicting the data wherein the majority of the respondents indicated they would pursue careers within the agriculture industry if they were not teaching agriculture. Shoulders and Myers (2011) suggested agriculture teachers' professional identities were different from those of other teachers, in part, because of their frequent previous first-hand connections with the agriculture industry. The findings here suggest that agriculture teachers either identified as agriculturalists previously and evolved away from these original agriculturalist identities as they gained new educational experiences, or never identified as agriculturalists, perhaps leading them to pursue careers in education. Further research investigating how agriculture teachers develop their professional identities during their preservice teacher education experience, as well as research exploring the differences in professional identity between preservice teachers with and without firsthand experience in the agriculture industry, can assist in better understanding the differences between the professional identities of agriculturalists and agricultural educators.

Findings indicated teachers' professional identities for each of the three professions was not associated with length of teaching experience. Beijaard et al. (2000) found that while the professional identities of teachers did change over time, that change was dependent upon the discipline in which the teacher was employed. The findings herein suggest that agricultural education may be a discipline in which length of teaching experience has less influence on professional identity than is found in other disciplines, although the reasons for this difference remain unknown. Researchers should investigate the reasons why agricultural educators are resistant to change within their professional identities, as the evolution of professional identity over time is considered part of the development process of successful teachers (Antonek et al., 1997; Beijaard et al., 2004). There is reason to believe focusing on teachers' development of professional identity could assist in impacting the challenges within agricultural education that have led to decades-long calls for change, such as teacher attrition and STEM integration.

While this study provides new information for researchers and practitioners in the area of agriculture teacher professional identity, its assumptions and limitations also provide opportunity for further research. While the PISC was established as a valid and reliable instrument to evaluate counselors' professional identities, it relied on previous qualitative literature to understand how professional identity was expressed within counselors' work. The PISAE quantitatively described agriculture teachers' professional identities, but we do not yet know how these identities are

expressed through teachers' behaviors. We recommend qualitative research be conducted with agriculture teachers, students, parents, and administrators to further understand how professional identity influences the behaviors of agriculture teachers, as well as how these behaviors align with scores on the PISAE. Further, because the PISC accurately portrayed the professional identities of counselors, we assumed the PISAE would yield similarly accurate portrayals of other professions. We recommend researchers utilize appropriate parts of the PISAE to examine the professional identities of educators and agriculturalists to ensure the instrument is valid in portraying the identities of professionals in these fields.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211.
- Anderson, T. J., Barrick, R. K., & Hughes, M. (1992). Responsibilities of teacher education for Vocational teacher professional development programs. *Journal of Agricultural Education*, 33(2), 43-50. doi: 10.5032/jae.1992.02043
- Antonek, J. L., McCormick, D. E., & Donato, R. (1997). The student teacher portfolio as autobiography: Developing a professional identity. *Modern Language Journal*, 81(1), 15-27.
- Barrick, R. G., & Garton, B. L. (2010) Frameworks for agriculture teacher preparation. In R. M. Torres, T. Kitchel, & A. L. Ball (Eds.), *Preparing and Advancing Teachers in Agricultural Education* (pp. 30-41). Columbus, OH: The Ohio State University.
- Beijaard, D., Meijer, P. C., & Verloop, N. (2004). Reconsidering research on teachers' Professional identity. *Teacher and Teacher Education*, 20, 107-128. doi:10.1016/j.tate.2003.07.001
- Beijaard, D., Verloop, N., & Vermunt, J. D. (2000). Teachers' perceptions of professional identity: An exploratory study from a personal knowledge perspective. *Teaching and Teacher Education*, 16, 749-764.
- Blythe, J. M., DiBenedetto, C. A., & Myers, B. E. (2015). Inquiry-based instruction: Perceptions of National Agriscience Teacher Ambassadors. *Journal of Agricultural Education*, 56(2), 110-121. doi: 10.5032/jae.2015.02110
- Camp, W. G. (2000). *A national study of the supply and demand for teachers of agricultural education in 1996-1998*. Alexandria, VA: Association for Career and Technical Education. Retrieved from <https://files.eric.ed.gov/fulltext/ED458358.pdf>
- Dawis, R. V. (1987). Scale construction. *Journal of Counseling Psychology*, 34, 481-489.
- Desimone, L. M. (2011). A primer on effective professional development. *Phi Delta Kappa*, 92(6), 68-71.
- Doolittle, P. E., & Camp, W. G. (1999). Constructivism: The career and technical education perspective. *Journal of Vocational and Technical Education*, 16(1). Retrieved <http://scholar.lib.vt.edu/ejournals/JVTE/v16n1/doolittle.html>

- Goodson, I. F., & Cole, A. L. (1994). Exploring the teacher's professional knowledge: Constructing identity and community. *Teacher Education Quarterly*, 21(1), 85–105.
- Healey, A. C. (2009). *Female perspectives of professional identity and success in the counseling field* (Doctoral dissertation). Retrieved from ProQuest. (UMU No. 3393006).
- Keiny, S. (1994). Constructivism and teachers' professional development. *Teaching & Teacher Education*, 10(2), 157–167.
- Lindner, J. R., Murphy, T. H., & Briers, G. E. (2001). Handling nonresponse in social science research. *Journal of Agricultural Education*, 42(4), 43-53. doi: 10.5032/jae.2001.04043
- Miller, L. W., & Smith, K. L. (1983). Handling nonresponse issues. *Journal of Extension*, 21, 45-50.
- Myers, B. E., Thoron, A. C., & Thompson, G. W. (2009). Perceptions of the National Agriscience Teacher Ambassador Academy toward integrating science into school-based agricultural education curriculum. *Journal of Agricultural Education*, 50(4), 120-133. doi: 10.5032/jae.2009.04120
- National Research Council. (2010). *Preparing teachers: Building evidence for sound policy*. Committee on the Study of Teacher Preparation Programs in the United States, Center for Education. Division of Behaviors and Social Sciences Education. Washington, DC: The National Academies Press.
- Parr, B., & Edwards, M. C. (2004). Inquiry-based instruction in secondary agricultural education: Problem-solving – an old friend revisited. *Journal of Agricultural Education*, 45(4), 106-117. doi: 10.5032/jae.2004.04106
- Pennington, M. C., & Richards, J. E. (2016). Teacher identity in language teaching: Integrating personal, contextual, and professional factors. *RELC Journal*, 47(1), 5-23. doi:10.1177/0033688216631219
- Peressini, D., Borko, H., Romagnano, L., Knuth, E., & Willis, C. (2004). A conceptual framework for learning to teach secondary mathematics: A situative perspective. *Educational Studies in Mathematics*, 56(1), 67–69.
- Rice, A. H. & Kitchel, T. (2017). Shaping pedagogical content knowledge for experienced Agriculture teachers in the plant sciences: A grounded theory. *Journal of Agricultural Education*, 58(4), 50- 64. doi: 10.5032/jae.2017.04050
- Richardson, V. (1996). The role of attitudes and beliefs in learning to teach. In J. Sikula (Ed.), *Handbook of Research on Teacher Education* (2nd ed) (pp. 102-119). New York, NY:Simon and Shuster Macmillan.
- Shoulders, C. W., & Myers, B. E. (2011). Considering professional identity to enhance agriculture teacher development. *Journal of Agricultural Education*, 52(4), 98-108. doi:10.5032/jae.2011.04098

- Simonneaus, L. (2000). Influence of cultural and disciplinary identity on the way teachers in agricultural education in France relate to knowledge in biotechnology. *New Genetics and Society*, 19(1), 23–48.
- Smith, A. R., Lawver, R. G., & Foster, D. D. (2017). National agricultural education supply and Demand study. 2016 Executive Summary. Retrieved from aaeonline.org/resources/documents/dsd2016summary.pdf
- Strahan, R., & Gerbasi, K. (1972). Short, homogenous version of the Marlow-Crowne Social Desirability Scale. *Journal of Clinical Psychology*, 28, 191-193.
- Thoron, A. C., Myers, B. E., & Barrick, R. K. (2016). In Roberts, T. G., Harder, A., & Brashears, T. (Eds.), *American Association for Agricultural Education national research agenda: 2016-2020* (pp: 41-48). Gainesville, FL: Department of Agricultural Education and Communications.
- Ulmer, J. D., Velez, J. J., Lambert, M. D., Thompson, G. W., Burris, S., & Witt, P. A. (2013). Exploring science teaching efficacy of CASE curriculum teachers: A post-then-pre assessment. *Journal of Agricultural Education*, 54(4), 121-133.
doi:10.5032/jae.2103.04121
- Witt, P. A., Ulmer, J. D., Brashears, T., & Burley, H. (2014). A comparison of student engaged time in agriculture instruction. *Journal of Agricultural Education*, 55(2), 16-32.
doi:10.5032/jae.2014.02016
- Woo, H. R. (2013). *Instrument construction and initial validation: Professional identity scale in counseling (PISC)*. (Doctoral dissertation). Retrieved from: <http://ir.uiowa.edu/etd/2663>