Journal of Agricultural Education. 57(2), 172-186.
doi: 10.5032/jae.2016.02172

The Chasm Between Beliefs and Practice: A Case Study of the Epistemological Positions of Pre-Service Agricultural Education Teachers

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Abstract

Recent trends in epistemological research suggest that teachers' epistemological beliefs influence the approaches he or she employs in both teaching and learning. Therefore, the purpose of this instrumental case study was to understand the initial epistemological positions of pre-service agricultural education teachers at Oklahoma State University. The study's findings are reported through five themes. Themes one, two, three, and four align with Perry's (1970) four epistemological positions. However, the fifth theme represents an interesting departure from the theory. This theme showcases the lack of continuity between participants' articulated views and how they propose to operationalize those beliefs as an agricultural educator. As such, we recommend examination into the following questions, "Does the chasm exist beyond first year pre-service teachers?" and "How can the chasm be bridged?"

Keywords: epistemology; experiential learning; pre-service teachers

Introduction

Philosophical debates have quietly raged throughout history (Gage, 1989). This endless sparring of minds known as the *battle of snails* can be traced to the times of Aristotle and Plato (Gage, 1989; Anderson & Herr, 1999). Agricultural educators have not escaped the dustups of this war (Drost, 1977). For instance, vocational education became a flashpoint in the *Dewey vs. Snedden* debate of whether the curriculum should be content centered or an amalgamation of content and contextualized experience (Drost, 1977; Snedden & Dewey, 1977). This discrepancy *may* very well be the first formal epistemological point of contention in agricultural education.

Epistemological beliefs are a branch of philosophy concerned with how individuals perceive knowledge is best attained (Hofer, 2004; Rodriguez & Cano, 2006). Personal epistemological beliefs are theorized to influence many aspects of an individual's daily life including how they learn (Brownlee, Purdie, & Boulton-Lewis, 2001; Cano, 2005; Peng & Fitzgerald, 2006; Pintrich, Hofer, & Pintrich, 2002; Tolhurst, 2007), reason (Bendixen, Schraw, & Dunkle, 1998; Klaczynski & Robinson, 2000; Yang, 2005), as well as how they make decisions (King, 2000; Weinstock & Cronin, 2003).

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Upon a broad reading of the empirical evidence associated with episteme research, we (the authors) discovered the terms used to classify personal epistemologies differ from study-to-study yet often have parallel meanings. In a similar vein, epistemology research has all but forgotten the classical notion that assumes that knowledge is absolute (Hofer, 2001, 2004). Instead, contemporary research has expanded to the following areas: accuracy of knowledge, organization of knowledge, the attainment of knowledge, and how individuals defend their beliefs regarding the acquisition of knowledge (Falmagne, Iselin & Todorova, & Welsh, 2013; O'Siochru & Norton, 2014; Porsc & Bromme, 2011; Stahl & Bromme, 2007; Stahl, Pieschl, & Bromme, 2006; Wang, Zhou, & Shen, 2014).

Epistemology-based studies scale an array of disciplines. For instance, mathematics (Schoenfeld, 1983; Weber, Inglis, & Mejia-Ramos, 2014; Rigo-Lemini, 2013), science (Mason, Boscolo, Tornatora, Ronconi, 2013) and physics (de Ataide & Greca, 2013) usually address how teachers' epistemological orientations can influence student learning. Conclusions from these studies describe struggling students as those that view knowledge as a phenomenon in which they have no control (Mason et al., 2013; Rigo-Lemini, 2013; Schoenfeld, 1983). On the other hand, elaborate constructs have been developed to explain how personal epistemologies can develop and mature over time (Belenky, Clinchy, Goldberger, & Tarule, 1986; Perry, 1970).

Empirical evidence regarding personal epistemologies is rife with assertions that teachers' epistemological beliefs influence the approaches he or she employs in both teaching and learning (Buehl & Fives, 2009; Cheng, Chan, Tang, & Chen, 2009; Fives & Buehl, 2008; Jacobson et al., 2010; Tanase & Wang, 2010). However, there is a lack of appreciation within teacher preparation programs regarding the consideration of students' personal epistemological stances (Brownlee et al., 2001; Buehl & Fives, 2009; Cheng et al., 2009; Fives & Buehl, 2008). For instance, numerous scholars (Alexander, Schallert, & Hare, 1991; Gill, Ashton, & Algina, 2004; Muijs & Reynolds, 2002; Tanase & Wang, 2010) posit that pre-service teachers' beliefs about knowledge can shape the learning experiences they provide their students. However, little is known about pre-service teachers epistemological positions when entering teacher preparation programs (Brownlee et al., 2001). Therefore, investigating the personal episteme of pre-service teachers at various stages in teacher preparation could yield powerful insight into their future practices (Brownlee et al., 2001).

Wurdinger (2005) explained, "It is time for traditional education to change the way it views knowledge" (p. 3). Congruent to Wurdinger's (2005) call, epistemic research has recently began to shift its focus towards the use of interventions to shape pre-service teachers' epistemological stances in a manner deemed desirable by teacher preparation programs (Cheng et al., 2009; Fives & Buehl, 2008; Tanase & Wang, 2010). Findings from intervention-based studies show promising results (Brownlee et al., 2001; Cheng et al., 2009; Tanase & Wang, 2010). Therefore, probing pre-service teachers' initial epistemological beliefs could serve as a key to learning how to initiate the process (Tenase & Wang, 2010).

Glimpses of the epistemological dogmas of agricultural education can be seen in the literature (Baker, Robinson, Kolb, 2012; Roberts & Ball, 2009). For instance, Roberts and Ball (2009) postulated the focus of agricultural education has become a merger of Snedden's "rigid application model" with Dewey's holistic approach (p. 87). Roberts and Ball's (2009) assertion suggests agricultural education prescribes to an epistemological stance where knowledge is acquired through a process of learning experiences (Roberts & Ball, 2009). More recently, Baker et al. (2012) conflated agricultural education's three-circle model with Kolb's (1984) Experiential Learning Theory. Baker et al.'s (2012) proposed enrichment suggests the tenets of agricultural education support the acquisition of knowledge through purposeful experiences. Despite some progression, however, this area of research remains relatively unexplored in the agricultural education literature base. Though many pre-service agricultural educators purport a philosophical alignment with experiential learning (Baker et al., 2012), does their epistemology and choice of pedagogical practice align? This alignment would indicate a true commitment to experiential learning rather than a somewhat faint appreciation that might "obscur[e] our problems and distract us from doing something about them" (Moore, 1999, p. 23).

Emergent Theoretical Lens

Through the analysis of data, Perry's (1970) work regarding the personal epistemic emerged as our lens for interpreting the study's findings. Perry (1970) conducted the first empirical-based study in the field of epistemology. In this longitudinal investigation, Perry (1970) and his associates interviewed over 700 males from both Radcliffe and Harvard Universities to probe their personal epistemologies. As a result, Perry (1970) developed an epistemological continuum with four primary positions: (a) dualism; (b) multiplism; (c) relativism; and (d) relativism commitment.

Individuals with dualistic views believe knowledge is passively received from an authority figure (Perry, 1970). Moreover, they view knowledge as unchanging (Perry, 1970). Meanwhile, multiplism is when one begins to question the passive acquisition of knowledge (Perry, 1970). They believe that individuals uniquely receive knowledge; therefore, multiplists' view knowledge as a subjective phenomenon (Perry, 1970). Meanwhile, relativism represents beliefs that an individual dynamically forms knowledge (Perry, 1970). However, the individual must follow a set of procedures to accomplish this task (Perry, 1970). In relativism commitment, individuals view knowledge as a flexible progression of self-construction (Perry, 1970). Therefore, they do not believe knowledge has to be acquired through a fixed set of procedures.

Perry's (1970) four primary epistemological positions are empirical-based constructs verified through numerous studies over the past three decades (Belenky et al., 1986; Brownlee et al., 2001; Magolda, 1994; Mansfeld & Volet, 2014). Moreover, these constructs have shown consistency among various disciplines (Brownlee et al., 2001; Mansfeld & Volet, 2014). After provisional themes had been negotiated in the data analysis process, we sought to understand the relationships of our findings. During this procedure, Perry's (1970) four primary epistemological positions emerged as an epistemological lens that assisted with understanding the epistemological stances of pre-service agricultural education teachers. This process is described in greater detail in the methodology section.

Convergence of the Case

The aim of this instrumental case study (Stake, 1995) was to understand the initial epistemological stances of pre-service agricultural education students using Oklahoma State University's entry-level Foundations and Philosophies of Teaching Agricultural Education course as a bounded case. The study aligns with Priority Two, New Technologies, Practices and Product Adoption Decisions of the National Research Agenda for the American Association for Agricultural Education (Doerfert, 2011). To explore the phenomenon under investigation, we followed Hofer's (2004) recommendations to contextualize epistemologies to promote a sense of relevancy to participants. Using an emic perspective we described 1) pre-service teachers expressed beliefs of how knowledge is best created, and 2) how pre-service teachers plan to operationalize these beliefs as an agricultural education instructor.

Methodology

We agreed that employing an instrumental case study approach (Stake, 1995) would best guide understanding the initial epistemological perspectives of pre-service agricultural education teachers. This qualitative approach can offer unique insights into how a phenomenon influences a bounded system (Creswell, 2013; Stake, 1995). Further, instrumental case studies offer value to qualitative researchers who attempt to make their investigations transferable to other circumstances (Creswell, 2013; Merriam, 2009; Stake, 1995).

Participants

All participants were enrolled in the fall 2014 Foundations and Philosophies of Teaching Agricultural Education course at Oklahoma State University. This introductory class is the first exposure pre-service teachers experience related to pedagogical and theoretical perspectives in agricultural education coursework. As such, the participants ($N = 42$) were purposefully selected (Patton, 2002; Stake, 1995) based on their lack of teacher preparation coursework. Moreover, we saw the structure of this bounded system as closely mirroring other introductory-level courses in agricultural education programs across the United States. In all, there were 22 male and 20 female participants ranging from sophomore to junior in classification level.

Data Sources, Collection, and Analysis Strategies

Written statements generated by the pre-service teachers were the principle source of data collection. To attain the *initial* epistemological stance of pre-service teachers, data was collected at the beginning of the semester. According to Stake (1995), "gathering data by studying documents follows the same line of thinking as observing or interviewing" (p. 68). As such, students responded to the following two prompts:

> 1) After accepting a position as an agricultural educator in Oklahoma, you are charged with designing five new courses that allow students to acquire knowledge about agriculture. Provide a minimum of three quality paragraphs describing how a typical day in your classes would appear from an outsider's perspective. 2) Using your response from section one as a frame, provide three quality paragraphs defending your stance of how knowledge is best acquired.

Through analyzing the two writing prompts, we were able to extract the pre-service teachers' epistemological beliefs and how they planned to operationalize those beliefs. The use of written statements to probe participants' epistemological stances has arisen as a preferred technique (Brownlee & Chak, 2007; Roberts, 2001; Tigchelaar, Vermunt, Brouwer, 2012). The writing prompts were constructed using Hofer's (2004) recommendations to contextualize epistemologies in a way that participants can apply this abstract concept to a real-world scenario. Since the research team was comprised of the lead instructor and two laboratory instructors for the course, it was also possible to conduct multiple observations.

Data were analyzed using the NVivo® software program throughout a process of coding, categorization, and generation of themes through the constant comparative method (Corbin & Straus, 2015). The constant comparative method consists of three major coding strategies: open, axial, and theoretical coding (Corbin & Strauss, 2015). We engaged the data by initiating the open coding process, which required us to code each data source line-by-line (Corbin & Strauss, 2015). Then, by recognizing segments of relevant data, notations of their value were recorded (Cohen, Manion, & Morrison, 2007; Corbin & Straus, 2015). After all documents were analyzed, we independently presented initial codes to the research team (Corbin & Straus, 2015). Then an intense process of open code negotiation occurred. After negotiations, we initiated a second cycle of coding through an axial coding technique (Cohen et al., 2007; Corbin & Straus, 2015). Documents were the re-read to attain a holistic view of our findings (Miles, Huberman, & Saldaña, 2014). Then, a focused exploration of the relationships among axial codes occurred in which they were further inspected (Corbin & Straus, 2015). After this process, the axial codes were further evaluated to determine the credibility of our understandings of the data (Miles et al., 2014). Through this process of critical analysis, we made the decision to revise and reconfigure our codes in a way that we felt represented participants' views best (Corbin & Strauss, 2015). Finally, we entered a theoretical coding cycle in which we scrutinized our codes against relevant theoretical bases (Corbin & Strauss, 2015). Ultimately, five themes were agreed upon and utilized for data interpretation.

Reflexivity

We used self-reflexivity to assist with first understanding the biases' we brought to the study and ultimately to set aside these predispositions while interpreting the data (Tracy, 2010). As Tracy (2010) explains, "self-reflexivity encourages writers to be frank about their strengths and shortcomings" (p. 842). This technique compelled us to release the following information regarding our agricultural education experiences and epistemological beliefs.

We have multiple years of experience as school-based agricultural educators in four different states. Further, we individually completed a bachelor's degree in agricultural education from a land grant institution. Currently, two of us are seeking doctoral degrees in agricultural education where we are employed as graduate assistants. The remaining researcher received his doctoral degree in agricultural education and is currently employed as an assistant professor at Oklahoma State University. One researcher was the primary instructor for the course while the other two served as his graduate teaching assistants. Because of our positions, we were allowed to have direct contact with participants numerous times per week. Written statements were collected at the beginning of the semester; consequently, researchers had only minimal contact with the participants at the time of data collection.

In reference to Perry's (1970) developmental scheme, each member of the research team held a unique position. Two researchers most closely aligned with the tenets of relativism, where knowledge is attained through a deductive process aimed at attaining a greater understanding of the phenomenon holistically (Perry, 1970). The other saw himself within the lineage of relativism commitment where knowledge is actively constructed by the individual (Perry, 1970). We realize these experiences and worldviews might have influenced our interpretation of the data; however, through Tracy's (2010) recommendations attempts were made to bracket out these biases whenever possible.

Building Quality into the Study

Creating rigor in the qualitative research process is imperative. Merriam (2009) elucidated, "To have any effect on either the practice or the theory of a field, research studies must be rigorously conducted; they need to present insights and conclusions that ring true to readers, practitioners, and other researchers" (p. 210). To give clarification to how qualitative researchers can attain both rigor and trustworthiness in their investigations, Lincoln and Guba (1985) promoted four key principles: (a) credibility; (b) transferability; (c) dependability; and (d) confirmability.

Credibility encourages the purposeful addition of "trustworthiness, verisimilitude, and plausibility" (Tracy, 2010, p. 7). Furthermore, Miles et al. (2014) recommended the use of *thick description* to ensure participants were accurately represented. To operationalize the concept of credibility, whenever possible, we used direct quotes from participants in the theme generation process to produce a "*vicarious presence"* of the participants (Miles et al., 2014, p. 279). To further ensure we achieved credibility, the following strategies were integrated into the study: (a) thick description; (b) triangulation of data; and (c) releasing our predispositions (Creswell, 2013; Merriam, 2009; Miles et al., 2014).

Uncertainty surrounding the generalizability of data is a popular critique of the qualitative research paradigm (Merriam, 2009). Nevertheless, Merriam (2009) maintains that generalizability only allows "teachers and other clinicians to be more informed gamblers" (p. 224). Although it has been argued that qualitative research can be generalized (Stake, 1995) we elected to present our data in hopes of it being *transferable* to other similar situations (Lincoln & Guba, 1985; Merriam, 2009), namely other agricultural education teacher preparation programs. To enhance the transferability of our findings, Miles et al.'s (2014) advice was followed where data from multiple informants was used for both coding and theme formation.

Dependability is the third tenet researchers should consider when building quality into qualitative research (Lincoln & Guba, 1985). Although we chose to use an emergent design, Miles et al. (2014) accentuated that regardless of the design of the study it should be "consistent, reasonably stable over time and across research methods" (p. 278). To ensure the highest standards of dependability were met in this study we: (a) devised a study that met the purpose; (b) ensured the findings reflected the dominant views expressed by numerous participants; (c) aligned findings with basic paradigms and logical constructs; (d) negotiated findings and themes (Miles et al., 2014).

Confirmability is the final principle purposed by Lincoln and Guba (1985) to ensure quality. This notion relates to whether "the conclusions depend on the subject and conditions of the inquiry, rather than the inquirer" (Miles et al., 2014, p. 278). We made every attempt to ensure the results reflected the views of the participants; however, we realize that researchers bring numerous biases and assumptions into studies (Creswell, 2013; Licoln & Guba, 1985; Merriam, 2009; Miles et al., 2014). Although we attempted to bracket out these biases, we felt ethically bound to release a statement of reflexivity so that readers would understand the biases we brought to the study when interpreting the findings (Creswell, 2013).

Limitations of the Study

Because we served in instructional roles over participants in this bounded system, participants could have been influenced to develop statements they felt we desired (Miles et al., 2014). Another limitation relates to how the two prompts were presented to participants. For instance, participants were first asked to contextualize how they would construct knowledge for their future students when developing curriculum for a new agricultural education course. Then, they were asked to defend their beliefs of how knowledge is best created using the first section as a frame of reference. We speculate that if the two sections were reversed, the data yielded from this study might have been different. Despite these limitations, however, we made every attempt to ensure this case could be transferrable to other agricultural education teacher education programs (Lincoln & Guba, 1985; Merriam, 2009).

Findings, Implications, Conclusions, & Recommendations

We chose to present the finding, implications, conclusions, and recommendations of this study through five themes. Themes one, two, three, and four align with Perry's (1970) four epistemological positions. It is important to note these four positions should be considered on a continuum of epistemological beliefs (Perry, 1970). However, the fifth theme represents an interesting departure from Perry's (1970) theory.

Dualism

Many pre-service teachers depicted agricultural educators as wise and in a position of power. Moreover, they held the belief that knowledge should be delivered to students through teacher-centered approaches such as lecture-based instruction. Students were perceived as passive learners who received knowledge, rather than actively engaging in learning experiences. Perry (1970) characterized this epistemological stance as dualism, which is the belief that one must hear the truth from those who know.

Pre-service teachers who prescribed to dualism emphasized classroom instruction with statements like: "Classroom instruction through lectures is the basis of all learning in agriculture" [Participant 33, 1587]. Numerous statements illuminated that learning is received passively from someone of authority. They envisioned intently planned classroom experiences that allowed the pre-service teacher to maintain this authority. For instance, Participant 8 illustrated a dualistic epistemology with the following statement, "Students will learn the basic and important facts about agriculture by staying in the classroom setting and learning about the different things involved with agriculture" [357:359].

The dualistic pre-service teachers illustrated a student dependence on the teacher for knowledge. For instance, modeling was defined as one of the primary responsibilities of the teacher. Participant 11 demonstrated this perspective with the statement: "I think for them to get the most out of their education they need to be shown how to do what you are teaching" [518:519]. Further, those who personified the epistemological belief of dualism envisioned the purposeful use of direct instruction. Participant 32 epitomizes the dualistic view through the following passage regarding her future teaching behaviors:

> I started off the class by reading off what I was lecturing over that day. On this particular day, [I] was lecturing over animal digestion, so I was showing a video of a dairy farmer checking his cannulated cows. After the video was over I then began [the] lecture for that day. [1539:1542]

Multiplism

Not all pre-service teachers championed the notion that knowledge should be passively received. Instead, some *actively* desired their future students to be open to the ideas and thoughts of others since "everyone's opinion is of equal value" (Perry, 1970, p. 324). They expressed their primary goal was for students to see the world has multiple truths and sometimes there is no right or wrong answer. Perry (1970) explained that individuals operating in the multiplism epistemological position no longer saw knowledge as a set of facts that had to be memorized or emanating from a great authority figure. Instead, multiplistic pre-service teachers consider knowledge to acquire through questioning the validity of others opinions (Perry, 1970).

One way pre-service teachers expressed how they planned to operationalize the idea of multiplism was the through deep classroom discussion. Just learning from a book was not enough, according to Participant 12. He explained, "I believe letting students voice their opinions is the best way to allow them to learn" [Participant 12, 545:546]. Empowering students to weigh in on the topic is important to those adhering to multiplism (Brownlee, Walker, Lennox, Exley, & Pearce, 2009). The pre-service teachers simply do not want their students to mimic their behavior. Instead, they hope to empower students to see their beliefs are just as relevant as everyone else. Participants also expressed the deeper meaning behind teaching in this manner. "By doing this, I am enabling the certain students that may not retain knowledge from a lecture style class, but may retain knowledge based on opinionated discussions" [Participant 35, 1727:1728]. Several pre-service teachers mentioned that teaching with a multiplism-type style would allow their students to attain deeper levels of cognition. Some even suggested this might help them be able to test at a higher level. Participant 9 illuminated:

> Having a conversation is the best way these students are able to learn. Having detailed discussion over animal science, horticulture, or food science, they are able to make connections and remember the information to a great level. In this way they are able to make a personal connection with the topic and relate it back when it is time for a quiz or test. [360:365]

A number of other pre-service teachers rationalized the acquisition of knowledge as teaching one to be able to defend their knowledge verbally. As Participant 22 stated, "Allowing the students to form their own opinion and discuss the subject teaches them to defend their decisions, and to become an advocate for agriculture" [1034:1036].

Relativism

The third of Perry's (1970) epistemological stances, relativism, represents a pivot in thinking. From the relativists' perspective, no longer is knowledge handed down or the result of a sparing of viewpoints, instead it is contingent upon the conditions surrounding the attainment of said knowledge (Perry, 1970). Therefore, relativism can be thought of as procedural in nature where the individual attempts to attain a holistic understanding through a process of learning techniques (Perry, 1970).

In relativism, participants' attitudes toward learning were very optimistic. Knowledge was not a phenomenon that was unattainable, but rather a calculated process that simply needed to be boiled down so that students could more easily understand the concept. Also, many participants expressed the need to start teaching from a theoretical level and then progressively moving to an application of the concept. Participant 42 eloquently explained,

> I like to discuss what we are learning in depth and then show the students a real life example that they can see, feel, and learn from. This is also very beneficial for keeping the students engaged every day in class. [2056: 2059].

As noted by Participant 42, engagement was important to those adhering to this stance. Many expressed that only using theory-based discussions made learning boring. Therefore, they needed to spice up the learning process with an activity that was more practical.

Although many participants emphasized the engagement of learners was a major benefit to procedural-based learning, they also expressed a much deeper meaning behind their reasons for adhering to this epistemological stance. Participant 30 described connecting real-world experiences and content to the learning *process* as a central desire of students. For example, when justifying his beliefs about how knowledge is best-gained, he elucidated:

> Hands on activities incorporated with classroom instruction help to reinforce the topics being discussed. In the mind of a student, if a practice cannot be used it seems like time has been wasted and the information may seem useless. [Participant 30, 1469: 1472]

Some participants noted the learning *process* continued even after one obtained a hands-on experience. For instance, it is imperative to reflect upon the process individuals use to acquire knowledge. Participant 14 described how this process would unfold in his classroom, "I have also learned they like to see how it matters to them now" [405: 406]. She also described the importance of connecting learning to what students already know and understand. Therefore, in relativism commitment teacher can be seen as a builder of knowledge based on the student's current level.

Relativism Commitment

Relativism commitment, as described by Perry (1970), maintains elements of relativism but includes a greater element of fluidity of *truths.* This epistemology is typified by students making choices and affirming their roles and responsibilities within a relativistic world (Perry, 1970). Congruent to this concept, students repeatedly discussed a very fluid, experiential, learning process whereby students each make meaning in their own unique way. One student shared, "In the Ag leadership class, by sharing their own opinions, the students learn to agree and disagree, but they also learn to support and defend their views and opinions on the agriculture industry" [Participant 21, 1010: 1012].

Similar in nature, Participant 34 shared, "sometimes not everything can be taught in the classroom. We can give students information they need, but they may not actually learn it until they discover it themselves" [1673: 1674]. This dominant perspective seems to connect to Perry's (1970) conclusion that at this stage in the epistemological continuum, the learner holds knowledge, and as such, sources are evaluated and meaning is ever changing and context specific. Perry (1970) referred to commitments as "affirmations: in all the plurality of the relativistic world – truths, relationships, purposes, activities, and cares, in all their contexts" (p. 150). This cognitive complexity was evident as students described their plans for a new agricultural education program.

> I believe the best way of students learning is by hands on training and one on one time with your advisor. Growing up through the FFA, I was lucky enough to have a teacher who taught this way. Whether it was fitting cattle, writing speeches, or welding he was always by all our or sides teaching us one on one how to work smarter and not harder. [Participant 10, 454: 458]

Furthermore, Perry (1970) explained that *disorientation* is an important element of the learning process as viewed through a relativism commitment lens:

> I believe that in order to accommodate all learning styles and reach all students, I, as a teacher, can't just read off a PowerPoint and expect my students to truly learn anything. I believe in rolling your sleeves up and truly EXPERIENCING agriculture. After all, a "SAE" is a SUPERVISED (as in teacher guided) AGRICULTURAL (it is AG. ED.) EXPERIENCE (key to the learning). Next is letting the students make mistakes. In my life experience, I learned the most from making mistakes. I can't hold every student's hand every step of the way. If I did, they wouldn't learn anything. It would be robbing them of an education because, as teachers, we are preparing students for a job life after high school and hopefully a higher education, and we can't do their job or studies for them. [Participant 19, 889: 905]

The Chasm Between Beliefs and Practice

The final theme diverges from Perry's (1970) theory. This theme showcased a lack of continuity between participant's articulated views and how they propose to operationalize those beliefs as an agricultural educator. For example, when participants were asked to defend their epistemological stance through a written statement, an overwhelming majority of participants indicated that knowledge is rooted in experience.

However, Participant 11 had a different story in her earlier response when asked to put her beliefs about knowledge into practice. She explained,

> [Participant 11] began the lecture by showing the students different agriculture based companies and the different jobs at that certain company. [Participant 11] then lectured on how these businesses needed to have business plans to be a successful company. [830: 832]

As demonstrated by Participant 11, many pre-service teachers claim to believe in learning from contextualized experiences, but instead chose to present new information to their future classes in a detached, abstract manner. Analogously, Participant 40 indicated learning should be assessed experientially. He indicated that the best way to access student learning was to ask them to perform a skill in a hands-on fashion. However, this notion starkly contrasted from his earlier stated intended classroom practices. Participant 40 explained, "I would be doing this [teaching] by using informational PowerPoints to give the students an idea of things the need to know" [1949:1952].

This chasm between pre-service agricultural education teachers' beliefs and practice inundates much of the data in this study. Time and time again, participants clung to experiential-grounded dogmas when describing the roots of their ideologies about how knowledge is reached by individuals. However, when asked to put these beliefs into practice, participants often reverted back to techniques they had witnessed throughout their educational careers.

Conclusions, Recommendations, and Discussion

The purpose of this study was to understand the initial epistemological stances of pre-service agricultural education students using Oklahoma State University's entry-level Foundations and Philosophies of Teaching Agricultural Education course as a bounded case. We reported and interpreted findings through Perry's (1970) epistemological scheme: dualism, multiplism, relativism, and relativism commitment.

For dualists, active participation and conversation between students seemed to hold little value because they believed that knowledge should be gained from experts— not friends or classmates (Belenky et al., 1986). Current research (Robinson, Kelsey, & Terry, 2013) regarding pre-service agricultural

education teachers demonstrates that pre-service teachers tend to orient toward teacher-centered approaches early in their teacher preparation courses. Perhaps the reason underpinning this preference is an adherence to a dualistic epistemological stance. However, teacher education programs seem to emphasize the need for pre-service teachers to transition into more student-centered approaches (Robinson et al., 2013). To address this issue, perhaps teacher education programs should begin to develop interventions that could encourage pre-service teachers to advance into a more sophisticated epistemological position.

Participants operating in the multiplism position expressed they planned to prepare their students for the real world by training them to question everything. This finding aligns with Perry's (1970) theory. Also, the tenets of multiplism seem to align with agricultural education quality indicators of instruction where the teachers "actively engage students" (Jenkins, Kitchell, & Haines, 2010, p. 57). Teacher preparation programs should be cognizant that some pre-service teachers are drawn to use methods of instruction that allow them to encourage their students to question the theories and topics being taught. However, Perry (1970) explained those adhering to multiplism can often let their passion interfere with future growth and development. Therefore, we encourage teacher educators to stress caution when a pre-service teachers' multiplistic epistemological stance begins to influence their instructional practices.

At the heart of relativism stance is the idea of employing critical thinking skills to attain knowledge (Perry, 1970). Relativist's take in multiple views across theoretical bases and then attempt to form their beliefs and understanding based upon a well-executed procedure (Perry, 1970). For relativists in this study, learning is all about the journey to understanding. The principles underlying this epistemological stance could be considered consistent with indicators for quality instruction in agricultural education where teachers should use variability in instructional practices (Jenkins et al., 2010). Since relativists believe learning is a process, using a variety of instructional practices naturally lends itself to this epistemological belief.

Pre-service teachers operating in the relativism commitment position believed that knowledge is fluid. For example, they described their teaching approach as one that would promote an atmosphere where students would be able to construct their own knowledge from experiences. Educational scholars suggest that teachers should use similar approaches (Calderhead & Robson, 1991; Jenkins et al., 2010; Kagan, 1992; Pajares, 1992). For example, highly quality teachers are often depicted as facilitators of the learning process rather than authority figures that hold the ultimate truth (Calderhead & Robson, 1991; Jenkins et al., 2010; Kagan, 1992; Pajares, 1992). Through this process, the learner is better able to connect the experience and apply it to his or her life (Kagan, 1992). Further, through this approach, the learner becomes the "*agent* and *chooser* of his life in which he invests his energies, his care, and his identity" (Perry, 1970, pp. 149-150).

This search for understanding also led to a somewhat conflicting conclusion – the epistemologies of pre-service agricultural education teachers did not necessarily extend and/or match chosen teacher practices, as represented in the final theme. We, as researchers, submit two possible explanations for this incongruence. First, could it be that there is a social value connected to an epistemology in line with hands-on learning propagated in our rich history and culture of experiential learning? Students may be conditioned, or feel socially pressured, to prescribe to a more relativism commitment approach in word, but expose their true beliefs when describing their classroom practices – which are more passive and dualistic. The second explanation could be that students truly prescribe to a more relativistic view of knowledge formation, but cannot connect this more complex belief to specific teaching strategies. It seems logical that as the epistemology becomes more complex, so do the teaching methods considered within that belief system.

Finally, this lack of congruency also begs the question, "Do pre-service teachers enter programs with an accurate understanding of experiential learning?" If agricultural education discipline truly is based in experience, teacher educators should perhaps devote more attention in the curricula to teaching pre-service teachers how to operationalize this method of instruction. If a more clear understanding of this

educational approach is attained, perhaps this clarity will help pre-service teacher bridge the chasm between their beliefs and their intended practices.

So what? Regardless of the reasoning behind the epistemological and practice *chasm*, epistemologies should be explicitly explored, and then linked to praxis. Fives and Buehl (2008) warned that teacher education often becomes a methods factory model where the focus lies almost exclusively in the *what* rather than the *why*. As such, Brownlee et al. (2001) recommended that teacher education focus more on teacher beliefs to facilitate changes in teaching. Though research has purported that a focus on epistemological perspectives will ultimately influence performance in the classroom (Buehl & Fives, 2009; Cheng et al., 2009; Fives & Buehl, 2008; Jacobson et al., 2010; Tanase & Wang, 2010), we contend there is one vital step absent in that assertion – purposefully bridging the chasm by explicitly connecting epistemological beliefs to practical methods of teaching. Agricultural educators cannot hide behind the socially valued veil of experiential learning without committing to an in-depth understanding of the epistemological roots, bridged to practical methods intended to facilitate the process. The *why* is important, but equally important is adequate preparation in the *what.*

What exactly is experiential learning? Is it a teaching method or an educational framework? Does the chasm exist beyond first-year pre-service teachers? What effect does a teacher education program have on bridging the chasm? These are important questions warranting exploration in future examinations.

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