

The Motivational Changes Pre-Service Agricultural Education Teachers Endure while Facilitating Quality Supervised Agricultural Experiences: A Six-Week Project-Based Learning Experience

Richie Roberts¹ & J. Shane Robinson²

Abstract

The Planning the Community Program in Agricultural Education course exists to provide pre-service teachers in agricultural education with knowledge about FFA and supervised agricultural experiences (SAEs). As such, pre-service teachers embarked on a six-week project-based learning experience in Spring 2016 in which they raised a pen of broilers from a one-day old chick to harvest ready (42 days). The broilers were used as the context to learn about managing data for entrepreneurial SAEs. This case study examined pre-service teachers' motivation regarding their self-reported beliefs and perspectives for participating in the project. Three themes emerged: (a) initial self-ambition, (b) achievement stagnation, and (c) stabilized self-concept. Students began the project with high motivation and excitement. However, toward the midway point of the project, students' motivation waned, due to monotony and challenges. Finally, during the last two weeks, pre-service teachers' motivation stabilized, as their self-concepts and reflection abilities matured. The study holds important implications for how teacher educators in agricultural education should design and deliver future project-based learning experiences regarding students' motivational processes. Specifically, this study indicates that, although student motivation may fluctuate at various stages, it is developed and sustained in a successive manner over time.

Keywords: motivation, project-based learning, SAE

Introduction

Agricultural education exists, as a discipline, to enable students to learn valuable life skills necessary for employment in various sectors of the agricultural industry through rich, experiential learning opportunities (Baker, Robinson, & Kolb, 2012; Rice & Kitchel, 2017). However, creating such opportunities where students are expected to apply their knowledge and skills in various contexts can be a difficult and imperative task (Arnold, Warner, & Osborne, 2006). To be deemed effective, agricultural education teachers are expected to be quality classroom instructors, advise students in the FFA program, and operate, maintain, and utilize all school-based laboratories (Roberts & Dyer, 2004) by providing rich experiences across the comprehensive agricultural education model (Baker et al., 2012).

Agricultural education teachers face a myriad of challenges regarding their professional role. Among them is a lack of student motivation for learning or experiencing agriculture (Boone & Boone, 2009). Fewer people than ever before rely on farming as their livelihood (Environmental

¹ Richie Roberts is an Assistant Professor at North Carolina A&T University, frichardroberts@ncat.edu.

² J. Shane Robinson is a Professor of Agricultural Education in the Department of Agricultural Education, Communications and Leadership and the Associate Director of the Institute for Teaching and Learning Excellence at Oklahoma State University, PIO Building, Stillwater, OK, 74078, shane.robinson@okstate.edu.

Protection Agency, 2012). As people have become further removed from the family farm (Sayers, 2011), so too has their basic knowledge about (Dale, Robinson, & Edwards, 2017; Wingenbach, McIntosh White, Degenhart, Pannkuk, & Kujawski, 2007), as well as their motivation for and appreciation of agriculture, food, fiber, and natural resources (Boone & Boone, 2009; Dyer & Breja, 2003; Stair, Warner, & Moore, 2012).

Sadly, in addition to the general public, today's college students know very little about agriculture. Colbath and Morrish (2010) revealed that incoming freshmen students enrolled at a higher education institution in central Texas failed (54%) a basic agricultural literacy test, where 70% was deemed *acceptable*. Unfortunately, students majoring in agriculture do not fare much better. In a study of the entire freshmen body at Oklahoma State University, it was found that students in the College of Agricultural Sciences and Natural Resources possessed barely a passing grade (61%) on a similar 100-point test regarding their knowledge of basic agricultural concepts (Dale et al., 2017). This lack of basic knowledge has implications for pre-service agricultural education teachers as they come to the university with a dearth of experiences in agriculture. It becomes the role of teacher preparation programs and educators to provide the adequate human capital, such as knowledge and experiences, pre-service teachers need before entering the profession (Mundt, 1991; Robinson & Baker, 2013; Rice & Kitchel, 2017).

Fortunately, teacher preparation programs of agriculture exist to provide coursework and experiences that enable students to learn technical agricultural skills and improve their confidence to teach them (Leiby, Robinson, & Key, 2013). Kennel (2009) stated, "because teachers are the single most important influence on student achievement, teacher education programs need to provide learning experiences for pre-service educators to impact their confidence to teach pertinent subject matter" (p. 2). One such area of need is supervised agricultural experience (SAE) programs (Rubenstein, Thoron, & Estep, 2014).

Rubenstein et al. (2014) stated:

Since its inception, school-based agricultural education in the United States has utilized the home project method, later known as a supervised agricultural experience program (SAE), as a way to provide students with contextual, hands-on learning experiences outside of class that complement classroom learning. (p. 72)

Although SAEs are a fundamental component of the agricultural education program (Croom, 2008; Ramsey & Edwards, 2012) and have been since Stimson's Farm Project Method was introduced in the early 1900s (Boone, Doerfert, & Elliot, 1987), teachers spend the least amount of time teaching students about them in comparison to other aspects of their job (Robinson, Krysher, Haynes, & Edwards, 2010; Terry & Briers, 2010). Therefore, a decline in student participation in SAEs at the secondary level exists (Croom, 2008). Although the reasons for the decline are largely unknown (Bird, Martin, & Simonsen, 2013), it could be due to teachers' lack of knowledge of and experience in SAEs (Lewis, Rayfield, & Moore, 2012).

It is recognized widely that, although agricultural education consists of a balanced and integrated three-circle model including classroom and laboratory instruction, FFA, and SAE (Croom, 2008; Phipps, Osborne, Dyer, & Ball, 1988), the SAE component appears to be the weakest among the three (Croom, 2008; Rubenstein et al., 2014; Wilson & Moore, 2007). In addition to being the weakest component, Dyer and Breja (2003) revealed that SAEs actually serve as "obstacles" to recruiting students into agricultural education programs (p. 84).

Part of the reason SAE participation has decreased over time is due to historical issues. Stimson's vision of SAE "became in actuality a mission statement of agricultural education. Many teachers soon realized, however, that education in agriculture must encompass more than only one home project, and initiated broader SAE programs" (Dyer & Osborne, 1995, p. 6). The Vocational Act of 1963 was intended to improve the broader aspect of what constituted an SAE. However, it came with unintended consequences and "de-emphasize[d] the need for SAE programs" (Dyer & Osborne, 1995, p. 7), which had a negative impact on SAE activity in the US (Boone, Doerfert, & Elliot, 1987). The decrease in students' SAE participation eventually had a ripple effect, resulting in teachers being less experienced in and knowledgeable about teaching SAEs (Dyer & Osborne, 1995).

To increase participation, teachers have tried to motivate and encourage students to participate in SAEs through extrinsic rewards (Bird et al., 2013). Specifically, teachers use FFA awards as the motivation for students to participate in quality SAEs (Wilson & Moore, 2007). However, the spirit of SAEs may be more intrinsic than extrinsic for students in secondary programs (Bird et al., 2013).

Motivation can be impacted by the types of experiences students have (Baker, Robinson, & Terry, 2015). Kolb (1984) recognized the need for establishing concrete learning experiences in which students reflect, draw conclusions, and then retry their new ideas for experiencing a novel situation. It is important that an expert be present to guide the novice learner through a novel learning experience (Kolb, 1984).

Teacher educators should provide the expert guidance to pre-service teachers regarding the skills and experiences they need to be successful in the classroom (Rubenstein & Thoron, 2015; Stair et al., 2012). Teachers have indicated that ensuring SAE quality and effectiveness is one of the most important and difficult tasks associated with teaching school-based agriculture (Dyer & Osborne, 1995; Ramsey & Edwards, 2012; Robinson & Haynes, 2011; Rubenstein et al., 2014). Therefore, including SAEs in teacher preparation programs is imperative (McLean & Camp, 2000). Specifically, "teacher preparation programs in agriculture [should] provide authentic, relevant instruction to preservice teachers on developing, implementing, maintaining, sustaining, evaluating, and supervising an SAE program" (Rubenstein et al., 2014, p. 72). For SAEs to be relevant, viable, and impactful for secondary students, teachers must be well equipped, as they play an integral role in the development and delivery of student SAEs (Rubenstein & Thoron, 2015). Given the importance that motivation plays in shaping quality SAEs (Bird et al., 2013), a need existed to understand how pre-service teachers experienced motivation as they engaged in experiences designed to enhance their instructional knowledge and skills to facilitate SAEs.

Theoretical Framework

Through our analytic procedures, we decided Maehr's and Zuscho's (2009) achievement goal theory (AGT) served as the most appropriate theoretical lens to describe how pre-service agricultural education students experienced motivation during a six-week SAE project focused on raising broilers. Although scholars have theorized the link between motivation and learning from multiple perspectives (Schunk, 2016), AGT emphasizes the importance that *motivational processes* play in students' learning experiences. Motivational processes affect the way students acquire, transfer, and use new knowledge and skills (Dweck, 1986). Further, AGT scholars (Senko et al., 2013; Senko & Hulleman, 2013) conceptualize motivational processes as the *goal-directed behaviors* students' exhibit over time. Goal-directed behaviors involve social cognitive processes such as motives, strivings, achievements, concerns, and action. As a consequence, Maehr and Zuscho (2009) argued that motivation should be examined in terms of students' shifting

perspectives, beliefs, and behaviors throughout the *life* of learning activities.

Therefore, we discerned motivation through students' self-reported beliefs and perspectives regarding their goal-directed behaviors. For example, we analyzed how participants articulated their choice to engage in particular activities, quality of engagement, performance, and resolve. In other words, we used this *a posteriori* theoretical lens to make sense of the *motivational shifts* participants experienced during their six-week broiler project. However, AGT also positioned us to consider the role that *cultural* and *individual* factors might have played in shaping the motivational processes of participants. For example, through the lens of AGT, we analyzed the influence that factors such as the culture of learning activities, individual tasks, and as well as the laboratory environment might have played in affecting students' motivation. Therefore, AGT served as underlying theoretical scaffolding to which the study's findings are anchored.

Theoretical Perspective, Purpose, and Rationale

From this study's early conception, we nested our decisions in Koro-Ljungberg's, Yendol-Hoppy's, Smith's, and Hayes' (2009) position that qualitative researchers' philosophical perspective and methodological choices should be aligned. Therefore, we grounded this study in the worldview of *constructionism* (Crotty, 1998). Constructionists consider knowledge to be "... contingent upon human practices, being constructed in and out of interaction between human beings and the world, and developed and transmitted within an essentially social context" (p. 42). Grounded in this perspective, we developed the purpose of this study, which was to describe how pre-service agricultural education teachers experienced motivation during a project-based learning assignment that used broilers as a context for teaching data management (i.e., record keeping) and SAE concepts. Consequently, we also were positioned to address Priority 4 of the National Research Agenda, which calls for "meaningful, engaged learning in all environments" (Roberts, Harder, & Brashears, 2016, p. 37). Next, we will outline the background of the study.

Background of the Study

Planning the Community Program in Agricultural Education is the third in a sequence of courses taken by agricultural education students at Oklahoma University. Per the 2016-2017 [University] Course Catalog, the *Planning the Community Program in Agricultural Education* course exists to increase students' human capital regarding "FFA chapter advisement, planning and managing the instructional program, [and] identification and completion of records and reports required to be a teacher of agricultural education in Oklahoma" (p. 199). The course is designed to assist and equip students with the tools needed to conduct quality SAE programs at the secondary level (Robinson, 2016). The aim of this course is to allow students to gain a theoretical and practical understanding of the FFA and SAE components of agricultural education's integrated three-circle model. In Spring 2016, the course's lead instructor introduced record keeping and SAE concepts through a project-based learning approach. Through this project, 34 pre-service teachers partnered to care for approximately 200 one-day-old broilers over a six-week period. As an additional requirement for the course, students designed broiler experiments, tested interventions, collected and maintained accurate records, and rotated between student and advisory roles to gain insight into facilitating such experiences. Specifically, each student was provided "five (5) broilers to raise and collect data for the last six weeks of the semester" (Robinson, 2016, p. 5). Students were paired with a partner, so as to have 10 birds between them, to design an experiment and role-play the teacher and student during the project's duration.

To assist pre-service teachers with making learning connections, they were required to submit weekly reflections, photos, and data collection records. Further, the pre-service teachers

were required to create and deliver a final presentation of their experience to their peers. In the design of this project, our personal beliefs about teaching and learning influenced its conceptualization. Therefore, to be transparent about our influences, the reflexivity section details our position in the design, collection, and analysis of data associated with this study.

Reflexivity

It is crucial for qualitative researchers to reveal the biases and perspectives influencing their decision-making (Patton, 2002). As a consequence, we constructed the following reflexivity statement as a way to promote *honesty* and *sincerity* before offering an interpretation of the study's findings (Lincoln & Guba, 1985).

Both researchers were involved directly with the course under investigation. For example, at the time of data collection, the lead researcher was a doctoral student in agricultural education at OSU and served as a teaching assistant for the course. The second author was a Professor at OSU and served as the course's lead instructor. It also is important to note that both researchers are former school-based, agricultural education (SBAE) instructors in Oklahoma. Because we consider Oklahoma traditional in regard to agricultural production, we also held biases concerning the importance of using animals as a context for teaching and learning. This bias influenced our decision to use poultry (i.e., broilers) to facilitate the teaching of record keeping and SAEs for this project-based learning assignment.

Given these experiences and perspectives, we recognize our influences on the study. However, we attempted to mitigate our biases whenever possible. Consequently, the following section outlines our methodological decisions, analytic moves, and discoveries as we sought to understand this phenomenon.

Methodology

We chose to ground this study, methodologically, in Stake's (1995) instrumental case study approach. Due to its roots in the interpretivist paradigm (Stake, 1995), this choice allowed us to bring our theoretical and methodological decisions into philosophical alignment (Koro-Ljungberg et al., 2009). For example, instrumental case studies can offer rich understandings into bounded systems (Stake, 1995). However, this qualitative approach's strength lies in the context-rich description of *specific issues* that may have transferability to similar circumstances (Creswell, 2013; Stake, 1995).

In this study, *time* and the *unit of analysis* bounded the case. For example, we limited the project-based learning assignment to a six-week period and analyzed data for only one particular laboratory section of the course. Our reason for bounding this case during this time period is because the broilers are typically harvested at Oklahoma State University after 42 days (Name, personal communication, January 17, 2016). We offer a deeper insight into participant characteristics and selection criteria next.

Participants

Each participant ($n = 14$) was enrolled in Laboratory Section 001 of the *Planning the Community Program in Agricultural Education* course at Oklahoma State University in Spring 2016. Our decision to mobilize data from this particular *unit of analysis* was threefold: (a) it was

the largest laboratory section, (b) it reflected student demographics best, and (c) the lead researcher was immersed in all of the section's major activities throughout the duration of the project. As a consequence, we purposefully selected (Patton, 2002) seven female and seven male pre-service agricultural education teachers from this bounded system.

Data Sources and Analysis

We collected multiple sources of data to triangulate findings. For example, written reflections, student photographs, record keeping submissions, field observations, summative presentation materials, and video of participants' final presentations all furnished sources of data. Analysis was an ongoing process as we began to engage data sources (Saldaña, 2015). To make sense of our analytic work, we used memoing techniques to mobilize findings, empirical assertions, and analytic shortcomings. Because data become fragmented in qualitative analysis, we followed Saldaña's (2015) recommendations to continually return to the data corpus to minimize misrepresentations, thus improving the transferability of the findings.

Data were analyzed using the constant comparative method (Corbin & Strauss, 2015). Both hand coding and NVivo® qualitative analysis software were used to explore and manage the data. To initiate analysis through the constant comparative method, we used Saldaña's (2012) coding suggestions consisting of the following techniques: (a) open, (b) axial, and (c) selective. Through two distinct rounds of open coding and multiple coders, we identified initial codes (Saldaña, 2012). Then, we scrutinized the relationships of the open codes in the axial coding phase. When analyzing these relationships, we considered the study's context and the consequences of reducing data units into particular categories through a negotiation phase (Patton, 2002). Ultimately, the resulting product was used to develop evidentiary warrants (Corbin & Strauss, 2015). To mobilize the evidentiary warrants, we reengaged the data through selective coding (Saldaña, 2012). The use of selective coding allowed us to develop an analytic storyline that we chose to narrate through the three themes (Saldaña, 2015).

Rigor and Trustworthiness

Before offering our interpretation of the findings, it is important to discuss our strategies for building *rigor* and *trustworthiness* into this investigation. From this study's inception, we allowed Lincoln's and Guba's (1985) four standards of qualitative quality – credibility, transferability, dependability, and confirmability – to drive our ethical decision-making. Strategies for upholding each standard are outlined below.

Credibility refers to the production of trustworthy findings (Lincoln & Guba, 1985). We addressed credibility through three major strategies: (a) persistent observations, (b) triangulation of data sources, and (c) peer debriefing sessions. We also stressed the importance of the study's findings in providing meaning to other contexts, or *transferability*. To accomplish this, we provided a rich description of the setting and participants while also being frank about the limitations of the study. The third standard, *dependability*, represents the stability of the investigation. We emphasized dependability in three major ways: (a) only collecting data that connected to the study's purpose, (b) describing clearly each researchers' role in the study, and (c) outlining the philosophical paradigms influencing this investigation's design. Finally, the extent to which the study's findings could be linked to data, or *confirmability*, was addressed through using direct quotes from participants and comparing claims regularly against relevant data sources. Through our efforts to uphold standards for rigor and trustworthiness, we gained confidence in our interpretations of this investigation's findings.

Findings

Through our analysis of the data, three processes emerged that describe how participants experienced motivation in the project-based learning assignment under investigation. Using Maehr's and Zuscho's (2009) AGT as theoretical lens, we narrated the processes through three themes: (a) *initial self-ambition*, (b) *achievement stagnation*, and (c) *stabilized self-concept*. The processes provide new insights into the role that motivational shifts can play in shaping learning outcomes for pre-service agricultural education teachers. Using relevant examples from the data, each theme seeks to distinguish how participants experienced these *motivational processes* throughout the six-week broiler project, which provided a context for teaching record keeping and SAE concepts.

Initial Self-Ambition

Through the lens of AGT, individual goals and ambitions could serve as powerful motivators (Maehr & Zuscho, 2009). In accordance, participants in the study articulated the *ambitions* they held regarding the broiler project were connected largely to building their professional capacity. Typically, participants expressed these sentiments in the *early stages* of the project. For example, Participant 11 revealed his ambition was to gain a deeper understanding of teaching the scientific method in the context of agriculture. In his first journal entry, he wrote:

I feel like there are a lot of valuable things that can be learned and taught by doing this assignment. For example, you can learn to teach the scientific method and the importance of being consistent and responsible. The scientific method is crucial in the agriculture industry.

Meanwhile, Participant 13's early goal was to hone her pedagogical skills to keep students engaged in laboratory settings. She explained, "This type of project is one that most students will be excited and motivated to complete." On the other hand, Participant 7 saw value in the project due to its focus on animals. He explained, "The livestock side of teaching Ag is something I'm excited for, yet nervous for at the same time." Consequently, his ambition was to gain more knowledge about facilitating such experiences for his future students.

In the project's introduction, participants also were optimistic about learning to facilitate record keeping for SAEs. In week one, various pre-service teachers expressed their ambitions to gain proficiency in this particular technical area through the project. For instance, Participant 4 found this element of the project "thrilling and exciting." Several participants even submitted photos after week # 1 that depicted elements of the record keeping process (see Figure 1).



Figure 1. Participant 1's (Left) and Participant 2's (Right) photo submission from week # 1 of the broiler project. Photos depict pre-service agricultural education teachers in various phases of the record keeping process.

In the first theme, we outlined the *initial self-ambitions* experienced by participants in the broiler project. This motivational process appeared to be manifested through the pre-service teachers' early goals and ambitions to gain proficiency in various pedagogical and content-specific areas, such as animal husbandry and record keeping. However, as participants gained experience and competence with the broilers, these positive views often became stagnated, as achievement appeared to stall.

Achievement Stagnation

After several weeks of caring for the broilers, participants appeared to lose sight of their initial ambitions. Further, their motivation for the project seemed to become *disconnected*, *narrow*, and *stagnant*. AGT scholars (Huang, 2011; Linnenbrink-Garcia, 2012; Putwain, Larkin, & Sander, 2013) argued that *stagnation* occurs as individual challenges and concerns begin to overpower learners' goals and expectations. For instance, Participant 2 did not perceive growth in her abilities; consequently, she struggled to make sense of how to engage her future students in similar projects. She explained:

I feel that I am satisfactory. I myself am a little tuned out from this project. This project to me is the same routine. I feel I can't engage students if I myself am not engaged. This particular project isn't something I have found passion in and until I find that spark I don't really know how excited I will really be. I feel maybe it will be more interesting as the project goes on but right now I have no clue how to engage my students.

Other participants articulated their struggles with staying motivated were due to the demanding and monotonous tasks associated with the project. For example, Participant 10 explained, "keeping motivated can be a hard task." Similarly, Participant 9 voiced that he experienced "little growth" during this phase of the project. Interestingly, participants' photo submissions also appeared to lack a sense of motivational and skill development. For example, in photo submissions for week # 3 several participants submitted photos illustrating their

unwillingness to test new boundaries and work toward achieving their initial goals for the project. Instead, their submissions depicted rudimentary skills, such as weighing broilers (see Figure 2).



Figure 2. Participant 4's (Left), Participant 11's (Center), and Participant 12's (Right) photo submissions from week # 3 of the broiler project. Photos depict participants' weighing broilers – a low-level skill for this phase of the project.

The second theme, *achievement stagnation*, demonstrated a substantial shift in participants' motivational schemes. For instance, they seemed to lose sight of the importance of their early ambitions as they engaged in monotonous and tedious activities associated with the broiler project. This motivational disengagement also appeared to influence their learning outcomes, as numerous participants refrained from making important pedagogical and content knowledge connections.

Stabilized Self-Concept

Over the final weeks of the project, students began to encounter more complex problems. For example, in the project, many of the participants faced issues such as “sickness” (Participant 12), “disease” (Participant 6), “irregular growth patterns” (Participant 8), and the “death” of one or more of their broilers (Participant's 7, 10, and 14). Interestingly, after confronting these difficulties, participants began to articulate more *complex, integrated, and stable* perspectives. In this regard, AGT conjectures that as learners persist through the trials of learning activities, their motivation often stabilizes as they begin to *make meaning* of how these difficulties helped them to grow and mature (Maehr & Zuscho, 2009). The maturation of one's self-perspective, therefore, holds substantial implications for the study of motivation.

In the literature, Schunk (2016) defined *self-concept* as the self-perspectives individuals hold of themselves. As a consequence, one's self-concept is formed by the confidence a person maintains as a result of his or her experiences (Shunk, 2016). In this study, participants' self-concept appeared to stabilize in the later stages of the broiler project. This factor also appeared to positively influence the pre-service teachers' motivation to gain quality professional benefits from the assignment.

For example, as the broiler project came to a conclusion, we asked the pre-service teachers to reflect deeply on their professional growth and development. To facilitate this process, we required each student to develop and deliver a final presentation (Robinson, 2016). Through this

process, participants seemed to *make sense* of their experience, which also appeared to help them crystallize their beliefs about the role the project had in shaping their pedagogical and technical development. We captured the final presentations and resulting discussions on video; therefore, we were able to use these moments of explanation, clarification, and co-construction of knowledge as important data points in this study.

In students' final evaluation of their learning, they seemed to make important connections in regard to the value the broiler experience might provide as they transitioned into teaching in a real-world laboratory setting. Participant 3 explained,

Towards the end we became more comfortable with the project and began to learn what needed to be done to help out the animals and make their life easier day-by-day. For example, we had to move the feeders up and down. This is part of the learning process and will help us solve problems when we are in the real world as ag teachers.

Other participants perceived they had matured professionally through the project as well. For example, they espoused they could "provide recommendations" to future students (Participant's 10 and 14), "plan successful laboratory experiences" (Participant's 8 and 9), overcome "unexpected challenges" (Participant's 2 and 5), and "manage students" in a laboratory setting (Participant's 4 and 6) better than they could before engaging in the experience. Thus, the final theme detailed how these pre-service teachers began to move beyond the motivational stagnation experienced in the mid-stages of the broiler project. By confronting complex issues and reflecting deeply on their experiences, numerous participants' *self-concept* seemed to stabilize in the project's final stages, which encouraged positive professional growth.

Conclusions

In this study, we sought to describe how pre-service teachers in agricultural education at Oklahoma State University experienced motivation during a project-based learning assignment that used broilers as a context for teaching concepts related to data management and SAEs. Interpreting the findings through the theoretical lens of Maehr's and Zuscho's (2009) AGT revealed three themes: (a) initial self-ambition, (b) achievement stagnation, and (c) stabilized self-concept.

The first theme, *initial self-ambition*, illuminated the importance of participants' early goals and expectations regarding the broiler assignment, which mainly seemed to reflect their desire for professional growth and development. For example, participants articulated enthusiasm to enhance their knowledge and skills about facilitating the *scientific method*, *livestock projects*, as well as *record keeping* for SAEs. These early ambitions appeared to drive the motivational processes experienced by participants. As a consequence, we conclude that identifying participants' individual self-ambitions is central to understanding how motivational shifts might occur at the individual level during project-based learning assignments. Although this literature on motivation and learning supports this finding (Dweck, 1986; Maehr & Zuscho, 2009), scant evidence exists in the context of agricultural education.

In the mid-stages of the broiler project, pre-service teachers seemed to experience *achievement stagnation*. For instance, participants reported the *challenges*, *demands*, and *monotony* of certain tasks associated with the assignment caused them to lose sight of its intents and purposes. As a result, participants' course submissions also appeared to lack a sense of pedagogical and content-specific growth. Existing evidence across disciplines suggests that challenges in learning endeavors may result in students lacking the motivation needed to attain their

educational and professional goals (Huang, 2011; Senko et al., 2013). However, findings from this investigation hold new insights for the motivation literature by providing a basis for how *contextual*, *emotive*, and *visceral* dimensions of learning might affect students' motivation.

The final theme demonstrated how participants' motivation appeared to *stabilize* in the latter phases of the assignment. This stabilization seemed to occur through the maturation of participants' self-concept through reflective strategies that required participants to consider how they grew professionally during the project. The view that *reflection* serves as a crucial element of learning process is situated firmly in the agricultural education literature (Baker, Brown, Blackburn, & Robinson, 2014; Epler, Drape, Broyles, & Rudd, 2013; Lambert, Sorenson, & Elliot, 2014). However, the notion that reflection may be used as a technique to stabilize the self-concept of pre-service teachers has not been addressed explicitly.

Discussion, Implications, and Recommendations

Recently, the construct of motivation appears to have been operationalized as a quantitative variable in the agricultural education literature (Baker et al., 2015; Chumbley, Haynes, & Stofer, 2015; Roberts, Terry, Brown, & Ramsey, 2016). However, by approaching this study from the qualitative paradigm, this study's findings hold important implications for agricultural education in regard to future research, theory, and practice.

First, existing research in agricultural education largely attempts to measure students' changes in motivation using pre-determined outcomes through treatments that are both short-term and novel in design (Baker et al., 2015; Chumbley et al., 2015; Roberts et al., 2016). However, by using an emergent design that was more longitudinal in nature, this study's findings illuminated three existing motivational processes while also providing empirical evidence of a theorized, sequential relationship among them. Additional research is needed to explore the parameters of this relationship and whether more nuanced motivational processes need to be *discovered* and more evocatively *defined*. Researchers exploring the motivation of pre-service teachers also should consider the findings to examine whether the motivational process identified might influence the design, collection of data, and resulting outcomes of their studies.

The three motivational processes also warrant future research. For example, *initial self-ambitions* appeared to influence the major motivational shifts experienced by participants. Consequently, future work should attempt to identify pre-service teachers' goals and expectations more extensively as they engage in project-based learning throughout teacher preparation training. Additional research is needed to explore the *stagnation* participants experienced in regard to achievement. In this case, *monotony* and the *demands* associated with the project seemed to have influenced participants' motivation negatively. To this point, we recommend that future investigations test various interventions throughout project-based learning assignments to determine whether learners' motivation could be maintained at a more consistent level. Finally, although the agricultural education literature is rife with evidence concerning the importance of reflection (Baker et al., 2014; Epler et al., 2013; Lambert et al., 2014), more research is needed to identify the types of reflective strategies that might be most useful in assisting pre-service teachers' self-concept to *stabilize*.

In this investigation, we used Maehr's and Zuscho's (2009) AGT as an *a posteriori* lens to make meaning of the study's emergent findings. Therefore, we allowed AGT to assist in organizing our understanding of how participants experienced motivation during the broiler project. As a result, we were able to grasp and explain each motivational process more intimately. Nevertheless, we believe the study's findings could offer a crucial expansion to AGT. For example, participants

in this study appeared to experience the motivational processes in a successive manner. Consequently, more theory-building efforts should be undertaken to generate a clearer conceptual explanation for how AGT might unfold in praxis.

In an era where less people are exposed to agriculture (Environmental Protection Agency, 2012; Dale et al., 2017; Sayers, 2011; Wingenbach et al., 2007), this course was focused on providing concrete experiences in which students could participate and reflect over time (Kolb, 1984). However, providing such experiences came with a *cost*. The broiler project under investigation required *time, money, and human capital* to be successful. In practice, therefore, university officials should deeply consider whether they are willing to dedicate the time and resources necessary to ensure that students gain a quality learning experience. We also recommend that practitioners consider whether broilers might be the most appropriate context to facilitate learning the principles of data management (i.e., record keeping) and SAEs. For example, perhaps a horticulture project could be a more cost-effective and less controversial alternative given the rise of animal advocacy legislation in recent years. Moving forward, we recommend that university officials consider the *motivational processes* identified in this study in the design and delivery of project-based learning assignments for pre-service teachers in agricultural education. By integrating strategies to promote consistent motivational behaviors purposefully, perhaps greater learning outcomes can be achieved.

Finally, although motivation for participating in the six-week project fluctuated over time for these pre-service teachers, it served as a valuable teaching opportunity regarding their prospective students' SAE projects. Undoubtedly, their future secondary students will become demotivated and disenfranchised with their own SAEs at some point throughout the process. Having experienced and rebounded from their own lack of motivation might help these pre-service teachers relate better to the potential struggles of their future students when and as they occur.

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