# USING TIME ALLOCATION TO UNDERSTAND THE PERCEIVED TEACHING ABILITY OF STUDENT INTERNS IN AGRICULTURAL EDUCATION: A Q-METHOD STUDY

By

SHEYENNE KRYSHER

Bachelor of Science in Agricultural Education
Sam Houston State University
Huntsville, TX
2000

Master of Science in Agriculture
Sam Houston State University
Huntsville, TX
2002

Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF PHILOSOPHY
December, 2010

USING TIME ALLOCATION TO UNDERSTAND

THE PRECEIVED TEACHING ABILITY OF STUDENT

INTERNS IN AGRICULTURAL EDUCATION:

A Q-METHOD STUDY

Dissertation Approved:

Dr. J. Shane Robinson

Dissertation Adviser

Dr. M. Craig Edwards

Dr. Cindy Blackwell

Dr. Diane Montgomery

Outside Committee Member

Dr. Mark E. Payton

Dean of the Graduate College

# ACKNOWLEDGMENTS

I would like to acknowledge my committee for their time and effort put forth in guiding this document. I wish to express my sincere appreciation to my advisor, Dr. Shane Robinson, for his guidance and encouragement during this entire process. He read numerous drafts and I am truly indebted for all the edits. In the end, it was well worth those efforts for us both as I have now joined the scholarly world and he concluded the advisement of his first doctorial student.

I would like to thank Dr. Diane Montgomery for introducing me to Q-methodology and guiding me through its proper application. Proper "thank you's" must also go to Drs. Edwards and Blackwell for providing thoughtful suggestions for my study. I would like to extend appreciation to Dr. Edwards, the first true logophile I have met. His endless quest for the precision of word application undoubtedly increased to readability of this manuscript.

I would like to give heartfelt appreciation to my longtime second family, Cookie and Jim Oberg, for spending countless hours discussing my research with me, encouraging and supporting me, and making sure I never ran out of brain food.

TABLE OF CONTENTS

Chapter Page

Chapter Page

Chapter Page

LIST OF TABLES

Table Page

LIST OF FIGURES

Figure Page

# CHAPTER I

## INTRODUCTION

Student teaching is one of the most commonly and widely used components in the teacher preparation process nationally (Carnegie Forum's Task Force, 1986). It is a culminating internship which provides experiential learning and is "the most crucial [of] activities" (Schumann, 1969, p. 159) during the preparation process. An internship within a cooperating center (i.e., secondary school) exposes student teachers to the same experiences they will encounter as a full-time teacher. These experiences include numerous activities both in and out of the classroom. In addition to the time spent planning and delivering instruction, a teaching experience "involves reteaching, providing multiple meaningful activities for diverse groups of students, managing behaviors, bookkeeping, management, organization, traffic flow, collecting and distributing materials, and more" (Spooner, Flowers, Lambert, & Algozzine, 2008, p. 268). Further, in regard to the preparation of instruction, a teacher may need to plan for diverse curriculum within his/her content area. For an individual in agricultural education, this means he/she must instruct courses across the curriculum such as animal science, horticulture, agribusiness, and agricultural mechanics (Robinson, Krysher, Haynes, & Edwards, in press).

Time and experience are central to the growth and development of student teachers (Spooner et al., 2008). However, as graduation requirements are decreased to under 128 credit hours, exposing pre-service agricultural education students to real-life challenges becomes a daunting task (Burris, Robinson, & Terry, 2005). The reduction in graduation hours limits the amount of time available to provide vital learning experiences to future teachers. The lack of potential learning experiences could lead to lower levels of student proficiency, which could then lead to teachers' levels of confidence or self-efficacy related to their teaching being diminished. For example, new agricultural education teachers do not often feel prepared to teach agricultural mechanics subject matter (Hubert & Leising, 2000), which is understandable when numerous universities offer few or no agricultural mechanics courses during teacher preparation (McLean & Camp, 2000).

## Theoretical Framework

According to Bandura (1993), confidence can influence a person's ability to fulfill his/her expectations to perform a task successfully. "This is because unless people believe that their actions can produce the outcomes they desire, they have little incentive to act or to persevere in the face of difficulties" (Pajares, 2002, para. 14). Confidence, or beliefs an individual holds about his or her ability to perform tasks, is known as self-efficacy (Bandura, 1977). "People guide their lives by their beliefs of personal efficacy" (Bandura, 1997, p. 3). Individuals form self-efficacy beliefs regarding specific domains or contexts in all facets of life, including teaching.

Berman, McLaughlin, Bass, Pauly, and Zellman (1977) provided an early definition of teaching efficacy as, "the extent to which the teacher believes he or she has

the capacity to affect student preformance" (p. 137). Tschannen-Moran, Hoy, and Hoy (1998) provided a more encompassing definition of self-efficacy. They stated teacher efficacy is a person's "belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context" (p. 233). It can have an effect on a teacher's behaviors in the classroom, effort invested in teaching, and goal setting (Tschannen-Moran & Hoy, 2001).

Self-efficacy is domain specific (e.g., academic self-efficacy or career self-efficacy), and teaching self-efficacy is context specific. As the school day progresses, what a student teacher instructs will change with each passing class period. In addition to varying courses being taught, the classroom may be filled with students ranging in age, ability and preferred learning style. "Teachers feel efficacious for teaching particular subjects to certain students in specific settings . . ." (Tschannen-Moran et al., 1998, p. 227), so, a student teacher's self-efficacy may change with each class, topic, and set of students.

Teaching efficacy is not only important to current teachers but also to future (i.e., pre-service) teachers. Efficacy is an important phenomenon to understand, especially regarding a person's perception about his/her teaching ability. Tschannen-Moran et al. (1998) posited, "once efficacy beliefs are established, they appear to be somewhat resistant to change" (p. 235). As such, it is important to assess student teacher self-efficacy while these individuals are still at the pre-service level (Korthagen & Kessels, 1999) so that efforts can be made to improve the preparation they encounter during their teaching practicums (Parajes, 1992). "Helping teachers develop strong efficacy beliefs early in their career will pay lasting dividends" (Tschannen-Moran et al., 1998, p. 234).

For example, a teacher with a high level of teaching efficacy might exert more effort to break through to difficult students. In relation to agricultural education, understanding teaching self-efficacy can help predict the success or failure of a student teacher (Stripling, Ricketts, Roberts, & Harlin, 2008).

Though teacher efficacy is a powerful construct, it has been difficult to measure (Tschannen-Moran and Hoy, 2001). Several methods of measuring efficacy have been employed over the years from the two-item scale used in the Rand Corporation studies (Armor et al., 1976; Berman et al., 1977) to the 24-item scale used in the Teachers' Sense of Efficacy Scale (Tschannen-Moran et al., 1998). However, in many cases, people make judgments about their capabilities without a clear task or activity in mind. Therefore, self-efficacy instruments often suffer from "mismeasurement." Bandura (1997) warned that instruments with few measurements are too global and instruments that are too specific become less generalizable. Efficacy measurements should be a balance between task and domain specific assessment (Bandura). Other researchers have suggested that employing a variety of research methods, including qualitative inquiry, would serve to enrich the understanding of teacher efficacy (Henson, 2002; Tschannen-Moran et al., 1998).

Due to the need to measure self-efficacy both quantitatively and qualitatively, Q-methodology appears to be a logical approach. Q-methodology is a qualitative research method with quantitative features (Watts & Stenner, 2003), which might serve to study teacher efficacy through means that have been overlooked previously. It has been recommended that, "self-efficacy beliefs should be assessed at the optimal level of specificity that corresponds to the task being assessed and the domain of functioning

being analyzed" (Pajares, 1996, p. 547). Q-method seeks to interrogate the phenomenon holistically.

> If value preferences are at issue, the most sensible and straightforward strategy is to ask a person to provide a synthetic picture of what his value preferences are, and one crude way of doing this is to instruct him to model his preferences in a Q sort. (Brown, 1980, p. 53)

Thus, the use of Q-methodology could allow for a subjective examination of self-efficacy to which both the task and domain being analyzed are evident to that person.

Self-efficacy has received increased attention in the teacher education aspect of agricultural education. Multiple studies have been conducted by researchers to understand the teacher efficacy of student, novice, and experienced teachers. In particular, the overall sense of teaching efficacy has been studied at varying levels of the teaching experience (Burris, McLaughlin, McCulloch, Brashears, & Fraze, 2010; Knobloch, 2006; Roberts, Briers, & Harlin, 2008; Roberts, Harlin, & Ricketts, 2006; Stripling, Ricketts, Roberts, & Harlin, 2008; Whittington, McConnell, & Knobloch, 2006). Teacher efficacy in agricultural education also has been explored in varying contexts such as communications (Edgar, Roberts, & Murphy, 2009), gender bias (Kelsey, 2007), personality type (Roberts, Mowen, Edgar, Harlin, & Briers, 2007), student teaching experience (Knobloch & Whittington, 2002), comfort level in teaching prescribed instructional objectives (Wingenbach, White, Degenhart, Pannkuk, & Kujawski, 2007), job satisfaction (Blackburn & Robinson, 2008), and career commitment (Knobloch & Whittington, 2003).

In their study of novice agricultural education teachers, Whittington et al. (2006) recommended that teacher efficacy research be conducted in relation to student teachers in all fields including agricultural education. Therefore, this study was designed to understand more about student teachers' allocation of time to various teaching activities during the student teaching internship and how it may affect the self-perception of their teaching ability.

Teaching agriculture includes an increasing amount of job responsibilities (Delnero & Montgomery, 2001). Specifically, numerous activities both in and out of the classroom such as instructional preparation, laboratory preparation and management, grading student work, administrative duties, in-service, management of the FFA program, Supervised Agricultural Experience (SAE) observations and preparation for competition should be conducted by the teachers (Torres, Ulmer, & Aschenbrener, 2008).

Numerous studies have been conducted regarding the allocation of time within a secondary agricultural education program. Torres and Ulmer (2007) analyzed the time student teachers spent conducting various job responsibilities while at their cooperating centers; Nekolny and Buttles (2007) and Robinson et al. (in press) compared time spent conducting activities between fall and spring semester student teachers; Torres et al. (2008) compared between student, novice and experienced teachers; and Lambert, Ball, and Tummons (2010) studied the phenomenon qualitatively according to early career teachers.

## Problem Statement

Few studies have been conducted on student teachers in agricultural education regarding their self-efficacy. Previously employed self-efficacy measurements have

failed to capture the subjectivity associated with the self-referent human dimension; however, Q-methodology is a type of inquiry which is designed specifically to capture human subjectivity. Particularly, it was important to assess how student teachers' daily time allotment affected their perceptions of their teaching ability.

## Purpose of the Study

The purpose of this study was to describe the views student teachers in agricultural education at Oklahoma State University had regarding their 12-week student teaching experience. To accomplish this purpose, this study explored the perceptions of agricultural education student teachers in the spring and fall semester of 2009, regarding aspects of self-efficacy. Further, this study sought to describe the amount of time student teachers spent performing various activities (i.e., teaching in classroom and laboratory settings, observation, instruction of specific curriculum, and time in alternate settings) while at their cooperating centers.

## Research Questions

1. What views did agricultural education student teachers have about their teaching ability?

2. How did student teachers spend their time in various activities (i.e., teaching in classroom and laboratory settings, observation, instruction of specific curriculum, time in alternate settings, and SAE supervision) during the 12-week student teaching experience?

3. How did the amount of time student teachers spent in each activity help describe their views on teaching ability (i.e., Q-sort factor load)?

4. What were the selected personal and professional characteristics (i.e., age, sex, setting of the cooperating center, and types of agricultural courses taught) of student teachers at Oklahoma State University who interned during the spring and fall semesters of 2009?

## Definition of Terms

Agricultural education—"systematic instruction in agriculture and natural resources at the elementary, middle school, secondary, postsecondary, or adult levels for the purpose of (1) preparing people for entry or advancement in agricultural occupation and profession, (2) job creation and entrepreneurship, and (3) agricultural literacy" (Phipps, Osborne, Dyer, & Ball, 2008, p. 3)

Concourse—all possible opinions which may exist on a given topic (Brown, 1993).

Condition of instruction—is a prompt in which the participants formulate an opinion (Brown, 1993).

Cooperating Center—the classroom and/or learning environment in which the student teacher is guided by the cooperating teacher (Kitchel, 2006).

Cooperating teacher—"is the regular and certified staff member of a local accredited school to whom a student teacher is assigned" (Oklahoma State University agricultural education ooperating teacher handbook., 2009, p. 1).

FFA (National FFA Organization)—"an educational, nonprofit, nonpolitical youth organization for students enrolled in school-based agricultural education programs" (Phipps et al., 2008, p. 6)

P-set—the set of persons (participants) who participate in a study by rank-ordering a set of statements (Brown, 1980).

Pre-service teacher—"One who has declared an education major but has not yet completed training to be a teacher" ("Pre-service teacher", n.d.)

Q-methodology—is a research technique designed to study human subjectivity systematically (Robbins, 2005) and allows for the interrelated comparisons of people based on their views (Brown, 1980).

Q-set—collection of statements presented to the participant for rank-ordering (McKeown & Thomas, 1988).

Q-sort—the product of a participants' rank-ordering of the statements in the Q-set (Brown, 1993).

Secondary Agricultural Education Courses—Agricultural education on the secondary level teaches and reinforces science, math, language arts and social science principles. Major areas of instruction in secondary Agricultural Education include: Agricultural Business, Agricultural Mechanics & Technology, Horticulture, Agricultural Sciences, and Environmental/Natural Sciences ("Agricultural education program", n.d.).

Self-efficacy—a person's beliefs about his/her ability to be successful in given situations (Bandura, 1997).

Student teacher—"a college student who is working under the guidance of a certified teacher in an approved setting" Oklahoma State University agricultural education ooperating teacher handbook., 2009, p. 1).

Student teaching internship—"the experience [which] provides prospective teachers opportunities to apply pedagogical knowledge and skills of teaching in a real-life setting under the supervision of an experienced teacher" (Torres & Ulmer, 2007, p. 1). The student teacher also "takes increasing responsibility for leading the school experiences of a given group of learners over an extended period of time and engages directly in many of the activities which constitute the wide range of a teacher's responsibilities" (Oklahoma State University agricultural education ooperating teacher handbook., 2009, p.1).

Subjectivity—"a person's point of view on any matter of personal and/or social importance" (McKeown & Thomas, 1988, p. 7).

Supervised Agricultural Experience (SAE)—a program in which the knowledge and skills an agricultural education student acquires in school can by applied to real-life situations. The SAE program may include agriculturally-related entrepreneurship and placement experiences, research and laboratory projects, or other exploratory and improvement experiences (Phipps et al., 2008).

Teacher efficacy—a person's "belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context" (Tschannen-Moran et al., 1998, p. 233).

## Q-Methodology

Q-methodology is a research technique designed to study human subjectivity systematically (Robbins, 2005) and allows for the interrelated comparisons of people based on their views (Brown, 1980). Very useful in pursuing this inquiry was the Q-method, which provided a means to study subjective personal perceptions. This research technique acquired its name to differentiate it from other traditional methodologies which Q-methodologists refer to as R-methods or R-techniques. "R" methods and techniques are any other psychometric technique (Watts & Stenner, 2005) or correlational measurement in which data is often gathered from opinion surveys with standardized scales (Robbins, 2005).

Mathematically, Q-method is similar to R methods in the factor analysis techniques in which both use. However, Stephenson (1935) explained that in R methods, it is people who are measured by tests, and in Q methods, it is tests (statements) which are measured by people. Therefore, Q method describes a population of viewpoints, not a population of people. An R method question would ask, "What proportion of student teachers believe they have a high level of teaching ability?" In contrast, Q method question would ask, "What are the variations of opinions about teaching ability?"

## Limitations

The study was limited by its context specific focus (i.e., agricultural education) and selection of participants (i.e., student teachers at Oklahoma State University during

the spring and fall semesters of 2009). Both agricultural education and student teachers were selected to address a gap in the literature. As such, the results from this study should be generalized to other groups of people or contexts with caution.

An additional limitation must be noted that the researcher made no distinction in the length of the class period. The length of class period varies from school to school in the state of Oklahoma. As such, for more ease of interpretation, one hour was recorded for each class period regardless of the actual length of any given class period.

## Assumptions

The viewpoints of the participants were assumed to be an honest expression of their perceptions. Q-methodology was not assumed to be a superior method for measuring teaching ability but rather an *exploration* of the views (i.e., profile type) and what these groups of student teachers perceived to feel about their teaching ability.

## Summary

The growing number of job responsibilities does not make teaching any easier. This is especially true in agricultural education where teachers may spend their time in numerous activities both in and out of the classroom (Torres et al, 2007). The experiences student teachers have while interning at a cooperating center expose them to the varied activities of a full-time teacher. People form opinions about themselves (i.e., self-efficacy) based on their reflections of their experiences (Bandura, 1993). Therefore, self-efficacy may be affected by the amount of time a student teacher spends in different activities while interning. In addition, self-efficacy is an important construct to consider in the professional preparation of student teachers due to its ability to raise their teacher efficacy level and increase their performance (Tschannen-Moran et al., 1998).

Improvements can be made in the teacher preparation process to help student teachers build strong efficacy beliefs earlier in their career.

Research questions were formed to explore the effects of self-efficacy and time allocation on student teachers' teaching ability. Specifically, the purpose of this study was to describe the views student teachers in agricultural education at Oklahoma State University had regarding their 12-week student teaching experience. To accomplish this purpose, this study explored the perceptions of agricultural education student teachers in the spring and fall semester of 2009, regarding aspects of self-efficacy. Useful in pursuing this inquiry was the Q-method, which provided a means to personal perceptions subjective. Further, this study sought to describe the amount of time student teachers spent performing various activities (i.e., teaching in classroom and laboratory settings, observation, instruction of specific curriculum, and time in alternate setting) while at their cooperating centers.

# CHAPTER II

# REVIEW OF LITERATURE

This chapter includes a review of relevant literature, including self-efficacy and the larger framework it emerged from, social cognitive theory. In addition, there is a review of literature of the different domains of self-efficacy such as teacher efficacy and student teacher efficacy, as well as the previous methods of measurement of self-efficacy. This chapter also contains a literature review of time allocation and the student teacher preparation program at Oklahoma State University.

## Purpose of the Study

The purpose of this study was to describe the views student teachers in agricultural education at Oklahoma State University had regarding their 12-week student teaching experience. To accomplish this purpose, this study explored the perceptions of agricultural education student teachers in the spring and fall semester of 2009, regarding aspects of self-efficacy. Further, this study sought to describe the amount of time student teachers spent performing various activities (i.e., teaching in classroom and laboratory settings, observation, instruction of specific curriculum, and time in alternate settings) while at their cooperating centers.

## Research Questions

1. What views did agricultural education student teachers have about their teaching ability?
2. How did student teachers spend their time in various activities (i.e., teaching in classroom and laboratory settings, observation, instruction of specific curriculum, time in alternate settings, and SAE supervision) during the 12-week student teaching experience?
3. How did the amount of time student teachers spent in each activity help describe their views on teaching ability (i.e., Q-sort factor load)?
4. What were the selected personal and professional characteristics (i.e., age, sex, setting of the cooperating center, and types of agricultural courses taught) of student teachers at Oklahoma State University who interned during the spring and fall semesters of 2009?

As stated in the purpose, this study sought to capture the perceptions agricultural education student teachers held regarding their teaching ability. As such, self-perceptions are understood and clarified best by discussing self-efficacy theory. However, to understand self-efficacy theory better, a person must first understand the theory from which it emerged, i.e., the social cognitive theory.

## Social Cognitive Theory

Social cognitive theory, in its early life, was better known as social learning theory (Bandura, 2004). This theory was important to the paradigm shift from previous

psychological theories rooted in behaviorism. "Behavior was said to be regulated by an inner psychic life of animated impulses and complexes operating below the level of consciousness and disguised by defensive mental operations" (Bandura, 2004, p. 614). That is, the behavior displayed by people was nothing more than inborn genetic qualities which controlled the course of an individual's actions. Bandura, however, rejected the "mindlessness" inherent in the behaviorism theories of that time and launched his work with Walters in 1963, i.e., Social Learning and Personality Development. According to Pajares (2002), they broadened "the frontiers of social learning theory with the now familiar principles of observational learning and vicarious reinforcement" (para. 1) by including tenets of observational learning.

Bandura's learning theory evolved during the 1970s. In 1977, Bandura identified cognitive processes as the critical missing element in his previous work. Specifically, his theory coined the term "self-efficacy" and operated on the premise that cognitive processes (i.e., psychological procedures) altered the level and strength of a person's view of his/her ability to complete tasks (Bandura, 1977). By 1986, Bandura refined and renamed his work "social cognitive theory" emphasizing that a person's cognitive thoughts can regulate his/her actions (Pajares, 2002).

The social cognitive theory is a large framework that describes humans as autonomous individuals who can regulate themselves by inner reflection rather than being solely a reaction to their environment (Bandura, 1986). Bandura also expressed the belief that the most unique human capability is that a person can exercise control over his/her life. The social cognitive theory describes human functioning as an interconnection of three main components: a person's behavior, cognitive processes

(personal factors), and the environment. Bandura (1986) explained the interconnection of these three components as triadic reciprocality (Figure 1).

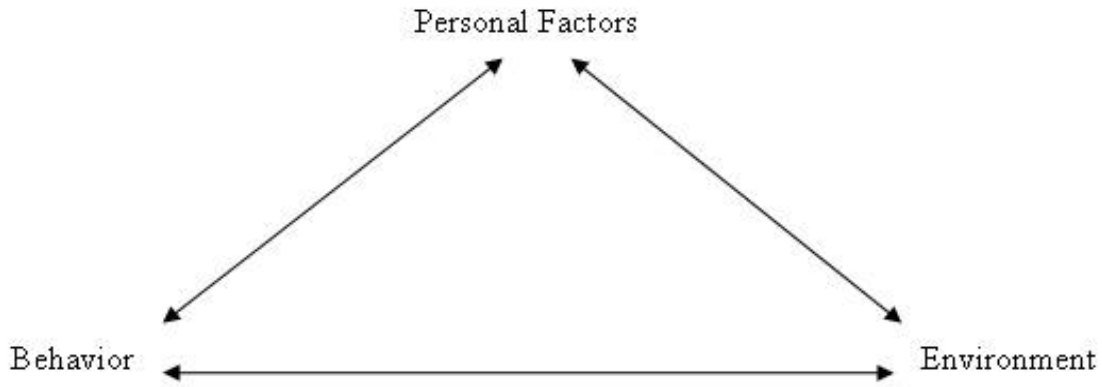



*Figure 1*. Bandura's Triadic Reciprocality Model (1986).

It was the inclusion of "personal factors," i.e., cognitive processes, beliefs, self-perceptions, and its bi-directional association with the other components, which made Bandura's model different from other models at the time. Previous models showed only a unidirectional interaction between two components at a time; however, this model stressed that human functioning is the result of the interplay and influence of all three components, which also demonstrates that people are both products and producers of their environment (Bandura, 1986). In this model, people are proactive agents in their own lives because they can exercise control over their thoughts, feelings, and actions (Bandura). Because personal factors play such a large role in social cognitive theory, self-efficacy emerges as a critical component of all cognitive processes.

## Self-Efficacy

Efficacy is a self-belief. As such, it can influence a person's daily functioning overall. Specifically, self-efficacy is the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). To put it simply, a person asks himself/herself the question, "Can I organize and perform an activity to accomplish my goal?" Central to this question is not only whether an individual has the cognitive, social, and behavioral sub-skills to organize activities to attain a specific goal, but whether these sub-skills can be integrated into an appropriate course of action under difficult circumstances (Bandura, 1997).

Bandura explained, "An efficacy expectation is the individual's conviction that he or she can orchestrate the necessary actions to perform a given task (as cited in Tschannen-Moran et al., 1998, p. 210). Bandura added further, "outcome expectancy is the individual's estimate of the likely consequences of performing that task at the expected level of competence" (p. 210). In essence, if a person believes he/she has the ability to perform the given task, then he/she believes the outcome will be successful at the expected level deemed necessary. However, a person's efficacy beliefs can differ in level, generality, and strength (Bandura, 1977, 1997).

Efficacy beliefs tend to be task-specific, that is, they can vary with the perceived *level* of difficulty associated with the task (e.g., the increasing difficulty of spelling words during a spelling bee). "When tasks are ordered in level of difficulty, the efficacy expectations of different individuals may be limited to the simpler tasks, extend to the moderately difficult ones, or include even the most taxing performances" (Bandura, 1977, p. 194). Efficacy beliefs also vary in *generality* or transferability of the task between

contexts. Some tasks require precise mastery skills while others require skills which are more universal. Efficacy beliefs also may differ in *strength*. The strength of an individual's convictions of their own effectiveness is likely to affect a person's perseverance in coping with given situations (Bandura, 1977). A person with low efficacy beliefs may give up easily while a person with strong efficacy beliefs garners greater perseverance.

Self-efficacy has another unique characteristic in the form of self-regulation. Bandura (1993) opined, "People make causal contribution to their own functioning through mechanisms of personal agency . . . none is more central or pervasive than people's beliefs about their capabilities to exercise control over their own level of functioning" (p. 118). In particular, self-efficacy is critical to the outcome of the human functioning, given the inputs of personal behavior, cognitive processes, and the environment factors of the triadic reciprocality model (Figure 1).

**Self-efficacy as a Construct**

Psychological theories are often based on a "construct," i.e., a concept or idea about an intangible human dimension. Self-efficacy is both a personal construct and a social construct. As a personal construct, it concerns "some underlying, unobservable aspect of an individual's characteristics or . . . internal state" ("Construct," 2010). As a social construct, self-efficacy depends on the beliefs people develop about themselves when interacting with the environment.

**Self-efficacy versus Other Related Constructs**

Self-efficacy belongs in a group of several other "self-referent" constructs such as self-esteem, self-concept, self-worth, and confidence. These are all similar in that they

feed into the internal concept of how a person perceives himself or herself and are, theoretically, "fellow travelers" in the context of social cognition. However, subtle differences exist.

Self-efficacy is a future-oriented belief in relation to an individual's capabilities. It is based on "the conviction that one can successfully execute the behavior required to produce the outcomes" (Bandura, 1977, p. 193). It has more to do with a person's perceptions of competence rather than actual ability (Tschannen-Moran et al., 1998). Further, self-efficacy is very task-specific; a person's level of efficacy can change throughout the day as new and different activities are encountered.

Self-esteem is a broader process of self-evaluation where an individual makes a judgment of his/her self-worth (Bandura, 1997). Self-concept is a composite view of self given experiences and feedback from others. "Confidence is a nondescript term that refers to strength of belief but does not necessarily specify what the certainty is about . . . [it] is a catchword rather than a construct embedded in a theoretical system" (Bandura, 1997, p. 382).

**Development of Self-efficacy**

Over several years, Bandura developed and refined his work on self-efficacy. Through that development, four sources of influence from which a strong sense of self-efficacy emerged: mastery experiences, vicarious experiences, social persuasion, and physiological and emotional state (Bandura, 1977, 1986, 1997). The most important of which is the mastery experience.

**Mastery Experiences.** "Enactive master experiences are the most influential source of efficacy information because they provide the most authentic evidence of

whether one can muster whatever it takes to succeed" (Bandura, 1997, p. 80). It is through experiences that self-efficacy is shaped; this comes from the cognitive functioning of the brain as it performs an evaluative interpretation of the outcome of the task attempted. Successes raise our level of self-efficacy, whereas failures lower them. Stronger efficacy beliefs arise from repeated successes or repeated failures. However, success alone does not always produce high levels of self-efficacy. If the experience is easy, producing quick success, a person may become discouraged by failure when attempting a more complicated task. Bandura explained that a useful purpose in persisting through tough times exists; i.e., stronger efficacy can emerge from adversity. As a person strives to overcome obstacles to succeed in a task, greater levels of perseverance are created. Efficacy beliefs, once set, tend to remain fixed over time in more experienced teachers (Ross, 1994).

**Vicarious Experience.** Though mastery experiences are the most influential sources of efficacy, efficacy beliefs are also derived from vicarious experiences. Vicarious experiences are those in which an observer watches someone else perform a task. "Seeing or visualizing people similar to oneself perform successfully typically raises efficacy beliefs in observers that they themselves possess the capabilities to master comparable activities" (Bandura, 1997, p. 87). To that end, the vicarious experience(s) attained through others serves a modeling effect. In addition, modeling serves as a social barometer in which to judge a person's own accomplishments when there is no established criterion for success. Models can also serve as inspiration. People seek models who demonstrate knowledge and skills and other capabilities to which they aspire.

**Social Persuasion.** People can also develop efficacy beliefs based on feedback or verbal influence received from others. Social persuasion involves the formation of efficacy beliefs through others' suggestions about a person's performance. "If people are persuaded that they have what it takes to succeed, they exert more effort than if they harbor self-doubts and dwell on personal deficiencies when problems arise" (Bandura, 2004, p. 622). The degree of persuasion also affects how people internalize praise. Insincere praise does not have a lasting effect on self-efficacy; whereas, constructive accolades may build self-efficacy. In addition, negative feedback tends to weaken efficacy beliefs more quickly than positive feedback can build it.

**Physiological and Emotional State.** The judgment of a person's efficacy also may rely on his/her emotional or physical state. High states of emotional arousal, such as stress, fear, and anxiety may influence a person's vulnerability thereby lowering the appraisal of efficacy. Similarly, a person's efficacy beliefs may diminish as he/she experiences fatigue or pain from physical activities.

## Teacher Self-Efficacy

"People guide their lives by their beliefs of personal efficacy" (Bandura, 1997, p. 3). Similar to how self-efficacy beliefs can influence an individual's daily life, a person can form self-efficacy beliefs within specific domains such as teaching.

Teacher efficacy is a specific type of self-efficacy in which an individual focuses on his/her ability to teach. Teacher efficacy was first described as, "the extent to which the teacher believes he or she has the capacity to affect student preformance" (Berman et al., 1977, p. 137). Later, Ashton (1985) focused on the efficacy improvement aspect by framing teacher efficacy as, "teachers' belief[s] in their ability to have a positive effect on

student learning" (p.142). Other scholars further defined teacher efficacy by postulating that teachers can have a positive effect despite those students who are "difficult or unmotivated" (Gibson & Dembo, 1984; Guskey & Passaro, 1994). However, Tschannen-Moran, Hoy, and Hoy (1998) provided a more encompassing definition of self-efficacy regarding the act of teaching. Like much of Bandura's work, their definition captured tenets of *task* and *context*. They stated that teacher efficacy is a person's "belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context" (p. 233). This is an important addition because efficacy levels rise and fall as a task becomes more difficult or the context changes to something unfamiliar. Further, teacher efficacy can have an effect on the teachers' behaviors in the classroom, efforts invested in teaching, and their goal setting (Tschannen-Moran & Hoy, 2001).

The above definition employs the term "belief." Sometimes the terms "belief" and "knowledge" are confused when discussing self-efficacy in teaching. The distinction is that knowledge of a subject is different than an individual believing that he/she can teach it. A teacher's beliefs about teaching a subject is a better predictor of his/her effectiveness as a teacher than it is regarding how much he/she actually knows about a subject (Parajes, 1992). Moreover, a teacher's self-efficacy can be challenged as he or she is required to teach a new grade level or unfamiliar content.

**Development of Efficacy within the Domain of Teaching**

All four sources of efficacy (i.e., mastery experience, vicarious experience, social persuasion, physiological and emotional state) "contribute both to the analysis of the teaching task and to self-perceptions of teaching competence, but in different ways"

(Tschannen-Moran et al., 1998, pp. 228-229); see Figure 2. These factors play a large part in a person's sense of self-efficacy based on the interplay of internal and external factors in teaching.

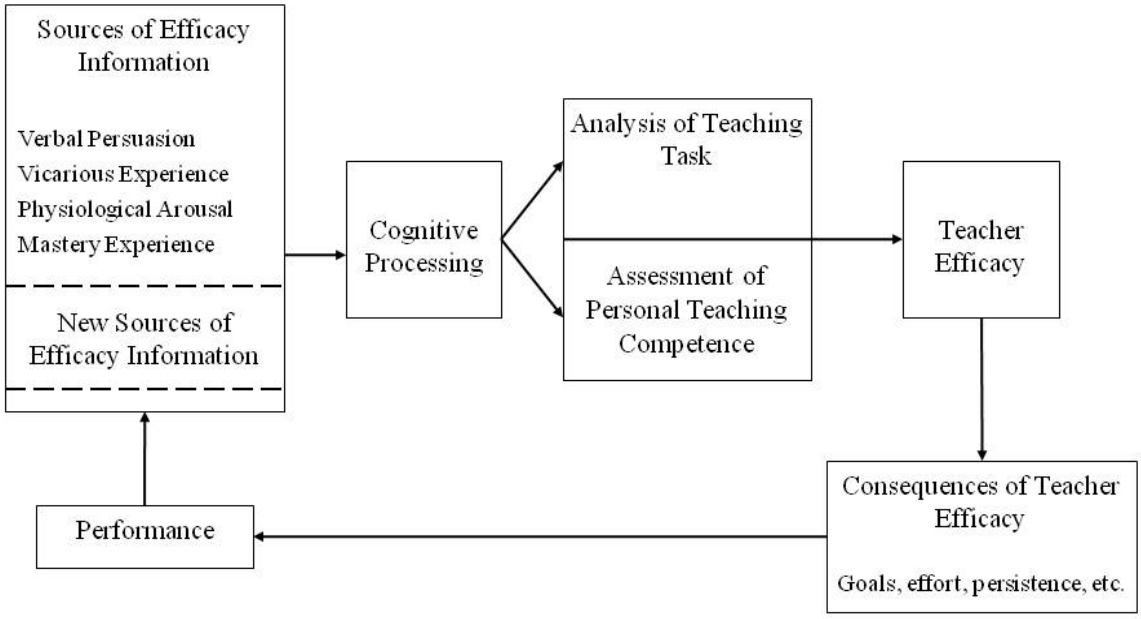



*Figure* 2. Tschannen-Moran, Woolfolk Hoy and Hoy's (1998) model of Teacher Efficacy.

Mastery experiences are the most influential sources of positive self-efficacy beliefs (Bandura, 1986, 1997). Although mastery experiences are influential in teaching effiacy, Tschannen-Moran et al. (1998) added that the physiological arousal assoicated with those experiences directly has an important effect as well. The combination of the two is a process that builds on positive experiences. For example, in English Language Arts (ELA), it was found that, ELA teachers' efficacy "will likely be raised when they witness improvement in student performances as a result of their teaching. This belief

subsequently contributes to optimism that future performances will also be proficient, resulting in greater effort and persistence" (MacFarlane & Tschannen-Moran, 2010, p. 220).

Vicarious experiences help shape an individual's impressions of the teaching task as he/she observes others modeling teaching behaviors. Models of successful teaching form the foundation of whether "the teaching task is manageable and that the situational and personal resources are adequate" (Tschannen-Moran et al., 1998, p. 230). This is especially important to beginning teachers who form the notions of self-efficacy by believing they have the ability to be successful teachers under similar circumstances (Bandura, 1977, 1986).

Verbal persuasion can provide valuable input regarding an individual's teaching performance. Performance feedback "can be a potent source of informance about how a teacher's skills and strategies match the demands of a particular teaching task" (Tschannen-Moran et al., 1998, p. 230). A teacher's sense of efficacy may rise or fall depending on if the feedback is postitive or negative. A persuasive boost can encourage a person to try a new teaching strategy or to employ more effort toward a teaching task; whereas, over-criticism can lead teachers to adopt self-protective stratgies. However, depending on the credibility, trustworthiness, and expertise of the persuader, a "pep talk" may have only a limited effect on a person's sense of efficacy (Bandura, 1986).

Physiological and emotional arousal are factors in teacher efficacy as well. Emotions are a double-edged sword and individualistic in increasing or inhibiting a person's self-efficacy. Some individuals perform best when relaxed and self-assured in the anticipation of future success (Bandura, 1997). Moderate levels of "arousal" or

nervousness can increase heart rate and cause sweating, but may improve performance by focusing attention and energy on a task for others; however, high levels of arousal may impair function and performance of some people (Tschannen-Moran et al., 1998, p. 229).

### Subject Efficacy

Teacher efficacy is not only a specific type of self-efficacy, but it is both context and subject matter specific as well. "A teacher may feel very competent in one area of study or when working with one kind of student and feel less able in other subjects or different students" (Tschannen-Moran et al., 1998, p. 215). For instance, mathematics teachers with a lower sense of self-efficacy refrained from using innovative instructional practices, whereas, teachers who perceived themselves to be effective in teaching mathematics were much more likely to embrace creative and inquiry-based methods of teaching (Wilkins, 2008). Also, because a teacher's sense of efficacy is not necessarily uniform across all different aspects of a subject matter (Bandura, 1997), a range of self-efficacy perceptions within the same person teaching the same subject may exist. For instance, it was found by Hansen (2006) that teachers selected specific components of the English Language Arts curriculum in which their self-efficacy was the highest to teach, and neglected areas where they perceived themselves to be weaker.

## Student Teacher Efficacy

Efficacy beliefs play a definite role in the preparation of student teachers (Poulou, 2007). Pajares (1992) explained that the greater effects of self-efficacy for the prospective teacher come from the ability to organize instruction not necessarily the knowledge of the subject.

Bandura (1997) postulated that efficacy would be most malleable at the early stages in the learning experiences. It is an important phenomenon to understand because "once efficacy beliefs are established, they appear to be somewhat resistant to change" (Tschannen-Moran et al., 1998, p. 235). As such, it is important to assess student teacher self-efficacy while these individuals are still at the pre-service level and considered novice teachers (Korthagen & Kessels, 1999).

Self-efficacy has applications across a number of domains (e.g., academic self-efficacy, career self-efficacy, and teaching self-efficacy). Within the domain of teaching efficacy, an individual's perception of his/her ability can be context specific as well. As the school day progresses, what a student teacher instructs will change with each passing class period. Animal science may be taught as the first subject of the day, followed by horticulture, later agricultural communications, and finishing the school day with agricultural mechanics. In addition to the various courses being taught, the classroom may be filled with high school students ranging in age from 14 to 18 usually. "Teachers feel efficacious for teaching particular subjects to certain students in specific settings . . ." (Tschannen-Moran et al., 1998, p. 227); i.e., a student teacher's self-efficacy may change each class period with the transition to the next subject and new students. However, "Helping teachers develop strong efficacy beliefs early in their career will pay lasting dividends" (Tschannen-Moran et al., 1998, p. 234).

As self-efficacy may be resistant to change over time (Tschannen-Moran et al., 1998), the development of the student teacher becomes more important. Though mastery experiences are the most influential overall (Bandura, 1997), vicarious experiences may be the most influential during student teaching (Mulholland & Wallace, 2001). Due to

the daily amount of contact with a student teacher, cooperating teachers may influence a student teacher's efficacy more so than a college supervisor (Borko & Mayfield, 1995; Byler & Byler, 1984), especially through verbal persuasion and modeling (Knoblauch & Woolfolk Hoy, 2008).

## Teacher Efficacy Measurements

"The search for ways to measure teacher efficacy has not suffered from a lack of effort" (Tschannen-Moran et al., 1998, p. 217). As such, teacher efficacy has been measured in a number of ways throughout the years. Some of the first studies of efficacy were performed by the Rand Corporation (Armor et al., 1976; Berman et al., 1977), which were based largely on Rotter's social leaning theory (Woolfolk & Hoy, 1990).

Several researchers developed their own teacher efficacy measures by adding to the two-item scale used in the Rand Corporation's method, e.g., Teacher Locus of Control (TLC) (Rose & Medway, 1981), Responsibility for Student Achievement (RSA) (Guskey, 1981), and the Webb Efficacy Scale (Ashton et al., as cited in Tschannen-Moran et al., 1998). A second line of teacher efficacy research grew from Bandura's self-efficacy theory. These studies claimed to have captured the "outcome expectations" of efficacy which the Rand Corporation studies overlooked. These instruments included the Teacher Efficacy Scale (Gibson & Dembo, 1984), the Science Teaching Efficacy Belief Instrument (Riggs & Enochs, 1990), and the Teacher Self-Efficacy Scale (Bandura, 1997). Tschannen-Moran et al. (1998) constructed a unified measurement, Teachers' Sense of Efficacy Scale, which "weaves together both conceptual strands" (p. 227).

Tschannen-Moran et al. (1998) urged for the employment of a variety of research methods including qualitative inquiry. Henson (2002) echoed this notion by suggesting that the study of teacher efficacy beliefs requires more elaborative or qualitative investigation. A few studies have attempted to address this call by adding qualitative components to their data collection (e.g., Ashton & Webb, 1986; Poulou, 2007). Poulou (2007) noted the need to use a tailor-made instrument for measuring student teachers' sense of teaching efficacy instead of instruments created for in-service teachers. Strides have been made to capture what some view as an elusive construct; however, "despite the measurement confusion, teacher efficacy still emerge[s] as a worthy variable in educational research" (Henson, 2002, p. 138).

## Efficacy Studies in Agricultural Education

Self-efficacy has received increasing attention in agricultural education research. In particular, the overall sense of teaching efficacy has been studied at varying levels of teaching experience (Burris et al., 2010; Knobloch, 2006; Roberts et al., 2008; Roberts et al., 2006; Stripling et al., 2008; Whittington et al., 2006). Teacher efficacy in agricultural education also has been explored in varying contexts such as communications (Edgar et al., 2009), gender bias (Kelsey, 2007), personality type (Roberts et al., 2007), student teaching experience (Knobloch & Whittington, 2002), comfort level in teaching prescribed instructional objectives (Wingenbach et al., 2007), job satisfaction (Blackburn & Robinson, 2008), and career commitment (Knobloch & Whittington, 2003).

**Types of Student Teachers.** In agricultural education, personality type has been studied little, especially in student teachers. Most studies in agricultural education have employed the Myers-Briggs Type Indicator® (MBTI®) as the method of determining

personality type. Kitchel and Torres (2006) found that student teachers' most predominant personality type, according to the MBTI®, was extroverted, intuition, thinking, and judging (ENTJ). Two predominant personality types of student teachers were found in a study conducted by Roberts et al. (2007). Specifically, these types were extroverted, sensing, feeling, and judging (ESFJ) and extroverted, intuition, feeling, and perceiving (ENFP). Roberts et al. also sought to determine a relationship between personality type and teaching efficacy; however, they found that was a negligible relationship between the two existed.

**Q-Methodology.** Q-methodology is a research technique designed to study human subjectivity systematically (Robbins, 2005) and allows for the interrelated comparisons of people based on their views (Brown, 1980). Very useful in pursuing this inquiry was the Q-method, which provided a means to study subjective personal perceptions. This research technique does not use instruments based on standardized scales or other measurement associated with data gathered from opinion surveys. Q-method employs a factor analysis, but instead of correlating statements (tests), it correlates people.

As a methodology, "Q" has been used to describe teachers' beliefs or perceptions in other researchers' studies (e.g., Rimm-Kaufman, Storm, Sawyer, Pianta, & LaParo, 2006; Thorman, Van Eman, & Montgomery, 2006). This method also has been used to study emotional "type" of teachers (Bang & Montgomery, 2010). In agricultural education, Q-methodology has been used to describe how secondary agricultural education teachers in California perceived their job responsibilities (Delnero & Montgomery, 2001; Delnero & Weeks, 2000).

## The Student Teaching Experience

The Carnegie Forum's Task Force (1986) identified student teaching as one of the most widely accepted components of teacher education programs. It is referred to often as the capstone experience of a teacher's education program (Hoy & Woolfolk, 1990). As such, its purpose is to "provide teachers with the core ideas and broad understanding of teaching and learning that give them traction on their later development" (Darling-Hammond & Bransford, 2005, p. 3).

Successful teaching involves numerous components such as knowledge of the subject-matter taught and understanding how students learn; however, teacher educators have long struggled with what experiences "soon-to-be" teachers must have (Putnam & Borko, 2000). The preparation of student teachers continues to change with the evolution of teacher educator programs, such as the "realistic approach" proposed by Korthagen and Kessels (1999). The changes in teacher preparation programs can have an effect on students. Darling-Hammond, Chung, and Frelow (2002) reported that graduates of teacher education programs had a "variety" of views and attitudes in regard to their preparation for the different aspects of teaching.

Typically, an internship within a cooperating center (i.e., secondary school) exposes student teachers to the same experiences that will be encountered as a full time teacher. In agricultural education, these experiences include numerous activities both in and out of the classroom such as instructional preparation, laboratory preparation and management, grading student work, administrative duties, in-service, management of the FFA program, Supervised Agricultural Experience (SAE) observations, and preparation for competition (Torres et al., 2008). Classroom and laboratory instruction is an

important element of the student teaching experience as rated by cooperating teachers (Edwards & Briers, 2001) and by the student teachers themselves (Harlin, Edwards, & Briers, 2002). Moreover, during instructional preparation, student teachers instruct courses across the curriculum, such as animal science, horticulture, agribusiness, and agricultural mechanics (Robinson et al., in press).

While at the cooperating center, student teachers emphasize their relationship with their cooperating teacher strongly (Harlin et al., 2002; Young & Edwards, 2006); however, less concerning is their relationship with the university supervisor (Byler & Byler, 1984).

Time and experience are central to the growth and development of student teachers (Spooner et al., 2008). However, as graduation requirements are decreased to under 128 credit hours, exposing pre-service agricultural education students to real-life challenges becomes a daunting task (Burris et al., 2005). The reduction in graduation hours limits the amount of time available to provide vital learning experiences to future teachers. Lack of learning experiences could lead to lower levels of confidence or self-efficacy of student teachers as related to their teaching.

**Teacher Education at Oklahoma State University**

Students must be admitted to the Teacher Education Program before they can enroll in the student teaching sequence of courses at Oklahoma State University. Among other requirements, students must maintain a grade point average of at least a 2.50, pass the Oklahoma General Education Test (OGET), and complete the professional portfolio submission I successfully, to be eligible for admission to Teacher Education Program.

All professional and teacher education programs at Oklahoma State University operate under the Professional Education Unit (PEU) Strategic Plan, which is accredited by the National Council for Accreditation of Teacher Education (NCATE). The mission of the PEU "prepares and develops professional educators who facilitate life long learning and enrich quality of life for people in public schools and other educational settings" (Fry & Engelhardt, 2006, p. 5). With the overarching goal to prepare education professionals as ethical leaders, the core values of the professional education programs, is based on the L.E.A.D.S. conceptual framework: Leadership; Ethics; Academics and Professional Roles; Diversity; Service Orientation/Community Outreach (Fry & Engelhardt, 2006).

**Agricultural Education at Oklahoma State University**

Students in agricultural education must complete a variety of courses successfully, totalling 124 hours, in pursuit of their degree (Agricultural Education Degree Sheet, 2008-2009). In addition to core curriculum, (e.g., English composition, political science, and mathematics), the student also must complete courses in agriculture, general education, and professional education in preparation for teaching secondary agricultural education. The capstone experience for degree completion is a 12-week, off-campus student teaching experience at a selected cooperating center within an approved school district.

**Pre-service Teachers.** Three main required courses in Agricultural Education must be completed successfully by a student prior to admission into the University Teacher Education program. The first course suggested for students is AGED 3101 – Laboratory and Clinical Experiences in Agricultural Education (Oklahoma State

University agricultural education course description, n.d.). The pre-professional, clinical experience in agricultural education is the main focus of the course and it is graded on a pass-fail basis. Through this course, technical writing skills are honed while the student prepares documents for his/her professional teaching portfolio submission.

The second course is AGED 3103 – Foundations and Philosophies of Teaching Agricultural Education (Oklahoma State University agricultural education course description, n.d.). This course focuses on the teaching responsibilities of teachers of agricultural education. A large component of this course includes laboratory instruction, which takes students through the steps of the teaching-learning process. Students create and deliver a unit of three lessons to their peers. Improvement of lessons is encouraged through students' reflections on their performance, as well as instructor and peer feedback. Final unit delivery occurs over three days at a cooperating center under the supervision of a mentor teacher.

The third course for which a pre-service student teacher must complete successfully is AGED 3203 – Planning the Community Program in Agricultural Education (Oklahoma State University agricultural education course description, n.d.). This course focuses on year-long program planning and identification of agricultural resources in the community. Students learn about program policies, FFA chapter advisement, planning and managing the supervised agricultural experiences (SAE) of students as well as, and technical reports and records of a full-time teacher of agricultural education in Oklahoma.

**Student Teachers.** A student of Agricultural Education must have full admission to the University Professional Education Unit before enrolling in the final three courses.

Prior to admission into the program, a student must hold junior standing in the College of Agricultural Sciences and Natural Resources with a 2.50 grade point average (Professional education unit student information, n.d.). These courses compose the final component of student teacher preparation which, in most cases, occurs during a student's last semester prior to graduation. This segment of courses is sometimes referred to as the "student teaching block" as the three courses require concurrent enrollment, i.e., the courses are "blocked" together.

The concurrent enrollment of courses begins with an intensive four-week, on-campus preparation prior to student teachers beginning the internship at their respective cooperating centers. Two of the three courses compose the four-week, on-campus segment. The first course is AGED 4103 – Methods and Skills of Teaching and Management in Agricultural Education (Oklahoma State University agricultural education course description, n.d.). This course focuses on the teaching-learning process. Course components include unit and lesson planning, instructional delivery methods, classroom management, and motivational techniques.

The second course is AGED 4113 – Laboratory Instruction in Agricultural Education (Oklahoma State University agricultural education course description, n.d.). This course includes instruction in the methodology of teaching in a laboratory setting, laboratory safety instruction, and application of technical agricultural skills to the secondary program.

After the four-week, on-campus courses are completed successfully, the student teachers proceed to their internships at the cooperating centers. This is facilitated through the course AGED 4200 – Student Teaching in Agricultural Education and is graded on a

"pass-fail" basis (Oklahoma State University agricultural education course description, n.d.). Important to this course is the complete immersion of the student into a secondary education school system. The student teaching internship is a full-time directed experience in an approved agricultural education department. Through the guidance of the cooperating teacher, the student will gain hands-on experience in agricultural education as related to selecting, adapting, utilizing, and evaluating curriculum, as well as garner experiences in overall program planning within the organization and operation of the entire school system. It was posited by the researcher that all of these experiences in aggregate informed the study participants' "self-referent" perceptions or sense of self=efficacy about their teaching ability, vis-a-vis student teaching in agricultural education.

## Time Allocation in Agricultural Education

Teaching agriculture includes an increasing amount of job responsibilities (Delnero & Montgomery, 2001). Specifically, numerous activities both in and out of the classroom such as instructional preparation, laboratory preparation and management, grading student work, administrative duties, in-service, management of the FFA program, Supervised Agricultural Experience (SAE) observations and preparation for competition occur and are expected (Torres et al., 2008). Essential to any educational program, classroom and laboratory instruction was rated as an important element by cooperating teachers (Edwards & Briers, 2001) and by student teachers in agricultural education (Harlin et al., 2002). Accordingly, studies have been conducted on the distribution of time a student teacher gives to various activities which occur in an agricultural education program.

Torres and Ulmer (2007) analyzed five years of data on student teachers in agricultural education at the University of Missouri. Specifically, they analyzed time spent in observation, planning, teaching, administration, and other teaching-related activities. In the course of a week, most of the student teachers' time was spent in teaching-related activities (10.80 hours), followed by planning (8.44 hours), teaching (8.19 hours), observation (2.73 hours), and administrative activities (2.05 hours).

Likewise, Nekolny and Buttles (2007) analyzed the time allocation of agricultural education student teachers during spring and fall semesters at the University of Wisconsin-River Falls from 2003 to 2006. Similar to Torres and Ulmer (2007), they found that student teachers spent more time teaching than observing. They found that their spring student teachers taught more and observed more than the fall student teachers overall.

In 2008, at the University of Missouri, Torres et al. (2008) compared the time allocations of student teachers, novice teachers, and experienced teachers among 11 teaching activities: preparation for instruction, classroom/laboratory teaching, laboratory preparation/maintenance, grading/scoring students' work, administrative duties, professional activities, SAE observation and recording, local FFA activities, non-local FFA activities, CDE preparation, and adult education. Observations times were only recorded for student teachers, because observation was not a factor in the novice and experienced teacher populations. The researchers found that all classes of teachers spent the majority of their time in instruction. Students and novices spent their second largest amount of time expenditure in preparation; whereas, the experienced teachers spent the second largest portion of their time in Career Development Events preparation.

Lambert, Ball, and Tummons (2010) conducted a qualitative study with seven early career agricultural teachers in Missouri and North Carolina on how they spent their time and the potential effects time had on their level of stress. Five patterns emerged: 1) the day consists of patterns that vary depending on the time of the year; 2) a conscious allocation of work time emerged; 3) the process of managing time adapts and evolves over time; 4) personal and social time for the teacher is woven into or around work; and, 5) tensions exist between how teachers would like to spend their time and how they actually spend their time. These teachers seemed to have allocated their time purposefully. Segments of time were patterned throughout the day and year. External stressors were found to create changes in how the teachers patterned or segmented their days.

The most recent study in time allocation in agricultural education was conducted by Robinson et al. (in press) at Oklahoma State University. This study analyzed time allocation of agricultural education student teachers during spring and fall semesters during a three-year period. The authors found that fall student teachers spent more time in teaching and observation than their spring semester counterparts. Spring student teachers spent more time conducting out-of-school activities which may have included FFA and livestock competitions (which traditionally occur in the spring in Oklahoma), along with CDEs.

## The Influence of Time Allocation on Self-Efficacy

Few studies have analyzed the influence of time allocation on self-efficacy or vice versa. Smith et al. (2010) studied the level of parental self-efficacy regarding the amount of time their children spent in organized activities or watching television. They found

high levels of parental self-efficacy were associated with children who spent more time in organized activities, while low parental self-efficacy was associated with children who allocated more time to watching television. Chambers and Hardy (2005) compared one to two semesters of student teaching for an impact on student teachers' classroom management orientation and self-efficacy beliefs. They found that a longer student teaching experience did not affect the self-efficacy beliefs or classroom management orientation of the student teacher.

## Summary

The social cognitive theory is a large framework that describes humans as autonomous individuals who can regulate themselves by inner reflection rather than being reactive to their environment solely (Bandura, 1986). Specifically, this theory describes human functioning as an interconnection of three main components: a person's behavior, cognitive processes, and the environment (Bandura). Also, from this theory stems the concept of personal efficacy or self-efficacy. Self-efficacy is the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). Therefore, self-efficacy is an essential part of the human functioning given the inputs of personal behavior, cognitive processes, and environment. To understand self-efficacy better, Bandura (1993) stated, "People make causal contribution to their own functioning through mechanisms of personal agency . . . none is more central or pervasive than people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives" (p. 118). In other words, self-efficacy is a person's judgment of his/her ability to perform tasks despite distracting or impeding factors.

"People guide their lives by their beliefs of personal efficacy" (Bandura, 1997, p. 3). And, self-efficacy beliefs can influence daily life, individuals can form self-efficacy beliefs regarding specific domains or contexts such as teaching. Berman et al. (1977) provided an early definition of teaching efficacy as, "the extent to which the teacher believes he or she has the capacity to affect student preformance" (p. 137). Tschannen-Moran et al. (1998) provided a more encompassing definition for teacher self-efficacy. They stated teacher efficacy is a person's "belief in his or her capability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context" (p. 233). It can have an effect on the teachers' behavior in the classroom, effort invested in teaching, and goal setting (Tschannen-Moran & Hoy, 2001). Much of the above mentioned is also relevant to student teachers, including individuals who student teach in agricultural education.

Self-efficacy is domain specific (e.g., academic self-efficacy or career self-efficacy); moreover, teaching self-efficacy is also context specific. As the school day progresses, what a student teacher instructs will change with each passing class period. In addition to varying courses being taught, the classroom may be filled with high school students ranging in age, ability and preferred learning style. "Teachers feel efficacious for teaching particular subjects to certain students in specific settings . . ." (Tschannen-Moran et al., 1998, p. 227); i.e., a student teacher's self-efficacy may change with each class, topic, and set of students. Though the experiences during the student teaching internship will vary from person to person, it is through these experiences that they gain information about their teaching performance. Bandura (1986, 1997) describes four main sources by which efficacy is built: mastery experiences, vicarious experience, social

persuasion, and physiological and emotion state. Mastery experiences are particularly influential to student teachers through the practice of teaching, while vicarious experiences are also influential through the observations of model or expert teachers.

Self-efficacy, regarding an individual's perception about his/her teaching ability is an important phenomenon to understand because "once efficacy beliefs are established, they appear to be somewhat resistant to change" (Tschannen-Moran et al., 1998, p. 235). As such, it is important to assess student teacher self-efficacy while these individuals are still at the pre-service level (Korthagen & Kessels, 1999) so that efforts can be made to improve the preparation they go through and their teaching practice experiences (Parajes, 1992). "Helping teachers develop strong efficacy beliefs early in their career will pay lasting dividends" (Tschannen-Moran et al., 1998, p. 234). Teachers of agricultural education, including student or intern teachers, are covered by this proviso.

The measurement of efficacy has been a focus of several research studies, most of which attempted to capture the construct through instruments which were too broad or too narrow. Instead, the measure of self-efficacy through the application of Q-methodology, a research method designed to study human subjectivity, will be useful for this inquiry. Accordingly, this study explored the perceptions of teaching ability among student teachers in agricultural education and juxtaposed these perceptions against their self-reported allocation of time during the 12-week, clinical student teaching experience.

# CHAPTER III

# METHODOLOGY

This chapter includes a description of Q-methodology including the population (P-set), the process used in instrument development, and the various components of Q-method factor analysis. This chapter also discusses how the student teachers' time allocation data was captured to describe the amount of time they spent performing various activities. Related data analyses are also described.

## Purpose of the Study

The purpose of this study was to describe the views student teachers in agricultural education at Oklahoma State University had regarding their 12-week student teaching experience. To accomplish this purpose, this study explored the perceptions of agricultural education student teachers in the spring and fall semester of 2009, regarding aspects of self-efficacy. Further, this study sought to describe the amount of time student teachers spent performing various activities (i.e., teaching in classroom and laboratory settings, observation, instruction of specific curriculum, and time in alternate settings) while at their cooperating centers.

## Research Questions

1. What views did agricultural education student teachers have about their teaching ability?

2. How did student teachers spend their time in various activities (i.e., teaching in classroom and laboratory settings, observation, instruction of specific curriculum, time in alternate settings, and SAE supervision) during the 12-week student teaching experience?

3. How did the amount of time student teachers spent in each activity help describe their views on teaching ability (i.e., Q-sort factor load)?

4. What were the selected personal and professional characteristics (i.e., age, sex, setting of the cooperating center, and types of agricultural courses taught) of student teachers at Oklahoma State University who interned during the spring and fall semesters of 2009?

## Rationale for Using Q-Methodology

The theoretical structure of this study was based largely on Bandura's self-efficacy theory (1993). Bandura's work on self-efficacy (1997) describes extensively how an individual's perceptions of his or her ability is self-referent. "Q-studies, from conception to completion, adhere to the methodological axiom *that subjectivity is always self-referent*" (McKeown & Thomas, 1988, p. 12). Specifically, subjectivity is the communication of a person's viewpoint, and self-reference is a person's internal frame of

reference(McKeown & Thomas). Therefore, Q-methodology and its approach is an ideal method for use in this study.

## Q-Methodology

Q-methodology was developed originally by William Stephenson in the 1930s as a research method to study human subjectivity systematically. It is an "adaptation of the quantitative technique known as factor analysis" (Watts & Stenner, 2005, p. 71) and provides researchers a way to study a person's viewpoint, attitude, and/or belief on a chosen topic (Brown, 1993).

Mathematically, Q-method employs factor analysis, sometimes referred to as "inverted" factor analysis. Traditional factor analysis is used in correlational research and often employs the symbol "*r*" to indicate correlation coefficients (Shemmings, 2006), as would be reported in a Pearson product-moment correlation (Smith, 2001). These correlational research methods are often referred to as R-methods or R-techniques by Q-methodologists in order to differentiate the two. "R" methods and techniques are psychometric techniques (Watts & Stenner, 2005), or correlational measurements, in which data are often gathered typically from opinion questionnaires with standardized scales (Robbins, 2005).

As stated earlier, Q-method is similar to R-methods in the factor analysis techniques in which both use. However, Stephenson (1935) explained that in R-method studies, it is *people* who are measured by tests, whereas, in Q-method studies, it is *tests* (statements) which are measured by people. That is, Q-method describes a population of viewpoints, while R-methods describe populations of people. An R-method question would ask, "What proportion of student teachers believe they have a high level of

teaching ability?" In contrast, a Q-method question would ask, "What are the variations of opinions about teaching ability?"

It is important to remember that Q-methodology does not test people, nor are the statements (i.e., scaled items) similar to that of a questionnaire. When a researcher uses an instrument with a standardized scale, statements are evaluated and scaled independently of one another. Therefore, Q-methods allows for the items to interact (Brown, 1980). In Q-method research, when a person ranks statements, he/she is rank-ordering each statement in comparison to one another, not evaluating the independent statements individually. As the Q-sort is performed, the individual decides what is and is not meaningful from his/her perspective as opposed to rating the scale items in conventional instruments, which have predetermined meaning from the researcher (Watts & Stenner, 2005).

## Institutional Review Board

Federal regulations require a review and approval of all research studies which involve human subjects. The review is conducted through the university to protect the rights and welfare of human subjects which are involved in biomedical and behavioral research. The Institutional Review Board (IRB) at Oklahoma State University reviewed all documents which could involve interaction between human subjects and the researcher including the solicitation letter, informed consent document, researcher script, response sheet, and demographic survey. Approval was granted. A copy of the approval letter for this study, Application No. ED0931, can be found in Appendix A. A mass distribution of the solicitation letter (Appendix B) was sent via email to all student teachers, after completing a minimum of eight weeks of student teaching at their

respective cooperating centers. This process was conducted once during the spring semester and again during the fall semester. Before participating, each student teacher was required to sign an informed consent document acknowledging his/her awareness of any risks involved as well as his/her voluntary participation of the study (Appendix C).

## Selection of the Research Subjects

### Sample Population

The sample population for this study was student teachers ($N$ = 28) of agricultural education at Oklahoma State University during the spring 2009 and fall 2009 academic semesters. Studying student teachers in agricultural education can provide unique information compared to student teachers of other subjects due to the diversity of the program and curricula (Phipps et al., 2008). The range of Oklahoma Agricultural Education curriculum consists of animal and plant sciences, agricultural power and technology, agribusiness, and agricultural communications (Careertech, n.d.; Krysher, Haynes, & Robinson, 2009). Along with the diverse curriculum, student teachers experience a variety of roles related to the program (i.e., instructor of classroom and laboratory learning environments, advisor of the FFA program, and supervisor of agricultural projects) [National FFA Organization, 2005]).

### Participants (P-set)

The P-set is the set of persons who participate in a study (Brown, 1980). As such, the P-set for this study consisted of all student teachers in agricultural education who were enrolled in AGED 4200 – Student Teaching in Agricultural Education at Oklahoma State University during the spring and fall semesters of 2009. Each participant completed the 4-week component of on-campus courses prior to beginning an internship at their

respective cooperating centers. Specifically, during their time on campus, students were enrolled in AGED 4103 – Methods and Skills of Teaching and Management in Agricultural Education and AGED 4113 – Laboratory Instruction in Agricultural Education, the precursors to AGED 4200 – Student Teaching in Agricultural Education.

As the student teachers responded to the solicitation letter required by the IRB at Oklahoma State University, appointments were scheduled to collect data. Primarily, data were collected during the observational site-visits made by the university supervisors to the cooperating center in which the student teacher was interning; however, some data were collected at the university. Data was collected by different university supervisors therefore a script was provided to ensure similar instruction were given to the Q-sort participants (Appendix D). The Q-sort was completed by each student teacher during weeks nine through 12 of the student teaching internship. After the completion of the Q-sort, each participant's rank ordering of the statements was recorded onto a response sheet (Appendix E). Additional demographic data were collected via the Demographic Survey (Appendix F) which was printed on the reverse side of the response sheet.

## Instrumentation

The development of the instrument began by sampling items from the concourse. The concourse is considered to be all possible opinions or beliefs which may exist about a given topic (Brown, 1993). Because an infinite number of views may exist on teaching ability, a sampling was taken to narrow the focus, i.e., the concourse provided the raw material which the Q-set statements were developed.

The Q-set (or Q-sample) is a group of statements presented to the participants for rank-ordering (McKeown & Thomas, 1988). The Q-set is representative of several

aspects or viewpoints of a topic (van Exel & de Graaf, 2005) and can be developed naturalistically or theoretically. Naturalistic Q-sets are derived from oral and/or written communication, while theoretical Q-sets are derived from other sources or studies (McKeown & Thomas, 1988). This study used a combination, or hybrid approach, involving both naturalistic and theoretical types.

The theoretical statements used in this study originated from The Teaching Ability Questionnaire (Spooner et al., 2008), which is a validated instrument designed to measure student teachers' beliefs about teaching. For the purpose of this study, the theoretical statements taken from this instrument were used in a subjective manner via Q-method, which allowed the researcher to capture the internal, subjective views of the student teachers regarding this study's purpose.

A total of 36 statements (30 theoretical and six naturalistic) were used to develop the Q-set (Table 1). According to McKeown and Thomas (1988), statements can be borrowed from other instruments and incorporated into a Q-set. As such, 30 statements (statement #1through #30) were adopted directly from The Teaching Ability Questionnaire (Spooner et al., 2008) to build the majority of the Q-set. Spooner and colleagues based the items of their questionnaire on teaching standards established by the Interstate New Teacher Assessment and Support Consortium (1992). Specifically, these items provided different ways in which student teachers look at their teaching ability including: their overall ability to teach, motivate students, handle discipline problems, and develop curriculum (Spooner et al., 2008).

Table 1

*Statements of the Q-set*

| # | Statement |
|---|---|
| 1. | I like how teaching makes me feel. |
| 2. | Teaching is easy for me. |
| 3. | When I teach, I feel satisfied. |
| 4. | I am getting better at teaching. |
| 5. | I am confident in my ability to teach. |
| 6. | I am relaxed when I teach. |
| 7. | I need less help with teaching than I did before. |
| 8. | My students think I teach well. |
| 9. | My university supervisor thinks I teach well. |
| 10. | My clinical instructor thinks I teach well. |
| 11. | When I teach, lessons flow. |
| 12. | My lessons contain meaningful learning experiences. |
| 13. | My students understand the lessons I teach. |
| 14. | I understand how children learn and develop. |
| 15. | I have enough training to deal with student learning problems. |
| 16. | I know how and where to refer students with learning problems. |
| 17. | I have observed other teachers deal with student learning problems. |
| 18. | I know how to individualize instruction. |
| 19. | I feel comfortable with my classroom-management skills. |

Table 1 (continued)

| # | Statement |
|---|---|
| 20. | I know how to encourage positive social interactions. |
| 21. | I am able to handle discipline problems in my classroom. |
| 22. | I have observed other teachers' classroom-management procedures. |
| 23. | I feel comfortable with my ability to plan instruction. |
| 24. | I feel comfortable with my ability to motivate students. |
| 25. | I have observed other teachers' techniques to motivate students. |
| 26. | I am able to use a prescribed curriculum for instruction. |
| 27. | I know how to use a variety of instructional strategies. |
| 28. | I have learned ways to grow as a professional. |
| 29. | I feel comfortable with my ability to communicate with colleagues and parents. |
| 30. | I have observed teaching that I will model in the future. |
| 31. | I can construct lessons plans in all Ag Ed subjects. |
| 32. | I can construct lesson plans for only the subjects I am comfortable with. |
| 33. | I feel comfortable teaching only one or two subjects. |
| 34. | It easy to find curriculum materials to instruct with. |
| 35. | I can teach any agricultural education course. |
| 36. | I have observed other teachers use a variety of materials to build lessons. |

In order to provide breadth to the Q-set, the additional six statements were naturalistic (statement #31 through #36). These statements were based on informal discussions and debriefings with several semesters of student teachers. Using an

individual's own words (i.e., student teachers), helped to reduce the likelihood of misinterpreting the meaning of the statements (Brown, 1993; McKeown & Thomas, 1988). As such, the additional six statements focused on the concern student teachers anticipated upon arriving at the cooperating center. These concerns included locating, developing, and teaching curriculum in multiple agricultural education subjects, i.e., animal science, horticulture, agricultural mechanics, and agribusiness. In total, all the statements represented multiple roles of teacher performance, which should reveal the participants perception of their teaching ability accurately.

**Q-sort**

Each statement in the Q-set was printed onto a 1 x 1 inch piece of cardstock and presented to the student teachers for sorting. A Q-sort is the product of a participants' rank-ordering of the statements in the Q-set (Brown, 1993). The rank-ordering of the statements is in response to a condition of instruction. The condition of instruction is a prompt in which the participants formulate an opinion (Brown). The condition of instruction for this study was, "How do you feel about the courses you instruct?" This question was presented to the student teachers before they began ranking the statements from the Q-set. The script used in this process can be found in Appendix D.

After the condition of instruction was presented to the students, they began to rank-order each statement of the Q-set. To begin the process, each student read every statement and determined how it represented his or her feelings about the courses they instructed. Student teachers were instructed to sort the Q-statements into three distinct piles. The first pile contained statements that participants believed represented how they felt about the courses they taught. The second pile contained statements they did not

believe represented their feelings about the courses they taught. The third pile contained statements in which they felt neutral regarding the courses they taught.

After all the statements had been placed into one of the three piles, the cards were then distributed onto a Q-sort Form Board. The form board was constructed with a distribution range of nine columns (Krysher, 2009). Each column was assigned a ranking value from -4 to +4 (Figure 3). The two statements in which the student teachers believed were most like them were placed on the extreme right side of the distribution (+4), and the two statements the student teachers believed were most unlike them were placed on the extreme left side (-4) of the distribution. The process was repeated working toward the middle row (0) until all cards were placed on the board by each student teacher. The statements placed in the middle row consisted of statements in which the student teacher felt neutral. Finally, the placement of the statements was recorded onto the response sheet by the student teacher for data analysis (Appendix E). When completed, the researcher checked the accuracy between the Q-sort and the response sheet. Then, students were asked to flip the response sheet over to complete the Demographic Survey (Appendix F). In addition, space was available for the student teachers to add written comments about their perceptions of their teaching ability

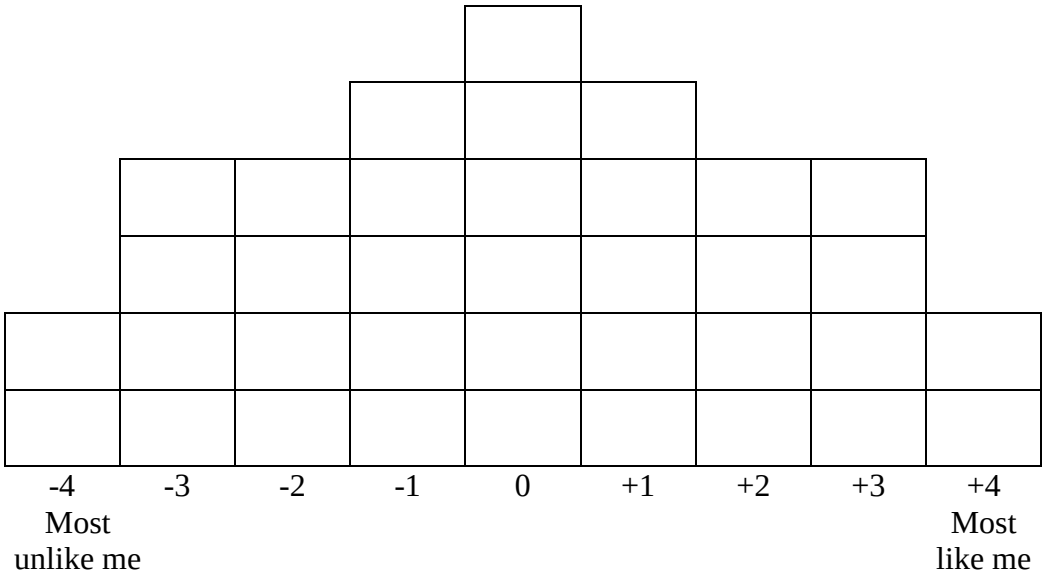



*Figure 3*. Q-sort Form Board

## Factor Analysis

### Computer Software

For what were once tedious calculations, computer software programs have aided in the quick analysis of Q-sorts. The software programs available now are "user-friendly," and only a basic knowledge of factor theory is needed to analyze the data (Brown, 1996; Shemmings, 2006). Several programs are available such as, PQMethod (Schmolck, 2002a), PCQ (Stricklin & Almeida, 2004), and QUANAL (Van Tubergen, 1975). Each program differs slightly in its computational features; however, each aids in the analysis of the data by applying three sequential statistical procedures. These statistical procedures consist of establishing correlation coefficients, factor analysis, and the computation of factor scores.

All data collected via the 28 Q-sorts, were entered into the software program, PQMethod (2.11), for analysis. PQMethod (2.11) was available to the researcher as a free Internet download.

**Correlation Coefficients**

As each participant performed a Q-sort, he/she was rank-ordering a set of statements to express an internal viewpoint. Determining the correlation each Q-sort has with one another is desired to examine the similarity between the rank-order patterns in each Q-sort. Intercorrelation was computed for each pair of Q-sorts. The result of these intercorrelations produced a 28 x 28-correlation matrix (Appendix G). A high, positive correlation between two Q-sorts indicates those individuals' similarity in the rank-ordering process.

**Factor Model**

The next step consisted of performing a factor analysis on the correlation matrix. Through the software program, two factor analysis models, centroid factor analysis and principal components analysis (PCA), were available to perform the calculations. Stephenson preferred the centroid factor analysis due to its computational ease; however, it is not used much outside the "Q community" nowadays (Schmolck, 2002b). PCA is considered to be more precise mathematically (McKeown & Thomas, 1988) and is "the most widely used method of factor extraction" (Comrey & Lee, 1992, p. 78). Arguably, regardless of the factor model used, little difference in the resulting factor structure is found, as most factor models will generally produce the same results (Brown, 1980; Burt, 1972). Nonetheless, PCA was the choice factor model used in this study because its' mathematical precision.

Employing PCA through the software program produced eight factors automatically, though not all eight need to be taken into consideration (Schmolck, 2002b). The purpose of factor analysis is to create clusters of individuals who have sorted similarly, thereby allowing the researcher "to explain the phenomena of interest with fewer than the original number of variables"(George & Mallery, 2003, p. 247). The eight factors produced by PCA were inspected to determine how many factors to retain before performing a factor rotation. The PCA matrix of the eight unrotated factors can be found in Appendix H.

**Factor Retention**

Determining the amount of factors to retain is not always straightforward. Several methods, both statistical and theoretical, should be considered in the selection process (McKeown & Thomas, 1988), each of which are more or less a general guide. Much of factor selection is "common-sense" including processes which consider face validity or other subjective measures (George & Mallery, 2003; Redburn, 1975). It is a common strategy for several factor identification and retention methods to be explored before choosing the final solution (Ford, MacCallum, & Tait, 1986; Raven, 1994).

One of the most widely used methods to determine the number of factors to retain is examining the eigenvalues for each factor. An eigenvalue shows the proportion of variance accounted for by each factor. PQMethod computed an eigenvalue for each of the original eight factors. Generally, factors with eigenvalues larger than 1.00 are considered to be significant (Comrey & Lee, 1992). Using this criterion, seven of the eight factors had eigenvalues larger than 1.00. Factor 8 had an eigenvalue of 0.99; therefore, it was rejected. Because this method called for the retention of seven of the

eight factors, the researcher continued to explore methods to reduce the number of factors.

"Another method for determining the number of factors is to accept those that have at least two significant loadings" (Brown, 1980, p. 222). Note, this procedure to determine whether or not a factor is significant, is not to be confused with a similar procedure for determining Q-sort "factor loading" in the final rotation solution. The correlation coefficients dictate the amount that an individual Q-sort has in common with each unrotated factor. To determine which Q-sorts were to be considered, the significance level needed to be determined. Two significance levels ($p < 0.05$ and $p < 0.01$) were considered. Standard error was calculated as $SE_r = (1/\sqrt{N})$, where $N$ = the number of Q statements ($N = 36$), $SE_r = (1/\sqrt{36}) = 0.166$ (McKeown & Thomas, 1988).

$$1.96(SE_r) = 1.96(0.166) = 0.33 \ (p < 0.05)$$

$$2.58(SE_r) = 2.58(0.166) = 0.43 \ (p < 0.01)$$

The significance level of $p < 0.01$ was chosen over $p < 0.05$ in order to produce more variance. Therefore, Q-sorts with factor correlation coefficients in excess of ±0.43 were used to define a factor. Using this criterion, Factors 1 through 6 were considered significant. Factors 7 and 8 did not have two or more loadings above ±0.43. Using this method allowed for the retention of six factors.

Alternative methods for identifying factors to retain do not always need to be measured by a statistical procedure. A scree test is a visual test used sometimes in selecting the number of factors to rotate to a final solution (George & Mallery, 2003). The scree test, as first proposed by Cattell (1966), involves plotting the eigenvalues on a graph for visual inspection. The scree, or the long trailing end, should be ignored

keeping only factors on the steep portion of the graph for retention and rotation. The subjectivity involved comes while looking for the break where the steep slope transitions into a more gradual slope (Zwick & Velicer, 1982). Though some researchers criticize the scree test for its subjective nature, it is effective when strong factors are present and is consistently accurate at identifying factors (Ford et al., 1986; Zwick & Velicer, 1982).

The eigenvalues for six factors were plotted for a scree test (Figure 4). Factor 7 and Factor 8 were not plotted as they were determined previously as insignificant by the researcher. The scree plot shows a steep drop between Factor 1 and Factor 2. A milder decline between Factor 2 and Factor 3 was observed, and Factor 4 through Factor 6 leveled out. Though the decline between Factor 2 and Factor 3 was not as obvious as that between Factor 1 and Factor 2, it was not part of the flattened trailing end of the graph either. Therefore, Factor 1 through Factor 3 were retained for further factor rotation.

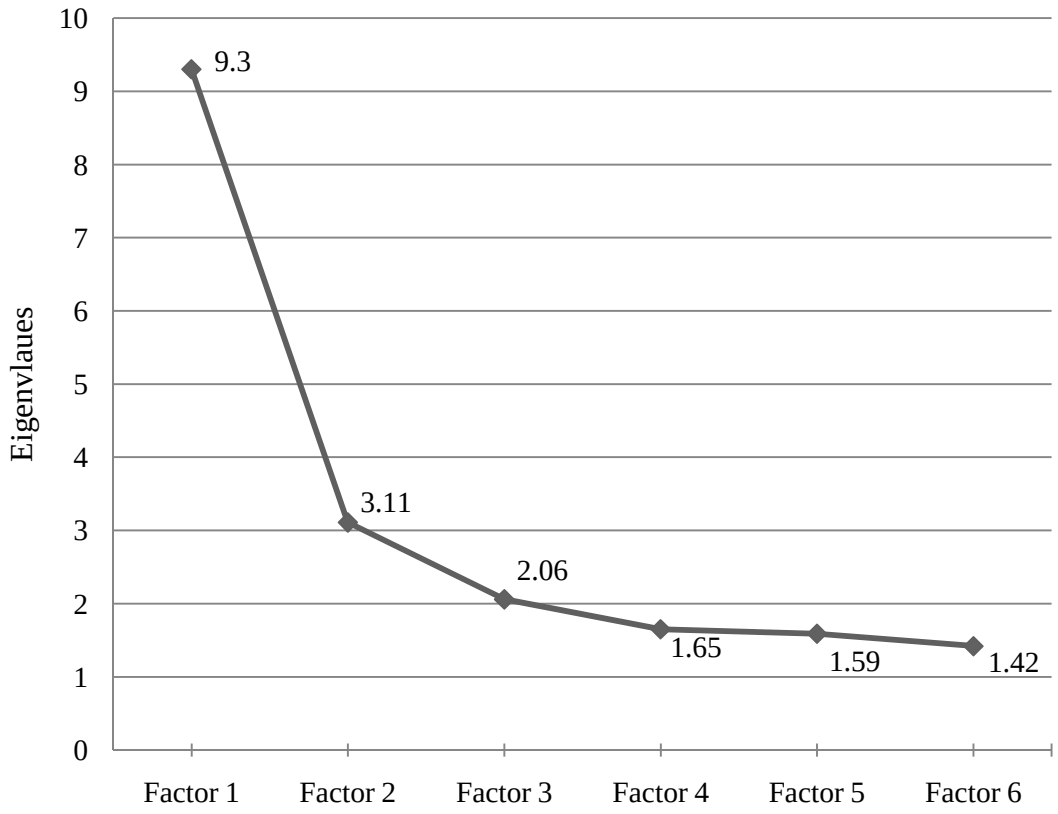



*Figure 4*. Scree plot of eigenvalues for Factors 1 through 6.

**Factor Rotation**

After the three factors were chosen, they were then rotated to a terminal factor solution. Leaving the factors in the original factor structure might be correct mathematically; however, the data become difficult to interpret (George & Mallery, 2003). The factor rotation process is used to improve the meaningfulness of each factor. Specifically, it rotates the axis giving new perspective and clarity to the data, yet in no way does it change the positional relationships among the factors (Robbins, 2005). "The goal of rotation is to achieve what is called *simple structure*, that is, high *factor loadings* on one factor and low loadings on all others" (George & Mallery, 2003, p. 248). The

final result of the factor rotation is that each factor becomes an interpretable best-estimate of characteristics for that factor (Watts & Stenner, 2005).

The computer program allowed for factors to be rotated analytically with varimax or subjectively with hand rotation. The rotation technique chosen "depends on the *nature of the data* and upon the *aims of the investigator"*(Brown, 1980, p. 238). Hand rotation can be done to align the data for theoretical reasons allowing a vantage point from which to view the data (McKeown & Thomas, 1988). Varimax, a mathematical method, is applied to provide an objective rotation. Because no unique angle was sought by the researcher, a varimax rotation was chosen. Application of a varimax rotation resulted in a final factor solution. The final factor solution contained the same previous three factors with the difference being each factor was rotated to differentiate it from other factors more clearly. Each rotated factor produced distinct groupings of individuals with similar points-of-view. These individuals were correlated highly with each other within their factor yet uncorrelated with other individuals on the other factors.

**Factor Loading**

Factor loading is the identification of relevant Q-sorts which define a factor. A Q-sort is said to *load* significantly on a factor when a high correlation coefficient is present for only one factor. Due to the nature of factor rotation, a Q-sort's correlation coefficient may have changed during the rotation process; therefore, the correlation coefficients must be re-examined. The correlation a Q-sort had to a factor prior to rotation may have changed after the varimax rotation was applied. The correlation may have increased, decreased or it may have changed to be correlated to a different factor.

The new correlation coefficients were assessed using the same significance value established during factor retention: that is, $2.58(SE_r) = 2.58(0.166) = 0.43$ ($p < 0.01$). All Q-sorts, with a significant loading (±0.43) on only one factor, i.e., defining Q-sort, were used in the interpretation of the final factor solution. Q-sorts which significantly loaded on two or more factors (split load) were rejected because of the multiple perspectives the sort represented. A Q-sort which did not significantly load on any factor was also rejected because it was not able to describe any viewpoint captured in the scope of this study.

**Factor Reliability and Validity**

In Q-methodology, test/retest reliability is the most relevant. It is assumed that under normal circumstances a person will sort nearly the same way each time he/she is provided the same statements and condition of instruction. "We expect a person performing a Q-sort to correlate with himself; i.e., we expect $r_{ab}$ to be positive and significant" (Brown, 1980, p. 289). Studies have shown that the reliability of the correlation coefficient tends to remains stable and high in test/retest situations producing an average reliability coefficient of 0.80 (Brown). This average (0.80) is built into the PQMethod computer program and used to calculate the composite reliability for each factor.

By nature, a Q-sort is subjective and relative only to the person performing the sort. "The concept of validity has very little status since there is no outside criterion for a person's own point of view" (Brown, 1980, pp. 174-175).

## Student Teachers' Allocation of Time

To study how agricultural education student teachers spent their time throughout the school day, additional data were collected for each participant who performed a Q-sort ($N$ = 28). As part of a course requirement for AGED 4200, all agricultural education student teachers at Oklahoma State University complete a summative report which is submitted weekly for each of the 12 weeks of the student teaching internship. Student teachers self-report how their time was allocated throughout the day in various activities such as teaching, observing, supervising SAEs and advising FFA activities. All reports are submitted weekly via electronic mail to the student teachers' university supervisors. Then, these reports are archived to a database within the Department of Agricultural Education, Communications and Leadership.

For this study, the weekly reports were retrieved from the archived database after the participant completed the Q-sort. Data were recorded from a total of 336 weekly reports, 12 reports from each of the 28 Q-sort participants. A Microsoft Office Excel spreadsheet was used to record and analyze the data. The data recorded from each report consisted of time spent teaching in a classroom setting, teaching in a laboratory setting, instructing specific curriculum, observing, and advising students in alternate settings outside of the school or classroom (i.e., extracurricular events during school hours). Measures of central tendency and variability were used in this portion of the study. Specifically, the descriptive statistics used to analyze the data included frequency, means and standard deviations.

In regard to class period, the researcher made no distinction as to the length of a particular class. In Oklahoma, the length of class periods can vary from school to school.

Some schools consist of 45-minute periods, others have 85-minute "blocks," and others fall somewhere in between. As such, for ease of interpretation, one hour was recorded for each class period regardless of the actual length of the class period. The time spent in alternate settings outside of the school or classroom consisted of student teachers attending activities such as livestock exhibitions, Career Development Events, leadership camps/conventions or FFA activities (Robinson et al., in press). Time spent in alternate settings was recorded only if the activities involved the student teacher acting in a teacher role, i.e., supervision of secondary students. Time was not recorded if the student teacher was completing assignments required for the university, such as mock interviews or observational visits to other schools.

## Comparative Analysis

Specifically, the time allocation data were grouped per factor after the final solution for the factor analysis was accepted, and the defining Q-sorts were identified. That is, all time allocation data for the participants whose Q-sort defining Factor 1 were analyzed for modes of central tendency and variability. This process was repeated for Factor 2 and Factor 3.

## Summary

Chapter III provided the methodology used in the study. This chapter included a description of Q-methodology including the sample population, the process used in instrument development, and the various components of Q-method factor analysis. This chapter also discussed how the time allocation data was captured to describe the amount of time student teachers spent performing various activities during their 12 weeks of clinical student teaching.

Q-methodology was employed in this study to capture the subjective views student teachers held about their teaching ability. As a method, Q is an adaptation of factor analysis specifically designed to study human subjectivity.

The instrument used in this Q-study consisted of a 36-statement Q-set from which the majority of the statements were adopted from The Teaching Ability Questionnaire (Spooner et al., 2008). Specifically, these statements included aspects of student motivation, classroom management, curriculum development, and overall ability to teach. Participants were asked to rank-order the statements within the distribution of "Most like Me" (+4) to "Most unlike Me" (-4) (Figure 3), given the prompt (condition of instruction), "How do you feel about the courses you instruct?" The participants (P-set) for this study used Oklahoma State University student teachers during the spring and fall semesters of 2009. Data (Q-sort) was collected from the P-set during weeks nine through 12 of the student teaching internship. Data describing the student teachers' personal and professional characteristics were collected at the same time the Q-sort was performed.

Q-sorts were collected from 28 participants and entered into the software program PQMethod (2.11) for analysis. A principal components analysis (PCA) was performed on the correlation coefficients produced between each Q-sort. The PCA produced eight factors with corresponding eigenvalues. Eigenvalues were plotted onto a graph for visual inspection via a scree test (Figure 4). Three factors were chosen for retention and further rotation. The eigenvalues for the three retained factors accounted for 51 percent of the variance. A varimax rotation was chosen as the rotation method to produce the final factor solution.

Additional data describing the participants weekly activities at their student teaching centers was also gathered. From an archive, 336 weekly reports which described the participants' various teaching activities were inspected. Data from each report was entered into a Microsoft Office Excel spreadsheet which captured the amount of time student teachers spent teaching in classroom settings, teaching in laboratory settings, instructing specific curriculum, observing, and advising students outside of the classroom. This data was analyzed with descriptive statistics including frequency, means and standard deviations.

Time allocation data was compared to each factor after the final factor solution was accepted and defining sorts were identified. Specifically, all time allocation data corresponding to the participants who significantly loaded on Factor 1 were analyzed for means and standard deviations. Factor loadings and interpretations of each factor are presented in Chapter IV.

# CHAPTER IV

# FINDINGS

The purpose of this study was to describe the views student teachers in agricultural education at Oklahoma State University had regarding their 12-week student teaching experience. To accomplish this purpose, this study explored the perceptions of agricultural education student teachers in the spring and fall semester of 2009, regarding aspects of self-efficacy. Further, this study sought to describe the amount of time student teachers spent performing various activities (i.e., teaching in classroom and laboratory settings, observation, instruction of specific curriculum, and time in alternate settings) while at their cooperating centers.

## Research Questions

1. What views did agricultural education student teachers have about their teaching ability?
2. How did student teachers spend their time in various activities (i.e., teaching in classroom and laboratory settings, observation, instruction of specific curriculum, time in alternate settings, and SAE supervision) during the 12-week student teaching experience?
3. How did the amount of time student teachers spent in each activity help describe their views on teaching ability (i.e., Q-sort factor load)?

4. What were the selected personal and professional characteristics (i.e., age, sex, setting of the cooperating center, and types of agricultural courses taught) of student teachers at Oklahoma State University who interned during the spring and fall semesters of 2009?

An analysis of the data for research question one, including the final factor solution, loadings, and interpretations, is found in this chapter. There is a description of the student teachers allocation of time while at the cooperating center as well as an analysis of time distribution as it corresponds to each students' factor loading. In addition, the results of the personal and professional characteristics of the student teachers are reported overall and according to their factor loading.

## Research Question 1

Research question one was, "What views did agricultural education student teachers have about their teaching ability?" The response was determined by collecting data via Q-methodology, and interpreting three extracted factors which represented the participants' beliefs regarding their teaching ability.

### Analysis of the Data

Data were analyzed using the software PQMethod (2.11) (Schmolck, 2002a). The Q-sorts for each of the 28 student teachers was entered into PQMethod to develop a correlation matrix. The matrix correlated each individual sort to all other sorts to determine the level of agreement or disagreement between all viewpoints. Next, a factor analysis of the correlation matrix was performed using principal component analysis

(PCA). The PCA was used to calculate a factor matrix which established the number of natural groupings that occurred from the student teachers' perceptions on their teaching ability. PCA also produced eigenvalues (i.e., percentage of factor variance) as part of its calculations. The eigenvalues were subjected to a scree test, which allowed for the visual identification of three factors. Three factors were rotated with varimax to produce a final factor solution.

The final solution for the three rotated factors produced low correlations between factors (Table 2) and accounted for 51 percent of the variance. A low correlation indicated dissimilarity between factors; therefore, each factor represents groupings of unique points-of-view (Brown, 1980). High/low correlation assessment was based on the scale 0.00 through 1.00, where 0.00 equals no correlation and 1.00 equals perfect correlation.

Table 2

*Correlation Between Factors*

| | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| Factor 1 | 1.00 | 0.28 | 0.37 |
| Factor 2 | | 1.00 | 0.30 |
| Factor 3 | | | 1.00 |

To establish a significance level at $p < .01$, the following equation was used: 2.58 *SE* $(1/\sqrt{N})$, where $N$ = the number of Q statements (36 statements for this study). Therefore, $2.58(1/\sqrt{36}) = |0.43|$. All Q-sorts were examined and those with a factor

loading of ±0.43 significance or higher were identified as defining a factor, i.e., a person whose views highly agree with their respective factor loading.

Using the ±0.43 significance level, 21 of 28 sorts loaded significantly on one of three factors. Factor 1 had 12 defining Q-sorts, Factor 2 had five defining Q-sorts and Factor 3 had four defining Q-sorts (Table 3). Noteworthy is Q-sort number 11, which loaded negatively on Factor 2. Although this person's Q-sort still defines Factor 2, his/her negative load indicates a rejection of the views of that factor, i.e., this person expressed views opposite of the other three Q-sorts in Factor 2. This happens during the sorting process "when participants place cards at opposite ends of the distribution" (Webler, Danielson, & Tuler, 2009, p. 30).

Seven Q-sorts were identified as non-significant or confounding and therefore were not used in the interpretation of factors. Non-significant Q-sorts are those Q-sorts which did not meet the ±0.43 significance criterion (Q-sort numbers 14, 21, and 26); thus, these three participants did not share a viewpoint which was captured in the factors of this study. Confounding Q-sorts met the ±0.43 significance criterion for more than one factor (Q-sort numbers 10, 18, 23, 27). These four participants' viewpoints were not "pure," that is, they shared multiple viewpoints. Only pure, single load Q-sorts were used in the flagging (i.e., indentified by an X) of defining sorts for the interpretation of the factors in this study. In Table 3, Q-sorts that met the significance criterion ±0.43 are shown in bold print. However, confounding Q-sorts were not used in the interpretation of factors.

Table 3

*Factor Solution*

| Q-sort | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| 12 | **0.8586X** | −0.0165 | −0.0979 |
| 9 | **0.8571X** | −0.0025 | 0.1240 |
| 6 | **0.7243X** | 0.1787 | 0.2968 |
| 13 | **0.6516X** | 0.3890 | 0.3509 |
| 28 | **0.6575X** | 0.0528 | 0.1044 |
| 3 | **0.6050X** | 0.2692 | 0.2846 |
| 8 | **0.5883X** | 0.1986 | 0.0268 |
| 22 | **0.5508X** | 0.3930 | 0.1880 |
| 19 | **0.4955X** | −0.0573 | 0.2984 |
| 25 | **0.4902X** | 0.0651 | 0.2756 |
| 5 | **0.4557X** | 0.3637 | 0.2311 |
| 16 | **0.4350X** | 0.1243 | 0.3684 |
| 17 | 0.0902 | **0.7868X** | 0.4128 |
| 11 | 0.2190 | **−0.7482X** | 0.1250 |
| 4 | 0.0825 | **0.7321X** | 0.1214 |
| 7 | 0.1752 | **0.6294X** | 0.1924 |
| 15 | 0.4238 | **0.5946X** | −0.0236 |
| 20 | 0.0489 | −0.0114 | **0.6797X** |
| 24 | 0.0895 | 0.2093 | **0.6132X** |
| 2 | 0.2207 | 0.4033 | **0.5925X** |

Table 3 (Continued)

| Q-sort | Factor 1 | Factor 2 | Factor 3 |
|---|---|---|---|
| 1 | 0.1681 | −0.0721 | **0.5646X** |
| 10 | 0.3671 | **0.4815** | **0.5753** confounded |
| 18 | **0.5472** | **0.5665** | −0.0086 confounded |
| 23 | **0.4649** | **0.7156** | −0.2057 confounded |
| 27 | 0.2078 | **−0.5163** | **0.5546** confounded |
| 14 | 0.3820 | 0.2421 | 0.2964 non-sig. |
| 21 | 0.4226 | 0.0123 | 0.3375 non-sig. |
| 26 | 0.3831 | 0.3659 | 0.2118 non-sig. |
| Number of defining sorts | 12 | 5 | 4 |

*Note*. Factor loading > .43 are in boldface; an "X" indicates a defining sort.

**Factor Scores.** With the aid of the computer program, PQMethod (2.11) (Schmolck, 2002a), factor scores were calculated for each statement within each of the factors. The calculated factor scores are presented as z-scores. A z-score measures how far a statement lies from the middle of a distribution (Shemmings, 2006). Using the z-scores, a model Q-sort, or factor array, was generated for each factor. A factor array "represents how a hypothetical respondent with a 100% loading on that factor would have ordered all the statements of the Q-set" (van Exel & de Graaf, 2005, p. 9). Statements with the highest z-scores are those with a factor array position of +4. Statements with the lowest z-scores are those with a factor array position of -4.

**Interpretation of the Factors.** Interpretation involved an examination of the factor array of statements created for each factor. A factor array tells a story with the placement of the positively and negatively placed statements. Statements of neutrality also may be an important element of the story depending on what a researcher is seeking.

The interpretation was constructed by a careful consideration of "most like" and "most unlike" statements both individually and holistically. As the viewpoints began to evolve, consideration was then given to distinguishing statements and consensus statements. The final refinement of the viewpoint came with an examination of the qualitative comments gathered from the student teachers' personal and professional characteristics questionnaire (Appendix F). Of particular interest were the written comments garnered from the "high" and "pure" factor loads.

**Distinguishing Statements.** Distinguishing statements are those statements which had a statically distinct placement in a factor array in comparison to its placement in other factors arrays. Such statements help define the unique viewpoints of a factor. As such, the z-score of a distinguishing statement may or may not be imperative to the researcher due to the context of the interpretation, i.e., a low z-score may still produce a statically distinct statement. Z-scores are important for intra-factor interpretations, whereas distinguishing statements are important for inter-factor interpretations. Distinguishing statements for this study were those which met the significance level $p < .05$. Earlier, $p < .01$ significance was used to establish the ±.043 criterion for identifying defining Q-sorts, i.e., identifying *people* who highly agreed with the views represented by their respective factor; whereas, $p < .05$ was used for identifying distinguishing statements, i.e., the placement of *statements* that were ranked significantly different

between the differing views. Using a less stringent significance value for distinguishing statements helped to optimize the number of statements that differed between each factor which led to ease of interpretation (van Exel, 2005).

**Factor 1: *Emerging Teacher***

*The Emerging Teacher*. This factor was defined by 12 of the Q-sorts and accounted for 22% of the variance in the analysis. This group was named *Emerging Teacher* because its emphasis was on growth despite experiencing a few struggles. Participants with this view believed they were growing as a teacher and as a professional. As they grew in their confidence, they needed less help with their teaching, though they still expressed that teaching, overall, was not easy. Student teachers with this view struggled to understand the growth, development, and education needs of children. In addition, locating and developing curriculum across the spectrum of agricultural education courses was difficult for those individuals who held the *Emerging Teacher* view.

Unique to this view was a social dimension. Student teachers with this view were comfortable in their interactions with students, parents and other teachers. Communication and motivation were two particular areas of interaction in which they were comfortable as teachers. Table 4 provides the top 10 statements which were ranked "most like" and the top 10 statements which were ranked "most unlike" for Factor 1. A complete factor array for the *Emerging Teacher* view can be found in Appendix I.

Table 4

*Factor 1: The Emerging Teacher View: High and Low Ranking Statements*

| No. | "Most Like" Statements | Array Position | Z score |
|---|---|---|---|
| 29.* | I feel comfortable with my ability to communicate with colleagues and parents. | 4 | 1.74 |
| 28. | I have learned ways to grow as a professional. | 4 | 1.72 |
| 20.* | I know how to encourage positive social interactions. | 3 | 1.61 |
| 4. | I am getting better at teaching. | 3 | 1.56 |
| 1. | I like how teaching makes me feel. | 3 | 1.36 |
| 21.* | I am able to handle discipline problems in my classroom | 3 | 1.12 |
| 19. | I feel comfortable with my classroom management skills. | 2 | 1.03 |
| 7. | I need less help with teaching than I did before. | 2 | 1.02 |
| 5.* | I am confident in my ability to teach. | 2 | 0.78 |
| 24.* | I feel comfortable with my ability to motivate students. | 2 | 0.75 |
| **No.** | **"Most Unlike" Statements** | **Array Position** | **Z score** |
| 14. | I understand how children learn and develop. | -2 | -0.79 |
| 26. | I am able to use prescribed curriculum for instruction. | -2 | -0.82 |
| 16. | I know how and where to refer students with learning problems. | -2 | -0.82 |
| 18.* | I know how to individualize instruction. | -2 | -0.86 |
| 32. | I can construct lesson plans for only the subjects I am comfortable with. | -3 | -1.18 |
| 2.* | Teaching is easy for me. | -3 | -1.23 |
| 15.* | I have enough training to deal with student learning problems. | -3 | -1.24 |
| 35.* | I can teach any agricultural education course. | -3 | -1.36 |
| 34. | It is easy to find curriculum materials to instruct with. | -4 | -1.43 |
| 33. | I feel comfortable teaching only one or two subjects. | -4 | -2.06 |

*Denotes a distinguishing statement; $p < .05$.

The *Emerging Teacher* view is concerned itself with growth. This type of student teacher did not feel that teaching was particularly easy (statement 2, z-score -1.23) (Table 4). Yet, these individuals recognized that they were getting better at teaching (4, 1.56) and perceived to need less help teaching than they did before (7, 1.02). In addition, they liked how teaching made them feel overall (1, 1.36).

Written comments were also collected from the student teachers after the Q-sort procedures were completed. Written comments which supported this point of view were "They [my classes] are all good and going great" (participant 6) and "[I] hope that the rest of my experience is as enjoyable" (participant 3).

These student teachers recognized they were still growing as a professional (28, 1.72) (Table 4). This continued growth aspect was emphasized further with the "most unlike me" placement of two distinguishing statements ($p < .05$); "I have enough training to deal with student learning problems" (15, -1.24), and "I know how to individualize instruction" (18, -0.86). Participant 22 said, "I feel that I would have liked to know a little more about which IEP [Individualized Education Plan] students have." IEPs are implemented in the school system and are designed to meet the particular educational needs or learning problems of a specific student. This participant's comment can be related back to the growth needed as a teacher in relation to the aforementioned statements concerning individualized instruction and management of student learning problems. In addition, those with this view failed to understand how children learn and develop (14, -0.79). Nor did these student teachers know how and where to refer students with learning problems (16, -0.82). These statements defined the student teachers' awareness that he/she needed more growth in this area.

Student teachers holding the *Emerging Teacher* view clearly did not feel comfortable teaching all aspects of agriculture, as defined by the rejection of the distinguishing statement, "I can teach any agricultural education course" (35, -1.36) (Table 4). Participant 13 wrote, "I am learning in ag[ricultural] mechanics and will continue to do so, but basic welding [is] what I am comfortable with now." Although these student teachers did not feel comfortable teaching *all* agricultural education courses, they did feel strongly about their ability to teach several different agricultural subjects due to their rejection of the statement, "I feel comfortable teaching only one or two subjects" (33. -2.06). However, despite any discomfort in *teaching* across the curriculum, these student teachers had no problem creating lesson plans across the curriculum. This aspect is supported by their rejection of the statement, "I can construct lesson plans for only the subjects I am comfortable with" (32, -1.18). Participant 12 explained, "I just have to do my part in researching/studying the topics before I actually teach it to my students."

In terms of curriculum development, the *Emerging Teacher* might be able to construct lessons across the curriculum, but finding the materials do so was no easy feat. These student teachers felt unable to use prescribed curriculum for instruction (26, -0.82); yet, when pursuing the creation of their own materials, it was not easy to find curriculum materials with which to instruct (34, -1.43) (Table 4).

Unique to this view was a social dimension. Particularly noteworthy were three "most like me" distinguishing statements. These were, "I feel comfortable with my ability to communicate with colleagues and parents" (29, 1.74), "I know how to encourage positive social interactions" (20, 1.61), and "I feel comfortable with my ability

to motivate students" (24, 0.75) (Table 4). This social dimension of those holding the *Emerging Teacher* view also trickled down to their comfort with classroom management skills (19, 1.03). Their knowledge in encouraging positive social interactions was emphasized by another distinguishing statement, "I am able to handle discipline problems in my classroom" (21, 1.12).

Noteworthy as well was the z-score of the distinguishing statement, "I am confident in my ability to teach" (5, 0.78) (Table 4). As a distinguishing statement, this indicated its placement within the factor was statically different than its placement in other factors; however, its overall effect was interpreted as somewhat neutral due to the lack of strength in the z-score. This was interpreted holistically as the *Emerging Teacher* did not have *strong* feelings of confidence about their teaching ability.

Overall, the view of the *Emerging Teacher* recognized areas in which the student teachers still needed growth and development but also recognized their development toward becoming a professional. Teaching was not easy for them, especially in instructing the diverse amount of curriculum areas found in agricultural education courses, yet, they did feel confident in planning lessons in all areas. They had a unique social dimension which gave them comfort in motivating students, communicating with colleagues and parents and dealing with teaching responsibilities such as classroom discipline and management.

**Factor 2: *Self-Assured Teacher***

*The Self-Assured Teacher.* This factor was defined by five of the Q-sorts and accounted for 17% of the variance in the analysis. This group was named *Self-Assured Teacher* because its emphasis was on confidence. Participants with this view had high

comfort and confidence in their ability to teach despite areas which still needed growth and development. Table 5 provides the top and bottom 10 statements which were ranked "most like" and "most unlike" for Factor 2. A complete factor array for the *Self-Assured Teacher* can be found in Appendix J.

Table 5

*Factor 2: The Self-Assured Teacher View: High and Low Ranking Statements*

| No. | "Most Like" Statements | Array Position | Z score |
|---|---|---|---|
| 5. | I am confident in my ability to teach. | 4 | 2.19 |
| 3.* | When I teach, I feel satisfied. | 4 | 1.58 |
| 23. | I feel comfortable with my ability to plan instruction. | 3 | 1.37 |
| 2.* | Teaching is easy for me. | 3 | 1.26 |
| 1. | I like how teaching makes me feel. | 3 | 1.15 |
| 6.* | I am relaxed when I teach. | 3 | 1.06 |
| 8. | My students think I teach well. | 2 | 0.91 |
| 12. | My lessons contain meaningful learning experiences. | 2 | 0.88 |
| 35. | I can teach any agricultural education course. | 2 | 0.85 |
| 19. | I feel comfortable with my classroom management skills | 2 | 0.84 |
| **No.** | **"Most Unlike" Statements** | **Array Position** | **Z score** |
| 34.* | It is easy to find curriculum materials to instruct with. | -2 | -0.54 |
| 15. | I have enough training to deal with student learning problems. | -2 | -0.69 |
| 14. | I understand how children learn and develop. | -2 | -0.70 |
| 30.* | I have observed teaching that I will model in the future. | -2 | -0.95 |
| 25. | I have observed other teachers techniques to motivate students. | -3 | -0.98 |
| 17. | I have observed other teachers deal with student learning problems. | -3 | -1.01 |
| 26. | I am able to use prescribed curriculum for instruction. | -3 | -1.20 |
| 36. | I have observed other teachers use a variety of materials to build lessons with. | -3 | -1.22 |
| 32.* | I can construct lesson plans for only the subjects I am comfortable with. | -4 | -2.17 |
| 33. | I feel comfortable teaching only one or two subjects. | -4 | -2.25 |

*Denotes a distinguishing statement; $p < .05$.

The *Self-Assured Teacher* view is concerned itself with confidence. This type of student teacher was confident about their teaching ability (statement 5, z-score 2.19) and classroom management skills (19, 0.84) (Table 5). In addition, these student teachers felt they could teach any agricultural education course (35, 0.85). This was emphasized further with the "most unlike me" placement of the distinguishing statement ($p < .05$), "I feel comfortable teaching only one or two subjects" (33, -2.25,). Participant 17 supported the view of being able to teach any agricultural education course by writing, "I really feel that I was prepared for [the] content."

The high confidence of the *Self-Assured Teacher* was emphasized with other statements as well. The "most like me" placement of two distinguishing statements, "Teaching is easy for me" (2, 1.26), and "I am relaxed when I teach" (6, 1.06) added to the interpretation of comfort and confidence (Table 5). However, the *Self-Assured Teacher*, though comfortable and confident in his/her own teaching ability, had not observed teaching that he/she will model in the future (30, -0.95).

In terms of finding quality curriculum, the *Self-Assured Teacher* struggled. The distinguishing statement, "It is easy to find curriculum materials to instruct with" (34, -0.54), was rejected (Table 5). And, while curriculum was difficult to find, these student teachers did not want to use prescribed curriculum for instruction (26, -1.20) either. Participant 15 wrote, "Good curriculum is the key, not having to go home at night and fill in gaps would be beneficial." This supported a view that these student teachers wanted quality instructional curriculum. It was noteworthy that they have not observed other teachers use a variety of materials to build lessons with (36, -1.22).

The *Self-Assured Teacher* expressions of confidence regarding their ability to teach any agricultural education course was also tied to their confidence in planning instruction. The struggle in locating curriculum materials did not affect their ability in lesson planning. These student teachers felt their lessons contained meaningful learning experiences (12, 0.88), and they were comfortable with their ability to plan instruction overall (23, 1.37) (Table 5). They also were confident in their ability to construct lessons across the agricultural education curriculum as expressed by their rejection of the statement, "I can construct lesson plans for only the subjects I am comfortable with" (32, -2.17). This is an interesting view, because through personal comments, the student teachers did not seem to plan for many classes. Participant 7 claimed to "use the same lesson plan for both horticultural classes," and Participant 4 stated his classes were "somewhat cover-all in subject matter…all ag[ricultural] subjects [were taught] inside one class so the students get a broad view of ag[riculture]."

Given all their confidence, the student teachers with the *Self-Assured Teacher* view felt unprepared in some areas of teaching. They do not feel they had enough training to deal with student learning problems (15, -0.69) nor did they understand how children learn and develop (14, -0.70) (Table 5). These student teachers have not observed other teachers model the teaching tasks specified either. This is demonstrated in the rejection of the statements, "I have observed other teachers deal with student learning problems" (17, -1.01), and "I have observed other teachers techniques to motivate students" (25, -0.98).

Teaching not only evoked confidence for the *Self-Assured Teacher* but feelings of pleasure and satisfaction as well. A "most like me" statement included, "I like how

teaching makes me feel "(1, 1.15), and a distinguishing statement was, "When I teach, I feel satisfied" (3, 1.58) (Table 5). The confidence of the *Self-Assured Teacher* view was endorsed further by others' thoughts on their teaching ability. This was reflected in the "most like me" statement, "My students think I teach well" (8, 0.91).

Overall, the view of the *Self-Assured Teacher* view was a high level of comfort and confidence in their teaching ability. This confidence extended to their views on developing lessons and teaching across the agricultural education curriculum. Despite not having observed model teaching, these student teachers 81erceived they could effectively create lesson plans and manage a classroom. Because the *Self-Assured Teacher* viewed teaching as being easy, feelings of pleasure and satisfaction were evoked.

**Factor 3: *Determined Teacher***

*The Determined Teacher*. This factor was defined by four of the Q-sorts and accounted for 12% of the variance in the analysis. This group was named the *Determined Teacher* because of its balance of teaching confidence and hard work. Participants with this view had confidence in their teaching ability yet felt they were still growing as a teacher and professional. Teaching was not easy for the student teachers with this viewpoint. Table 6 provides the top 10 statements that were ranked "most like" and the top 10 statements which were ranked "most unlike" for Factor 3. A complete factor array for the *Determined Teacher* can be found in Appendix K.

Table 6

*Factor 3: The Determined Teacher View: High and Low Ranking Statements*

| No. | "Most Like" Statements | Array Position | Z score |
|---|---|---|---|
| 5. | I am confident in my ability to teach. | 4 | 2.02 |
| 4. | I am getting better at teaching. | 4 | 1.68 |
| 1. | I like how teaching makes me feel. | 3 | 1.37 |
| 28. | I have learned ways to grow as a professional. | 3 | 1.34 |
| 12. | My lessons contain meaningful learning experiences. | 3 | 1.09 |
| 30.* | I have observed teaching that I will model in the future. | 3 | 1. 02 |
| 35. | I can teach any agricultural education course. | 2 | 0.84 |
| 23. | I feel comfortable with my ability to plan instruction. | 2 | 0.81 |
| 8. | My students think I teach well. | 2 | 0.80 |
| 7. | I need less help with teaching than I did before. | 2 | 0.73 |
| **No.** | **"Most Unlike" Statements** | **Array Position** | **Z score** |
| 22. | I have observed other teachers' classroom management procedures. | -2 | -0.67 |
| 24.* | I feel comfortable with my ability to motivate students. | -2 | -0.71 |
| 20. | I know how to encourage positive social interactions. | -2 | -0.75 |
| 17. | I have observed other teachers deal with student learning problems. | -2 | -0.87 |
| 32. | I can construct lesson plans for only the subjects I am comfortable with. | -3 | -0.89 |
| 11.* | When I teach, lessons flow. | -3 | -1.08 |
| 34. | It is easy to find curriculum materials to instruct with. | -3 | -1.26 |
| 36. | I have observed other teachers use a variety of materials to build lessons with. | -3 | -1.72 |
| 2.* | Teaching is easy for me. | -4 | -1.92 |
| 6.* | I am relaxed when I teach. | -4 | -2.37 |

*Denotes a distinguishing statement; $p < .05$.

The *Determined Teacher* view is concerned with persistence. This type of student teacher felt strongly that teaching was not particularly easy (statement 2, z-score -1.92) (Table 6). In addition to teaching not being easy, these student teachers had perceived feelings of stress and tension in relation to teaching. Two "most unlike me" distinguishing statements ($p < .05$) verified this view firmly: "I am relaxed when I teach" (6, -2.37), and "When I teach, lessons flow" (11, -1.08).

Yet, countering the *Determined Teacher* view were perceived feelings of teaching stress, they recognized a level of confidence in their ability to teach (5, 2.02) (Table 6). The *Determined Teachers* felt they needed less help teaching than before (7, 0.73) and that they were growing as a professional (28, 1.34). In addition, teaching was a source of pleasure to this group. A "most like me" statement was, "I like how teaching makes me feel" (1, 1.37). Supporting this view was a written comment made by participant 2 who stated, "I feel that [my classes] are going very well." The *Determined Teachers'* confidence was supported by others' thoughts on their teaching ability. This was expressed in the "most like me" statement, "My students think I teach well" (8, 0.80).

Unique to the *Determined Teacher*, however, was the distinguishing statement, "I have observed teaching that I will model in the future" (30, 1.02) (Table 6). This was interesting because of their ranking of other statements, i.e., they had not seen teachers perform several important tasks associated with teaching. They rejected three statements associated with the observation of other teachers. Those three were, "I have observed other teachers' classroom management procedures" (22, -0.67), "I have observed other teachers deal with student learning problems" (17, -0.87), and "I have observed other teachers use a variety of materials to build lessons with" (36, -1.72).

Not seeing others teachers complete these tasks however, did not interfere with the *Determined Teachers'* views on completing these tasks for themselves. In terms of curriculum planning and instruction, these student teachers expressed comfort with their ability to plan instruction (23, 0.81) and create lessons with meaningful learning experiences (12, 1.09) (Table 6).

In addition, these student teachers felt they could teach any agricultural education course (35, 0.84) (Table 6). The *Determined Teacher* also perceived they could construct lesson plans for more than just the subjects with which they were comfortable (32, -1.08). Participant 20 emphasized this by stating, "I feel comfortable with [all] the agriculture subjects." This participant did mention a lack of comfort with the agricultural communications curriculum, however. And, although these student teachers perceived they could construct lesson plans, finding the actual materials needed for the development of the curriculum was not easy for them. To that end, these student teachers rejected the statement, "It is easy to find curriculum materials to instruct with" (34, -1.26).

Overall, the view of the *Determined Teacher* recognized confidence but not comfort in their teaching ability. Teaching did not always come easy for them, but they recognized they were getting better at it. As a growing professional, when these student teachers taught, they were not relaxed, lessons did not flow, and they had difficulty finding curriculum materials. These student teachers did feel confident in constructing lesson plans and providing instruction across the agricultural education curriculum. Despite not having several specific aspects of teaching modeled for them, they did observe teaching overall that they would like to model. The *Determined Teacher* is an

individual who is persistent, and is working through teaching discomforts to provide good teaching.

**View Similarities**

Though distinct, the three views on teaching ability, *Emerging Teacher, Self-Assured Teacher,* and *Determined Teacher*, did have some commonality. Similarities are expressed by consensus statements. Consensus statements are those statements which were placed similarly in each factor. These consensus statements also explain the small amount of correlation that existed between factors (Table 2). In addition, the consensus statements are non-significant statements because they do not help distinguish between any of the three factors. Although a consensus statement does not define one individual factor explicitly, such as a distinguishing statement, it does define all three factors (Table 7).

This study revealed nine consensus statements ranked similarly by all the student teachers who participated. All of the student teachers had salient agreement with statement 1, "I like how teaching makes me feel" (factor 1 z-score, 1.36; factor 2 z-score, 1.15; factor 3 z-score, 1.37) (Table 7). Student teachers who shared this view had positive feelings about their teaching experience. These feelings were supported by several participants who commented that their classes were enjoyable and going well.

Table 7

*Consensus Statements*

| No. | Consensus Statements | Z-score | | |
|---|---|---|---|---|
| | | Factor 1 | Factor 2 | Factor 3 |
| 1. | I like how teaching makes me feel. | 1.36 | 1.15 | 1.37 |
| 10. | My clinical instructor thinks I teach well. | -0.30 | 0.04 | 0.19 |
| 12. | My lessons contain meaningful learning experiences. | 0.62 | 0.88 | 1.09 |
| 13. | My students understand the lessons I teach. | 0.26 | -0.24 | -0.09 |
| 14. | I understand how children learn and develop. | -0.79 | -0.70 | -0.31 |
| 16. | I know how and where to refer students with learning problems. | -0.82 | -0.20 | -0.36 |
| 17. | I have observed other teachers deal with student learning problems. | -0.40 | -1.02 | -0.87 |
| 19. | I feel comfortable with my classroom management skills. | 1.03 | 0.84 | 0.42 |
| 27. | I know how to use a variety of instructional strategies. | 0.12 | -0.17 | 0.14 |

The three groups agreed with statement 12, “My lessons contain meaningful learning experiences” (0.62, 0.88, 1.09) (Table 7). However, regardless of the learning experience, they did not have strong views about whether the students understood the lesson or not. This is demonstrated by the neutral placement of the statement. Neutrality is created through the central placement of a statement compared to the two polar ends of “most like me” and “most unlike me.” Statement 13, “My students understand the

lessons I teach" (0.26, -0.24, 0.09), was a statement about which the student teachers were neutral.

Other statements for which all three groups held limited views about were statement 10 and statement 27 (Table 7). Statement 10, "My clinical instructor thinks I teach well" (-0.30, 0.04, 0.19), reflects they did not know what their cooperating teacher's opinion was in relation to their teaching. In addition, none of the student teachers had strong feelings regarding any variation in teaching methods, as reflected through statement 27, "I know how to use a variety of instructional strategies" (0.12, -0.17, 0.14).

These student teachers also agreed to reject three statements: statement 14, "I understand how children learn and develop" (-0.79, -0.79, -0.31), statement 17, "I have observed other teachers deal with student learning problems" (-0.40, -1.02, -0.87), and statement 16, "I know how and where to refer students with learning problems" (-0.82, -0.20, -0.36). These statements all reflect that student teachers needed more development in addressing student growth and learning problems.

## Research Question 2

Research question two was, "How did student teachers spend their time in various activities (i.e., teaching in classroom and laboratory settings, observation, instruction of specific curriculum, time in alternate settings, and SAE supervision) during the 12-week student teaching experience?" This question was answered by collecting data via weekly reports submitted by each student teacher for each week spent at the cooperating center.

**Time Allocation**

Time allocation data was reviewed and analyzed for 28 student teachers who interned in either the spring or fall semester of 2009. Data were recorded from a total of 336 weekly reports, 12 reports from each of the 28 Q-sort participants. Specifically, time was recorded for teaching in a classroom setting, teaching in a laboratory setting, instructing specific curriculum, observing, and advising or supervising students in alternate settings outside of the classroom.

The first area of time allocation examined was that in which student teachers devoted time to instruction versus observation. It was discovered that the 2009 student teachers taught more than 10 hours per week ($M$ = 10.48, $SD$ = 7.93) (Table 8). In comparison, they observed fewer hours more per week on average ($M$ = 5.17, $SD$ = 5.94). The student teachers spent nearly eight hours per week instructing in a classroom setting ($M$ = 7.89, $SD$ = 6.23) and considerably less time teaching in a laboratory setting ($M$ = 2.63, $SD$ = 3.80). When assessing the time spent in school during school day hours, the student teachers spent more than 18 hours per week in school ($M$ = 18.63, $SD$ = 9.21). When assessing the time spent out of school during school day hours, the student teachers spent about four and one-half hours ($M$ = 4.49, $SD$ = 6.82) in this way (Table 8).

Table 8

*Average Weekly Time Allocation of the 2009 Student Teachers* (*N* = 28)

| Teaching Activity | *M* | *SD* |
|---|---|---|
| Teaching | 10.48 | 7.93 |
| Observing | 5.17 | 5.94 |
| Instructing in the Classroom | 7.89 | 6.23 |
| Instructing in the Laboratory | 2.63 | 3.80 |
| Time Spent in School | 18.63 | 9.21 |
| Time Spent Out of School | 4.49 | 6.82 |

**Time Devoted Across Curriculum Areas**

Time allocation data were also examined for the amount of time student teachers devoted to instruction in specific curriculum areas of agricultural education. Across all different courses, the 2009 student teachers spent the most amount of time instructing Agriscience I and II (*M* = 3.20, *SD* = 3.46), followed by Plant Science (*M* = 1.96, *SD* = 2.81) and 7$^{th}$ and 8$^{th}$ grade Agriculture (*M* = 1.83, *SD* = 2.12) (Table 9). Courses taught the least were Agribusiness and Marketing (*M* = 0.07, *SD* = 0.48) followed by Leadership (*M* = 0.09, *SD* = 0.59). None of the 2009 student teachers reported teaching a Food Science course (Table 9).

Table 9

*Student Teachers' Time Spent Teaching across the Agricultural Education Curriculum as Averaged Weekly* (*N* = 28)

| Curriculum Area | *M* | *SD* |
|---|---|---|
| Agribusiness and Marketing | 0.07 | 0.48 |
| Agricultural Communications | 0.10 | 0.60 |
| Agricultural Mechanics | 1.47 | 2.31 |
| Agriscience I and II | 3.20 | 3.46 |
| Animal/Equine Science | 1.40 | 2.01 |
| Food Science | 0.00 | 0.00 |
| Leadership | 0.09 | 0.59 |
| Plant Science/Natural Resources | 1.96 | 2.81 |
| $7^{th}$ and $8^{th}$ Grade Agriculture | 1.83 | 2.12 |

## Research Question 3

Research question three was, "How did the amount of time student teachers spent in each activity help describe their views on teaching ability (i.e., Q-sort factor load)?" This was determined by connecting the data collected via weekly reports and the three views on teaching ability described above.

The weekly reports submitted by each student teacher were analyzed to determine how the student teachers' spent their time in various activities (i.e., teaching in classroom and laboratory settings, observation, instruction of specific curriculum, time in alternate settings, and SAE supervision) during the 12-week student teaching experience. The

time allocation data were then connected to the Q-sort participants' views on their teaching ability. Only the time allocation data from student teachers who loaded significantly (±0.43) on a factor were analyzed for central tendency and variability. The Q-sort data of student teachers that were either confounded or non-significant were not used in the analysis of this data.

**Teaching versus Observing**

The first area of time allocation examined was the amount of time student teachers devoted to instruction versus observation. It was discovered that the *Emerging Teacher* and the *Determined Teacher* taught almost 10 hours per week ($M$ = 9.88, $SD$ = 7.40 and $M$ = 9.90, $SD$ = 7.64, respectively) (Table 10). In comparison, the *Self-Assured Teacher* taught in excess of one additional hour per week on average ($M$ = 11.27, $SD$ = 8.77).

Although *Self-Assured Teachers* spent more time teaching per week than the *Emerging Teachers* and *Determined Teachers*, they observed the least amount when compared with the other two factors ($M$ = 4.57, $SD$ = 6.12). The *Emerging Teachers* observed just over five hours per week ($M$ = 5.24, $SD$ = 5.63). Moreover, the *Determined Teachers* spent the most amount of time per week in observation ($M$ = 5.90, $SD$ = 6.20) (Table 10).

Table 10

*Differences in Time Spent Teaching versus Observing per Week by View*

| Experience | *M* | *SD* |
|---|---|---|
| Taught | | |
| Emerging Teacher | 9.88 | 7.40 |
| Self-Assured Teacher | 11.27 | 8.77 |
| Determined Teacher | 9.90 | 7.64 |
| Observed | | |
| Emerging Teacher | 5.24 | 5.63 |
| Self-Assured Teacher | 4.57 | 6.12 |
| Determined Teacher | 5.90 | 6.20 |

**Time Devoted Across Curriculum Areas**

The second area of time allocation examined was that in which student teachers devoted time to instruction in specific curriculum areas of agricultural education. Across all views the most amount of time was spent instructing Agriscience I and II (Table 11). For the *Emerging Teachers*, the majority of their time was spent instructing in the area of Agriscience I and II (*M* = 3.08, *SD* = 3.80), 7$^{th}$ and 8$^{th}$ grade Agriculture (*M* = 1.97, *SD* = 2.32), Plant Science/Natural Resources (*M* = 1.92, *SD* = 2.64), and Animal/Equine Science (*M* = 1.15, *SD* = 2.04).

The *Self-Assured Teachers* spent the majority of their time instructing Agriscience I and II (*M* = 3.18, *SD* = 3.36), Plant Science/Natural Resources (*M* = 2.48, *SD* = 3.75),

Agricultural Mechanics (*M* = 2.05, *SD* = 3.31), and 7th and 8th grade Agriculture (*M* = 1.78, *SD* = 1.96) (Table 11).

The *Determined Teachers* spent the majority of their time instructing Agriscience I and II (*M* = 2.80, *SD* = 2.70), 7th and 8th grade Agriculture (*M* = 2.19, *SD* = 1.91), Animal/Equine Science (*M* = 2.00, *SD* = 2.10), and Agricultural Mechanics (*M* = 1.65, *SD* = 1.90) (Table 11).

Table 11

*Student Teachers' Time Spent Teaching across the Agricultural Education Curriculum by View*

| | Emerging Teachers (*N* = 12) | | Self-Assured Teachers (*N* = 5) | | Determined Teachers (*N* = 4) | |
|---|---|---|---|---|---|---|
| Curriculum Area | *M* | *SD* | *M* | *SD* | *M* | *SD* |
| Agribusiness and Marketing | 0.04 | 0.28 | 0.00 | 0.00 | 0.40 | 1.10 |
| Agricultural Communications | 0.44 | 1.33 | 0.50 | 1.20 | 0.10 | 0.60 |
| Agricultural Mechanics | 1.05 | 1.79 | 2.05 | 3.31 | 1.65 | 1.90 |
| Agriscience I and II | 3.08 | 3.80 | 3.18 | 3.36 | 2.80 | 2.70 |
| Animal/Equine Science | 1.15 | 2.04 | 1.27 | 1.94 | 2.00 | 2.10 |
| Food Science | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Leadership | 0.23 | 0.89 | 0.00 | 0.00 | 0.00 | 0.00 |
| Plant Science/Natural Resources | 1.92 | 2.64 | 2.48 | 3.75 | 0.70 | 1.5 |
| 7th and 8th Grade Agriculture | 1.97 | 2.32 | 1.78 | 1.96 | 2.19 | 1.91 |

**Classroom Teaching versus Laboratory Teaching**

The third area explored regarding the student teachers' time allocation was that in which they spent time teaching in a classroom setting versus teaching in a laboratory setting. The *Emerging Teachers* and the *Determined Teachers* spent approximately the same amount of time teaching in a classroom setting ($M$ = 7.54, $SD$ = 6.19 and $M$ = 7.50, $SD$ = 5.55, respectively); however the *Self-Assured Teachers* spent slightly more time teaching in a classroom setting per week ($M$ = 8.20, $SD$ = 6.29) (Table 12).

Similar to the classroom teaching result, the *Emerging Teachers* and the *Determined Teachers* spent approximately the same amount of time teaching in a laboratory setting ($M$ = 2.35, $SD$ = 3.55 and $M$ = 2.42, $SD$ = 3.27, respectively), and the *Self-Assured Teachers* spent slightly more time teaching in a laboratory setting per week ($M$ = 3.07, $SD$ = 4.64) (Table 12).

Table 12

*Time Spent Teaching in the Classroom versus Teaching in the Laboratory each Week per View*

| Experience | *M* | *SD* |
|---|---|---|
| Classroom | | |
| Emerging Teachers | 7.54 | 6.19 |
| Self-Assured Teachers | 8.20 | 6.29 |
| Determined Teachers | 7.50 | 5.55 |
| Laboratory | | |
| Emerging Teachers | 2.35 | 3.55 |
| Self-Assured Teachers | 3.07 | 4.64 |
| Determined Teachers | 2.42 | 3.27 |

**Time Spent in School versus Out of School**

The fourth area explored in the student teachers time allocation was that in which they spent time in school, during usual school hours, versus the time they spent away from school during usual school hours. The *Emerging Teachers* spent the most amount of time in school during the usual school day ($M$ = 18.82, $SD$ = 9.20) (Table 13). The *Self-Assured Teachers* spent nearly 18 hours per week ($M$ = 17.87, $SD$ = 9.53) in school. And, the *Determined Teachers* spent the least amount of time in school during the school day when compared to the other views ($M$ = 16.73, $SD$ = 8.31).

When assessing the time spent out of school during the school day, the *Self-Assured Teachers* spent the least amount of time out of school ($M$ = 3.65, $SD$ = 6.20), and the *Emerging Teachers* spent five hours out of school per week ($M$ = 5.00, $SD$ = 7.21), which was the most of the three views. The *Determined Teachers* spent slightly more than four and one-half hours out of school ($M$ = 4.41, $SD$ = 6.28) each week (Table 13).

Table 13

*Time Spent in School versus Out of School per Week by Factor*

| Location | *M* | *SD* |
|---|---|---|
| In School | | |
| Emerging Teacher | 18.82 | 9.20 |
| Self-Assured Teacher | 17.87 | 9.53 |
| Determined Teacher | 16.73 | 8.31 |
| Out of School | | |
| Emerging Teacher | 5.00 | 7.21 |
| Self-Assured Teacher | 3.65 | 6.20 |
| Determined Teacher | 4.41 | 6.28 |

## Research Question 4

### Characteristics of the P-set

Personal and professional characteristic data were collected from the participants after Q-sorts had been completed. Characteristics of the agricultural education student teachers for the 2009 spring and fall academic semesters included age, sex, previous experience in agriculture courses at the high school level, size of his/her cooperating center, and specific courses he/she instructed while student teaching.

Twenty-eight agricultural education student teachers, consisting of 16 males and 12 females, completed a Q-sort (Table 14). The students ranged in ages from 21 to 33, with a mean age of 22.5 years. Twenty-seven of the 28 participants were within the age range of 21 to 24. The setting of the cooperating center was reported by the student teacher as either rural or suburban. As such, 21 student teachers identified their cooperating centers as rural, and seven identified their cooperating centers as suburban. No student teachers reported completing their internship in a cooperating center that was in an urban setting. Data were also collected on student teachers' enrollment in an agriculture course as a high school student. All of the student teachers reported enrollment in agricultural courses as high school students (Table 14).

Of the 28 who completed a Q-sort, 21student teachers loaded on one of three views (i.e., emerging, self-assured, and determined teachers) (Table 14). All of the student teachers expressed being prepared adequately to instruct their courses regarding teaching methodologies or pedagogy. Six student teachers did not view themselves as prepared to instruct their courses at the cooperating center regarding the content they were expected to teach.

Table 14

*Selected Personal and Professional Characteristics of Agricultural Education Student Teachers, Spring and Fall Semesters of 2009* (*N* = 28)

| Q-Sort | Sex | Age | Prepared in Content | Prepared in Teaching Method | School Setting | Teaching Ability Viewpoint |
|---|---|---|---|---|---|---|
| 12 | M | 21 | N | Y | Rural | *Emerging* |
| 9 | M | 22 | Y | Y | Rural | *Emerging* |
| 6 | M | 22 | Y | Y | Suburban | *Emerging* |
| 13 | F | 21 | Y | Y | Suburban | *Emerging* |
| 28 | F | 22 | N | Y | Rural | *Emerging* |
| 3 | M | 22 | Y | Y | Suburban | *Emerging* |
| 8 | M | 21 | N | Y | Suburban | *Emerging* |
| 22 | M | 23 | Y | Y | Rural | *Emerging* |
| 19 | F | 22 | Y | Y | Rural | *Emerging* |
| 25 | F | 22 | Y | Y | Rural | *Emerging* |
| 5 | F | 22 | Y | Y | Rural | *Emerging* |
| 16 | F | 23 | Y | Y | Rural | *Emerging* |
| 17 | M | 22 | Y | Y | Rural | *Self-Assured* |
| 11 | F | 22 | N | Y | Rural | *Self-Assured* |
| 4 | M | 23 | Y | Y | Rural | *Self-Assured* |
| 7 | F | 24 | Y | Y | Suburban | *Self-Assured* |
| 15 | M | 33 | Y | Y | Suburban | *Self-Assured* |
| 20 | M | 23 | N | Y | Rural | *Determined* |
| 24 | M | 23 | N | Y | Rural | *Determined* |
| 2 | M | 21 | Y | Y | Rural | *Determined* |
| 1 | M | 21 | Y | Y | Rural | *Determined* |
| 10 | F | 22 | Y | Y | Rural | Confounded |
| 18 | F | 21 | Y | Y | Rural | Confounded |

Table 14 (Continued)

| Q-Sort | Sex | Age | Prepared in Content | Prepared in Teaching Method | School Setting | Teaching Ability Viewpoint |
|---|---|---|---|---|---|---|
| 23 | M | 21 | Y | Y | Rural | Confounded |
| 27 | M | 23 | Y | Y | Rural | Confounded |
| 14 | F | 24 | Y | Y | Rural | Non-significant |
| 21 | M | 22 | Y | Y | Suburban | Non-significant |
| 26 | F | 22 | Y | Y | Rural | Non-significant |

*Note.* M = Male, F = Female; Y = Yes, N = No

**Selected Characteristics of the *Emerging Teacher* View**

Twelve student teachers held the viewpoint of *Emerging Teacher* (Table 15). Of these, six were male and six were female. Eight student teachers taught in rural schools and four taught in a suburban setting. The *Emerging Teacher* view ranged in age from 21 to 23 years, with an average age of 22 years. Regarding content, nine *Emerging Teachers* perceived they were prepared in all content areas of agriculture. Moreover, all *Emerging Teachers* viewed themselves as prepared to use a variety of teaching methods to instruct their classes.

Table 15

*Selected Characteristics of the Emerging Teacher View* (*N* = 12)

| Q-Sort | Sex | Age | Prepared in Content | Prepared in Teaching Method | School Setting |
|---|---|---|---|---|---|
| 3 | M | 22 | Y | Y | Suburban |
| 5 | F | 22 | Y | Y | Rural |
| 6 | M | 22 | Y | Y | Suburban |
| 8 | M | 21 | N | Y | Suburban |
| 9 | M | 22 | Y | Y | Rural |
| 12 | M | 21 | N | Y | Rural |
| 13 | F | 21 | Y | Y | Suburban |
| 16 | F | 23 | Y | Y | Rural |
| 19 | F | 22 | Y | Y | Rural |
| 22 | M | 23 | Y | Y | Rural |
| 25 | F | 22 | Y | Y | Rural |
| 28 | F | 22 | N | Y | Rural |

*Note.* M = Male, F = Female; Y = Yes, N = No

Not all of these student teachers had the opportunity to instruct every agricultural education course (subject) that was offered at their cooperating center. Six student teachers did not have the opportunity to instruct in each course offered. Ten of the 12 student teachers taught Agriscience I/II and 7th and 8th Agriculture. Eight student teachers taught Agricultural Mechanics, seven taught Plant Science, six taught Animal Science, four taught Natural Resources, and three taught Agricultural Communications.

Only one student teacher from the *Emerging Teacher* view taught Agribusiness. Both sexes were found to have equal representation across the teaching opportunities available at their cooperating center.

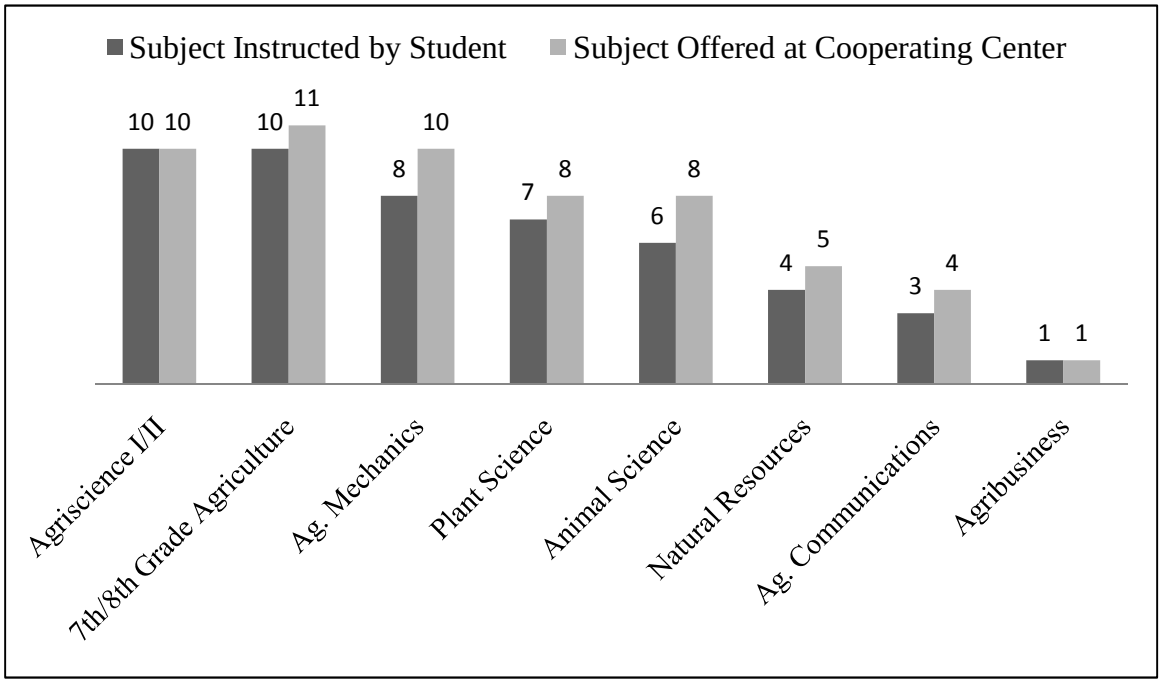



*Figure 5.* A comparison of the courses offered at the cooperating center and those taught by the student teacher for Factor 1, *Emerging Teacher*

**Selected Characteristics of the *Self-Assured* View**

Five student teachers held the viewpoint of *Self-Assured Teacher* (Table 16). Of these, three were male and two were female. Three student teachers taught in rural schools, and two taught in a suburban setting. Student teaching holding the *Self-Assured Teacher* view ranged in age from 22 to 33 years, with an average age of 24.5 years. Regarding content, only one *Self-Assured Teacher* reported he/she perceived being

unprepared to instruct their classes. However, all *Self-Assured Teachers* perceived to be prepared to instruct their classes, as it pertained to teaching methodology.

Table 16

*Selected Characteristics of the Self-Assured Teacher View* (*N* = 5)

| Q-Sort | Sex | Age | Prepared in Content | Prepared in Teaching Method | School Setting |
|---|---|---|---|---|---|
| 4 | M | 23 | Y | Y | Rural |
| 7 | F | 24 | Y | Y | Suburban |
| 11 | F | 22 | N | Y | Rural |
| 15 | M | 33 | Y | Y | Suburban |
| 17 | M | 22 | Y | Y | Rural |

*Note.* M = Male, F = Female; Y = Yes, N = No

Only one *Self-Assured Teacher* had the opportunity to teach each course offered at his/her cooperating center. All of the student teachers reported instructing Agriscience I/II. Four student teachers reported instructing Animal Science, Plant Science and 7th and 8th Agriculture. Three student teachers reported teaching Agricultural Mechanics. Of note, neither of the female teachers reported teaching Agricultural Mechanics, even though it was a course offered at their cooperating center. Three student teachers instructed Natural Resources, and one instructed Agricultural Communications. None of the *Self-Assured Teachers* reported instructing Agribusiness during their student teaching experience (Table 16).

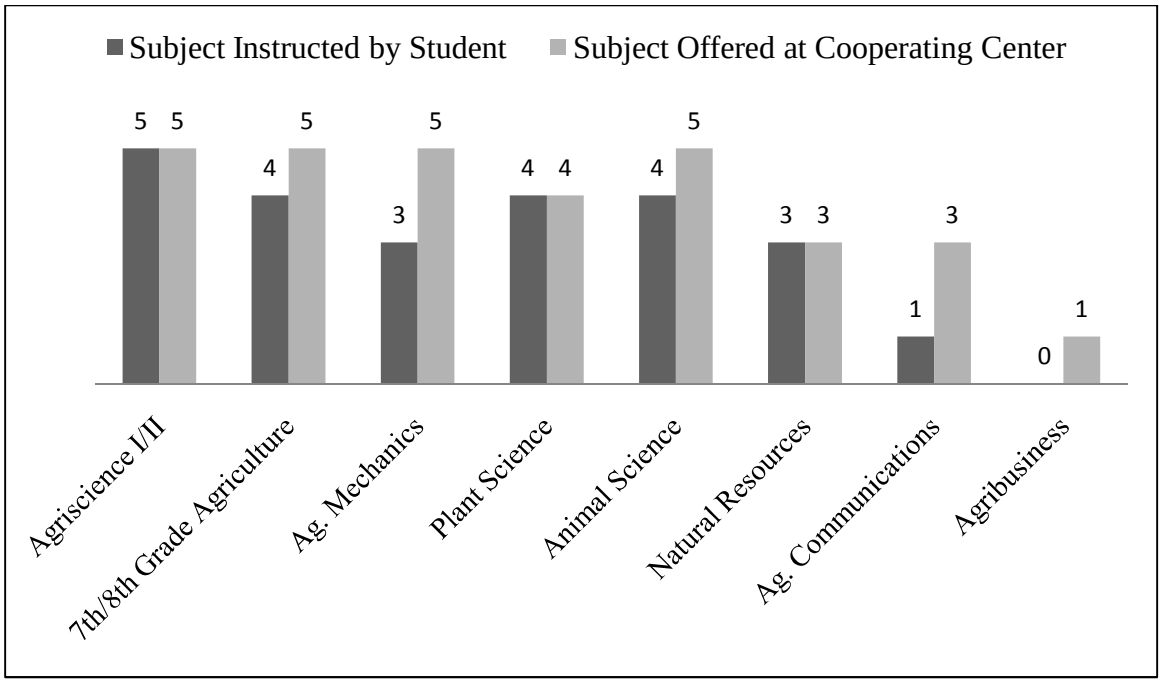



*Figure 6.* A comparison of the courses offered at the cooperating center and those taught by the student teacher for Factor 2, *Self-Assured Teacher*

**Selected Characteristics of the *Determined Teacher* View**

Four student teachers held the viewpoint of *Determined Teacher* (Table 17). This viewpoint was perceived by males exclusively. All of those student teachers taught in a rural school setting. *Determined Teachers* ranged in age from 21 to 23 years, with an average age of 22 years. Regarding content taught, two *Determined Teachers* viewed themselves as unprepared to teach the content comprising in the courses they instructed. However, all *Determined Teachers* perceived to be prepared to use a variety of teaching methods.

Table 17

*Selected Characteristics of the Determined Teacher View* (*N* = 4)

| Q-Sort | Sex | Age | Prepared in Content | Prepared in Teaching Method | School Setting |
|---|---|---|---|---|---|
| 1 | M | 21 | Y | Y | Rural |
| 2 | M | 21 | Y | Y | Rural |
| 20 | M | 23 | N | Y | Rural |
| 24 | M | 23 | N | Y | Rural |

*Note.* M = Male, F = Female; Y = Yes, N = No

Although no females held the *Determined Teacher* view, when confounding sorts were examined, females did load on the *Determined Teacher* factor in addition to another view. Because those sorts were confounding, they were not used to define the *Determined Teacher* view; however, these individuals did share a commonality with those student teachers who were used to define this factor. Therefore, an individual's sex was not determined to be a predictive variable for the *Determined Teacher* view.

Two student teachers had the opportunity to instruct in each course offered at their cooperating center (Figure 7). Though Agricultural Mechanics was offered one student teacher did not have the opportunity to instruct in that subject. All of the student teachers reported instructing 7th and 8th Agriculture. Three student teachers reported instructing Agriscience I/II, Animal Science, and Agricultural Mechanics. Only one student teacher reported instructing Plant Science, Natural Resources, and Agricultural Communications. None of the student teachers reported instructing Agribusiness. The

*Determined Teacher* view was represented by males only; as such, these courses were not inspected for equal representation of the sexes.

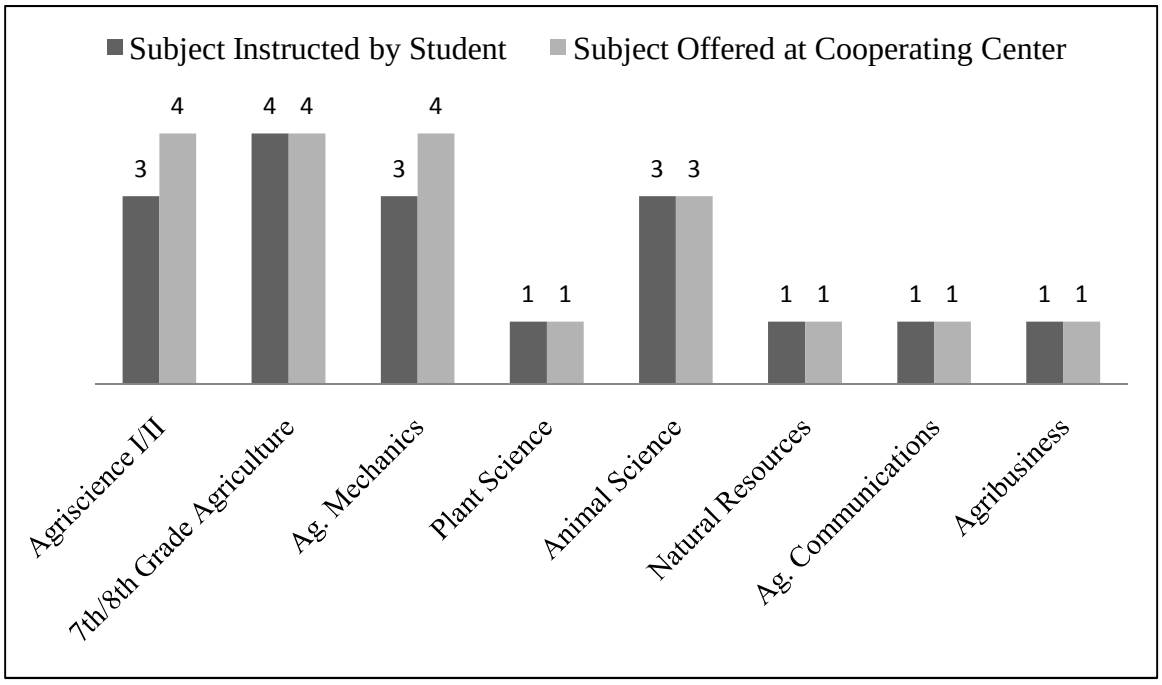



*Figure 7.* A comparison of the courses offered at the cooperating center and those taught by the student teacher for Factor 3, *Determined Teacher.*

## Summary

### Research Question 1

The three factors produced from the Q-method factor analysis represented the three distinct views found in the sample population of agricultural education student teachers regarding their perceptions of teaching ability during the clinical student teaching experience. The three views were interpreted as the *Emerging Teacher*, the *Self-Assured Teacher*, and the *Determined Teacher.*

The *Emerging Teacher* view was interpreted as such because these student teachers recognized areas in which they still needed growth and development but also recognized their development toward becoming a professional. Teaching was not easy for them, especially when instructing the various curriculum areas found in agricultural education courses; yet, they did express confidence in planning lessons for all subject areas. They had a unique social dimension which gave them comfort in motivating students, communicating with colleagues and parents, and dealing with teaching responsibilities such as classroom discipline and management.

Student teachers who held the *Self-Assured Teacher* view demonstrated a high level of comfort and confidence in their teaching ability. This confidence extended to their views on developing lessons and teaching across the curriculum in agricultural education. Despite not having observed "model" teaching, these student teachers perceived they could create lesson plans and manage a classroom effectively. The *Self-Assured Teacher* view embodied the perception that teaching was easy. As such, teaching evoked pleasure and satisfaction in these student teachers.

The *Determined Teacher* view represented those student teachers who recognized confidence in their teaching ability but not comfort. Teaching did not always come easy for them, but they recognized they were getting better. As a growing professional, when these student teachers taught, they were not relaxed, lessons did not flow, and they had difficulty locating curricular materials. These student teachers did express confidence in constructing lesson plans and providing instruction across the curriculum in agricultural education. Despite not having several specific aspects of teaching modeled for them, they did observe teaching, overall, which they preferred to model. The *Determined*

*Teacher* is an individual who is persistent in working through various teaching discomforts to provide good teaching (Phipps et al., 2008).

**Research Question 2**

Time allocation data was reviewed for 28 student teachers who interned in either the spring or fall semester of 2009. Data were recorded from a total of 336 weekly reports. Time was recorded for different teaching activities based on a comprehensive agricultural education program (i.e., classroom and laboratory, FFA, and SAE) (Phipps et al., 2008).

The first area examined was the amount of time student teachers devoted to instruction versus observation. It was discovered that student teachers taught almost ten and one-half per week and observed in excess of five hours per week, on average. The student teachers spent nearly eight hours per week instructing in a classroom setting and almost three hours per week instructing in a laboratory setting. When assessing the time spent in school during the usual school day, the student teachers spent in excess of 18 hours per week. Almost five hours per week were spent "out of school" during school day hours.

Time allocation data were also examined for the amount of time student teachers devoted to instruction in specific curriculum areas of agricultural education. The course taught most frequently was Agriscience I and II, followed by Plant Science, and 7th and 8th grade Agriculture. The courses taught least frequently were Agribusiness and Marketing, Leadership, and Food Science.

**Research Question 3**

Time allocation data were connected to the participants' Q-sort data by view (i.e., the *Emerging Teacher,* the *Self-Assured Teacher,* and the *Determined Teacher* view). The first area examined was the amount of time student teachers devoted to instruction versus observation. The *Emerging Teacher* and the *Determined Teacher* views both spent nearly 10 hours teaching per week, and the *Self-Assured Teacher* view spent in excess of 11 hours teaching per week. Regarding the hours per week each view spent observing, the *Emerging Teacher* view spent just over five hours, the *Self-Assured Teacher* view spend slightly more than four and one-half hours, and the *Determined Teacher* view spent almost six hour per week observing another teacher.

When considering how much time each view spent teaching in a classroom setting, the *Emerging Teacher* and the *Determined Teacher* views both spent seven and one-half hours, and the *Self-Assured Teacher* view spent in excess of eight hours teaching in a classroom setting. As for the time each view spent teaching in a laboratory setting, the *Emerging Teacher* and the *Determined Teacher* view each spent less than two and one-half hours per week, and the *Self-Assured Teacher* view spent slightly more than three hours per week teaching in a laboratory setting.

The next area explored time spent in school versus out of school during usual school hours. The *Emerging Teacher* view spent the most amount of time in school, at almost 19 hours per week. The *Self-Assured Teacher* view spent approximately 18 hours per week in school, and the *Determined Teacher* view spent almost 17 hours per week in school. In contrast, the *Emerging Teacher* view spent five hours per week out of school, the *Self-Assured Teacher* view spent slightly more than three and one-half hours out of

school, and the *Determined Teacher* view spent slightly more than four and one-half hours out of school per week.

**Research Question 4**

Twenty-eight student teachers, consisting of 16 males and 12 females, participated in this study and completed a Q-sort. The student teachers ranged in ages from 21 to 33, with a mean age of 22.5 years. The setting of the cooperating centers was reported by the student teachers were either rural or suburban. All of the student teachers reported enrollment in agricultural courses as a high school student. Of the 28 who completed a Q-sort, 21student teachers loaded on one of three factors. The seven remaining students loaded on multiple factors or no factor at all. As such, these data were confounding or non-significant, and were not considered for the study.

Neither age, sex, previous experience in agriculture courses at the high school level, size of the cooperating center, nor specific courses instructed while at their cooperating centers distinguished any of the participants' views. The *Determined Teacher* view was represented by male student teachers only; however, on closer inspection, an individual's sex was not found to be a predictive variable for that factor. No single personal or professional characteristic represented any view entirely.

# CHAPTER V

## CONCLUSION, DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

The purpose of this chapter is to present a summary of this study, including all of its major components. A detailed summary of these items and appropriate conclusions and recommendation for practice and future research are presented based on the data gathered, analyzed, and interpreted within the scope of this study.

### Purpose of the Study

The purpose of this study was to describe the views student teachers in agricultural education at Oklahoma State University had regarding their 12-week student teaching experience. To accomplish this purpose, this study explored the perceptions of agricultural education student teachers in the spring and fall semester of 2009, regarding aspects of self-efficacy. Further, this study sought to describe the amount of time student teachers spent performing various activities (i.e., teaching in classroom and laboratory settings, observation, instruction of specific curriculum, and time in alternate settings) while at their cooperating centers.

### Research Questions

1. What views did agricultural education student teachers have about their teaching ability?

2. How did student teachers spend their time in various activities (i.e., teaching in classroom and laboratory settings, observation, instruction of specific curriculum, time in alternate settings, and SAE supervision) during the 12-week student teaching experience?

3. How did the amount of time student teachers spent in each activity help describe their views on teaching ability (i.e., Q-sort factor load)?

4. What were the selected personal and professional characteristics (i.e., age, sex, setting of the cooperating center, and types of agricultural courses taught) of student teachers at Oklahoma State University who interned during the spring and fall semesters of 2009?

## Summary of the Study

Q-methodology was employed in this study to capture the subjective views student teachers had about their teaching ability. As a method, Q is an adaptation of factor analysis, which was designed specifically to study human subjectivity.

The instrument used in this Q-study consisted of a 36-statement Q-set from which the majority of the statements were adopted from The Teaching Ability Questionnaire developed by Spooner et al. (2008). Specifically, these statements included aspects of student motivation, classroom management, curriculum development, and the overall ability to teach. Participants were asked to rank-order the statements within the distribution of "most like me" (+4) to "most unlike me" (-4), given the prompt (condition of instruction), "How do you feel about the courses you instruct?" The participants (P-set) for this study consisted of student teachers ($N$ = 28) in agricultural education at

Oklahoma State University during the spring and fall semester of 2009. Data (Q-sort) were collected from the P-set during weeks nine through 12 of the 12-week student teaching internship. Personal and professional characteristics data were collected at the same time the Q-sort was performed.

Q-sorts were collected from 28 participants and entered into the software program PQMethod (2.11) for analysis. A principal component analysis (PCA) was performed on the correlation coefficients produced between each Q-sort. The PCA produced eight factors with corresponding eigenvalues. Eigenvalues were plotted onto a graph for visual inspection via a scree test (Figure 4). Three factors were chosen for retention and additional rotation. The eigenvalues for the three retained factors accounted for 51 percent of the variance. A varimax rotation was chosen as the rotation method to produce the final factor solution.

Additional data describing the participants' weekly student teaching activities were also gathered. From an archive, 336 weekly reports, which described various teaching activities, were reviewed and analyzed by the researcher. Data from each report were entered into a Microsoft Office Excel spreadsheet to describe the amount of time student teachers spent teaching in classroom and laboratory settings, instructing specific curriculum, observing, and advising students outside of the classroom. These data were analyzed with descriptive statistics including frequencies, means, and standard deviations.

Time allocation data were compared to each factor after the final factor solution was accepted and defining sorts were identified. Specifically, all time allocation data

corresponding to the participants who significantly loaded on the *Emerging Teacher* view were analyzed for central tendencies by calculating means and standard deviations.

## Summary of the Study's Findings

### Research Question 1: Factor Interpretation

The three factors produced from the Q-method factor analysis represented the three distinct views found in the sample population of agricultural education student teachers regarding their perceptions of teaching ability during the clinical student teaching experience. The three views were interpreted as the *Emerging Teacher,* the *Self-Assured Teacher,* and the *Determined Teacher*.

The *Emerging Teacher* view was interpreted as those student teachers who recognized areas in which they still needed growth and development but also recognized their development toward becoming a professional. Teaching was not easy for them, especially in instructing the diverse curriculum areas found in agricultural education courses; yet, they felt confident in planning lessons for all agricultural subject areas. They had a unique social dimension which made them more comfortable when motivating students, communicating with colleagues and parents, and dealing with teaching responsibilities such as classroom discipline and management.

Student teachers holding the *Self-Assured Teacher* view were comfortable and confident in their teaching ability. This confidence extended to their views on developing lessons and teaching across the agricultural education curriculum. Despite not having observed model teaching, these student teachers perceived they could create lesson plans and manage a classroom effectively. The *Self-Assured Teacher* view also expressed that teaching was easy, and, as such, they were satisfied with their abilities.

The *Determined Teacher* view consisted of those student teachers who exhibited confidence but were not yet comfortable in their teaching ability. Teaching did not always come easy for them, but they recognized that they were getting better. These student teachers were not relaxed when they taught, their lessons did not flow, and they had difficulty locating appropriate curricular materials. However, these student teachers were confident in their ability to construct lesson plans and provide instruction across the agricultural education curriculum. These student teachers had observed teaching that they would prefer to model. The *Determined Teacher* view consisted of those who were persistent in their efforts in becoming a "quality" teacher.

**Research Question 2: Time Allocation during Student Teaching**

Time allocation data were reviewed for 28 student teachers who interned in either the spring or fall semester of 2009. Data were gathered from a total of 336 weekly reports. Time allocation was calculated and analyzed for different teaching activities (i.e., teaching in classroom and laboratory settings, observation, instruction of specific curriculum, time in alternate settings, and SAE supervision).

It was discovered that student teachers taught 10.48 hours (*SD* = 7.93) per week and observed 5.17 hours (*SD* = 5.94) per week, on average (Table 8). They spent 7.89 hours (*SD* = 6.23) per week instructing in a classroom setting and 2.63 hours (*SD* = 3.80) instructing in a laboratory setting, on average. When assessing the time spent in school during the usual school day, the student teachers spent 18.63 hours (*SD* = 9.21) on average per week in school and 4.49 hours (*SD* = 6.82) on average per week out of school during school day time.

Time allocation data were also examined for the amount of time student teachers devoted to instruction in specific curriculum areas of agricultural education. The course instructed most frequently was Agriscience I and II, followed by Plant Science, and 7th and 8th grade Agriculture (Table 9). Courses that were taught the least amount of the time included Agribusiness and Marketing, Leadership, and Food Science.

**Research Question 3: Time Allocation by Factor**

Time allocation data were connected to the Q-sort data by view (i.e., *Emerging Teacher*, *Self-Assured Teacher*, and *Determined Teacher*). The first area examined was the amount of time student teachers devoted to instruction versus observation. The following hours per week were taught by each view: *Emerging Teacher* ($M$ = 9.88, $SD$ = 7.40), *Self-Assured Teacher* ($M$ = 11.27, $SD$ = 8.77), *and Determined Teacher* ($M$ = 9.90, $SD$ = 7.64) (Table 10). The following hours per week were observed by each view: *Emerging Teacher* ($M$ = 5.24, $SD$ = 5.63), *Self-Assured Teacher* ($M$ = 4.57, $SD$ = 6.12), and *Determined Teacher* ($M$ = 5.90, $SD$ = 6.20).

The second area examined instruction in specific curriculum areas of agricultural education. Across all views, the most amount of time was spent instructing Agriscience I and II (Table 11). All three views taught Agriscience I and II roughly three hours per week.

The third area explored the amount of time student teachers spent teaching in a classroom setting versus teaching in a laboratory setting. The following hours per week were taught within a classroom by each view: *Emerging Teacher* ($M$ = 7.54, $SD$ = 6.19), *Self-Assured Teacher* ($M$ = 8.20, $SD$ = 6.29), and *Determined Teacher* ($M$ = 7.50, $SD$ = 5.55) (Table 12). The following hours per week were taught within a laboratory by each

view: *Emerging Teacher* (*M* = 2.35, *SD* = 3.55), *Self-Assured Teacher* (*M* = 3.07, *SD* = 4.64), and *Determined Teacher* (*M* = 2.42, *SD* = 3.27).

The fourth area explored time spent in school versus out of school during usual school hours. The following hours per week were spent in school by each view: *Emerging Teacher* (*M* = 18.82, *SD* = 9.20), *Self-Assured Teacher* (*M* = 17.87, *SD* = 9.53), and *Determined Teacher* (*M* = 16.73, *SD* = 8.31) (Table 13). The following hours per week were spent out of school by each view: *Emerging Teacher* (*M* = 5.00, *SD* = 7.21), *Self-Assured Teacher* (*M* = 3.65, *SD* = 6.20), and *Determined Teacher* (*M* = 4.41, *SD* = 6.28).

**Research Question 4: Personal and Professional Characteristics of Participants**

Twenty-eight participants consisting of 16 males and 12 females completed a Q-sort (Table 14). The students ranged in ages from 21 to 33, with a mean age of 22.5 years. Twenty-one student teachers identified their cooperating center as rural, and seven identified their cooperating center as suburban. All of the student teachers reported enrollment in agricultural courses as a high school student. Of the 28 who completed a Q-sort, 21 student teachers loaded on one of three factors.

Neither age, an individual's sex, previous experience in agriculture courses at the high school level, size of the cooperating center, or specific courses instructed while at the cooperating center distinguished any of the views. The *Determined Teacher* view was represented by male student teachers only; however, on closer inspection, this was not found to be a predictive variable for that factor. No single personal or professional characteristic represented any view entirely.

## Conclusion/Discussion

Although past studies of teacher efficacy have focused on levels or individual differences (e.g., Armor et al., 1976; Bandura, 1997; Gibson & Dembo, 1984; Guskey & Passaro, 1994; Riggs & Enochs, 1990; Rose & Medway, 1981; Tschannen-Moran et al., 1998), this study sought to describe the types of teacher efficacy through the viewpoint of the student teacher. These "teacher types" provide different information about teacher efficacy than do measurement studies, which indicate "high or low" or "good or bad" teacher efficacy typically. The description of views recognized that each student teacher had different points of reference in framing their perceptions of teaching ability, but that such perceptions may be described in different ways. This study revealed new information related to teacher self-efficacy for other researchers and practitioners to consider.

The first research question of this study was, "What views did agricultural education student teachers have about their teaching ability?" In pursuit of an answer to this question per Q-methodology, three views were found to exist: *Emerging Teacher*, *Self-Assured Teacher*, and *Determined Teacher.*

This study found three different viewpoints of self-efficacy through the student teachers' perceptions of their teaching ability. These views were based on the perceptions of their feelings related to particular teaching tasks. As such, these student teachers expressed that they had mastered the tasks represented in their respective views. Bandura (1986, 1998) theorized that beliefs of efficacy originate from four main sources, of which mastery experiences are the most powerful. Specifically, the statements in the

array position of +4 could be viewed as those aspects of teaching which had been mastered by the participants.

Across all three views, only the *Determined Teacher* viewpoint observed quality teaching being modeled. This is unfortunate because observation of effective models improves a person's efficacy at performing similar tasks (Bandura, 1997), especially in regard to teaching (Tschannen-Moran et al., 1998).

When considering social persuasion, it is easier to gain and maintain a sense of efficacy when significant others profess faith in a person's abilities (Bandura, 1997). For a student teacher, this "significant other" may be a cooperating teacher, university supervisor, or the pupils being instructed. However, across all three views, the student teachers indicated neutrality on the statements, "My cooperating teacher thinks I teach well," and "My university supervisor thinks I teach well."

The *Determined Teacher* view admitted discomfort in teaching. In fact, they rejected the statements that teaching was easy and relaxing for them. Tschannen-Moran et al. (1998) explained that moderate levels of emotional arousal may improve performance by focusing attention and energy on the task at hand. Student teachers with this view may have experienced the correct amount of a heightened emotional state to help them strive for success in the teaching tasks they attempted.

The second research question in this study was, "How did student teachers spend their time in various activities (i.e., teaching in classroom and laboratory settings, observation, instruction of specific curriculum, time in alternate settings, and SAE supervision) during the 12-week student teaching experience?" Time allocation data were retrieved from 336 weekly reports for 28 student teachers who interned in either the

spring or fall semester of 2009. It was concluded that the student teachers taught over 10 hours per week, which was nearly twice as much as they observed. This finding is consistent with research by Robinson et al. (in press) who found that agricultural education student teachers in Oklahoma spent between 9 to 10 hours per week teaching and 6 to 8 hours observing. Further, this study found that student teachers instructed in a classroom setting nearly eight hours per week but notably less time in a laboratory setting. This finding is also consistent with the study performed by Robinson et al. (in press). When assessing the time spent in school during the usual school day, the student teachers spent over 18 hours per week in school and approximately four and one-half hours out of school. The course taught most frequently was Agriscience I and II, followed by Plant Science, and 7th and 8th grade Agriculture. Agribusiness and Marketing, Leadership, and Food Science were courses taught the least.

The third research question in this study was, "How did the amount of time student teachers spent in each activity help describe their views on teaching ability (i.e., Q-sort factor load)?" Time allocation data were connected to the Q-sort data by factor (i.e., *Emerging Teacher*, *Self-Assured Teacher*, and *Determined Teacher* viewpoints). It was concluded that the student teachers of the *Self-Assured Teacher* view taught more per week but observed less per week when compared to the *Emerging Teacher* and *Determined Teacher* views. The *Self-Assured Teacher* view taught more than 11 hours per week; this was more than one hour more per week when compared to the other views. The *Determined Teacher* view spent the most amount of time per week in observation.

Even though the largest amount of time for all views was spent teaching Agriscience I and II other courses were taught to varying degrees within each view.

Notably, the *Self-Assured Teacher* view taught Agricultural Mechanics and Plant Science/Natural Resources more than the other groups but did not instruct Agribusiness and Marketing at all. The *Determined Teacher* view taught Animal/Equine Science for approximately 45 minutes more per week than other groups. The Leadership course was taught by the *Emerging Teacher* view only, and none of the views taught Food Science.

The *Self-Assured Teacher* view spent in excess of one-half hour more teaching in a classroom setting per week than the *Emerging Teacher* and *Determined Teacher* views. Similar to the classroom teaching results, the *Self-Assured Teacher* view spent slightly more time teaching in a laboratory setting per week as well. In addition, the *Emerging Teacher* view spent nearly 19 hours per week in school. This was nearly one hour more per week than the *Self-Assured Teacher* view and more than two hours more per week than the *Determined Teacher* view. When assessing the time spent out of school during the usual school day, the student teachers of the *Emerging Teacher* view were out of school the most.

The fourth research question in this study was, "What were the selected personal and professional characteristics (i.e., age, sex, setting of the cooperating center, and types of agricultural courses taught) of student teachers at Oklahoma State University who interned during the spring and fall semesters of 2009?"

The *Determined Teacher* view was represented by male student teachers only; however, on closer inspection, this was not found to be a predictor of that factor. No student teacher reported completing his/her student internship at a cooperating center located in an urban area. It is concluded that no single personal or professional characteristic examined in this study represented or distinguished any view. This finding

supports Bandura's (1986, 1997) notion that efficacy is formed from four main sources: mastery experiences, vicarious experiences, social persuasion, and physiological and emotional state and not any one personal characteristic or trait a person may or may not have.

## Implications

A deficiency in studying the efficacy of student teachers in agricultural education exists (Whittington et al., 2006). Could a clear theoretical framework for evaluating the teacher efficacy of agricultural education student teachers be developed to address these deficiencies better? Perhaps, the information from this study could be used as a starting point for addressing this deficiency.

Student teaching is a valuable aspect of any teacher education program (Schumann, 1969). Teaching efficacy can affect a student teacher's performance while interning (Tschannen-Moran et al., 1998). Therefore, implications exist for the placement of student teachers as well as the amounts and types of feedback provided to them. Why were some students more assured of their ability than others? Could a different set of experiences at the pre-service level help student teachers perceive themselves as being more efficacious regarding their teaching performance? Other than the 36 statements used to capture these participants' views, what other factors contributed to their perceptions?

Perhaps, the time student teachers spend in various activities should be adjusted and monitored according to each individual. For example, if a student teacher perceives himself/herself to be inadequate when teaching a particular area of the curriculum, maybe that individual should focus on teaching that subject predominately. Then, after the

student teacher increases his/her level of self-efficacy for teaching that subject matter, he or she could be allowed to teach a different subject area.

According to Bandura (1986, 1997), mastery experiences are by far the most influential sources of positive self-efficacy beliefs. However, teaching takes time and practice for skills to be mastered. "Only in a situation of actual teaching can an individual assess the capabilities she or he brings to the task" (Tschannen-Moran et al., 1998, p. 229). The *Self-Assured Teacher* view concerned itself with confidence as it pertained to teaching ability; consequently, members of the *Self-Assured Teacher* view spent the most time per week teaching and the least amount of time per week observing.

Perhaps, the reason the *Self-Assured Teachers* were so confident in their ability was due to the amount of hours they spent teaching. If so, this would support Bandura's (1997) self-efficacy theory that, over time, tasks can be accomplished with more efficacy and confidence. However, where did the confidence for the *Determined Teacher* view originate? Although mastery experiences are the most influential, observation of teaching has its benefits as well, through the form of vicarious experiences. Mulholland and Wallace (2001) argued that vicarious experiences are most influential during the student teaching experience. Student teachers who expressed the *Determined Teacher* view reported observing the most of the three views. In addition, the *Determined Teacher* view was the only one view that observed teaching in which they intended to model in the future. Could the amount of observation, i.e., vicarious experiences through modeling, have influenced the confidence which the members of the *Determined Teacher* view expressed? If so, this would support research by Tschannen-Moran et al's. (1998) who explained that, "observing a teacher can provide information about the nature of a

teaching task, but it also contributes to self-perceptions of teaching competence, as the viewer compares self with model" (p. 229).

Conversely, the question must be posed, "Why did the lack in hours of observation not affect the confidence of the *Self-Assured Teacher*?" This could be a matter of quantity *and* quality. Although the *Determined Teacher* observed others teaching the most comparatively, it was also that teaching they wished to model. The *Self-Assured Teacher*, however, observed the least amount in terms of time. These student teachers also rejected statements about observing teaching that they would like to model and statements about observing teachers who performed a variety of teaching tasks. So, maybe the teaching observations of the *Self-Assured Teacher* view were not quality observations. Bandura (1997) stated, "Competent models command more attention and exert greater instructional influence than do incompetent ones" (p. 101). As such, this finding has implications for pre-service field observational experiences. Perhaps, pre-service teachers in agricultural education should be provided a more robust set of experiences related to observing effective teaching prior to student teaching.

There are implications that the three views which emerged in this study could also be linked to the cognitive learning style of the student teacher. According to Witkin, Moore, Goodenough, and Cox (1977), students with a field-dependent learning style are those who are global consumers of information, have difficulty breaking down tasks into parts, have highly developed social skills, are socially influenced, and extrinsically motivated. This could be linked back to the *Emerging Teacher* view which held a distinct social dimension that did not appear in the views. Wilkin et al. (1977) explained that students with a field-independent learning style are those who are more analytical,

goal-oriented, self-directed, intrinsically motivated, and can view tasks as discrete parts. The *Self-Assured Teacher* view had a high level of confidence and was comfortable with their teaching ability. As such, could their confidence be linked to the field-independent learning style? The *Self-Assured Teacher* view included those students who spent the most time teaching per week. In terms of time distribution, Torres and Ulmer (2007) found that student teachers who were field-independent spent consistently more time teaching than those who were field-dependent. The *Determined Teacher* view may be a combination of field-dependent and field independent. Like those who are oriented toward field-independence, the student teachers of the *Determined Teacher* view appeared to be motivated intrinsically because they were determined to work through the discomforts of teaching. However, their discomforts in their teaching ability may be derived from an inability to breakdown teaching tasks into smaller chunks, like those who are orientated toward field dependence.

Beliefs of efficacy can be context specific because, "teachers feel efficacious for teaching particular subjects" (Tschannen-Moran et al., 1998, p. 227). Results per research question two indicated that all three of the student teacher views had the opportunity to teach across the curriculum during their internships, e.g., animal science, horticulture, agri-business, and agricultural mechanics, regardless of their factor view. Members in each of the views expressed that they could construct lesson plans even for the subjects for which they were not comfortable; however, the *Emerging Teacher* view did not feel they could teach all agricultural education courses. Pajares (1992) explained that the greater effects of self-efficacy for the prospective teacher originates from the ability to organize instruction and not necessarily the knowledge of the subject.

It is noted that members of the *Emerging Teacher* view spent the most time in school and out of school during the usual school day. A limitation of this study was that each class period was recorded as one hour regardless of its actual length. As such, the amount of time spent in school or out of school was recorded per class period. It is possible that the student teachers across this study, who experienced more class periods per day, also loaded on the same factor.

It could be implied that student teachers need to be placed in a variety of centers. For example, no student teachers were placed in urban settings. A major reason for this is due to the fact that the majority of secondary agricultural education programs in Oklahoma are located in rural settings. However, if teacher educators at Oklahoma State University believe that a diverse set of experiences is important, then perhaps they should be more creative in how they allow student teachers to acquire their experiences. For example, it might be possible to allow pre-service students to observe teachers in urban settings outside of agricultural education but with relevance to their professional preparation (i.e., science).

## Recommendations for Future Research

It is suggested that this study be replicated with a different population of student teachers to determine if the same teaching ability views emerge. Also, future research should be expanded to gather data over time. Specifically, a longitudinal study during the entire student teaching internship could offer information on how student teachers differ at various stages of their internship experience. It would be helpful to collect data on the same group of student teachers prior to, during and after they have finished their student teaching experience at the cooperating center. Collecting data at these intervals would

allow a researcher to determine the impact of the student teaching experience on teachers' views of efficacy, as well as offer multiple views on assisting student teachers to improve on their deficiencies during their student teaching internship. Further, following a specific population of student teachers over time might lead to insights on how their self-efficacy regarding teaching ability may change as they transition into the first year of teaching and beyond. Hoy and Woolfolk (1990) suggested that there is a decline in self-efficacy during student teaching, but an increase in self-efficacy for novice teachers. However, Knobloch and Whittington (2003) found the opposite outcome to be true. They determined that student teachers had an inflated sense of self-efficacy when compared to early career teachers.

This study examined the perceptions of student teachers on their abilities and competencies as teachers holistically. The condition of instruction could be rewritten as, "How do you feel about *each* course you instruct?", thereby, asking the student teacher to perform multiple Q-sorts as he/she reflects upon each course individually. This study should also be replicated to include the views of interns' cooperating teachers as a form of triangulation. Also, follow-up interviews have shown to be helpful in the interpretation of the statements for each factor when using Q-methodology. Therefore, an increase in the number and depth of follow-up interviews should be conducted.

Roberts and Dyer (2004) noted that being a secondary agricultural education teacher includes more than classroom teaching. As such, Q-statements should be refined to capture other teaching activities unique to agricultural education. In particular, Q-statements should be developed to include the remaining aspects of the comprehensive agricultural education program, i.e., SAE and FFA. Information from such a study could

provide insight into student teachers' views on those activities with regard to mastery experiences (Bandura, 1986, 1997).

Agricultural education teachers spend a considerable amount of time out of school during and after the school day performing job-related activities. The student teachers in this study spent four and one-half hours out of school. As such, it is imperative to collect data regarding the non-formal educational experiences student teachers have with their students. Agricultural educators should be held accountable for the time they spend out of the classroom as well as be given "credit" for the impact that time may have on student learning and achievement. Moreover, it could be argued that students learn better through experiences that occur outside the confinements of the classroom (Kolb, 1984). To that end, research should be conducted to track the time student teachers spend outside the classroom, and attempts should be made to measure the impact of that time on their students' learning. Future studies might not only address deficiencies in a student's understanding of a given subject, but also determine if this deficiency is related to the time allocated to that subject or area.

Further, understanding the time spent in SAE and FFA activities may vary from one cooperating center to another. Often, cooperating centers reflect the community needs, budget constraints, and preferences of the cooperating teacher (A guide to local program success, 2002). Therefore, future studies should focus on obtaining a deeper understanding of these shifting priorities and their effect on the experiences and perceptions of student teachers in agricultural education.

The courses that student teachers instructed at the cooperating center did not impact their views on their teaching ability. However, through the collection of

qualitative data, some student teachers reported teaching courses which could be considered "catch all" (i.e., Agriscience I and II), or they taught multiple sections of the same course. It is recommended that future data collection should not only capture the courses being instructed, but also specific lessons being taught within those courses. Then, teacher educators and hiring officials would have a better understanding of the experiences the student teachers had regarding the teaching of specific content areas. In addition, personal and professional characteristics analyzed in this study were not useful in defining any of the factors. So, the questionnaire used for that purpose should be expanded to capture additional information about personal and professional characteristics such as a student teacher's race and ethnicity as well as his/her former experiences with FFA and SAE.

**Recommendations for Practice.**

The 36 statements used in this study should be evaluated and revised where necessary. For example, statements might be reworded to clarify certain aspects of the inquiry, with an aim toward obtaining more specific data. For instance, one general statement measuring confidence in the person's ability to teach "one or two" subjects might be altered to determine exactly which agricultural education subjects the student teacher held a greater or lesser sense of teacher efficacy.

Part of the weekly duties of the student teacher was to submit a form which indentified various activities to which he/she devoted time each week. A large amount of data could be "mined" from this form. As such, a certain degree of difficulty was encountered when transferring the data to software for analysis. Attention should be provided to the development of a form which can aggregate report results more

efficiently. In addition, some attention should be provided to the detail of the information sought from the report. Specifically, detail is needed in length of class period and out of school activities. Class period length for this study was assumed to be one hour, though realistically a class period could have varied in length depending on the school. Also, when student teachers reported being out of school during school hours, it was not always possible for the researcher to identify where they were and in what activities the student teachers may have been engaged. For example, a student teacher might have been "out of school" attending a mandatory school function during part of the school day. With the current report, this would be considered "out of school" time.

Student teachers can sense whether enough time was allocated to some aspects of their teacher preparation. In essence, did the student teachers perceive to feel they were prepared well because of the time allocated to a certain aspect of their educational preparation, or did student teachers feel that more time needed to be devoted to certain areas? Recommendations for time allocation could be made in various areas of professional development based on students' perceptions of the time allocation factor, either adequate or inadequate.

This study also found that student teachers did not always have the opportunity to instruct all the courses which were available at the cooperating center. As these student teachers graduate, it is a safe assumption many will seek jobs within the agriculture teaching profession. Not having the opportunity to teach a full day's worth of instruction over multiple days if not weeks could be a disadvantage for the student teacher, as that would not prepare them adequately for real-life teaching. So, university supervisors should seek those cooperating centers that offer student teachers the potential for all-day

instruction in all subjects taught, and strive to make all cooperators aware of the importance of this experience to their student interns.

## Contributions to Practice

This study helped to inform practice by providing information to university supervisors about the activities occurring at the cooperating centers. It was found that student teachers did not always have the opportunity to instruct all the courses which were available at the cooperating center. Dialogue should occur between the university supervisors and the cooperating teachers in order to provide a more robust set of student teaching experiences such as teaching all courses offered. Teaching a full day's curriculum would prepare a student teacher better for real-life teaching. It would be considered a disadvantage for a student teacher to not be prepared as he/she entered the workforce.

It was recommended that the Q-statements should be revised where necessary. As a future researcher considers duplicating this study using the current statements, he/she should revise statement number 33 to read, "I feel comfortable in teaching only some of the agricultural education courses available." In addition, statement number 32 and 34 were written poorly grammatically and should be changed accordingly. Also, improvements have been made to the weekly reporting form used to gather data from the student teacher while interning.

## Contributions to Literature

Researchers (Tshannen-Moran et al., 1998; Henson, 2002) have urged for the expansion of self-efficacy literature through the employment of non-quantitative research methods. This study added to the literature base by providing self-efficacy information

gathered through Q-methodology. Although some studies have focused on self-efficacy or time allocation in agricultural education, this study sought to examine self-efficacy through the time spent in various teaching activities.

These views of teaching ability regarding time allocation provides different information about teacher efficacy than do measurement studies, which indicate "high or low" or "good or bad" teacher efficacy typically. The description of views recognized that each student teacher had different points of reference in framing their perceptions of teaching ability, but that such perceptions may be described in different ways. This study is the beginning of the establishment of a theoretical framework for evaluating teacher efficacy of agricultural education student teachers.

Few studies have been conducted on the time distribution of student, novice, or experienced teachers in agricultural education. This finding can add to the limited studies that have been conducted with teaching agricultural education. Specifically, this study found similar time distributions of student teachers as Robinson et al. (in press).

## Contributions to Research

This study helped to further research by identifying the next steps in this line of inquiry. Q-methodology has shown to be useful in describing the views which may exist among a population of people. Future studies should continue with the Q-statements used in this study; however, the statements should be sorted by the student teacher and the cooperating teacher as a form of triangulation.

In addition, this study contributed to research by studying teaching ability student teachers' of agricultural education where gaps were indentified, i.e., subjectivity in

teacher self-efficacy. This study can now add to the conceptual framework which future researchers may use to organize their studies when pursuing a similar line of inquiry.

The student teachers of this study spent over four hours per week in out of school activities. Although it is unknown what they might have been experiencing, agricultural education often lends itself to experiential learning (Roberts, 2006). Research should be conducted to track the time student teachers spend outside of classroom time as well as a clear description of the activities to measure if this impacts experiential learning.

## REFERENCES

A guide to local program success. (2002). National Council for Agricultural Education and National FFA Organization. Indianapolis, IN. Retrieved from https://www.ffa.org/documents/lps_guide.pdf

Agricultural education degree sheet. (2008-2009). Oklahoma State University. College of Agricultural Sciences and Natural Resourses. Retrieved from http://aged.okstate.edu/Undergrad/files/08-09/AG_17_-_AGED.TCHG.PDF

Agricultural education programs. (n.d.). Careertech Agricultural Education. Retrieved from http://www.okcareertech.org/aged/Ag_Ed_Programs.htm

Armor, D., Conroy-Oseguera, P., Cox, M., King, N., McDonnell, L., Pascal, A. (1976). *Analysis of the school preferred reading programs in selected Los Angeles minority schools*. (R-2007-LAUSD). Santa Monica, CA: Rand Corp.

Ashton, P. T. (1985). Motivation and teacher's sense of efficacy. In C. Ames & R. Ames (Eds.), *Research on motivation in eduction: The classroom milieu* (Vol. 2, pp. 141-174). Orlando, FL: Academic Press.

Ashton, P. T., & Webb, R. B. (1986). *Making a difference: Teachers' sense of efficacy and student achievement*. NY: Longman.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215. doi: 10.1037/0033-295x.84.2.191

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28*(2), 117.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W. H. Freeman and Company.

Bandura, A. (2004). Swimming against the mainstream: The early years from chilly tributary to transformative mainstream. *Behaviour Research and Therapy, 42*(6), 613-630. doi: 10.1016/j.brat.2004.02.001

Bang, H., & Montgomery, D. (2010). Exploring Korean and American teachers' preferred emotional types. *Roeper Review, 32*(3), 176-188. doi: 10.1080/02783193.2010.485305

Berman, P., McLaughlin, M., Bass, G., Pauly, E., & Zellman, G. (1977). *Federal Programs Supporting Educational Change, Vol. VII: Factors Affecting Implementation and Continuation*. (Report No. R-1589/7-HEW). Santa Monica, CA: Rand Corp. Retrieved from http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/39/e1/87.pdf.

Blackburn, J. J., & Robinson, J. S. (2008). Assessing teacher self-efficacy and job satisfaction of early career agriculture teachers in Kentucky. *Journal of Agricultural Education, 49*(3), 1-11. doi: 10.5032/jae.2008.03001

Borko, H., & Mayfield, V. (1995). The roles of the cooperating teacher and university supervisor in learning to teach. *Teaching and Teacher Education, 11*(5), 501-518. doi: 10.1016/0742-051X(95)00008-8

Brown, S. R. (1980). *Political subjectivity: Applications of Q methodology in political science*. New Haven, CT: Yale University Press.

Brown, S. R. (1993). A primer on Q methodology. *Operant Subjectivity, 16*(3/4), 91-138.

Brown, S. R. (1996). Q methodology and qualitative research. *Qualitative Health Research, 6*(4), 561-567. doi: 10.1177/104973239600600408

Burris, S., McLaughlin, E. K., McCulloch, A., Brashears, T., & Fraze, S. (2010). A comparison of first and fifth year agriculture teachers on personal teaching efficacy, general teaching efficacy and content efficacy. *Journal of Agricultural Education, 51*(1), 22-31. doi: 10.5032/jae.2010.01022

Burris, S., Robinson, J. S., & Terry Jr., R. (2005). Preparation of pre-service teachers in agricultural mechanics. *Journal of Agricultural Education, 46*(3), 23-34.

Burt, C. (1972). The reciprocity prinicple. In S. R. Brown & D. J. Brenner (Eds.), *Science, psychology, and communication: Essays honoring William Stephenson* (pp. 39-56). New York: Teachers College Press.

Byler, B. L., & Byler, L. F. (1984). Analysis of student teacher morale before and after student teaching. *Journal of the American Association of Teacher Educators in Agriculture, 25*(3), 22-28. doi: 10.5032/jaatea.1984.03022

Careertech. (n.d.). Career majors in the official statewide framework for FY2011 Retrieved from https://www.okcareertech.org/ctis/instructional_framework/official_framework/reports/view_career_majors?fy=2011&career_cluster_id=1&submit_cluster=Go

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavior Research, 1*(2), 245-276. Retrieved from doi:10.1207/s15327906mbr0102_10

Chambers, S. M., & Hardy, J. C. (2005). Length of Time in Student Teaching: Effects on Classroom Control Orientation and Self-Efficacy Beliefs. *Educational Research Quarterly, 28*(3), 3-9.

Comrey, A. L., & Lee, H. B. (1992). *A first course in factor analysis* (2 ed.). Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Construct. (2010). *Encyclopædia Britannica online encyclopedia*. Retrieved from http://www.britannica.com/EBchecked/topic/134402/construct

Darling-Hammond, L., & Bransford, J. (Eds.). (2005). *Preparing teacher for a changing world: what teachers should learn and be able to do*. San Francisco, CA: Jossey-Bass.

Darling-Hammond, L., Chung, R., & Frelow, F. (2002). Variation in teacher preparation: how well do different pathways prepare teachers to teach? *Journal of Teacher Education, 53*(4), 286-302. doi: 10.1177/0022487102053004002

Delnero, J. A., & Montgomery, D. (2001). Perceptions of Work Among California Agriculture Teachers. *Journal of Agricultural Education, 42*(2), 56-67.

Delnero, J. A., & Weeks, W. G. (2000). How secondary agricultural education teachers describe their work. *Journal of Southern Agricultural Education Research, 50*(1), 7-14. Retrieved from http://pubs.aged.tamu.edu/jsaer/pdf/Vol50/50-00-007.pdf

Edgar, D. W., Roberts, T. G., & Murphy, T. H. (2009). Structured communication: Effects on teaching efficacy of student teachers. *Journal of Agricultural Education, 50*(1), 33-43. doi: 10.5032/jae.2009.01033

Edwards, M. C., & Briers, G. E. (2001). Cooperating teachers' perceptions of important elements of the student teaching experience: A focus group approach with quantitative follow-up. *Journal of Agricultural Education, 42*(3), 31. doi: 10.5032/jae.2001.03030

Force, C. F. s. T. (1986). A nation prepared: Teachers for the 21st century. *The Chronicle of Higher Education, 32*(12), 43-54.

Ford, J. K., MacCallum, R. C., & Tait, M. (1986). The application of exploratory factor analysis in applied psychology: A critical review and analysis. *Personnel Psychology, 39*(2), 291-314. doi: 10.1111/j.1744-6570.1986.tb00583.x

Fry, P., & Engelhardt, L. (2006). Instutional report of the professional education unit. Oklahoma State University. Retreived from http://education.okstate.edu/index.php/professional-education

George, D., & Mallery, P. (2003). Factor analysis. *SPSS for Windows step by step: A simple guide and reference* (4 ed., pp. 246-259). New York: Pearson Education.

Gibson, S., & Dembo, M. H. (1984). Teaching efficacy: A construct validation. *Journal of Educational Psychology, 76*(4), 569-582. doi: 10.1037/0022-0663.76.4.569

Guskey, T. R. (1981). Measurement of the responsibility teachers assume for academic successes and failures in the classroom. *Journal of Teacher Education, 32*(3), 44-51. doi: 10.1177/002248718103200310

Guskey, T. R., & Passaro, P. D. (1994). Teacher efficacy: A study of construct dimensions. *American Educational Research Journal, 31*(3), 627-643. Retrieved from http://www.jstor.org/stable/1163230

Hansen, S. (2006). I can't do everything! English teachers' efficacy beliefs: Extending our understandings of teacher efficacy. *Interational Journal of Learning, 13*(7), 53-60.

Harlin, J. F., Edwards, M. C., & Briers, G. E. (2002). A comparison of student teachers' perceptions of important elements of the student teaching experience before and after an 11-week field experience. *Journal of Agricultural Education, 43*(3), 72. doi: 10.5032/jae.2002.03072

Henson, R. K. (2002). From Adolescent Angst to Adulthood: Substantive implications and measurement dilemmas in the deveopment of teacher efficacy research. *Educational Psychologist, 37*(3), 137-150.

Hoy, W. K., & Woolfolk, A. E. (1990). Socialzation of student teachers. *American Educational Research Journal, 27*(2), 279-300.

Hubert, D. J., & Leising, J. (2000). An assessment of agricultural mechanics course requirments in agriculture teacher education programs in the United States. *Journal of Southern Agricultural Education Research, 50*(1), 24-31.

Interstate New Teacher Assessment and Support Consortium. (1992). *Model standards for beginning teacher licensing, assessment and development: A resource for state dialogue*. (Report No. ED369767). Washington DC: Council of Chief State School Officers. Retrieved from http://cehhs.utk.edu/ncate/utir/cf/cf.6.pdf.

Kelsey, K. D. (2007). Overcoming gender bias with self-efficacy: A case study of women agricultural education teachers and preservice students. *Journal of Agricultural Education, 48*(1), 52-63. doi: 10.5032/jae.2007.01052

Kitchel, T., (2006). Perceived differences, by gender, in student teacher-cooperating teacher interacitons. *Journal of Southern Agricultural Education Research, 56*(1), 62-75. Retreived from http://pubs.aged.tamu.edu/jsaer/pdf/Vol56/56-01-062.pdf

Kitchel, T., & Torres, R. M. (2006). The influence of personality type on the extent cooperating teachers provide psychosocial assistance to student teachers. *Journal of Agricultural Education, 47*(4), 134-144. doi: 10.5032/jae.2006.04134

Knoblauch, D., & Woolfolk Hoy, A. (2008). "Maybe I can teach those kids." The influence of contextual factors on student teachers' efficacy beliefs. *Teaching and Teacher Education, 24*(1), 166-179. doi: 10.1016/j.tate.2007.05.005

Knobloch, N. A. (2006). Exploring relationships of teachers' sense of efficacy in two student teaching programs. *Journal of Agricultural Education, 47*(2), 36-47. doi: 10.5032/jae.2006.02036

Knobloch, N. A., & Whittington, M. S. (2002). Novice teachers' perceptions of support, teacher preparation quality, and student teaching experience related to teacher efficacy. *Journal of Vocational Education Research, 27*(3), 331-341. Retrieved from http://scholar.lib.vt.edu.argo.library.okstate.edu/ejournals/JVER/v27n3/knobloch.html

Knobloch, N. A., & Whittington, M. S. (2003). Differences in teacher efficacy related to career commitment of novice agriculture teachers. *Journal of Career and Technology Education, 20*(1), 87-98.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Upper Saddle River, NJ: Prentice Hall.

Korthagen, F. A. J., & Kessels, J. P. A. M. (1999). Linking Theory and Practice: Changing the Pedagogy of Teacher Education. *Educational Researcher, 28*(4), 4-17.

Krysher, S. (2009, October). *Perceptions of self-efficacy Oklahoma agricultural education student teachers have toward teaching in various curriculum areas within the cooperating center.* Paper presented at the International Society for the Scientific Study of Subjectivity, St. Louis, MO.

Krysher, S., Haynes, J. C., & Robinson, J. S. (2009). *Experiences pre-service teachers acquire while student teaching: A three year synopsis.* Paper presented at the Annual Meeting of the American Association for Agricultural Education, Louisville, KY.

Lambert, M., Ball, A. L., & Tummons, J. D. (2010). *The meaning early career agriculture teachers ascribe to their time.* Paper presented at the Southern Region Confernce of the American Association for Agricultural Education, Orlando, FL.

MacFarlane, B., & Tschannen-Moran, M. (2010). I know I can! Teacher self-efficacy in the English language arts classroom. In D. Lapp & D. Fisher (Eds.), *The handbook of research on teaching the English language arts* (3rd ed.). Philadelphia, PA: Erlbaum/Taylor Francis.

McKeown, B., & Thomas, D. (1988). *Q methodology*. Newbury Park, CA: Sage Publications.

McLean, R., & Camp, W. G. (2000). An examination of selected preservice agricultural teacher education programs in the United States. *Journal of Agricultural Education*, *41*(2), 25-35.

Mulholland, J., & Wallace, J. (2001). Teacher induction and elementary science teaching: enhancing self-efficacy. *Teaching and Teacher Education, 17*(2), 243-261. doi: 10.1016/S0742-051X(00)00054-8

National FFA Organization. (2005). *FFA new professional kit*. Indianapolis, IN.

Nekolny, D. J. C., & Buttles, T. (2007). *Allocation of hours during the student teaching experience.* Paper presented at the North Central Region Conference, Columbia, MO.

Oklahoma State University agricultural education ooperating teacher handbook. (2009).Oklahoma State University, Department of Agricultural Education, Communications and Leadership. Oklahoma State University. Retrieved from http://aged.okstate.edu/studteac/downloads.htm

Oklahoma State University Agricultural education course descriptions. (n.d.). Office of the Registrar. Oklahoma State University. College of Agricultural Sciences and Natural Resourses. Retrieved from http://registrar.okstate.edu/index.php?option=com_content&view=article&id=63&Itemid=66

Pajares, F. M. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research, 66*(4), 543-578. doi: doi:10.3102/00346543066004543

Pajares, F. M. (2002). Overview of social cognitive theory and of self-efficacy. Retrieved from http://www.emory.edu/EDUCATION/mfp/eff.html

Parajes, F. M. (1992). Teachers' beliefs and educational research: cleaning up a messy construct. *Review of Educational Research, 62*(3), 307-332. doi: 10.3102/00346543062003307

Phipps, L. J., Osborne, E. W., Dyer, J. E., & Ball, A. L. (2008). *Handbook on Agricultural Education in Public Schools* (6th ed.). Clifton Park, NY: Thomson Delmar Learning.

Poulou, M. (2007). Personal teaching efficacy and its sources: student teachers' perception. *Educational Psychology, 27*(2), 191-218. doi: 10.1080/01443410601066693

Pre-service teacher (n.d.). In *Glossary of Education* online dictionary. Retrieved from http://www.education.com/definition/preservice-teacher

Professional education unit student information. (n.d.). Oklahoma State University. College of Education. Retrieved from http://education.okstate.edu/student-information

Putnam, R. T., & Borko, H. (2000). What Do New Views of Knowledge and Thinking Have to Say about Research on Teacher Learning? *Educational Researcher, 29*(1), 4-15. Retrieved from http://www.jstor.org/stable/1176586

Raven, M. R. (1994). The application of exploratory factor analysis in agricultural education research. *Journal of Agricultural Education, 35*(4), 9-14. Retrieved from http://pubs.aged.tamu.edu/jae/pdf/Vol35/35-04-09.pdf

Redburn, F. S. (1975). Q factor analysis: Applications to educational testing and program evaluation. *Educational and Psychological Measurement, 35*, 767-778.

Riggs, I., & Enochs, L. (1990). Toward the development of an elementary teacher's science teaching efficacy beleif instrument. *Science Education, 74*(6), 625-637. doi: 10.1002/sce.3730740605

Rimm-Kaufman, S. E., Storm, M. D., Sawyer, B. E., Pianta, R. C., & LaParo, K. M. (2006). The Teacher Belief Q-Sort: A measure of teachers' priorities in relation to disciplinary practices, teaching practices, and beliefs about children. *Journal of School Psychology, 44*(2), 141-165. doi: 10.1016/j.jsp.2006.01.003

Robbins, P. (2005). Q methodology. In K. Kempf-Leonard (Ed.), *Encyclopedia of Social Measurement* (Vol. 3, pp. 209-215). New York: Elsevier, Inc.

Roberts, T. G. (2006). A philosophical examination of experiential learning theory for agricultural educators. *Journal of Agricultural Education, 47*(1), 17-29. doi: 10.5032/jae.2006.01017

Roberts, T. G., Briers, G. E., & Harlin, J. F. (2008). Peer modeling and teaching efficacy: the influence of two student teachers at the same time. *Journal of Agricultural Education, 49*(2), 13-26. doi: 10.5032/jae.2008.02013

Roberts, T. G., & Dyer, J. E. (2004). Inservice needs of traditionally and alternatively certified agriculture teachers. *Journal of Agricultural Education, 45*(4), 14.

Roberts, T. G., Harlin, J. F., & Ricketts, J. C. (2006). A longitudinal examination of teaching efficacy of agricultural science student teachers. *Journal of Agricultural Education, 47*(2), 81-92. doi: 10.5032/jae.2006.04027

Roberts, T. G., Mowen, D. L., Edgar, D. W., Harlin, J. F., & Briers, G. E. (2007). Relationships between personality type and teaching efficacy of student teachers. *Journal of Agricultural Education, 48*(2), 92-101. doi: 10.5032/jae.2007.02092

Robinson, J. S., Krysher, S., Haynes, J. C., & Edwards, M. C. (in press). How Oklahoma State University student spent their time student teaching in agricultural education: A fall versus spring semester comparison with implications for teacher education. *Journal of Agricultural Education, 51*(4).

Rose, J. A., & Medway, F. J. (1981). Measurement of teachers' beliefs in their control over student outcome. *Journal of Educational Research, 74*(3), 185-190. Retrieved from http://web.ebscohost.com.argo.library.okstate.edu/ehost/pdfviewer/pdfviewer?vid=4&hid=104&sid=f55670c1-9a59-4045-a3a3-e4fd18cec3de%40sessionmgr114

Ross, J. A. (1994). The impact of an inservice to promote cooperative learning on the stability of teacher efficacy. *Teaching and Teacher Education, 10*(4), 381-394. doi: 10.1016/0742-051X(94)90020-5

Schmolck, P. (2002a). PQMethod (Version 2.11) [Computer software]. Retrieved from http://www.lrz-muenchen.de/~schmolck/qmethod/downpqx.htm

Schmolck, P. (2002b). PQMethod manual. Retrieved from http://www.lrz.de/~schmolck/qmethod/pqmanual.htm

Schumann, H. (1969). *The cooperating teacher's role in student teaching*: Agr Educ Mag.

Shemmings, D. (2006). 'Quantifying' qualitative data: an illustrative example of the use of Q methodology in psychosocial research. *Qualitative Research in Psychology*(3), 147-165. doi: 10.1191/1478088706qp060oa

Smith, B. J., Grunseit, A., Hardy, L. L., King, L., Wolfenden, L., & Milat, A. (2010). Parental influences on child physical activity and screen viewing time: a population based study. *BMC Public Health, 10*, 593-603. doi: 10.1186/1471-2458-10-593

Smith, N. W. (2001). Operant subjectivity. *Current systems in psychology: History, theory, research, and applications* (pp. 319-343). Plattsburg, NY: Wadsworth.

Spooner, M., Flowers, C., Lambert, R., & Algozzine, B. (2008). Is more really better? Examining perceived benefits of an extended student teaching experience. *Clearing House, 81*, 263-270.

Stricklin, M., & Almeida, R. (2004). PCQ for Windows Academic Edition (Version 1.4.1) [Computer software]. Portland, OR: PCQ Software.

Stripling, C., Ricketts, J. C., Roberts, T. G., & Harlin, J. F. (2008). Preservice agricultural education teachers' sense of teaching self-efficacy. *Journal of Agricultural Education, 49*(4), 120-130.

Thorman, J. M., Van Eman, L. M., & Montgomery, D. (2006). Teachers' perceptions of professional development. *Journal of Human Subjectivity, 4*(1), 96-110.

Torres, R. M., & Ulmer, J. D. (2007). An Investigation of Time Distribution of Pre-Service Teachers While Interning. *Journal of Agricultural Education, 48*(2), 1-12.

Torres, R. M., Ulmer, J. D., & Aschenbrener, M. S. (2008). Workload distribution among agricultural teachers. *Journal of Agricultural Education, 49*(2), 75-87.

Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: capturing an elusive construct. *Teaching and Teacher Education, 17*(7), 783-805.

Tschannen-Moran, M., Hoy, A. W., & Hoy, W. K. (1998). Teacher Efficacy: Its Meaning and Measure. *Review of Educational Research, 68*(2), 202-248.

van Exel, N. J. A., & de Graaf, G. (2005). Q methodology: A sneak peak. Retrieved from http://www.qmethodology.net/index.php?page=1&year=2005

Van Tubergen, G. N. (1975). QUANAL [Computer software]. Lexington: University of Kentucky.

Watts, S., & Stenner, P. (2003). Q-methodology, quantum theory, and psychology. *Operant Subjectivity, 26*(4), 155-173.

Watts, S., & Stenner, P. (2005). Doing Q methodology: Theory, method and interpretation. *Qualitative Research in Psychology, 2*(1), 67-91. doi: 10.1191/1478088705qp022oa

Webler, T., Danielson, S., & Tuler, S. (2009). Using Q method to reveal social perspectives in environmental research. Greenfield, MA: Social and

Environmental Research Institute. Retrieved from www.seri-us.org/pubs/Qprimer.pdf.

Witkin, H. A., Moore, C. A., Goodenough, D. R. & Cox, P. W. (1977). Field-dependent and field-independent cognitive styles and their educational implications. *Review of Educational Research, 47*(1) 1-64.

Whittington, M. S., McConnell, E., & Knobloch, N. A. (2006). Teacher efficacy of novice teachers in agricultural education in Ohio at the end of the school year. *Journal of Agricultural Education, 47*(4), 26-38. doi: 10.5032/jae.2006.04027

Wingenbach, G. J., White, J. M., Degenhart, S., Pannkuk, T., & Kujawski, J. (2007). Pre-service teachers' knowledge and teaching comfort levels for agricultural science and technology objectives. *Journal of Agricultural Education, 48*(2), 114-126. doi: 10.5032/jae.2007.02114

Wilkins, J. L. M. (2008). The relationship among elementary teachers' content knowledge, attitudes, beliefs, and practices. *Journal of Math Teacher Education, 11*(2), 139-164. doi: 10.1007/s10857-007-9068-2

Woolfolk, A. E., & Hoy, W. K. (1990). Prospective teachers' sense of efficacy and beliefs about control. *Journal of Educational Psychology, 82*(1), 81-91. doi: 10.1037/0022-0663.82.1.81

Young, R. B., & Edwards, M. C. (2006). A comparison of student teachers' perceptions of important elements of the student teaching experience before and after a 12-

week field experience. *Journal of Agricultural Education, 47*, 45-57. doi: 10.5032/jae.2006.03045

Zwick, W. R., & Velicer, W. F. (1982). Factors influencing four rules for determining the number of components to retain. *Multivariate Behavior Research, 17*(2), 253-269. doi: 10.1207/s15327906mbr1702_5

# APPENDICES

# APPENDIX A

## Oklahoma State University Institutional Review Board

| | |
|---|---|
| Date: | Tuesday, March 03, 2009 |
| IRB Application No | ED0931 |
| Proposal Title: | Agricultural Education Student Teachers on Curriculum Assignments Within the Cooperating Center |
| Reviewed and Processed as: | Exempt |

**Status Recommended by Reviewer(s): Approved  Protocol Expires: 3/2/2010**

Principal Investigator(s):


Sheyenne Krysher
459 Ag Hall
Stillwater, OK 74078

Diane Montgomery
424 Willard
Stillwater, OK 74078


---

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☒ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219 Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,

Shelia Kennison, Chair
Institutional Review Board

## APPENDIX B

Dear Student Teacher:

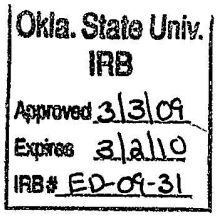
A study is being conducted on the perceptions of agricultural education student teachers. The goal of this study is to describe experiences agricultural education student teachers have during their internship at the cooperating center. The information you provide will remain confidential.

While this study is strictly voluntary, I hope you will agree to participate as your responses will provide valuable insight for the faculty in our department. The purpose of this correspondence is to inform you that you will have the opportunity to participate in this study during your next supervisory visit. Should you have any questions or concerns about this project, please contact me at sheyenne.krysher@okstate.edu

Thank you in advance for your assistance and participation in this study.

Sincerely,

Sheyenne Krysher
Teaching and Research Associate
Oklahoma State University



# APPENDIX C

## INFORMED CONSENT

**Project Title:** Perceptions of Agricultural Education Student Teachers on Curriculum Assignments within the Cooperating Center

**Investigator:** Sheyenne Krysher, Graduate Student of Agricultural Education, Oklahoma State University.

**Purpose:** This is a research study. The purpose of this study is to describe the perspective of agricultural education student teachers at Oklahoma State University toward experiences in specific curriculum at their cooperating center during the 12-week internship.

**Procedures:** You will be asked to complete a Q-sort which involves reading several statements and sorting them two separate times into categories based on the extent to which the statements reflect agreement or disagreement with your opinions. You will then be asked to record your results on a Record Sheet. In addition, you will be asked to complete a short survey that has demographic questions about you and questions about how you might describe yourself. The session should last about 30 minutes. If you choose to provide a pseudo name or code name and phone number, you may be called to discuss study results from your perspective. The call will last about ten minutes.

**Risks of Participation:** There are no known risks associated with this project which are greater than those ordinarily encountered in daily life.

**Benefits:** The results from this study may be beneficial to agricultural education teacher educators. The views of how student teachers feel about teaching specific curriculum might enhance the factors used in selecting an appropriate student teaching site.

**Confidentiality:** Your responses to both the Q-sorts and the surveys are confidential. No names or other identifying information will be attached to your packet and only aggregate data will be reported.

The data will be securely stored in a locked file cabinet in the researcher's office. The paper copies will be destroyed one year after the completion of the study. Only the researchers will have access to the information that is stored on a computer disk without any identifying information and it will be destroyed five years from completion of the study.

The OSU IRB has the authority to inspect consent records and data files to assure compliance with approved procedures.

**Contacts:** Please feel free to contact the researcher or her advisor if you have questions or concerns about this research project.

Sheyenne Krysher, Oklahoma State University, 459 Ag Hall, Stillwater, OK 74078, 405-744-2972, sheyenne.krysher@okstate.edu

Diane Montgomery, Professor, Oklahoma State University, 424 Willard Hall, Stillwater, OK 74078; 405-744-9441; diane.montgomery@okstate.edu

For information on participants' rights, contact Dr. Shelia Kennison, Oklahoma State University, IRB Chair, 219 Cordell North, 405-744-1676, irb@okstate.edu.

**Participant Rights:** Participation in the current research activity is entirely voluntary. You are free to decline to participate and may stop or withdraw from the activity at any time. There is no penalty for withdrawing your participation.

---

**Signatures:** I have read and fully understand the consent form. I sign it freely and voluntarily. A copy of this form has been given to me.

Okla. State Univ. IRB
Approved 3/3/09
Expires 3/2/10
IRB# ED-09-31

_____ _____
**Signature of Participant** **Date**

I certify that I have personally explained this document before requesting the participant to sign it.

Sheyenne Krysher 3/10/09
**Signature of Researcher** **Date**

## APPENDIX D

### Researcher's Script: Directions for Sorting Q Statements

Thank you for agreeing to participate in this study. Please make sure you have the materials in front of you. You should have a Form Board and an envelope containing 36 cards, each with a statement printed on it describing ideas about decision making. You will need a pencil later.

Step 1: Please read through the statements and sort them into three (3) piles according to the question: **"How do you feel about the courses you instruct?"**

The pile on your right are those statements that are **most like** what you think about the question and the pile on your left are those statements that are **most unlike** what you think about the question. Put any cards that you don't have strong feelings about in a middle pile.

Step 2: Now that you have three piles of cards, start with the pile to your right, the "most like" pile and **select** the two (2) cards from this pile that are **most like** your response to the question and place them in the two (2) spaces at the far right of the Form Board in from of you in column 9. The order of the cards within the column-that is, the vertical positioning of the cards-does not matter.

Step 3: Next, from the pile to your left, the "most unlike" pile, **select** the two (2) cards that are **most unlike** your response to the question and place them in the two (2) spaces at the far left of the Form Board in front of you in column 1.

Step 4: Now, go back to the "most like" pile on your right and select the four (4) cards from those remaining in your **most like** pile and place them into the four (4) open spaces in column 8.

Step 5: Now, go back to the "most unlike" pile on your right and select the four (4) cards from those remaining in your **most unlike** pile and place them into the four (4) open spaces in column 2.

Step 6: Working back and forth, continue placing cards onto the Form Board until all of the cards have been placed into all of the spaces.

Step 7: Once you have placed all the cards on the Form Board, feel free to rearrange the cards until the arrangement best represents your opinions.

Step 8: Record the number of the statement on the **Response Sheet (D1)**.

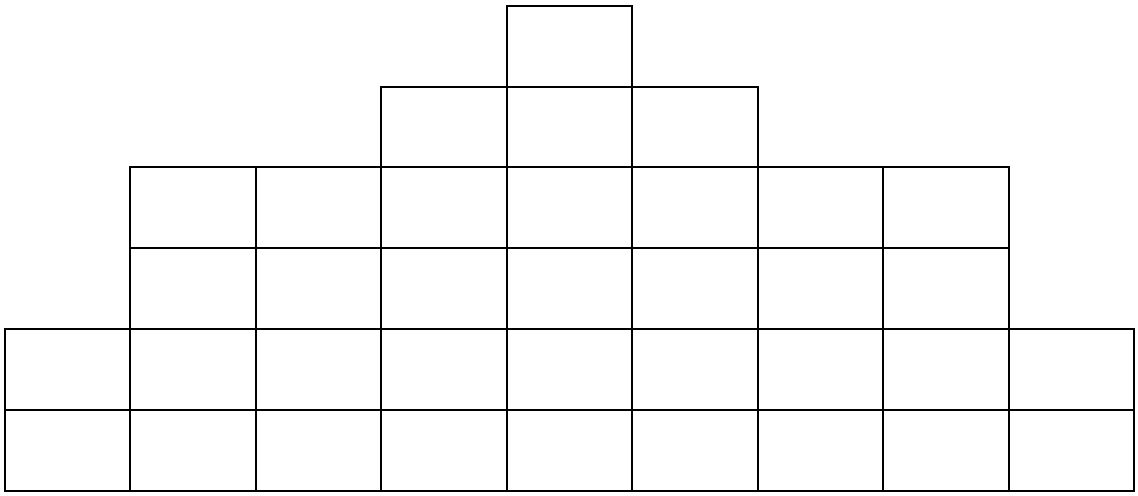
Finally, please complete the **Demographic Survey (D2)** found on the back of the Response Sheet and add any comments. Thank you for your participation!

## APPENDIX E

Response Sheet

Pseudonym/Code Name: _____

Sort I: HOW DO YOU FEEL ABOUT THE COURSES YOU INSTRUCT?



## APPENDIX F

Demographic Survey

1. What is your gender (check one)? _____Female _____Male
2. How old are you? _____ years
3. Were you enrolled in agricultural education courses at the high school level?

   _____Yes _____No
4. Would you describe the cooperating center in which you are completing your student teaching as (check one).

   _____Urban _____Suburban _____Rural
5. Please check all the courses which are <u>offered</u> at this cooperating center. Check all that apply.

   _____Agriscience I/II
   _____Animal Science
   _____Equine Science
   _____Veterinary Technology
   _____Plant Science/Horticulture
   _____Soil Science
   _____Exploratory Agriculture ($7^{th}$/$8^{th}$ grade)
   _____Agricultural Mechanization
   _____Natural Resources/Wildlife
   _____Agricultural Communication/Leadership
   _____Agri-Business/Marketing
   _____Other, please specify: _____

6. Please check all the courses which <u>you are instructing</u> during your internship at this cooperating center. Check all that apply.

   _____Agriscience I/II
   _____Animal Science
   _____Equine Science
   _____Veterinary Technology
   _____Plant Science/Horticulture
   _____Soil Science
   _____Exploratory Agriculture ($7^{th}$/$8^{th}$ grade)
   _____Agricultural Mechanization
   _____Natural Resources/Wildlife
   _____Agricultural Communication/Leadership
   _____Agri-Business/Marketing
   _____Other, please specify: _____

7. As it pertains to <u>content</u>, do you feel prepared to adequately instruct each of the courses you have been assigned at your cooperating center?

   _____Yes _____No

As it pertains to <u>teaching methodology</u>, do you feel prepared to adequately instruct each of the courses you have been assigned at your cooperating center?

_____Yes _____No

8. What else would you like to tell me about the courses you teach?

If you would like to participate in phone interview please write your first name or a code name that you will know and a telephone number at which you can be reached.

Pseudonym/Code Name _____ Phone Number_____

## APPENDIX G

Correlation Matrix between Sorts

| SORTS | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 m21r | 100 | 24 | 26 | 8 | 13 | 21 | -1 | 10 | 19 | 38 | 30 | 10 | 31 | 30 | 19 | 6 | 16 | 6 | 16 | 19 | 23 | 16 | -11 | 49 | 25 | 6 | 11 | 29 |
| 2 m21r | 24 | 100 | 28 | 30 | 29 | 37 | 35 | 16 | 36 | 60 | -17 | 15 | 53 | 31 | 36 | 37 | 46 | 34 | 17 | 30 | 42 | 43 | 35 | 53 | 20 | 38 | 16 | 23 |
| 3 m22s | 26 | 28 | 100 | 55 | 47 | 77 | 12 | 25 | 49 | 60 | -3 | 44 | 55 | 35 | 33 | 36 | 38 | 50 | 46 | 10 | 34 | 37 | 38 | 25 | 20 | 40 | 20 | 39 |
| 4 m23r | 8 | 30 | 55 | 100 | 34 | 27 | 32 | 5 | 7 | 43 | -47 | 3 | 35 | 23 | 44 | 13 | 62 | 35 | 24 | -15 | 11 | 28 | 56 | 31 | 11 | 25 | -22 | 7 |
| 5 f22r | 13 | 29 | 47 | 34 | 100 | 42 | 28 | 40 | 39 | 52 | -21 | 30 | 34 | 24 | 46 | 62 | 38 | 40 | 46 | 20 | 10 | 38 | 45 | 21 | 19 | 19 | 11 | 29 |
| 6 m22s | 21 | 37 | 77 | 27 | 42 | 100 | 26 | 32 | 65 | 61 | 4 | 46 | 68 | 46 | 26 | 39 | 34 | 54 | 47 | 17 | 35 | 48 | 38 | 19 | 38 | 33 | 22 | 49 |
| 7 f24s | -1 | 35 | 12 | 32 | 28 | 26 | 100 | 30 | 10 | 47 | -33 | 15 | 51 | 38 | 42 | 26 | 60 | 41 | 4 | 25 | 6 | 47 | 42 | 3 | 33 | 40 | -10 | 17 |
| 8 m21s | 10 | 16 | 25 | 5 | 40 | 32 | 30 | 100 | 35 | 38 | -3 | 55 | 48 | 24 | 50 | 17 | 21 | 54 | 26 | 30 | 9 | 33 | 28 | 11 | 42 | 31 | 4 | 36 |
| 9 m22r | 19 | 36 | 49 | 7 | 39 | 65 | 10 | 35 | 100 | 38 | 13 | 70 | 65 | 30 | 31 | 43 | 8 | 50 | 38 | 7 | 51 | 56 | 39 | 29 | 38 | 24 | 20 | 56 |
| 10 f22r | 38 | 60 | 60 | 43 | 52 | 61 | 47 | 38 | 38 | 100 | -15 | 19 | 61 | 41 | 40 | 26 | 64 | 53 | 37 | 36 | 27 | 43 | 41 | 31 | 37 | 35 | 19 | 22 |
| 11 f22r | 30 | -17 | -3 | -47 | -21 | 4 | -33 | -3 | 13 | -15 | 100 | 6 | -6 | 2 | -25 | -13 | -53 | -37 | 12 | -8 | 21 | -2 | -34 | -8 | 16 | -12 | 47 | -1 |
| 12 m21r | 10 | 15 | 44 | 3 | 30 | 46 | 15 | 55 | 70 | 19 | 6 | 100 | 43 | 28 | 32 | 42 | 4 | 54 | 41 | 12 | 23 | 34 | 35 | 4 | 42 | 43 | 15 | 57 |
| 13 f22s | 31 | 53 | 55 | 35 | 34 | 68 | 51 | 48 | 65 | 61 | -6 | 43 | 100 | 43 | 58 | 29 | 47 | 55 | 31 | 22 | 57 | 65 | 46 | 35 | 38 | 39 | 11 | 46 |
| 14 f24r | 30 | 31 | 35 | 23 | 24 | 46 | 38 | 24 | 30 | 41 | 2 | 28 | 43 | 100 | 47 | 8 | 41 | 32 | 31 | 21 | 14 | 28 | 29 | 11 | 29 | 2 | 18 | 34 |
| 15 m33s | 19 | 36 | 33 | 44 | 46 | 26 | 42 | 50 | 31 | 40 | -25 | 32 | 58 | 47 | 100 | 8 | 38 | 42 | 1 | 2 | 26 | 40 | 66 | 16 | 31 | 26 | -22 | 30 |
| 16 f23r | 6 | 37 | 36 | 13 | 62 | 39 | 26 | 17 | 43 | 26 | -13 | 42 | 29 | 8 | 8 | 100 | 28 | 32 | 40 | 31 | 20 | 44 | 17 | 35 | 28 | 38 | 26 | 31 |
| 17 m22r | 16 | 46 | 38 | 62 | 38 | 34 | 60 | 21 | 8 | 64 | -53 | 4 | 47 | 41 | 38 | 28 | 100 | 52 | 20 | 33 | 18 | 39 | 50 | 31 | 24 | 49 | -13 | 23 |
| 18 f21r | 6 | 34 | 50 | 35 | 40 | 54 | 41 | 54 | 50 | 53 | -37 | 54 | 55 | 32 | 42 | 32 | 52 | 100 | 21 | 14 | 17 | 46 | 57 | 18 | 12 | 34 | -22 | 29 |
| 19 f22r | 16 | 17 | 46 | 24 | 46 | 47 | 4 | 26 | 38 | 37 | 12 | 41 | 31 | 31 | 1 | 40 | 20 | 21 | 100 | 24 | 11 | 28 | 11 | 9 | 20 | 0 | 28 | 30 |
| 20 m23r | 19 | 30 | 10 | -15 | 20 | 17 | 25 | 30 | 7 | 36 | -8 | 12 | 22 | 21 | 2 | 31 | 33 | 14 | 24 | 100 | 21 | -2 | -21 | 28 | 20 | 27 | 40 | 13 |
| 21 m22s | 23 | 42 | 34 | 11 | 10 | 35 | 6 | 9 | 51 | 27 | 21 | 23 | 57 | 14 | 26 | 20 | 18 | 17 | 11 | 21 | 100 | 38 | 22 | 19 | 25 | 34 | 19 | 24 |
| 22 m23r | 16 | 43 | 37 | 28 | 38 | 48 | 47 | 33 | 56 | 43 | -2 | 34 | 65 | 28 | 40 | 44 | 39 | 46 | 28 | -2 | 38 | 100 | 52 | 39 | 39 | 37 | -7 | 25 |
| 23 m21r | -11 | 35 | 38 | 56 | 45 | 38 | 42 | 28 | 39 | 41 | -34 | 35 | 46 | 29 | 66 | 17 | 50 | 57 | 11 | -21 | 22 | 52 | 100 | 13 | 22 | 45 | -34 | 34 |
| 24 m23r | 49 | 53 | 25 | 31 | 21 | 19 | 3 | 11 | 29 | 31 | -8 | 4 | 35 | 11 | 16 | 35 | 31 | 18 | 9 | 28 | 19 | 39 | 13 | 100 | 22 | 19 | 10 | 21 |
| 25 f22r | 25 | 20 | 20 | 11 | 19 | 38 | 33 | 42 | 38 | 37 | 16 | 42 | 38 | 29 | 31 | 28 | 24 | 12 | 20 | 20 | 25 | 39 | 22 | 22 | 100 | 49 | 19 | 27 |
| 26 f22r | 6 | 38 | 40 | 25 | 19 | 33 | 40 | 31 | 24 | 35 | -12 | 43 | 39 | 2 | 26 | 38 | 49 | 34 | 0 | 27 | 34 | 37 | 45 | 19 | 49 | 100 | 3 | 34 |
| 27 m23r | 11 | 16 | 20 | -22 | 11 | 22 | -10 | 4 | 20 | 19 | 47 | 15 | 11 | 18 | -22 | 26 | -13 | -22 | 28 | 40 | 19 | -7 | -34 | 10 | 19 | 3 | 100 | 13 |
| 28 f22r | 29 | 23 | 39 | 7 | 29 | 49 | 17 | 36 | 56 | 22 | -1 | 57 | 46 | 34 | 30 | 31 | 23 | 29 | 30 | 13 | 24 | 25 | 34 | 21 | 27 | 34 | 13 | 100 |

## APPENDIX H

Unrotated Factor Matrix

| | Factors | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sorts | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 m21r | 0.316 | 0.332 | 0.3756 | -0.400 | -0.170 | 0.244 | 0.395 | -0.083 |
| 2 m21r | 0.617 | -0.037 | 0.424 | -0.178 | 0.050 | -0.209 | 0.013 | -0.015 |
| 3 m22s | 0.709 | 0.115 | -0.054 | 0.075 | -0.444 | -0.030 | -0.215 | -0.228 |
| 4 m23r | 0.495 | -0.540 | 0.139 | -0.037 | -0.427 | -0.043 | -0.096 | 0.018 |
| 5 f22r | 0.625 | -0.042 | -0.008 | 0.417 | -0.206 | -0.038 | 0.230 | 0.293 |
| 6 m22s | 0.756 | 0.243 | -0.117 | 0.052 | -0.241 | 0.044 | -0.265 | -0.109 |
| 7 f24s | 0.539 | -0.391 | 0.138 | 0.082 | 0.395 | 0.194 | -0.212 | 0.251 |
| 8 m21s1 | 0.555 | 0.074 | -0.269 | 0.163 | 0.375 | 0.310 | 0.287 | -0.043 |
| 9 m22r | 0.690 | 0.385 | -0.353 | -0.127 | -0.089 | -0.197 | 0.066 | -0.026 |
| 10 f22r | 0.760 | -0.051 | 0.340 | 0.039 | -0.106 | 0.197 | -0.136 | -0.002 |
| 11 f22r | -0.178 | 0.763 | -0.095 | -0.326 | -0.027 | 0.122 | -0.140 | 0.237 |
| 12 m21r | 0.593 | 0.317 | -0.541 | 0.159 | 0.169 | -0.028 | 0.116 | -0.160 |
| 13 f22s | 0.834 | 0.057 | -0.009 | -0.264 | 0.033 | 0.058 | -0.093 | -0.045 |
| 14 f24r | 0.533 | 0.054 | 0.071 | -0.079 | -0.114 | 0.602 | -0.073 | 0.083 |
| 15 m33s | 0.619 | -0.342 | -0.179 | -0.276 | 0.082 | 0.289 | 0.191 | 0.102 |
| 16 f23r | 0.540 | 0.201 | 0.090 | 0.447 | 0.038 | -0.482 | 0.140 | 0.240 |
| 17 m22r | 0.648 | -0.477 | 0.386 | 0.112 | 0.039 | 0.067 | -0.121 | -0.089 |
| 18 f21r | 0.703 | -0.264 | -0.235 | 0.148 | 0.000 | 0.018 | 0.084 | -0.276 |
| 19 f22r | 0.461 | 0.352 | -0.020 | 0.421 | -0.385 | 0.116 | -0.023 | 0.172 |
| 20 m23r | 0.306 | 0.276 | 0.542 | 0.363 | 0.404 | 0.125 | 0.038 | -0.266 |
| 21 m22s | 0.459 | 0.279 | 0.058 | -0.454 | 0.056 | -0.279 | -0.290 | -0.144 |
| 22 m23r | 0.694 | -0.045 | -0.092 | -0.221 | 0.039 | -0.238 | 0.012 | 0.416 |
| 23 m21r | 0.640 | -0.494 | -0.340 | -0.140 | -0.059 | -0.097 | -0.055 | 0.089 |
| 24 m23r | 0.425 | 0.082 | 0.489 | -0.242 | -0.096 | -0.308 | 0.507 | -0.011 |
| 25 f22r | 0.512 | 0.239 | -0.023 | -0.136 | 0.410 | 0.088 | -0.051 | 0.319 |
| 26 f22r | 0.564 | -0.080 | 0.014 | -0.019 | 0.461 | -0.336 | -0.236 | -0.175 |
| 27 m23r | 0.109 | 0.719 | 0.296 | 0.211 | 0.018 | 0.057 | -0.262 | 0.071 |
| 28 f22r | 0.561 | 0.253 | -0.257 | -0.010 | 0.035 | 0.038 | 0.207 | -0.282 |
| Eigenvalues | 9.304 | 3.112 | 2.059 | 1.654 | 1.594 | 1.421 | 1.130 | 0.988 |

**APPENDIX I**

Factor Array for Factor 1

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 6 | | | | |
| | | | 10 | 27 | 12 | | | |
| | 32 | 14 | 17 | 36 | 22 | 19 | 20 | |
| | 2 | 26 | 11 | 8 | 30 | 7 | 4 | |
| 34 | 15 | 16 | 9 | 23 | 25 | 5 | 1 | 29 |
| 33 | 35 | 18 | 31 | 3 | 13 | 24 | 21 | 28 |
| -4 | -3 | -2 | -1 | 0 | +1 | +2 | +3 | +4 |
| Most unlike me | | | | | | | | Most like me |

**APPENDIX J**

Factor Array for Factor 2

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 24 | | | | |
| | | | 20 | 10 | 11 | | | |
| | 25 | 34 | 7 | 27 | 4 | 8 | 23 | |
| | 17 | 15 | 13 | 16 | 9 | 12 | 2 | |
| 32 | 26 | 14 | 22 | 21 | 31 | 35 | 1 | 5 |
| 33 | 36 | 30 | 28 | 29 | 18 | 19 | 6 | 3 |
| -4 | -3 | -2 | -1 | 0 | +1 | +2 | +3 | +4 |
| Most unlike me | | | | | | | | Most like me |

**APPENDIX K**

Factor Array for Factor 3

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 10 | | | | |
| | | | 29 | 27 | 26 | | | |
| | 32 | 22 | 33 | 3 | 19 | 35 | 1 | |
| | 11 | 24 | 14 | 13 | 21 | 23 | 28 | |
| 2 | 34 | 20 | 16 | 15 | 9 | 8 | 12 | 5 |
| 6 | 36 | 17 | 25 | 31 | 18 | 7 | 30 | 4 |
| -4 | -3 | -2 | -1 | 0 | +1 | +2 | +3 | +4 |
| Most unlike me | | | | | | | | Most like me |

VITA

Sheyenne Krysher

Candidate for the Degree of

Doctor of Philosophy

Title of Study: THE USE OF TIME ALLOCATION TO UNDERSTAND THE PERCEIVED TEAHCING ABILITY OF STUDENT INTERNS IN AGRICULTURAL EDUATION: A Q-METHOD STUDY

Major Field: Agricultural Education

Biographical:

Education: Completed the requirements for the Doctor of Philosophy in Agricultural Education at Oklahoma State University, Stillwater, Oklahoma in December, 2010. Completed the requirements for the Master of Science in Agriculture at Sam Houston State University, Huntsville, Texas in 2002. Completed the requirements for the Bachelor of Science in Agricultural Education at Sam Houston State University, Huntsville, Texas in 2000.

Experience: Secondary Agricultural Education Teacher at Spring Branch Independent School District in Houston, Texas from 2002-2007. Teaching and Research Associate, Department of Agricultural Education, Communication and Leadership, Oklahoma State University, Stillwater, Oklahoma from 2007-2010.

Professional Memberships: American Association for Agricultural Education, North American Colleges and Teachers of Agriculture, Vocational Agriculture Teachers Association of Texas, National Association of Agricultural Educators.

Name: Sheyenne Krysher Date of Degree: December, 2010

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: USING TIME ALLOCATION TO UNDERSTAND THE PERCEIVED TEACHING ABILITY OF STUDENT INTERNS IN AGRICULTURAL EDUCATION: A Q-METHOD STUDY

Pages in Study: 160 Candidate for the Degree of Doctor of Philosophy

Major Field: Agricultural Education

Scope and Method of Study: The purpose of this study was to describe the views student teachers in agricultural education at Oklahoma State University had regarding their 12-week student teaching experience. Twenty-eight student teachers participated in the study. Q-methodology was employed to analyze the views of the student teachers. Modes of central tendency were employed to analyzed time allocation data.

Findings and Conclusions: Three distinct views emerged from the Q-methodology data analysis. These three views consisted of the *Emerging Teacher, Self-Assured Teacher*, and *Determined Teacher*. The *Emerging Teacher* view was defined by 12 Q-sorts. This view was interpreted to need continued growth and development regarding their teaching ability; however, they recognized their overall growth toward becoming a professional. The *Self-Assured Teacher* view was defined by five Q-sorts. This view was interpreted to have a high level of comfort and confidence related to their teaching ability. The *Determined Teacher* view was defined by four Q-sorts. This view was interpreted to have a high level of confidence, but they were not comfortable with their teaching ability. Regarding time allocation, the *Emerging Teacher* view spent the most amount of time, on average per week, in school as well as out of school during the regular school day. The *Self-Assured Teacher* view spent the most amount of time teaching and the least amount of time observing on average per week. Of the three views, the *Determined Teacher* view spent the most time in observation. All of the views spent the most amount of time teaching Agriscience I/II while at the cooperating center. It was concluded that different views on teaching ability exist within the population of the student teachers used in this study. Further, the amount of time spent in various teaching activities may serve to reinforce the student teachers' view on their teaching ability. Finally, no personal or professional characteristic distinguished any view. Future research should study student teachers' perceptions of their teaching ability longitudinally to investigate how perceptions change over time. In addition, Q-sorts should be completed by the cooperating teachers in order to triangulate the student teachers' perceptions.

ADVISER'S APPROVAL: Dr. J. Shane Robinson