

UNPACKING PRESERVICE AGRICULTURE TEACHER DEVELOPMENT THROUGH
REFLECTIVE AWARENESS OF STRESS: A MIXED METHODS STUDY

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ERICA B. THIEMAN

Dr. Tracy Kitchel, Dissertation Supervisor

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DEDICATION

This work is dedicated to my family.

They are a true example of resilience as defined by success in spite of adversity.

In memory of my parents, Jim and Carol Thieman.

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Chapter 1

When studying stress, a highly contextual phenomenon, researchers should employ a variety of techniques to fully grasp the entire concept. Stress operates on multiple planes including the external/environmental, the cognitive, the physiological, and the behavioral levels (Ages, 2011; Al-Fudail & Mellar, 2008; Buwalda, Geerdink, Vidal, & Koolhaas, 2011; Kyriacou, 2003). Multiple means of measurement must be used for an accurate picture of an individual's stress. Recording of guided reflection is one tool that can be used to glean information regarding all of the levels previously described. Reflection can be examined from the past (reflection-on-action), present (reflection-in-action), and future (reflection-for-action) tense (Killion & Todnem, 1991; Schon, 1987). Reflection, in any of the three tenses, can be used to guide individuals to examine physical sensations, feelings, emotions, thought processes, and behaviors experienced during a stressful encounter. Individuals can be guided through reflection to evaluate a past experience, current happening, or plan for a future known stressful event.

When scrutinizing the current state of the field of agricultural education at the secondary level through anecdotal and empirical evidence, one will find agricultural educators are exposed to many and varying forms of environmental stressors due to the nature of the position (Anderson, Kitchel, & Thieman, 2012; Cano & Miller, 1992; Chenevey, Ewing, & Whittington, 2008; Croom, 2003; Knobloch & Whittington, 2002). A complication in the phenomenon of educator stress is how stress is viewed in American culture, sometimes worn as a badge of honor by those in the trenches of a specific profession. Water cooler discussions become competitive, with individuals comparing personal stress levels, ability to multi-task, and how much work is on their proverbial

plates (Sapolsky, 2004b). Reasonably, preservice teachers begin immersion in this culture of professional stress upon entry into early field experiences where they are in schools and attending various professional meetings with in-service agricultural educators.

Throughout teacher development programming, preservice teachers begin to develop their conceptions and habits as future professionals via immersion through the field experiences (Darling-Hammond, Hammerness, Grossman, Rust, & Shulman, 2005). The culture of stress found in American society and schools makes the study of preservice teacher stress essential in order to work toward breaking the cycle of educator stress. To address the problem of stress in the lives of practicing teachers, researchers and teacher educators must go back to the beginning, the preservice years, with the end goal of effective and resilient practicing teachers in mind (Kyriacou, 2003).

Previous empirical evidence related to agricultural educator stress commonly indicates a moderate level of stress as measured through single time-point self report measures (Anderson, et al., 2012; Lambert, Torres, & Tummons, 2012; Torres, Lawver, & Lambert, 2008, 2009). The phenomenon of preservice agricultural educator stress has been examined scantily. Studies occurred during the time of the student teaching internship and typically with a focus on sources of stress, once again measured through single time-point self report measures (Thieman, Ball, & Kitchel, 2012). A “top down” approach where older, practicing teachers are the focus of studying stress is problematic in that habits of stress management and coping are difficult to alter once they have become embedded.

The body’s response to stressors can become so ingrained into the body chemistry at a cellular and neurological level it nearly becomes an instinctual response when a

particular stressor is encountered (Sapolsky, 2004b; Vrijkotte, van Doornen, & Geus, 2000). Additionally, effective stress management practices are not always innate and often need to be learned and practiced (Kyriacou, 2003; Nagel & Brown, 2003; Sapolsky, 2004b). Through the study of preservice teacher stress habits, teacher educators can become better informed on how to better prepare future teachers for the stress of the position and empower them with effective stress management practices. The use of a practice-based curriculum can be one method of exposing the preservice teachers to stressors common in the profession with the opportunity to provide mentoring and advice on effective stress management.

In a traditional agricultural teacher education program, teaching methods courses with microteaching imbedded in the curriculum provide the first opportunity to observe preservice teachers in the role of teacher (Amobi & Irwin, 2009; Cruickshank et al., 1996). Often, this will be the first time preservice teachers are exposed to completing a lesson from development and planning to teaching and assessment. Microteaching has evolved from its inception of a five- to ten-minute practice of discrete skills to a larger, more inclusive exercise where preservice teachers practice teaching an abbreviated lesson (Amobi & Irwin, 2009; Benton-Kupper, 2001; Phelps, 2006). The preservice teachers develop, plan, and teach a portion of a lesson and then complete a series of reflective activities regarding the completed microteaching lesson. Behavior management can be added to the microteaching experience through providing a simulated classroom environment with peers acting as students (Ball & Forzani, 2009). This additional component can help preservice teachers to further explore and reflect on behavior management practices as they are developing their identity as teachers (Stoughton, 2007).

Through this additional layer, preservice teachers can be exposed more fully to the complexity of teaching at a time prior to student teaching. This opportunity provides teacher educators with one more chance for evaluation and remediation of skill as necessary before the preservice teacher is out in the field with real students.

Initiating the study of stress with preservice teachers will provide a new lens to look at educator stress from the beginning with the neophyte teacher in the time of preservice training. From the teacher educator standpoint, preservice teachers are much more easily accessible in addition to being a relatively captive audience through required course work in comparison to inservice teachers. Additionally, during the preservice years, future teachers are in a development, or “learner’s” mindset as college students rather than the mindset found when they step to the other side of the desk as teachers. This mindset within the context of challenge presented by college-level courses puts preservice teachers in a position to be primed for the introduction and practice of stress management. Empirical evidence suggests inservice teachers to be much less malleable and receptive to professional development, preferring the topic of professional development to be content knowledge driven (Garet, Porter, Desimone, Birman, & Yoon, 2001; Hill, 2009). It is essential that awareness of stress and stress management practices be introduced during the preservice years for internalization and adoption so the preservice teachers will become effective and resilient professionals.

Problem

Agricultural teacher educators are faced with a challenge of preparing their preservice teachers for the reality of the profession that lies in everything that exists outside of content and pedagogical knowledge (Barrick & Garton, 2010; Cruickshank, et al., 1996; Darling-Hammond & Bransford, 2005). Understanding how preservice teachers develop is essential in the process of development, selection, and implementation of teacher preparation curriculum and practices (Cruickshank, et al., 1996). Through the study of preservice teacher struggles and reflection, teacher educators can work toward more developmentally appropriate practice to optimize the limited time students are in the teacher development program. Using measures of physiological stress is a good first step in identifying moments of struggle and increasing reflective awareness related to challenging aspects of the microteaching (Kyriacou, 2003; Lazarus & Folkman, 1984; McCraty & Tomasino, 2004). There is a need to increase reflective awareness of stress in preservice teachers to inform teacher educators how to better help novice educators proactively work to improve in areas where struggle is observed within their teaching practice (Kyriacou, 2003). Understanding how preservice teachers experience stress and how physiological stress can help indicate opportunities of growth where preservice teachers are struggling. This approach could help teacher educators tailor experiences maximizing growth and development in preservice teachers.

Purpose

The purpose of the current study was to use physiological stress as a vehicle to unpack preservice agriculture teacher development during two microteaching lessons in a

teaching methods course. To accomplish this purpose, I utilized a mixed methods approach. I began with physiological measures of stress as a way to identify critical incidences during microteaching that resulted in a stress response within the preservice teacher. Qualitative methods were then utilized to investigate the reflective practices engaged in by the teachers in addition to their cognitive awareness of physiological stress. A triangulation mixed method design was used, a design in which different but complementary data will be collected on the same topic (Creswell & Plano Clark, 2007).

The reason for collecting both quantitative and qualitative data is to bring together the strengths of both forms of research to establish a profile of stress for the teachers that is not solely based on measures of self-report. Several research questions were developed to address the purposes of this study. One quantitative question was developed to establish stress levels through physiological means by using heart rate variability (HRV):

1. *What does a profile of physiological stress (HRV) related to a microteaching experience look like in a preservice teacher?*

In order to further ground the nebulous concept of teacher stress as a phenomenon and further contextualize the quantitative measure of physiological stress, three questions utilizing a mixed methods approach were developed in the convergence of quantitative and qualitative findings:

2. *How do preservice agricultural educators describe their experience of stress related to a microteaching lesson singularly and over time?*
3. *How does the awareness level of stress in preservice teachers compare to actual levels of physiological stress?*

Definitions

Critical Incidences: refers to an interaction or event during the microteaching lesson where an emotional response was triggered within the participant, as indicated by heart rate variability readings and researcher observations of behavioral changes. This is not always a negative or dramatic event, simply one that has significance to the individual (Kain, 2007).

Reflective Awareness: refers to the level of personal perspective that a participant exhibits in reference to his or her own stress levels and behaviors while conducting a microteaching lesson through completing reflection forms and a follow-up interview. This process provides for the possibility of self-directed changes of behaviors and thought patterns (Ridley, 1991).

Preservice Teacher: for this study, is a student enrolled in a teacher preparation program and satisfactorily meeting the benchmarks for each appropriate stage in the program. This term is used to describe students through graduation and certification.

Educator Resilience: “the capacity to adjust to adverse conditions to increase one’s competence, achieve school goals, and remain committed to teaching” (Thieman, et al., 2012, p. 83).

Educator Stress: a negative emotional experience resulting from the perception of the workplace as a threat to personal well-being (Kyriacou, 2000).

Physiological Stress: refers strictly to the physical responses occurring within the body following the detection of a threat (Sapolsky, 2004b).

Stress Response: refers to the chain of events that take place on a physiological level within the human body upon detection of a threat (Sapolsky, 2004b).

Heart Rate Variability (HRV): beat-to-beat variations in heart rate, measured through electrocardiogram (ECG) readings. Characterized by several different frequency bands: Very Low Frequency (VLF), Low Frequency (LF), and High Frequency (HF). VLF is not used for this study due to a lack of accuracy in readings of five minutes or less. LF readings are indicative of sympathetic nervous system activation. HF readings indicate an activation of the parasympathetic nervous system (McCraty & Atkinson, 1996).

Negative Bias: the tendency of the brain to attend deeper and more frequently to perception of potential and existing threats. This is an evolutionary adaptation resulting from the necessity in avoiding negative situations as a stronger threat to survival than positive situations (Hanson & Mendius, 2009).

Acute Stress: refers to an experience of perceived threat that is intense and short-lived (Sapolsky, 2004b). Examples of acute stress would be coming across a snake in your path that then slithers away and an unexpected fire alarm that turns out to be false.

Chronic Stress: refers to an experience of perceived threat that is long lasting (Sapolsky, 2004b). Examples of chronic stress would be the threat of lay-offs in the workplace persisting for months at a time and a consistent lack of support from a key administrator or supervisor.

Assumptions

The most predominant assumption to be acknowledged in this study is that teachers across the range of experience from preservice to those nearing retirement encounter interactions and situations that initiate the stress response. Stress is personal and contextual, based upon previous experiences, especially those involving success or

failure (Lazarus & Folkman, 1984). Another basic assumption of the study is that of negative cognitive bias that is borne out of the survival instinct wherein a large portion of the brain is designated for scanning and surveying the environment for threats. This negative bias predisposes those who are under stress towards an increase in negativity of thoughts and assumptions (Sapolsky, 2004b). In line with the negative bias is the assumption that acute physiological stress can impact cognitive processes and behavior producing undesirable effects within the teaching context.

I am a former secondary agriculture educator, therefore I drew upon my own experiences and those observed of my peers in developing and conducting this study. As a current teacher educator, I examine data through a lens seeking to improve teacher preparation practices. As a researcher, I am also making the assumption that the participants are honest and truthful in their reflections related to the study.

Limitations

As a component of the design of the study, the small population size can be considered a limitation. As such, the findings are not to be generalized and extrapolated to have meaning beyond the population of preservice agricultural educators being studied. In addition, due to the demographics of the teaching cohort studied, participation by males was very limited with only two out of the eight participants being male. Therefore, differences noted between the sexes should be considered accordingly and will not be focused on in the findings.

Another limitation can be found in the quantitative data collection. It was originally intended to collect 12 hours worth of data on the day of the microteaching for each participant. However, due to scheduling restraints of the participants, only six hours

of data could be analyzed as this was the length of time data were present for all participants.

Through anecdotal knowledge, we know that the process of monitoring and evaluating the microteaching lesson could have an impact on the findings in relation to stress levels creating another limitation to the current study. Additionally, when the HRV monitor is attached to the teachers and an iPod touch with regular reminders to update the daily log, an awareness of being monitored is created. Both of these devices can influence stress levels of the participants. Through analysis of heart rate variability, the shortest unit of time that can be accurately analyzed is five minutes. Because of this limitation, the microteaching lesson is analyzed in consecutive five-minute increments starting at the beginning of the lesson.

Chapter 2: Review of Literature

Physiological stress in teachers can impact nearly every aspect of the educational setting in addition to being detrimental to the quality of life and health for the afflicted teacher (Sabanci, 2011). Decades of research on teacher stress have not resulted in a lessening of teacher stress, contrarily teacher stress is increasing with the expanding demands and responsibility placed on teachers and only exacerbated by a dwindling support system. Agricultural educators hold a position where many of these demands are magnified through the added responsibility of the obligations extending beyond the ordinary school day. With agricultural educator attrition continually mounting and a wave of Baby Boomer retirement impending, retention of qualified, effective teachers is vital to the continued success of field of agricultural education (Kantrovich, 2007). In the coming years, it is essential teacher stress be more effectively studied (Kyriacou, 2003). The findings of the study of teacher stress must then be utilized in reform of current practice and programming in teacher education an attempt to move toward a more sustainable model rather than maintaining the current model that appears to be chewing up and spitting out its young.

Stress

In the most basic sense, humans' relationship with stress begins with the dawn of modern man's innate "fight or flight" response in the struggle for survival. When a human realizes a predator is stalking him or her, the physiological stress response is activated, preparing the body for the impending defense mechanisms of either fighting or taking flight. When a threat is perceived, an intricate series of physiological responses are initiated in a domino-like system (Hanson & Mendius, 2009; Sapolsky, 2004b).

The human stress response is a systemic response involving the whole of the organism that is innate and instrumental to survival in human and beast alike. While inborn, it is also a dynamic system in that the triggers for the system are constantly changing and heavily influenced by cognition. In essence, humans learn, unlearn, and relearn the specific instances where the stress response should be activated. For example, if an individual has had only positive interactions with a dog, they are unlikely to have activation of the stress response upon sight of a dog. However, if several negative interactions with dogs should occur, the individual may learn to fear dogs, which could result in an automatic activation of the stress response upon sight or sound of an unfamiliar dog (Sapolsky, 2004b).

The physiology of stress is a chain reaction beginning with a stimulant, also known as a stressful event. The body does not know the difference between a threat of a physical attack and a non life-threatening situation, such as a rumor about layoffs in the workplace. The individual will begin by assessing the situation, then the the brain will determine if a threat is present, and finally the body's stress response is then activated (McCraty, Atkinson, Tiller, Rein, & Watkins, 1995).

The first step of this response system will be the release of chemicals from the hypothalamus, pituitary, and adrenal glands, which will include adrenaline; cortisol which is toxic at high levels, kills neurons, and reduces concentration and decision-making ability; and norepinephrine which triggers negative memory systems. The immune system will be stimulated, preparing for a potential injury. Feedback to the brain will involuntarily activate the sympathetic nervous system causing an increase in blood pressure, the heart to begin racing, blood rushing from digestive system to the muscles

causing tension, dilation of pupils, and more acute hearing (Vrijkotte, et al., 2000). To further prepare for a survival situation, hyper-focus results in tunnel vision to reduce cognitive noise, or thoughts that will detract from the focus of survival. In an acute stress response, recovery will then occur after the threat has passed. This is referred to as the fight-or-flight response (McCraty & Tomasino, 2004; Sapolsky, 2004a, 2004b).

When the threat does not pass, such as when the threat of layoffs in the workplace looms for weeks or months, the stress response then becomes chronic (Delaney & Brodie, 2000). In addition to increased blood pressure and a racing heart, the side effects of a prolonged fight-or-flight response in the body can be observed, including: shallow chest breathing, gastrointestinal upset, muscle tension, hyperventilation and anxiety, agitation, depression, and a change in appetite . Due to the chronic stress response, the body does not have the opportunity to fully recover, leading to a host of illnesses and diseases including heart disease and cancer in addition to exhaustion. Chronic stress in pregnant women has also been found to have negative impact on health, cognitive, and behavioral outcomes of the offspring exposed to the stress *in utero* across the span of the lifetime from lowered birth weight and cranial circumference to increased aggression in adulthood (Matthews & Phillips, 2011; Mulder et al., 2002).

Chronic stress can result in burned out neurons in addition to brain malfunction. There are three main parts of the brain that are affected by stress: the prefrontal cortex, which is responsible for positive and negative emotions; the hippocampus, which controls memory, concentration, and learning; and the amygdala, which is the threat detector and also processor of emotions. As a result, an individual who is stressed will have no problems finding the negative aspects of any situation in addition to potentially having

moments that are “blacked out” while the person might seem totally unaware of their surroundings (McCraty, Atkinson, & Bradley, 2004; Sapolsky, 2004a, 2004b). This negative bias leads humans to respond to and remember events tied to negative emotions more readily than those that were entirely positive. To provide an example, imagine you are a new teacher sitting in a teacher’s in-service, as you scan the room someone casually smiles while making eye contact and then looks away, the next few people have neutral facial expressions and do not make eye contact. As you are leaving the in-service to go back to your room, someone exits the door you are preparing to enter, makes eye contact with you and expresses displeasure on their face. What will be your course of action and thought pattern, which interaction will you remember the longest? Typically it will be the most negative interaction. Fights and altercations have started between strangers over a “dirty look” (Sapolsky, 2004b).

A more recent development in the study of stress is the discovery of a lack of ability of the human body’s systems to differentiate between life-threatening stressors, such as being chased by a predator, and a stressor of a less serious nature, such as concern regarding an upcoming meeting with an administrator or supervisor. The latter is an example of workplace stress, a facet of the phenomenon of stress recently coming under intense focus. Workplace stress, represented by a high imbalance of demand and reward in the workplace, was linked to significantly higher systolic blood pressure (SBP), higher heart rates during work and leisure, and lower heart rate variability (indicated by RMSSD) among white-collar workers (Vrijkotte, et al., 2000).

In an interesting turn in the literature on stress, recent empirical evidence suggests that “worry” concerning events of the past and anticipatory stress related to future events

may be the most significant of daily stress (Brosschot, Van Dijk, & Thayer, 2006). In addition to ambulatory physiological data collected, participants completed activity logs that focused on “worry.” The definition of worry used for the study follows:

Worry is a chain of negative thoughts, about the same or different topics that can have negative consequences for you in the future. A solution is not (yet) reached, and the same thoughts often return. It is difficult to stop when you are thinking these thoughts. They definitely engage you mentally and they are disturbing and intensive. (Brosschot, et al., 2006, p. 41)

In the logs, *worry frequency* and *worry duration* were both addressed, as were frequencies of stressors. This provided for a measure of rumination, where a particular thought continually and habitually reoccurs, as well as a method to measure the amount of time that was spent worrying.

Measurement of Stress

Measurement of stress can be divided into two categories: physiological (measurable) and perception-based. The most commonly used measures of physiological stress when conducting data collection outside of the laboratory setting are hormonal cortisol indicators, galvanic skin response (GSR), and heart rate variability (HRV). Hormonal cortisol indicators can be measured through collection and analysis of cortisol levels in the urine or saliva (Moyal-Albiol, Seranno, & Salvador, 2010). The analysis most often used is of the cortisol awakening response (CAR) where higher levels of cortisol indicate the physiological stress response has been activated. GSR measures the electrodermal activity of electrical fields occurring as a result of change in activation of different brain circuits (van Dooren, de Vries, & Janssen, 2012). To gain a complete view

of stress related to GSR, two devices are needed, one for each side of the body because the electrodermal response varies according to the region of the brain being activated. HRV is a measure of the beat-to-beat variations in heart rate that occur as a result of triggers to the emotional response. The emotional responses measured through HRV range from gratitude and appreciation to anxiety and frustration (McCraty, et al., 1995).

When examining the work of a teacher, one of the main requirements for the measurement of stress in the field is that the device must be able small and discrete with the capability to collect and store data without being tethered to a computer. This allows for free range of movement during data collection in addition to reduced awareness of the device and being studied. Recent technological advances within the last decade have provided such devices to measure both GSR and HRV. Following an analysis of available devices on the market, HRV devices are among the most economical.

In a large review of literature on teacher stress, Kyriacou (2003) indicated the most widespread measure of teacher stress has been self-report questionnaires. These questionnaires varied greatly from single item instrumentation to summated scores examining both frequency and occurrence. Behavioral and physiological indices of mental and physical ill health as well as studies of behavior have also been indicated. Fewer qualitative studies specifically focusing on educator stress are found.

When examining the perception-based measures of stress specifically used among educators, several instruments widely used include burnout inventories, job stress indicators, job satisfaction indices, and factor analyses of perceived stress associated with specific tasks, events, and roles of teachers. Chang (2009) described existing studies on burnout as problematic due to the one-time data collection of researchers operating under

the paradigm that burnout is a terminal end-product. This methodology made it difficult to imply teachers are actually experiencing clinical burnout rather than just temporarily experiencing some of the feelings and symptoms of burnout at the time data were collected. This same reasoning could also be applied to studies on teacher stress, especially within the field of agricultural education, as they are most often consisting of only one data collection point.

When separating studies of stress into the categories of methodology, being based in either physiology or perception, one of the major differences is found in the consistency of the findings. Studies couched within the physiological stress domain are much more consistent, even when comparing across contexts and populations than perception-based studies are found to be within populations, such as agricultural educators (McCraty, et al., 2004).

Educator Stress

When reviewing the literature on educator stress, it becomes apparent there are many conflicting results and an even wider array of opinions related to those results. Much of this conflict can be accounted for when the research methods and populations of the studies are examined and compared. While some characteristics involving responsibilities, duties, and roles can be found to be common across most teachers, more differences can be found from grade level to content area. When the structure of a school district is added into the mix, even within-district comparisons can be difficult; owing to the fact that each building has it's own culture, resources, and administrative structure (Chang, 2009).

Stress, as a phenomenon that is real and present in the lives of educators, has been described by a multitude of studies using many different methodologies across the range of grade levels, content areas, expertise, and years of experience (Ages, 2011; Al-Fudail & Mellar, 2008; Anderson, et al., 2012; Austin, Shah, & Muncer, 2005; Barber, Grawitch, Carson, & Tsouloupas, 2010; Barrick, 1989; Baxter, Stephens, & Thayer-Bacon, 2011; Boone Jr. & Boone, 2010; Lewis, 1999). Conflicting results have been found regarding the effect of stress on attrition and retention rates. One qualitative study of Georgia teachers in a single school district found stress did not appear to influence attrition or retention rates (Ages, 2011).

Much literature exists on the sources and causes of teacher stress. Some studies look at *personal characteristics* as contributors to stress. These characteristics would include emotional states and expression, preferred coping mechanisms, and interpersonal skills (Bauer et al., 2006; Chang, 2009). Other studies examine the *environment as a contributor* to workplace stress. These studies examine everything from resources and support provided to the teachers to organizational leadership and policies. (Austin, et al., 2005; Betoret, 2006; Brunetti, 2001; Byrne, 1998; Margolis & Nagel, 2006b). Yet a third category exists where *pedagogy and content specific skills* come into play to examine workplace specific skills such as technical content knowledge and classroom behavior management proficiency (Al-Fudail & Mellar, 2008; Lecavalier, Leone, & Wiltz, 2006; Lewis, 1999; Liu, 2007).

Personal characteristics.

Chang (2009) conducted a review of literature on teacher burnout and the corresponding unpleasant emotions describing burnout in a teaching career as something

that is a temporary state existing on a dynamic continuum rather than an terminal end-product. A German study found that teachers who indicated either being married or in a relationship to display significantly lower rates of burnout in addition to fewer negative psychological and psychosomatic symptoms associated with stress and burnout (Bauer, et al., 2006).

Environment as a contributor.

It is important to understand what the sources of joy and satisfaction are for a teacher in order to complete the concept of teacher stress. When the sources of joy and satisfaction become compromised, overall job satisfaction for teachers will be reduced. An often-cited piece in teacher education examined the job satisfaction of 169 teachers from California (Brunetti, 2001). The primary source of satisfaction and motivation for the California teachers was found to be the students. In particular, teachers indicated that seeing the young people they worked with learn and grow was a very rewarding experience. Students who were problematic and found unexpected success and disappointment in student failure were cited as key motivators for the teachers. Among the more significant factors additionally listed as key motivators included: passion for content, autonomy, collegiality, and significance to society. Teachers also listed some more practical motivators including: job security, salary/benefits, a schedule that provided benefits when raising a family, and the holidays afforded.

A quantitative study of teachers from two different schools and teaching a variety of grades and courses classified the sources of teacher stress into three distinct categories (Austin, et al., 2005). The first category is work-related stress and includes such things as an excessive caseload, administration, preparation, parental involvement, and the amount

of time spent working outside of the school day. The second category included time management, discipline, and motivation. The third category was professional distress and professional investment.

The teacher-administrator relationship often crops up when examining teacher stress and burnout. This relationship, when tenuous and/or volatile, appears to have heavy bearing on the stress and job satisfaction of teachers. A study of 138 teachers in a New York high school and community college found teachers not in agreement that salary, fear, and lack of parental concern as the main sources of their stress (Byrne, 1998). Rather, they indicated that problems with administrators from the aspects of personality conflicts and a perception that the administration was not fulfilling duties related to the allocation and distribution of materials and services. Perceived disregard from the administrators was identified as the single, greatest contributor to burnout. Along the same vein, a large quantitative study ($n = 247$) from Spain found that burnout occurred when a teacher's practice was interfered with or impeded by: excessive workload and lack of rewards, administrative guidelines, negative relationships with other teachers, and a classroom lacking resources (Betoret, 2006). In an examination of education reform and the role of administrators in mediating teacher stress, researchers reaffirmed the significance of administrators in molding either a positive, reaffirming environment or one that is undermining and debilitating to teacher work (Margolis & Nagel, 2006a).

Pedagogy and content specific skills.

Fewer studies have focused on a specific duty or role of a teacher and the presence of stress. One study used mixed methods to examine galvanic skin response of

teachers while using technology in the classroom (Al-Fudail & Mellar, 2008). The term “technostress” was coined to describe the stress associated with the use of technology, the study even examined the type of coping mechanisms that the teachers used when confronted with technological problems.

Handling behavioral problems of students is consistently cited as a source of teacher and caregiver stress. An analysis of a large national database from the Teacher Follow-Up Survey of former teachers asked participants were to indicate one item from a list as the most effective strategy for increasing teacher retention (Liu, 2007). Dealing more effectively with student discipline and making schools safer ranked second in the top strategies schools could implement to keep teachers in the profession. In a study focusing on how Australian teachers cope with the stress of classroom discipline ($n = 294$) a causal relationship was found to exist between teacher isolation and increased levels of teacher stress and burnout (Lewis, 1999). The researcher surmised that discipline-induced stress was aggravated by the isolation as a function of the teacher not seeking help and reaching out to others. These studies indicate the significance of efficacy in behavior management of students as being an essential component to teacher retention and effectiveness.

Agricultural Educator Stress

In the agricultural educator, stress has most often been examined in the context of job satisfaction or as a precursor to burnout. Studies in the field of agricultural education repeatedly find teachers are satisfied with their jobs (Barrick, 1989; Cano & Miller, 1992; Chenevey, et al., 2008; Kitchel et al., 2012; Walker, Garton, & Kitchel, 2004). In regards to burnout, the literature varies greatly especially when scrutinizing the levels of burnout

within and among specific constructs of burnout rather than the overall burnout levels. One consistency among the studies is that no levels of burnout have been indicated that exceed the moderate level on any single construct or overall burnout scores. In a recent study examining teacher job satisfaction and burnout within the context of social comparisons of almost 383 high school agriculture teachers from six states in different regions across the country, the construct of emotional exhaustion was found to reach moderate levels, with depersonalization and personal accomplishment both being low (Kitchel, et al., 2012).

One of the early studies of burnout and job satisfaction in the field comes from 1989 (Barrick) in a census ($N = 202$) of Ohio agricultural educators. The majority (59%) of the teachers were very satisfied with their job and 94% of the teachers indicated medium to low levels of occupational stress. Role overload and scope were the largest contributors to occupational stress. However, the combination of the medium and low categories of occupational stress is troubling in that, as previously established, stress is not a beneficial experience when one is being exposed to it on a regular basis, as is the case with workplace stress. This study also found teachers experiencing moderate to high levels of burnout, which is characterized, by high levels of emotional exhaustion and depersonalization and low levels of personal accomplishment. Personal accomplishment was found to have a particularly significant effect on the teachers with being positively correlated with job satisfaction and negatively correlated with stress and also strain.

When examining the stress of beginning Missouri agricultural educators, workplace stress and was found to be low overall, with some teachers crossing the threshold to distress (Lambert, et al., 2012). Researchers from the previous study

significantly noted a correlation between higher self-confidence and time management and lower stress levels. In another study, sex had an impact on exactly what duties and roles associated with the position become stressors among student teachers (Anderson, et al., 2012). In the quantitative study, females were found to have many more stressors related to administrative duties in addition to balancing work, student needs, and their personal lives. Preservice teachers also indicated more tasks as causing stress across the board, at seven. Males were found to struggle with tasks involving paperwork and clerical duties and only indicated three duties as being in the high stress category. A qualitative study focusing on female agricultural educators found that women felt they constantly had to prove their qualifications and cope with various forms of sexism within the profession in addition to perceived higher stress levels from balancing a family and personal life with their commitment to their job (Baxter, et al., 2011).

Contradictorily, Cano and Miller (1992) found men and women did not vary in overall job satisfaction scores. However, a significant correlation existed between overall job satisfaction and tenure status in women, with tenured teachers indicating they were more satisfied with their job than non-tenured teachers. Other demographic variables such as age, years in current position, total years of experience, and degree status had no significance on overall job satisfaction.

The teacher preparation program can have an influence on how student teachers experience stress. One study comparing teachers from the University of Kentucky and Oklahoma State University found students from each institution indicated very different duties as causing high stress (Anderson, et al., 2012). Mentoring and formal induction programs within agricultural education are currently being examined from the angle of

reducing attrition rates among neophyte teachers. A quantitative study of a Minnesota beginning teacher induction program examined the nature and impact of teaching events and beginning teacher assistance on the new teacher (Joerger & Boettcher, 2000). The study described three forms of assistance as having the highest impact on the teachers: students' parental support for the program; adequate provisions for classroom/laboratory materials and textbooks; and before school planning time. Six events were found to have critical impact and also to be occurring often in frequency: feeling in control of the program; support from direct-report administrator; experiencing satisfaction upon success of an activity; actions of students reflecting respect; and seeing students succeed in class.

An integral component to increasing the quality of education for students and quality of life of teachers is a better understanding of educator stress by all individuals vested in the preparation and development of teachers (Margolis & Nagel, 2006a). Following an extensive review of literature, Kyriacou (2003) describes the impact of teacher-student interactions and classroom climate in a particularly powerful statement, "Teacher stress can undermine teachers' feelings of goodwill towards pupils and lead teachers to overact with hostility towards pupils producing poor work or misbehaving." Adding another layer to the imperative nature of the study of teacher stress is the negative impact teacher stress has on overall organizational health of the school environment (Sabanci, 2011). Integration of stress management across the span of the teacher development curriculum would be a major step in moving towards producing teacher candidates well-adept at handling the stressors presented by the profession of teaching in addition to the curve balls life outside of the classroom can throw (Harris, 2011; Soloway, 2011)

For teacher education programs, the importance of a clear vision of teaching and learning with integration of discrete skills and concepts across the curricula rather than in segregated courses cannot be emphasized enough. This vision and integration is backed by much empirical evidence in the production of desirable outcomes in novice teachers (Barrick & Garton, 2010; Darling-Hammond, et al., 2005). The literature is also very clear contextual experiences involving application are vital to the development of preservice teachers. These experiences can be provided for through early field experience, microteaching experiences, and the student teaching internship and are essential in the sense-making process of the theoretically and conceptually-based coursework of teacher development programs (Darling-Hammond, et al., 2005). These findings do not mean that the preservice teachers must always be situated in the natural classroom, rather authentic materials should be used as often as possible. These authentic materials can range from curriculum materials and text books to audio/video recordings of natural classrooms (Darling-Hammond, et al., 2005; Hammerness et al., 2005). Authenticity of both materials and experiences is of utmost importance in providing a rigorous teacher development program; however, authenticity cannot be substituted for a well-coordinated teacher development program with follow-through and a common voice threaded through all aspects of the program.

Microteaching

Microteaching was formally developed at Stanford University in the 1960s to provide preservice teachers with a practical laboratory experience to practice distinct skills and dispositions necessary in the profession of teaching (Cruickshank, et al., 1996). In the early stages of use, microteaching was used to teach discrete skills through

modeling of an instructor and repetitive practice with the end goal being proficiency of a very specific skill set. The practice of microteaching has evolved over time to its most common form today as a more global experience requiring teachers to practice a scaled down version of developing and implementing a full lesson closely akin to a simulation (Amobi & Irwin, 2009). Early microteaching required preservice teachers to teach for shorter periods of time ranging from five to ten minutes in length. Some teacher educators have modified microteaching to be simply abbreviated lessons with multiple skill sets included. Longer time periods for the experience can allow some teachers to experience “flow” and all of the positive aspects involved as a result of reaching this state. “Flow” is a state of mind in which cognitive functioning reaches a synergistic place changing drive for a task to that of doing for the sake of doing, often used in describing athletic performance. Csikszentmihalyi’s model of flow has been applied to the teaching context with empirical evidence suggesting significance to the profession. Effective, award-winning teachers have been found to exhibit flow more frequently than others in addition to increased positive student outcomes resulting when a teacher achieved flow (Gunderson, 2003). Modern microteaching experiences provide practice in the art of teaching in addition to a low-risk environment for the budding teacher to grow through reflection on mistakes (Amobi, 2005). Microteaching involves the preservice teacher as an actor allowing them to immerse themselves in the role of “educator” (Cruickshank, et al., 1996). Through microteaching the preservice teacher can practice the role of educator in a supportive and constructive environment.

Theoretically, microteaching can be rooted in performance theory involving somewhat scripted elements layered with performances of the everyday self (Bell, 2007;

Goffman, 1959). The act of teaching in the traditional context has an emphasis on the oral component as well as physical presence, lending it to the application of performance theory (Bell, 2007; Goffman, 1959; Morgan-Fleming, 1999; Pineau, 1994). When in the microteaching context, the theatrical performance aspects of the experience are often demonstrated through student-reported rehearsal in preparation and the act of “getting into character.” As preservice teachers prepare for the onset of their microteaching performance, they can often be seen stepping to the front of the room, arranging materials, and shuffling papers. Following seeking the instructor’s approval to start the lesson, the preservice teachers often display a straightening of posture (Bell, 2007). As preservice teachers take to the stage that is the clinical laboratory where microteaching is staged, they are beginning to develop their own character, or personal identity as a teacher.

Performance theory places stress upon development of self-identity when applied to the context of the preservice teacher. Empirical evidence indicates that microteaching as performances can aid in the development of the professional identity (Bell, 2007). Researchers and teacher educators applying performance theory to their practice have called for a modification in the focus of teacher education from that of the products of teaching to the actual enactment of teaching (Bell, 2007; Morgan-Fleming, 1999; Pineau, 1994). Microteaching can be a stressful experience for the preservice teachers, as it usually an evaluated, complex task with many moving pieces. Through emphasizing the performance aspect of the task, teacher educators can reduce the anxiety around the situation because performance is often linked with play, which is typically viewed as enjoyable (Bell, 2007). Emphasis on the performance aspect of microteaching is also

indicated to help reduce the difficulty in critiquing oneself based on the audio/video replay of the performance by increasing the emotional distance from the self (Bell, 2007). Teacher educators can help preservice teachers gain more from the microteaching experience by helping to reduce the stress and anxiety surrounding the experience by focusing on the performance of an actor as opposed to the self.

Microteaching has been described as “a highly complex, layered (laminated) task for the participant” (Bell, 2007, p. 37). Microteaching is a practice implemented in a variety of ways, varying among teacher development programs that utilize it. The practice of microteaching has been extensively studied in teacher education with research being grouped into three categories: the duality of benefits achieved through practice and reflection; examination of use to counter or evaluate effectiveness of other practices; and comparing the effectiveness across variations of the practice (Amobi & Irwin, 2009). By its very nature, microteaching integrates reflective practices and is used in concert with other practices of authenticity making such comparisons difficult. To add more complexity to the practice, microteaching is a mercurial and dynamic practice requiring constant tweaking and changing to fit unique contexts of varying teacher education programs and institutions.

Today’s microteaching typically includes scaled-down versions of a lesson taught to a group of peers; audio/video recording of the lesson as presented; and peer/instructor feedback. Following the lesson, preservice teachers are typically asked to use the recording to complete a guided self-reflection and evaluation of performance (Amobi & Irwin, 2009). Feedback and audio/video recording of the microteaching lesson are two components that have been added to the original concept of microteaching, and are now

indicated as critical components (Amobi & Irwin, 2009). The use of audio/video recordings to guide self-reflection and feedback sessions in experimental studies has been found to result in marked improvement in teaching performance while microteaching (Kpanga, 2001). Through the use of technology, the reflective component of microteaching has been elevated from both the side of the self and that of the teacher educator through providing a viewable record for recall and discussion.

For over 20 years preservice teachers have considered the microteaching experience to be beneficial for development (Amobi, 2005; Benton-Kupper, 2001; Metcalf, 1993; Mills, 1991). Microteaching in the clinical laboratory setting in teacher education is a necessary experience in the sequence of authentic experience in the development of effective teachers (Amobi & Irwin, 2009; Benton-Kupper, 2001; Pultorak, 1996). Teacher educators must acknowledge preservice teachers enter teacher development programs with 14 years as a student in addition to accumulated life experiences leading to accumulated preconceived ideas about teaching and learning (Amobi & Irwin, 2009; Korthagen & Kessels, 1999). Through microteaching, teacher educators have the opportunity to correct miseducative or dissonance-inducing experiences that may have culminated through early field experiences and outside coursework (Amobi & Irwin, 2009).

The necessity of microteaching in the teacher development program goes beyond the element of practice and extends to providing an opportune environment for reflection. While in the natural classroom for early field experiences and the student teaching internship, reflection of the in-action nature becomes especially difficult as neophyte teachers are struggling with lack of experience leading toward deficits in skills in

addition to the added dynamic of real-world consequences related to the students (Amobi & Irwin, 2009).

There are specific components of teacher development programs that can lend themselves particularly to the inclusion of reflective exercises, including the student teaching internship, early field experiences, and the clinical teaching laboratory component of methods courses. For teacher reflectivity to be properly developed, the practice must be fostered by teacher educators on-campus in a constructive and supportive environment, such as the microteaching experience (Amobi & Irwin, 2009). The addition of reflection to these components of the teacher development program in a rigorous and empirically-based manner can help preservice teachers transition into professionals who continue to grow and improve through independent reflective practice (Amobi, 2005; Amobi & Irwin, 2009; Burrows, 2012; Rivera & Dann, 2011).

Reflection

From the time Dewey first applied reflection to the practice of teaching in 1933, both teachers and teacher educators have taken much creative license in the definition and application of the practice (Amobi, 2006; Dewey, 1933; Griffiths, 2000). Amobi defines teacher reflection as “framing (sequencing) a teaching action or experience to uncover the Gestalts and meanings of the situation, and reframing the consequences of the action to develop schema and theories of engagement for other teaching situations” (Amobi, 2006, p. 29). This definition indicates a preservice teacher as both consumer and constructor of his or her cognition of and about the profession of teaching. The preservice teacher is undergoing a process of learning the significant theoretical and conceptual components of teaching in addition to beginning to develop their identity as a teacher

with the expectation of becoming a full-fledged teacher upon completion of the degree program with certification (Stoughton, 2007). The larger view of reflection within teacher education is a facilitator of a process linking the epistemic (empirically-based knowledge) with the phronetic (procedural/perception-based knowledge) (Amobi, 2006).

The use of reflection, and more importantly the research and information available regarding reflection within teacher education, is not without its criticisms from researchers and teacher educators alike. Four main biases have been noted in articles available on reflection in teacher education (Marcos, Sanches, & Tillema, 2011). The first bias is an emphasis on the declarative “what” rather than “how to” informing readers of the conceptual attributes rather than the mechanics of how to facilitate reflection. The second bias consists of basing the information provided to teachers regarding reflection more in the author/researcher beliefs rather than empirical evidence. The third bias includes the “white washing” of reflection in providing mostly discussion of ideal cases rather than the pitfalls and obstacles that may occur. The fourth bias is promotion of the practice of reflection with authors using language such as “teachers should” (Marcos, et al., 2011). Awareness of these biases as they are consuming related literature when considering implementation of or changes to the use of reflection is essential. Seeking out empirically evidenced-based reflective practices is essential for teacher educators to provide students and teachers with accurate information in the construction of their reflective practice (Hammerness, et al., 2005; Marcos, et al., 2011)

Schon (1987) describes reflective practices of educators as falling within two categories. One category is *in action*, where the teacher is reflecting on events as they happen and the other being *on action*, where reflection is removed from the event,

occurring at a later time. Reflection in action leads to a teacher who is “actively engaged, and has a vital part in shaping, interpreting and changing situations” (Griffiths, 2000; Schon, 1987). Reflecting on action can be particularly beneficial in the continued growth of a teacher, as teachers develop a plan for action in the future based on the results and outcomes of the reflected upon processes and actions moving reflection to the transformative (Ball & Forzani, 2009; Griffiths, 2000; Schon, 1987).

When examining the actions and interactions of a teacher with others in the classroom and school, there are always components that are manifestations of “thinking like a teacher” or unconscious decision-making, of which one may be personally unaware. Surfacing these teacher thought processes that may not be given much heed makes reflection an integral component in the process of working towards best practices to being an effective educator (Amobi, 2005). Reflection on teacher thought process will address the need for preservice and in-service teachers to work toward development of a deeper understanding and more global view of the dynamics of the classroom (Mintz, 2007; Romano, 2005). Linking reflection on behavior of students with that of the actions and decisions of the teacher is necessary to help preservice teachers understand the interrelated nature of pedagogy, lesson planning, and the behavior of students (Darling-Hammond, et al., 2005)

Amobi (2005) developed a framework for analyzing reflectivity of preservice teachers on a microteaching experience containing four stages of reflectivity with multiple dimensions in each stage. The first stage is *Describe*, wherein preservice teachers narrate components of the microteaching experiences with the dimensions of detailing the teaching model, establishing content, description of learning outcomes, and

identification of instructional procedures. A pattern of omission in describing-type reflectivity related to a microteaching lesson is an indicator of the trend in preservice and inservice teachers to emphasize the observable actions in teaching while putting aside cognitive processes preceding the actions of teaching (Amobi, 2005). The second stage is *Inform*, where the events of the lesson are reviewed, a positive perception of performance is expressed, and recollection of previous microteaching are components. The third stage is that of *Confront* where a preservice teacher could display passive, defensive, affirmative, or self-critique dispositions. In this stage, the preservice teacher acknowledges unproductive actions, even if in a passive manner. The teacher can be attempting to defend, support, or be critical of a particular action. The final stage is *Reconstruct*, wherein preservice teachers can indicate complete satisfaction with performance with no reconstruction needed, implicit reconstruction where problems were identified with no plausible alternatives indicated, or explicit reconstructing where microteaching was viewed as real teaching and probable solutions were suggested to problems (Amobi, 2005).

This framing of reflection further underscores the importance of the current study in examining the interrelatedness of stress, cognitive processes, and behavior through physiological indicators. Through these descriptions of preservice teacher reflection, the spectrum of reflective ability it evident, some individuals may need more concrete examples to prompt reflection, while others are more well-adept at reflection. The current study can provide a different perspective on preservice teacher reflective practices by examining them through a different lens. Through the use of less subjective measures, such as physiological stress, the teacher educator can help the preservice teacher move

into higher levels of reflection, such as self-critique and posing effective alternatives to ineffective methods (Davis, 2006).

Within agricultural education, researchers have encouraged teacher educators to implement reflective practice throughout the teacher development program (Rivera & Dann, 2011). Critical reflection was encouraged through inclusion of readings on the topic and implementation of an action research project. Researchers indicated changes in teaching methods used by some of the student teachers were based on their personal reflections, leading to more effective teaching. Reflection was indicated as a cornerstone of the critical thinking process in the educator that leads towards effective problem solving and continuous improvement in practice (Rivera & Dann, 2011).

There is a need in teacher education to better understand the reflective processes of preservice teachers to move them toward more desirable types of reflection such as explicit reconstruction wherein an improvement in practice will be realized (Amobi, 2005). Facilitation of reflection for preservice teachers presents certain challenges and certain dispositions and practices should be adopted by facilitators to maximize the benefits of the experience. Preservice teachers face a large challenge as they transition mindsets from student to teacher. One of the greatest challenges as a facilitator of reflection is to encourage discovery and inquiry of the self in a manner that prevents opposition or shutting down (Davis, 2006). Reflection in the preservice teacher should not be viewed as a concrete, terminal skill by the teacher educator, rather the disposition should be towards that of development and internalization of the value of reflection across the tenure of teaching (Amobi, 2005; Amobi & Irwin, 2009; Burrows, 2012; Stoughton, 2007). Preservice teachers may need more concrete direction from teacher

educators facilitating reflection by explicit direction regarding the issues to address in the reflection (Davis, 2006; Romano, 2005; Schmidt, 2010). The neophyte teacher has been observed to focus more on themselves as teachers as opposed to the learners in reflections. However, when exposed to a teacher development program with a learner-centered focus preservice teachers are found to shift their reflection toward the direction of the learners (Davis, 2006). Preservice teachers should be provided with many authentic opportunities from early field experiences to microteaching and also asked to reflect upon these experiences (Romano, 2005; Schmidt, 2010)

Summary

Teacher development programs have an enormous charge in preparing future teachers for the classroom in a manner promoting resilience and the cultivation of reflective practitioners. Microteaching experiences with explicit in- and on-action reflective components can be one avenue of promoting proper coping mechanisms and reflectivity in preservice teachers. The vast majority of the empirical evidence regarding educator stress has been gleaned from measures of self-report questionnaires and measures of mental and physical health including burnout inventories. The literature base on educator, and more specifically agricultural educator stress has been described as “voluminous”. However, this research has not translated into a reduction of educator stress. In fact, quite the opposite is true; educators across the board are now exhibiting signs of stress and burnout more than ever. This is evidenced by the high attrition rates, with approximately fifty percent of America’s novice teachers closing the classroom door behind them for the last time within the first five years of their career.

Approaches centering on stress management and resilience need to be utilized and

developed for use in teacher education. Through the integration of stress management and resilience practices, teacher educators can work toward alleviating stress and burnout related issues in the individual teachers and system of education as a whole. This study will help in the advancement of teacher development in the field of agricultural education by examining an old problem with a new approach. Through examination of preservice teacher stress with physiological stress indicators and reflective awareness, teacher educators are provided with a basis from which to begin integration of stress management practices and resilience into their curriculum.

Chapter 3: Methodology

This mixed methods study addressed physiological stress and reflective awareness in preservice agricultural education students at the University of Missouri. The rationale for utilizing a mixed methods approach focused on a need to delve deeper into the phenomenon of teacher stress than would be permitted through the exclusive use of either quantitative or qualitative ideologies. The methodology for this study was developed and refined through a pilot study completed a year prior to the current data collection. The cohort of preservice teachers participating in the senior teaching methods course exactly a year ahead of the currently observed group was observed for the pilot study.

A convergent triangulation mixed method design was used, a design in which different but complementary data will be collected on the same topic (Creswell & Plano Clark, 2007). In this study, qualitative data gathered included qualitative reflections, activity logs, field notes, and interviews that explored reflective awareness of physiological stress for preservice agricultural educators in a senior teaching methods

course at the University of Missouri while conducting two microteaching lessons.

Concurrent with this data collection, quantitative physiological stress data in the form of heart rate variability will identify critical incidences, as indicated by increased heart rate variability and/or observed behavioral changes, that induce the stress response to determine the most common triggers for preservice teachers while teaching. The reason for collecting both quantitative and qualitative data is to bring together the strengths of both forms of research to establish a profile of stress for the teachers that is not solely based on measures of self-report (Kyriacou, 2003).

When writing about a mixed methods study, appropriate procedures must be followed in conducting and reporting each data type (Creswell & Plano Clark, 2007). Research questions were divided into quantitative, qualitative, and mixed methods to further ensure the integrity of each theoretical approach to research methodology. Therefore, in this dissertation, an impersonal voice will be used when describing and reporting on quantitative procedures and data. For reports related to the mixed methods research questions, a personal voice will prevail due to the emphasis on the qualitative findings.

Several research questions were developed to address the purposes of this study. One quantitative question was developed to establish stress levels through physiological means by using heart rate variability (HRV):

1. *What does a profile of physiological stress (HRV) related to a microteaching experience look like in a preservice teacher?*

In order to further ground the concept of teacher stress as a phenomenon and further contextualize the quantitative measure of physiological stress, two questions utilizing a

mixed methods approach were developed in the convergence of quantitative and qualitative findings:

2. *How do preservice agricultural educators reflect on their experience of stress related to a microteaching lesson singularly and over time?*
3. *How does the reflective awareness level of stress in preservice teachers compare to actual levels of physiological stress?*

Research Design

This mixed methods convergent triangulation study consisted of three different sequential phases of data analysis. The entire process was replicated for the third (Microteaching 1) and fourth (Microteaching 2) laboratory-based microteaching experiences of the preservice teachers and summated with a final interpretation of the mixed methods data collected. Figure 1 graphically represents the data collection and analysis process:

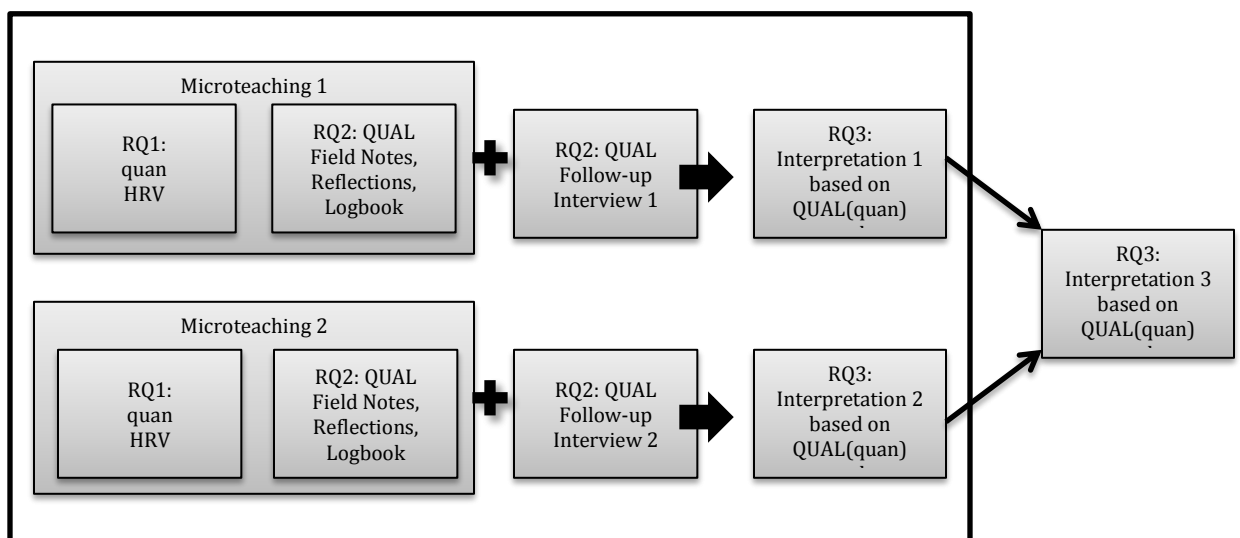


Figure 1. Graphic representation of data collection and analysis process.

Following is a general description of the process of the data collection and analysis. All data sources and analysis procedures will be further detailed later in the methodology section. The first phase was a concurrent data collection process, wherein quantitative data (HRV) was collected simultaneously, analyzed, and combined with qualitative data (researcher field notes, pre- and post-reflections, and activity logbook) collected during the period in which the HRV monitor was in place. This is represented in Figure 1 by the shaded box surrounding the forms of data collected, indicating data collection occurred concurrently while the teacher was conducting the microteaching lesson. Initial reflections were developed on each individual case and an individual profile of educator stress was developed. In an intermediate step, I used these reflections to add additional clarifying queries to the semi-structured follow-up interview protocol. Profiles of stress were color-coded and grouped according to color to compose homogenous groups according to stress levels. In the second phase, a follow-up interview focused on the interpretation of the data that had been collected was analyzed to corroborate quantitative and qualitative results. I then combined and interpreted the data sources surrounding each microteaching lesson (Microteaching 1 and Microteaching 2). These interpretations were combined for further analysis and interpreted in a final convergent step, a key component in a convergent triangulation design (Creswell & Plano Clark, 2007).

Data collection was conducted through a concurrent process. In a concurrent data collection, the quantitative and qualitative data are collected during the same time frame and are independent of each other (Creswell & Plano Clark, 2007). The concurrent design for this study is also demonstrated in Figure 1. For the current study, qualitative and

quantitative findings were not given equal weight as an emphasis is placed on the qualitative findings. In Figure 1, qualitative findings were weighted more heavily, demonstrated by an abbreviation for qualitative (QUAL) in capital letters; the de-emphasis of the quantitative (quan) is portrayed through the lower case abbreviation.

Initial data collected included: HRV recordings, time-stamped log of events and feelings experienced, pre- and post-reflections with reflection prompts, digital audio/video recordings of the microteaching lesson, and researcher field notes from microteaching lessons regarding classroom activity and observations of teacher demeanor/behavior. Following collection, HRV recordings were divided into several different time segments and analyzed. The profiles were grouped according to overall mean stress levels with low, medium, and high groups naturally emerging from this population. The groups were each color-coded, with low being blue, medium being orange, and high being red for use in the development of themes from the coded qualitative data.

The activity log entries, reflections, and field notes were overlaid and the HRV analyses embedded within to create a profile of stress for each teacher. The profile of stress was then utilized to develop the interview protocol for the one-on-one interview used for follow-up. Semi-structured interview questions were developed for each teacher on an individual basis. The questions were developed to probe awareness regarding stress levels, personal symptoms of stress, and further examine the relationship between individual reflective processes and stress levels.

Within a week of completion of the microteaching experience, I followed up with one-on-one interviews using the protocol based upon the profiles created following the

initial data collection. During the interview, digital audio/video recordings of the teacher's microteaching lesson were available to replay for stimulated recall enhancing participant recall of specific instances. Following questions regarding awareness, the HRV analyses were shown to the teacher and the findings explained. To further delve into the teacher's reflective process and stress awareness, I initiated a dialog about the findings. Audio recordings of the follow-up interviews were transcribed. I then brought together and analyzed all data sources surrounding each individual microteaching lesson for Interpretation 1 and Interpretation 2. In a final, convergent step, both of the interpretations were combined and analyzed to create Interpretation 3.

Participants

Preservice agricultural educators enrolled in their final semester prior to leaving the University of Missouri campus for their student teaching experience were selected for this study for several reasons. Teachers at this stage were chosen as a logical starting point for a linear research agenda examining teacher stress and resilience across the continuum of experience. This research agenda will begin with preservice teachers and move towards an understanding of novice teacher stress followed by an examination of the stress occurring in more seasoned veterans of the profession. Through starting with the preservice teachers, a longitudinal study can also begin as they are followed throughout their first years of classroom teaching. In addition, the study of a cohort of teachers enrolled in the same course and conducting lessons in the same laboratory setting controlled for some variance due to extraneous variables resulting from different school environments.

As a component of the senior-level teaching methods course (see Appendix A for the course syllabus) preservice teachers are asked to complete a total of four microteaching lessons in the laboratory and one microteaching lesson at the site where they will be student teaching the following semester. For the specific context of the current study, the concept of microteaching has been altered from its original conception described by Gage (1978) where preservice teachers conducted lessons that were discrete and skill-specific for five to ten minutes. The laboratory setting where the microteaching took place for this study was a simulation of a high school classroom with peers being assigned specific characters to role-play. This feature allowed for the necessity of the preservice teacher to practice and begin developing their skills of behavior management. For the current study, the preservice teachers plan an entire lesson, submit the lesson plan, and teach 35 minutes of the lesson while peers in the laboratory act out character roles simulating a high school classroom environment. Within a week of completion of the microteaching lesson, the preservice teacher will have a 30-minute one-on-one meeting with the instructor of the laboratory section to reflect on performance during the lesson in addition to performance within the character roles.

To increase transferability, a purposive sample was taken to represent the two laboratory groups ($N = 18$) from the Fall 2012 Agricultural Education Teaching Methods course at the University of Missouri. In interest of obtaining a more homogenous sample representative of the typical agricultural education student with teacher certification option, students were eliminated from the sample population if they were demographic outliers. Criterion for elimination included having children and/or being married. Students not entering the University of Missouri as an Agricultural Education major were

also eliminated, thus removing transfer students from the sample. Participants from the remaining pool ($n = 16$) were examined with input from the instructor of the teaching methods course to select those demonstrating average to slightly above average proficiency in the lab practicum skills related to pedagogy. The cohort had only three males, causing the sample to be disproportionate with more females than males selected (Female: $n = 8$; Male: $n = 2$) for a total of ten ($n = 10$) participants. Participants received an incentive of a gift card in the amount of \$10 upon each return of the BodyGuard and iPod Touch to a researcher at the end of the day of data collection.

Quantitative Data Collection

Physiological stress data were collected through the use of a wireless device commonly used to measure heart rate variability (HRV) in athletes. As previously indicated, a pilot study was completed a year prior to the current study to develop and refine methodology. During the pilot study, researcher familiarization with procedures necessary for proper functioning of the equipment used to measure physiological stress for this study was established.

Two disposable ECG electrodes (Ambu White Sensors) containing conductive gel were placed anteriorly below the right collar bone and on the left ribcage of the participant and attached to the device, recommended by researchers at the Institute of HeartMath. The device used in this study (BodyGuard) is extremely lightweight, small in size, and easily concealed beneath clothing. To control for error from improper placement of electrodes, participants were to ensure that excess body hair was removed from the attachment points 24 hours prior to placement. The attachment points were scrubbed with alcohol; a trained researcher attached electrodes and device a minimum of five hours

prior to onset of microteaching lesson. The HRV recording device was removed a minimum of two hours following completion of microteaching lesson by a researcher. Data were then be uploaded to a computer from the device.

Quantitative Data Analysis

Following cleaning to remove “noise” within the numerical coding of the data (any number exceeding 3 digits) resulting from jostling of the device, the data were analyzed using an HRV analysis software package. The ratio between Low Frequency (sympathetic activity, an involuntary physical response to stimulant) and High Frequency (parasympathetic activity, voluntary response to counteract sympathetic response) power was the LF/HF ratio that was calculated and used to evaluate stress levels of the preservice teachers. This ratio was normalized using a natural logarithm to control for skewness resulting from the absolute power spectrum values and root mean square of successive differences between the normal heart beats (RMS-SD). The smallest increment of time which can be accurately analyzed is five minutes. A high number is indicative of increased sympathetic activity or reduced parasympathetic nervous system activity, which in turn is an indication of physiological stress (McCraty & Atkinson, 1996). Time periods analyzed included: a) entire time device was worn, b) 30 minutes prior to microteaching, c) 30 minutes of microteaching, d) 30 minutes following microteaching, e) each five minute segment of microteaching, and f) each hourly segment of the time the device was worn for a total of 15 segments to be analyzed.

To answer the first and only quantitative research question: *What does a profile of physiological stress (HRV) related to a microteaching experience look like in a*

preservice teacher? The data collected using the BodyGuard will be represented in the results section through charts and tables comparing stress profile cohorts of heart rate variability values (Ln LF/HF) to measures of central tendencies of the group.

Qualitative Data Collection

Using several sources of qualitative data collected concurrently ensured the integrity and rigor of the study through the process of triangulation. Through using concurrent data collection and sequential design, the emergent and dynamic character of qualitative research was maintained (Merriam, 2009). Four qualitative data sources were collected in pursuit of building a deep contextual base for the study of educator stress. These sources include: activity logs, post-reflections, follow-up interview, and researcher field notes. All data were collected for both the first and last microteaching lesson for each participant.

In the pilot study, I was not present in the classroom for the microteaching lesson, instead relying on the audio/video recordings of the microteaching lesson to evaluate critical incidences prior to the follow-up interview. This proved problematic, as the quality of the recording was not sufficient from both the audio and video perspectives for an accurate and in-depth analysis. Also confounding was the failure or malfunction of equipment resulting in certain participants not having a video for stimulated recall during the follow-up interview. In addition, with the configuration of the classroom in which the microteaching lesson takes place, capturing all members of the classroom on video at all times is not possible.

Activity log.

While wearing the HRV monitor, participants used a diary-type application on the iPod touch to keep a log tracking events and noticeable emotions throughout the day. At the time of BodyGuard attachment, I provided participants with a brief tutorial instructing them how to properly complete log entries. I then had the participant enter the first log indicating initiation of recording by the HRV monitor to demonstrate understanding of the application. Previously, I had programmed the iPod Touch with hourly reminders (\pm five minutes) to ensure that participants were maintaining their logs. A series of closed ended prompts related to posture, substance (tobacco, caffeine, alcohol) use, worry, and stress, were displayed at the reminders, with selected open-ended prompts to allow for input to further explain the closed-ended questions, see Appendix B for a list of prompts.

Researcher field notes.

Following the pilot study, I determined the best course of action was for me to be present and take a first-hand account of the microteaching lessons conducted by the participants. In an effort to reduce my presence as a factor in increasing the stress of the teachers, I made my presence fairly regular in the lecture and laboratory setting of the class as opposed to dropping in for only the sessions in which a participant was being recorded. While the teacher was conducting the lesson, I was composing field notes looking for outward physical and behavioral manifestations of stress, see Appendix C and F for the forms used to record field notes. I also made note of interactions between the teacher and members of the class during the lesson.

Post-reflection.

Immediately following a microteaching lesson, a post-reflection form with six prompts related to perceptions of how they performed as a teacher and stress levels was completed, see Appendix D for the post-reflection form the participants filled out. This form was then submitted to the laboratory instructor, as it was a built-in component of the course syllabus. I used this post-reflection form to determine immediate reactions to the lesson and to begin examining the type of reflection process the participant tended to utilize following a lesson.

Follow-up interview.

When designing the methodology for the study, I determined that a follow-up interview was the key to ensure that the participant's voice was not lost in the study and as a component to the process of triangulation. Presenting the participants with the profile of stress that I developed for each lesson allowed the chance for member checking. This follow-up interview also provided for an opportunity to corroborate interpretations and rectify information that may have been contradictory among data sources. Within a week of completing the microteaching lesson, I completed a follow-up interview with the participant in a private conference room. A semi-structured interview protocol was developed to use for each interview, see Appendix E for the list of questions. In addition, the profile of stress I developed was used to add questions for the participant to clarify specific findings. Audio/video recordings and the reflection forms were available for stimulated recall when asking participants to recall emotions, thoughts, and feelings tied to specific instances within the microteaching lesson. While conducting the interview, I

was taking field notes on the interview protocol form of my impressions on the participant's answers.

Qualitative Data Analysis

Overall, qualitative data were analyzed using the three main steps outlined by Creswell (2007). The analysis of qualitative data for this study was also informed by (Amobi, 2005) in a study on preservice teachers' reflectivity related to a microteaching experience. Qualitative data were first read repeatedly until themes emerged so I could develop initial reflections for the second round of axial coding to group codes into categories. I began with the identification of codes by reducing the data to short segments revealing insight to the research questions of the study, the codes were then color-coded according to stress profile level, grouped into larger themes, and finally all of the themes were brought together in a chart for comparison and display. The analysis process for the qualitative section was inductive, using a constant comparative method in an effort to answer the qualitative research questions posed for this study. In a third step the categories were grouped into conceptually congruent themes.

Mixed Methods Data Analysis

Physiological stress measures (Ln LF/HF) were examined for highs and lows to determine when periods of high and low stress occurred. Initial reflections based on electronic log, pre- and post-reflections, and researcher field notes were used to develop a profile of stressful activities for each individual. These profiles were then be added to the physiological stress measures (Ln LF/HF) to develop a more complete representation of the individual's physiological stress and awareness of stress responses for Interpretation 1

and 2, QUAL(quan). The first two interpretations were then combined for a final, third interpretation, QUAL(quan).

The research questions using mixed methods were: *How do preservice agricultural educators reflect on their experience of stress related to a microteaching lesson singularly and over time? How does the reflective awareness level of stress in preservice teachers compare to the actual levels of physiological stress?* To answer these questions, findings will be arranged and represented thematically with supporting vignettes.

See Figure 2 for a chart depicting the research objectives, data sources attributed to each, and method of representation for each.

Research Question	Data Source	Data Representation
Develop a profile of physiological stress (HRV) related to a microteaching experience in preservice teachers	1. HRV Analysis	Charts/Tables
Relate how preservice agricultural educators describe their experience of stress related to a microteaching lesson singularly and over time	1. Activity Logbook 2. Researcher Field Notes 3. Post-Reflection 4. Follow-up Interview Transcription	Qualitative themes and vignettes
Compare awareness level of stress in preservice teachers to actual levels of physiological stress	1. HRV Analysis 2. Activity Logbook 3. Researcher Field Notes 4. Post-Reflection 5. Follow-up Interview Transcription	Qualitative themes and vignettes

Figure 2. Chart of research objectives, data sources, and forms of representation.

Quantitative Validation and Rigor

In examining validity and reliability in the context of previous work, the study of physiological stress is a relatively new field; however several types of measurements of varying manifestations of physiological stress have been developed, including, but not limited to: galvanic skin response, cortisol levels as measured in urine or saliva, and respiration rates. Heart rate variability (Ln LF/HF) has been designated as a highly valid and reliable measure of physiological stress in many fields (Brosschot, et al., 2006; Delaney & Brodie, 2000; Hall et al., 2012; Hjortskov et al., 2004; McCraty & Atkinson, 1996; McCraty, et al., 1995; Vrijkotte, et al., 2000).

To examine validity and reliability in the context of the current study, the primary investigator was trained in the analysis and interpretation of heart rate data collected with the BodyGuard device during the pilot study by researchers from the HeartMath Institute. Additionally, the primary investigator completed a course in the use of biofeedback to measure stress prior to the data collection for the current study. In the pilot study, the BodyGuard was determined a valid and reliable device for recording the preservice teacher stress levels as indicated by heart rate variability using member checking and corroboration with the activity logs. Following the pilot study, the decision was made to switch to a different ECG electrode yielding higher quality recordings, the Ambu White Sensor.

A purposeful sample of the teaching cohort graduating in May 2013 was chosen in an effort towards selection for the “typical” student to reduce the amount of variability in participants. The “typical” student was a traditional college student who was unmarried and without children and had entered the university with an agricultural

education major. It is not the intent of the researcher to extrapolate these findings to any population beyond the cohort of students sampled.

Qualitative Validation and Rigor

In addressing accuracy, trustworthiness, and credibility of the qualitative portion of the study, I will begin with my background as a researcher in the field of teacher education, stress, and resilience. In my tenure at the University of Missouri, I have taken a series of graduate-level courses related to stress and stress management grounded in the fields of positive psychology and Mindfulness Based Stress Reduction. I have primarily been trained as a teacher educator and educational researcher. This background has provided for many hours of coursework and numerous research projects related to various aspects of teacher education.

Issues of validity and reliability of the qualitative data were addressed through the completion of a pilot study conducted on the cohort completing their program the year prior to the cohort utilized for this study. The researcher-developed profiles of stress were deemed as valid and reliable through an analysis using multiple data sources, follow-up interviews, and member checking in the previously mentioned pilot study. Many different forms of qualitative data were triangulated to lend credibility to the study. Qualitative reliability is not addressed, as the primary investigator was the only coder for the current study.

Mixed Methods Validation and Rigor

Potential threats to validity in this concurrent convergent research design were addressed through a variety of means. According to Creswell and Plano Clark (2007), threats to validity exist during both data collection and data analysis. Issues in data

collection were first addressed through using the same sample in both the quantitative and qualitative portions of the study. In addition, follow-up interviews were utilized, wherein a component was to examine contradictory results in the initial reflections. Finally, unobtrusive data collection procedures were used through having one component built in to the design of the teaching methods course (post-reflection forms) and using data already being collected through the course (audio/video recordings of microteaching lessons). In the data analysis process, the threat of inadequate convergence of all data was addressed through the development matrices for each participant, to be used in the development of questions for the follow-up interviews and for each data source to be used in the final convergence of all data sources.

Positionality and Reflexivity

Upon completion of my first year of teaching high school agriculture at a regional career and technical institute, I looked around me and realized that less than a handful of teachers from my cohort of 17 were going to be returning for their second year of teaching. I had survived the ups and downs of the first year that every teacher experiences, from conflicts with senior students to extreme doubts regarding my ability to manage behavior. I had also been the recipient of many late night phone calls, sometimes tearful, from other first year agricultural educators as we struggled to support each other through the trials and tribulations of the first year. By the end of the third year, there were only three from the original cohort that were going to be entering the fourth year as secondary agricultural educators. As I transitioned to a different school, closer to the farm I was raised on and my family, I began to question why so many people seemed to leave the profession so early in their careers.

Following completion of my fifth year of teaching, I entered graduate school to work on a combined Master's and Doctoral program in Agricultural Education. Through participating in a professional development session at the Gallup Institute, I discovered the theory of Psychological Capital developed by Fred Luthans (Luthans, Avolio, Avey, & Norman, 2007). I began to focus my research and review of literature on resilience and then applied it to the context of educators. After developing a conceptual framework to guide the study of agricultural educator resilience (Thieman, et al., 2012), I decided to focus on the component of physiological stress. I have come to believe that it is a major component of teacher attrition that is not being properly studied or addressed within the field of education.

I feel it important to position myself within the field of positive psychology, as it provides me with an orientation of acknowledging the strengths and resources that an individual possesses and seeks to help them enhance and develop those strengths and resources. I am hoping to help educators achieve a more balanced and fulfilling life as well as increase their effectiveness as an educator by helping them increase awareness of stress and provide instruction on effective stress management techniques. Through being more emotionally balanced individuals, teachers will also exert influence on students' stress levels by not adding another volatile influence to the classroom, and in fact providing counter-influence to those negative forces and being a positive role model in the area of emotional balance.

Chapter 4: Findings

Quantitative Findings

The first research question for this study was quantitative in nature: *What does a profile of physiological stress (HRV) related to a microteaching experience look like in a preservice teacher?* To answer this question, all participant data collected via heart rate monitor was compiled and analyzed. Seventeen units of time from the day participants completed a microteaching lesson were analyzed. The first unit of time, Total, is the entire period of time the preservice teacher was wearing the heart rate monitor. The next time periods displayed are 35.1, 35.2, and 35.3. These titles are the 35 minutes leading up to the microteaching lesson (35.1), the 35-minute span of microteaching (35.2), and the 35 minutes following summation of the microteaching lesson (35.3). The series of titles from 5.1-5.7 are consecutive five-minute increments during the microteaching lesson. The final series of data consist of the range from 1.1-1.6. These time segments are the hourly segments of time in between electronic log entries by the participants on the day of microteaching beginning with the time of device hook up and ending with device removal.

Due to scheduling conflicts, some participants were only able to wear the device for six hours. The researcher decided to only include the written analysis for six hours for the sake of comparison; however, all data from each participant were analyzed. The first analysis completed was that of the entire group across both microteaching lessons to obtain the combined group measures. Table 1 displays the resulting values for mean, standard deviation, minimum, and maximum values for each microteaching lesson and both microteaching lessons combined.

Table 1
Mean Stress Levels Measured as Ln (LF/HF) of Preservice Agricultural Educators During two Microteaching Lessons

Time Period Analyzed	First Microteaching Lesson				Second Microteaching Lesson				Combined	
	Ln(LF/HF)				Ln (LF/HF)				Ln (LF/HF)	
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD
Total ^a	0.9	0.73	-0.4	1.7	0.9	0.51	0.3	1.7	0.9	0.61
35.1 ^b	1.1	0.64	0.4	2.1	1.1	0.45	0.4	1.7	1.1	0.53
35.2 ^c	1.2	0.71	0.1	2.2	1.3	0.42	0.6	1.8	1.2	0.57
35.3 ^d	1.1	0.90	0.1	2.1	1.0	0.65	0.0	1.6	1.0	0.76
5.1 ^e	1.5	0.66	0.4	2.5	1.4	0.49	.6	2.0	1.5	0.56
5.2 ^e	1.3	0.81	0.1	2.8	1.6	0.51	0.9	2.3	1.5	0.67
5.3 ^e	1.6	0.81	0.0	2.6	1.5	0.61	0.4	2.2	1.5	0.70
5.4 ^e	1.2	0.70	0.1	2.0	0.9	0.95	-1.2	1.8	1.0	0.83
5.5 ^e	1.3	0.73	-0.2	1.9	1.3	0.34	0.8	2.0	1.3	0.55
5.6 ^e	1.0	0.89	-0.3	2.4	1.4	0.72	0.3	2.3	1.2	0.81
5.7 ^e	1.1	0.98	-0.9	2.0	1.5	0.52	0.5	2.1	1.3	0.78
1.1 ^f	1.1	0.88	-0.2	2.1	1.1	0.76	0.1	2.0	1.1	0.80
1.2 ^f	0.8	1.12	-1.2	1.9	0.9	0.98	-0.6	2.0	0.9	1.02
1.3 ^f	1.1	0.91	-0.5	2.1	1.0	0.66	0.1	1.7	1.1	0.77
1.4 ^f	1.0	0.64	-0.2	1.7	0.9	0.63	0.1	1.8	1.0	0.61
1.5 ^f	1.1	0.57	0.1	1.7	1.1	0.53	0.1	1.7	1.1	0.53
1.6 ^f	1.1	0.60	0.5	1.7	0.9	0.55	0.1	1.9	1.0	0.57

^aTotal=entire time monitor was in place on day of microteaching; ^b35.1= 35 min before microteaching; ^c35.2=microteaching; ^d35.3=35 min after microteaching, ^e5.1-5.7=consecutive 5 min increments of microteaching; ^f1.1-1.6=hourly increments from time of hookup to removal of heart rate monitor on day of microteaching.

Stress levels, indicated by the naturalized log of the high frequency (HF) band of heart rate frequency indicating parasympathetic nervous system activity divided by the low frequency (LF) band of heart rate frequency indicating sympathetic nervous system activity, were compared for all participants across the seventeen time points. For the Total time measured across both microteachings, 0.9 ($SD = 0.61$) was found to be the mean with the first microteaching ($SD = 0.73$) and the second microteaching ($SD = 0.51$) also having means of 0.9.

In the 35 minutes leading up to the microteaching lesson the mean $\text{Ln}(\text{HF}/\text{LF})$ was found to be 1.1 for both the first ($SD = 0.64$) and second microteaching ($SD = 0.45$) lessons independently and when combined ($SD = 0.53$). The analysis of the 35 minutes of the microteaching lesson revealed an average of 1.2 ($SD = 0.57$) across the two lessons with the first ($M = 1.2$, $SD = 0.71$) and second lesson ($M = 1.3$, $SD = 0.42$) have a difference of only .1 points. The 35-minute time period following the lesson was found to be the segment with the lowest scores of the three 35-minute time periods with the first microteaching lesson having a mean of 1.1 ($SD = 0.90$), the second lesson 1.0 ($SD = 0.65$), and both lessons combined at 1.0 ($SD = 0.76$).

The next group of time points measured were the five-minute segments during the microteaching lesson, for a total of seven segments adding up to 35 minutes. In the first five minutes of the first microteaching lesson, stress levels averaged 1.5 ($SD = 0.66$), the second lesson averaged 1.4 ($SD = 0.49$), with a combined average of 1.5 ($SD = 0.56$). The second five minutes showed teachers to have a combined average stress level of 1.5 ($SD = 0.36$) as well with the first microteaching lesson being 1.3 ($SD = 0.81$) and the second being 1.6 ($SD = 0.51$). The third five-minute segment revealed total stress levels to be 1.5

($SD = 0.70$) with little difference between the first ($M = 1.6$, $SD = 0.81$) and second ($M = 1.5$, $SD = 0.61$) microteaching lessons. The fourth five-minute segment was consistently found to be one of the lowest among the teachers with the total average stress level at 1.0 ($SD = 0.83$), first lesson being a 1.2 ($SD = 0.70$) and the second lesson being a 0.9 ($SD = 0.95$). The fifth segment while teachers were microteaching was computed to have a mean of 1.3 across all three measures ($SD_{First} = 0.73$, $SD_{Second} = 0.34$, $SD_{Combined} = 0.55$). The sixth five-minute time period while teaching was 1.0 ($SD = 0.89$) for the first lesson, a 1.4 ($SD = 0.72$) for the second lesson, and 1.2 ($SD = 0.81$) for the combined mean Ln (LF/HF). Researchers found the last five minutes of the microteaching lesson to have a 0.4 point spread with the first lesson having a mean of 1.1 ($SD = 0.98$), the second lesson having a mean of 1.5 ($SD = 0.52$), and combined mean of 1.3 ($SD = 0.78$).

The hourly segment series was found to have the most variability in comparison to the five-minute and 35-minute segments. During the first hour of wearing the heart rate monitor, stress levels averaged 1.1 on the day of the first lesson analyzed ($SD = 0.88$), day of the second lesson ($SD = 0.76$) and when combined ($SD = 0.80$). The second hour was found to be the lowest on both the days of the first lesson ($M = 0.8$, $SD = 1.12$), the second lesson ($M = 0.9$, $SD = 0.98$), and when averaged ($M = 0.9$, $SD = 1.02$). Preservice teachers had an Ln (LF/HF) mean score of 1.1 for the third hour of analysis with the day of the first lesson ($M = 1.1$, $SD = 0.91$) being 0.1 higher than the day of the second lesson ($M = 1.0$, $SD = 0.66$) and the same as the combined average ($M = 1.1$, $SD = 0.77$). Hour four also was found to only have 0.1 difference between first day of teaching analyzed ($M = 1.0$, $SD = 0.64$), second day ($M = 0.90$, $SD = 0.63$), and the combined mean ($M = 1.0$, $SD = 0.61$). During the fifth hour of analysis, all means were calculated to be 1.1

($SD_{First} = 0.57$, $SD_{Second} = 0.53$, $SD_{Combined} = 0.53$). For the sixth, and final hour of the analysis, stress levels as indicated by Ln (LF/HF) were found to be 1.1 ($SD = 0.60$) on the first lesson analyzed, 0.9 ($SD = 0.55$) for the second lesson, and 1.0 ($SD = 0.57$) for the combined mean.

The next step in moving toward the creation of a profile of stress for the preservice teachers was to observe the data set for trends. Minimum and maximum values were observed with the lowest stress level being -1.2 and the highest being 2.8. Cell blocks containing values were color coded with dark blue indicating a value of less than -1.0, light blue ranging from -0.9 to 0.0, aqua ranging from 0.1 to 1.0, orange ranging from 1.1 to 2.0, and red being everything above 2.1. Following color-coding, participants were compared side-by-side with three distinct groups emerging.

Three individuals hung together creating the low stress group which contained mostly dark blue, light blue, and aqua color-coded squares, meaning the majority of time points were found to have stress levels of 1.0 and below. Three participants were next found to compose the medium stress group, containing mostly orange squares with a balance of fewer blues and red color-coded squares. This meant the majority of the time points for this group were found to have stress levels ranging from 1.1-2.0. The high stress group had two participants consistently displaying higher than average Ln (LF/HF) values at most time points, with only one light blue color-coded square and the rest being orange or red with more instances of stress levels 2.1 and higher than either of the previous two groups combined. Table 2 contains the means, standard deviations, minimums and maximums of each stress level group. Figure 3 displays a visual

representation of mean stress levels of the three groups with the combined means for comparison.

Low stress profile.

Preservice teachers falling within the low stress profile ($n = 3$) had a combined mean Ln (LF/HF) for the total day of 0.3 ($SD = 0.37$). The highest stress time periods for this group was observed while they were completing the microteaching lesson ($M_{5,3} = 2.3$, $M_{5,6} = 2.3$). Most mean scores for this group trended below the 1.0 stress level mark. Low stress individuals experienced higher stress levels in the 35 minutes prior to their microteaching lesson ($M = 0.9$, $SD = 0.37$), with stress levels decreasing during the lesson ($M = 0.7$, $SD = 0.31$), and reaching the lowest point in the 35 minutes following completion of the lesson ($M = 0.2$, $SD = 0.15$). The low stress group was found to have steadily decreasing stress levels as they settled into their lesson with the 5-minute increments toward the end of the lesson being lower than those at the beginning.

Medium stress profile.

The three participants included in the medium stress profile were found to have a very similar pattern of highs and lows of stress levels with a combined mean stress level of 1.1 ($SD = 0.11$) for the entire day. The majority of the means in this data series trended between the 1.0 and 1.7 mark of Ln (LF/HF). During the microteaching lesson, the five-minute segments analyzed resulted in an inverse bell-curve, with the high points being at the beginning and the end ($M = 1.7$, $SD_{5,1} = .31$, $SD_{5,7} = .41$) and the low point being the 20-25 minute time-period ($M = 1.0$, $SD = 1.12$). When the lesson was looked at as a whole, an upward trend was noted with mean stress levels being the lowest before the lesson ($M = 0.9$, $SD = 0.48$), increasing throughout the lesson ($M = 1.4$, $SD = 0.40$), and

peaking after the lesson ($M = 1.5$, $SD = 0.56$). For the hourly analysis of the entire days of the microteaching lessons, the medium stress profile preservice teachers ranged between a score of 1.0 and 1.6.

High stress profile.

The high stress profile teachers ($n = 2$) were found to have a mean of 1.6 ($SD = 0.15$) for their overall day of the microteaching lessons. Their mean scores across all analyses ranged from 1.4 to 2.2. Their stress levels were fairly constant when comparing the time-periods before ($M = 1.8$, $SD = 0.34$), during ($M = 1.8$, $SD = 0.33$), and after ($M = 1.6$, $SD = .22$) the microteaching lessons. The high stress teachers saw their highest stress during the 5-15 minute mark of their microteaching experience ($M_{5,2} = 2.2$, $SD_{5,2} = 0.58$, $M_{5,3} = 2.1$, $SD_{5,3} = 0.47$). Their lowest time immediately followed the previous two segments with the 20-minute mark having a mean of 1.5 ($SD = 0.33$). For the hourly analysis across the day, means ranged from 1.4 and 1.7.

Table 2
Profiles of Low, Medium, and High Mean Stress Levels Measured as Ln (LF/HF) of Preservice Agricultural Educators During Two Microteaching Lessons

Time Period Analyzed	Low Stress Profile Ln(LF/HF)				Medium Stress Profile Ln (LF/HF)				High Stress Profile Ln (LF/HF)			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
Total ^a	0.3	0.37	-0.4	0.7	1.1	0.11	1.0	1.3	1.6	0.15	1.4	1.7
35.1 ^b	0.9	0.31	0.4	1.2	0.9	0.48	0.4	1.5	1.8	0.34	1.3	2.1
35.2 ^c	.07	0.45	0.1	1.3	1.4	0.40	0.6	1.7	1.8	0.33	1.5	2.2
35.3 ^d	0.2	0.15	0.0	0.4	1.5	0.56	0.5	2.1	1.6	0.22	1.3	1.8
5.1 ^e	1.1	0.63	0.4	1.9	1.7	0.31	1.4	2.1	1.7	0.53	1.3	2.5
5.2 ^e	1.0	0.56	0.1	1.8	1.4	0.49	0.6	2.0	2.2	0.58	1.4	2.8
5.3 ^e	1.2	0.79	0.0	2.3	1.5	0.61	0.4	2.2	2.1	0.47	1.5	2.6
5.4 ^e	0.8	0.70	0.1	1.8	1.0	1.12	-1.2	2.0	1.5	0.33	1.1	1.9
5.5 ^e	0.8	0.55	-0.2	1.4	1.5	0.34	1.1	1.9	1.6	0.33	1.3	2.0
5.6 ^e	0.6	0.91	-0.3	2.3	1.6	0.30	1.2	2.1	1.6	0.64	0.9	2.4
5.7 ^e	0.7	0.93	-0.9	1.8	1.7	0.41	1.1	2.1	1.7	0.29	1.4	2.0
1.1 ^f	0.4	0.36	-0.2	0.7	1.3	0.92	0.1	2.0	1.7	0.37	1.2	2.1
1.2 ^f	-0.1	0.67	-1.2	0.6	1.3	0.90	0.0	2.0	1.7	0.19	1.4	1.8
1.3 ^f	0.2	0.50	-0.5	1.0	1.6	0.44	1.0	2.1	1.5	0.13	1.3	1.6
1.4 ^f	0.4	0.43	-0.2	0.9	1.2	0.55	0.7	1.8	1.4	0.24	1.2	1.7
1.5 ^f	0.6	0.43	0.1	1.3	1.3	0.33	0.9	1.7	1.6	0.13	1.4	1.7
1.6 ^f	0.6	0.08	0.5	0.7	1.0	0.65	0.1	1.7	1.6	0.29	1.2	1.9

^aTotal=entire time monitor was in place on day of microteaching; ^b35.1=35 min before microteaching; ^c35.2=microteaching; ^d35.3=35 min after microteaching, ^e5.1-5.7=consecutive 5 min increments of microteaching; ^f1.1-1.6=hourly increments from time of hookup to removal of heart rate monitor on day of microteaching.

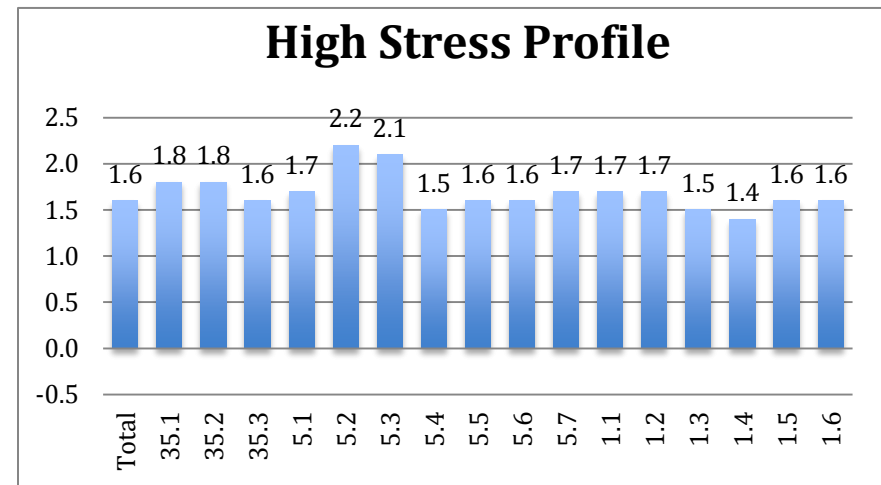
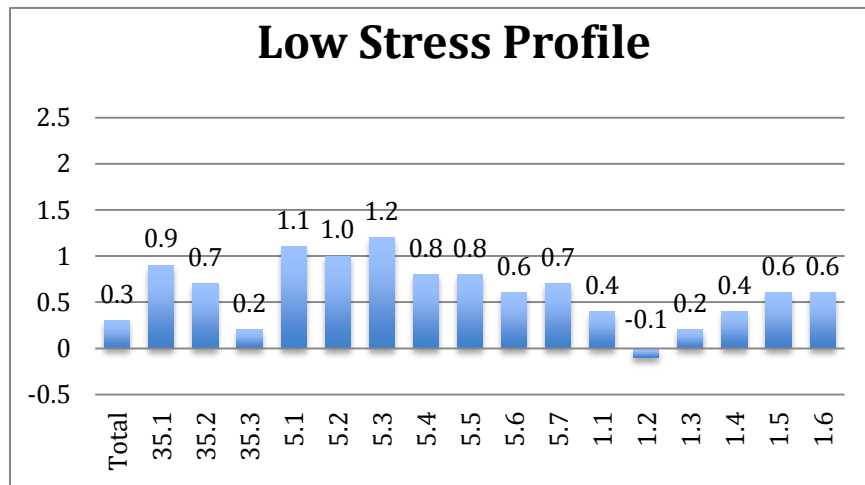
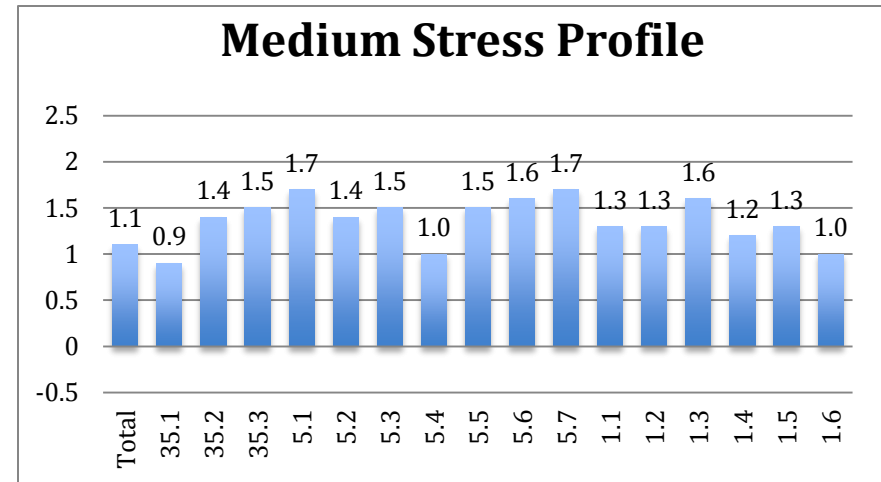
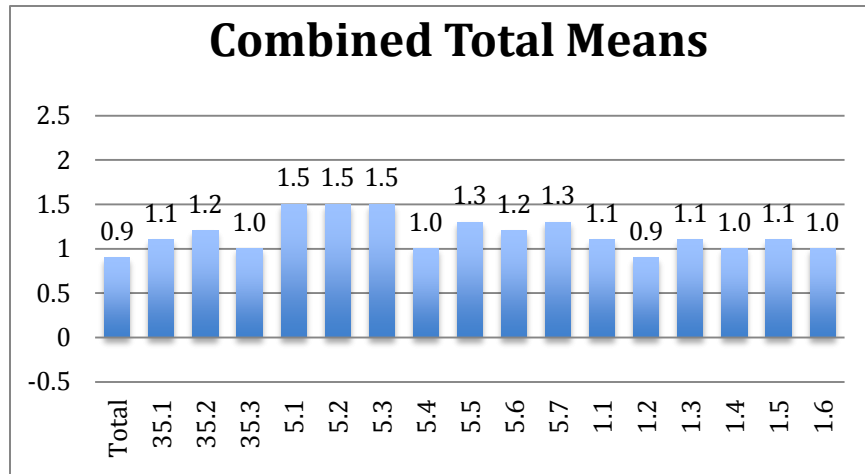


Figure 3. Histograms representing stress levels $[\ln(LF/HF)]$ for the Low, Medium, and High Stress Profiles and combined total means for preservice agricultural educators across two microteaching lessons.

Mixed Methods Findings

The second research question was mixed methods in nature: *How do preservice agricultural educators describe their experience of stress related to a microteaching lesson singularly and over time?* Interview transcriptions, researcher field notes, participant hourly logs, and participant reflection forms were coded for information regarding stress related to the microteaching lessons. The codes were then grouped into subthemes for each microteaching lesson and across the two lessons. Subthemes were finally grouped into larger grand themes resulting of three groups: First Microteaching Lesson, Second Microteaching Lesson, and Overall representing themes found across both lessons. Qualitative findings were merged with the quantitative stress profiles for representation of data to provide deeper context for the preservice teachers' statements.

First microteaching lesson.

Themes from the first microteaching lesson analyzed reflected sources of stress in the microteaching lesson as the preservice teachers were working through their third microteaching lesson of the semester with a focus on problem-based learning. The themes included: inability to answer student questions is perceived as failure and is stress-inducing; sufficient preparation is key to effective behavior management, gaining content knowledge breadth, and reducing stress; reflecting on video recording is an emotionally-charged, stressful experience; and the microteaching laboratory elicits pressure to perform in front of peers.

Theme 1A: Inability to answer student questions is perceived as failure and is stress-inducing.

This theme could be found across all three groups of preservice teachers when disaggregated by stress profile. Only one teacher did not directly describe inability to answer student questions as stress-inducing. For this individual, having students correct grammatical mistakes made in speaking and on in writing were a source of great stress, “She corrected me on saying „is“ instead of „are“ and I was almost embarrassed because I felt inadequate that my grammar was wrong. I'm trying to make sure it was right. It was embarrassing.” The inability to answer impromptu questions posed by students during the course of the lessons was relayed by the teachers as a very uncomfortable and stress-inducing occurrence, “I don't like when I'm asked a question that I don't know the answer to.” Another teacher described feelings of embarrassment and stress when they were unable to come up with the correct answer to a student’s question,

That is so embarrassing to be wrong I guess. It's a huge fear of mine. I was super stressed by not knowing. Then I sit and think to myself, „You're so dumb, why didn't you look all of this up and make sure you knew beforehand?“

Even the anticipation of not being able to answer student questions causing anxiety and stress, as a teacher related, “You never know what they will ask and you don't know. I feel like it's embarrassing to not know. I'm trying to teach you this, but I don't know the answer to your question.” The inability to appropriately answer student-posed questions was also commonly described as failure or something very akin to the concept of failure as a teacher,

Being the teacher, you have a thought that you are the all-knowing, that you are supposed to know or have a good idea about it. You just don't want to seem incompetent to the class. That probably causes a bit of stress.

The idea that being able to answer student questions correctly is an integral characteristic of teachers was often brought up, "I feel like I should know the answer to all the questions." Preservice teachers viewed the ability to answer student questions correctly as a hallmark of quality teaching,

When they started getting into things I don't know about, I get nervous because I want to be able to answer the questions. I know you don't always have to have the answer, you can tell them „I don't know,“ but I don't like not knowing.

In addition to being a main component of quality teaching, being able to answer student questions was indicated as vital in the development of positive perceptions of the teacher by the students,

Probably because I don't want to give an answer and then have it be not right. I know some of them know a lot more about horses. I don't want to say the wrong thing. Because students won't look at you [with as much respect].

Teachers often used the words "respect" and "credibility" when relating the link between answering questions correctly and student perceptions, "That's my biggest fear, not knowing something when they ask me or them knowing more than me. I don't look credible."

Inversely, lower stress was indicated during parts of the lesson where student questions were on-topic and expected with answers easily arrived at by the teachers. When describing why a particular time period was the lowest stress during the

microteaching lesson this subtheme often surfaced, “I think it was a lot less questions about where I was going, and questions out of left field that I didn't expect. It was pretty regimented and anticipated.” Not having to answer student-posed questions at all was also indicated as a primary reason for reduced stress, “I'm just standing there really. I wasn't having to answer questions. I was facilitating [the students completing] the presentations. It was more them-centered and not me-centered.” Some teachers even went so far as to describe answering student questions where the answer was known as enjoyable, “I do like it when they ask on topic questions that I do know the answer to. It shows I have their engaged interest and they are interested in what they are learning and want to know more.”

It is apparent with the significance of this theme student-posed questions are viewed by the preservice teachers as a significant component of the microteaching experience. Student-posed questions have the ability to impact the stress levels of the preservice teachers for better and for worse. When expected, and deemed appropriate by the teacher as well as within their area of content knowledge expertise, the questions are viewed as enjoyable and contributing to a positive learning environment. However, when the questions are outside of the teacher's depth and/or breadth of knowledge, or perceived as inappropriate the questions often contributed to increased stress levels and much frustration and anxiety on the part of the preservice teacher.

Theme 2A: Sufficient preparation is key to effective behavior management, gaining content knowledge breadth, and reducing stress.

Preservice teachers often discussed their level of preparation for the microteaching lesson, and compared preparation level for the current lesson with that of former lessons when reflecting on their overall feelings of how the lesson went,

I felt more prepared for this one, even though I still didn't feel that prepared for it. I think that the students liked it a lot better, they definitely acted like they liked it better. The behavior was way better and I feel my behavior management skills improved a lot for this lesson.

Less than ideal levels of preparation were indicated in leading to lessons that were less than satisfactory,

I wasn't prepared. I could have had the objectives written down somewhere else, had someone else come write on the board. But I forgot that when I was setting up before I even started teaching, I meant to have those on the board and then I can't explain it really, but I forgot.

Another teacher described a lack of preparation on the planning level,

The thing I was freaking out about was remembering to bring something.

Thinking I forgot something I would need for my lesson. I didn't know where I was going to start my lesson. We were supposed to start anywhere after interest approach. I didn't have that figured out until I was up there.

Lessons perceived to go well; or at the very least meet expectations, were described as having an ideal amount of preparation put into them prior to delivery of the lesson, "I had all of my supplies ready and with me. I normally do, but I planned way ahead and had

gone shopping and had my lists.” A lack of preparation of materials with sufficient lead time, i.e. the day of the lesson, was often indicated as increasing overall stress and anxiety of the preservice teachers. It was obvious the preparation level of materials for the lesson was an essential component of overall readiness to teach.

Preparation in the minutes leading up to the lesson take the form of “setting the stage” by preparing learning objectives, presenting classroom expectations, setting up visual aides, and arranging teaching materials such as lesson plan and computer presenter. This form of preparation was indicated as important to being in the desired frame of mind for teaching and when insufficient described as stress-inducing,

I had a lot of stress because there wasn't the right amount of people I thought, and [the TA made me start] before I was ready. That's what happened, but I was very anxious because I didn't have all my stuff I wanted done.

In addition to putting the teacher in the right frame of mind, the preparation going into a lesson was described as essential in developing content knowledge depth and breadth, especially when the content was unfamiliar, “I had looked over the lesson plan quite a few times. I knew the sequence of having to go back to the lesson plan. I knew the information a lot better.” Adequate preparation with sufficient lead time was described as helping to lower stress while insufficient preparation lead to anxiety before the lesson and more stress during the lesson.

When comparing discussion of preparation across teachers from the three stress profiles, an interesting observation was the total lack of mention of preparation by teachers in the high stress group. In fact, one of them explicitly indicated a very *laissez faire* attitude regarding preparation, “Honestly, I haven't thought too much ahead about it.

I haven't thought ahead to my next lesson yet.” This was in stark contrast to teachers from the low stress group who were very direct in their discussion of intentional preparation for upcoming lessons, “I was writing a lesson and it took so much time and tried to think of every single scenario that could have went wrong...” Teachers from the medium stress group typically described worry throughout the day leading up to their lesson as a result of hurried and last-minute preparations, “[When I was most stressed, I was thinking], „Did I forget to print something, bring something that I need?“ Because there is no going back for that. I didn't have time for that.” Preparation for the preservice teachers for their microteaching lesson was a very significant piece to their perceptions of the lesson as well as the reality of how the lesson actually played out. Sufficient preparation was indicated in lowering stress levels and contributing to positive outcomes in the lesson while insufficient preparation led to more instances of undesired outcomes and increased stress levels.

Theme 3A: Reflecting on video recording is an emotionally-charged, stressful experience.

The preservice teachers described the process of viewing and reflecting on their performance through the audio/video recording of their lesson with strong emotions, “It's awful. Ugh!” The true emotional duress experienced while replaying the microteaching lesson was captured by one of the teachers, “It was pure torture to watch my video. Torture.” Watching the video with another person, such as myself, seemed to heighten the gravity of emotion felt, “I just am embarrassed watching myself.” Teachers were obviously viewing their videos through a negatively-tinted lens, rather than the proverbial “rose-colored glasses.” However, the quotes included in this theme were only from the

low and medium stress individuals. The teachers in the high stress profile referred very little to actually watching the video with no references to the videos surfacing an emotional response, making the researcher question if they actually did watch the recordings or were able to emotionally distance themselves from the video.

The emotions expressed were universally negative in nature with much nervous laughter accompanying the viewing of video segments where stress was particularly high when a multitude of things in the classroom were awry, “I don’t like watching this part. I can realize I shouldn’t have done that, I should have set my timer.” The teachers even went so far as to indicate the pain of watching themselves experience what they perceive as failure, “It’s hard watching this because I’m watching myself fail.” Some of the teachers described being hyper-critical of aspects of themselves outside of their actual teaching performance including appearance and professionalism,

So then I start to get critical about my appearance, my professionalism as a teacher, the words that I use, because a lot of times I will use, Um, you know, I’ll shorten words but not use the proper terms, „Oh Yeah“ instead of „Yes“...That really bugs me when I watch me videos.

The preservice teachers had no problem quickly noticing events and actions in the simulated classroom that could be criticized and described their distaste of viewing the recordings unprompted by myself.

Teachers were often found to cover their eyes and remarked that I should have had the heart rate monitor on them while watching the video and talking through the reflection because they found it to be highly stressful. When describing differing

perceptions of the lesson from filling out the reflection form when the lesson ended, to later when watching the video, one teacher indicated,

It felt worse. I mean, I felt as bad as it was. The first ten minutes was fine and then I could feel I was losing control. I had to get them back and then just watching me doing it was a treat.

The sub-theme of re-living the painful experience of a lesson not going according to plan, as in the previous quote, was found to be common across many of the preservice teachers.

Theme 4A: The microteaching laboratory elicits pressure to perform in front of peers.

In the microteaching laboratory, preservice teachers are teaching a group of their peers in a simulated middle school or secondary classroom laboratory. The presence of peers was found to be a factor of which the preservice teachers were very aware most often in the group of individuals in the low and medium stress individuals, “I’m always worried my students will know more than me, my peers, I’ll say something wrong or stupid and then be really embarrassed.” In addition to embarrassment, appearance, especially from the professionalism standpoint was viewed as being extremely important because of the presence of peers, “...Because I know they are my peers and I come off a little less professional.” Some teachers indicated the peers could be unpredictable in their character roles, sometimes over- or under-acting. This unpredictability was described,

My last two lessons, I’m just as worried, because you never know what you’re going to get from the peers and the way they act. I’m so afraid I will lose my train

of thought and stand there and not have anything to say to them and just pause.

That's happened before in presentations. I'm feeling so embarrassed.

One of the low stress teachers related the story of a peer perceived to over-perform her character role, also indicating the behavior was intentional.

It is her goal to push every single person's buttons. In her character, she's supposed to be confused, but even if when she's a good character, she still is...it's difficult because I felt she almost intentionally, not sabotages, but she plays her role extra hard.

True to this teacher's statement, this peer-actors was indicated by several other teachers as being a "problem" student. The peer-actor in question, when interviewed for this study, also corroborated the purposeful intention of the behavior described by this teacher, "I'm kind of mean in their lessons so I kind of deserve it." Through the teachers' eyes, the presence of peers adds complexity to performance and elicits additional anxiety and worry.

Preservice teachers nearing the end of their methods course and last semester on campus were beginning to picture themselves in front of a live classroom and trying to grapple with developing a vision of what that reality would look like. One teacher indicated this developing vision and posited teaching a group of youth rather than peers would have a different feel,

Maybe in front of my own class it's going to be different. Maybe because this is a controlled environment and these are my peers and I want them to have a high opinion of me. I want [my students] to respect me but I guess I can tell them

something and they will believe it. Which is bad,...I want to tell them the right stuff, but...

Teachers across the board seemed to feel less pressure to perform when working with youth. This reduced pressure seemed to be related to a different dynamic of social comparison in addition to recognition of a lower level of content knowledge on the part of high school students when compared to peers.

An additional layer to the complexity of the presence of peers in the laboratory setting is the strong relational bonds between the members of this particular cohort being studied. The teachers often refer to each other as friends in the interview and described the amount of time they have spent together as a cohort, "I feel more comfortable in front of these peers because I've been with them for four years and know them really well but still you don't know what they will throw at you. I've thrown some curveballs myself." The exceptional degree to which this cohort socializes and spends casual time together outside of the academic setting is acknowledged by the researcher and instructors of the course. This is a dynamic that can often be found in small cohort programs like agricultural education; however, it is not always the case.

Second microteaching lesson.

The second microteaching lesson analyzed for this study was also the last lesson to be taught in the laboratory setting. The final lesson was to be taught in a live classroom at the school that would serve as the teacher's student teaching practicum site for the upcoming semester. This lesson presented a unique set of challenges as each teacher had two students with learning disabilities, as played by the professor and teaching assistants of the course, introduced to the classroom environment. Preservice teachers drew for the

learning disabilities they would be presented with including: Dyslexia, Asperger's Syndrome, "Low Vision" Visual Disorder, and Predominantly Hyperactive-Impulsive ADHD. Themes that emerged revealed increased stress and frustration by the teachers from the added layer of special needs students. Additionally, the researcher observed stress-induced behaviors during the microteaching lesson, with the teachers often being unaware of them. Teachers found maintaining their ideal atmosphere in the lively and dynamic environment of the simulated classroom was particularly challenging. Themes included: Microteaching experiences characterized as "more stressful" than teaching in a live classroom; the presence of simulated students with learning disabilities resulted in different reactions according to stress levels; behaviors of educator stress are observed, but not attributed to stress; and concurrently managing the flow of a lesson and student behavior is very challenging.

Theme 1B: Microteaching experiences characterized as "more stressful" than teaching in a live classroom.

Preservice teachers in the medium and high stress profile groups often indicated the microteaching experience was not "real-life." Teachers commonly referred to the microteaching laboratory as being an exaggeration of a live classroom, "I think it would be different for this versus a real classroom. For this, the behavior management stresses me out the most. I think that if I can handle them, I can handle pretty much anybody." Typically they were referring to the microteaching experience as presenting more extreme behaviors than would be seen in the typical middle school or secondary agriculture classroom. "It's hard to judge what I will actually be like as far as classroom management when this is a stretch of the truth." Several teachers felt the behaviors

demonstrated were so extreme the laboratory simulation was not a good measure of their teaching ability,

I don't feel like this is an effective way to test [classroom management ability]. I mean it is a little bit, but I don't think it's completely effective. I don't think a lot of it is true actions, like true classroom. Maybe one day a month that's how it actually is, but not daily.

This lack of perception of reality seemed to change the manner in which less than desirable outcomes in the classroom were reflected upon. Rather than viewing the poor outcome as indicative of changes needed to the lesson plan or teacher behaviors, teachers rationalized a different outcome from the same activity in a live classroom, "...but the activity I put in place would have helped in a real situation." Some of the preservice teachers also described how they would have taken different actions in a real classroom than they felt obligated to take when they were being graded, "If this was a real class, like if I was really doing this, I would have stopped. We would have done something different, we would not have continued on." These teachers obviously did not view microteaching as being even a simulation of a live classroom; it was an inauthentic representation of a classroom and students in their perceptions.

Teachers also expressed expectation for a different maturity level of middle and high school students in comparison to their college peers performing the role of middle and high school students, "Hopefully in a normal classroom the student wouldn't write inappropriate things on a paper, but I guess I'll find out." Along with this optimism for student maturity levels, teachers also expressed the concept of knowing live classroom students better than their peers turned students. One teacher expressed this feeling in

looking forward to being a classroom teacher, "...but I think in my actual classroom [I will get to know] some of the students better, and feel a little more comfortable there, I think it will be a lot better for me." The complexity of having peers in character roles also surfaced in this theme, where I got the sense of a struggle between knowing their peers well as friends, but uncertain about whom their peers were in their character roles.

When examining the teachers composing the low stress profile, of note is their absence in contributing to this theme. These teachers seemed to be much more of the mind that microteaching was real teaching, rather than an exaggeration of a classroom, indicated by many of the medium and high stress teachers.

Theme 2B: The presence of simulated students with learning disabilities

resulted in different reactions according to stress levels.

The second microteaching lesson analyzed for this study, and their final lesson to take place in the simulated classroom laboratory presented the preservice teachers each with two students having learning disabilities and IEPs. Across all stress profiles, an increased level of worry and anxiety over the introduction of students with learning disabilities was indicated, "I was more stressed about it, during the day, just because I knew it was the IEP [lesson], I think I worried about that one more." One teacher described the pressure and anticipatory anxiety levels experienced,

There was a lot of pressure for this lesson, because it was the IEP lesson. I know we talked in our group and talked about it and talked about it... So what does this IEP do? I think there was a lot of anticipation going into it. I think that could really help with stress level going up.

The preservice teachers indicated worry about this different dynamic on aspects of the classroom beyond just the student with the IEP. The teachers were also worried about how the other students would react to the new student in the classroom,

I was so nervous. I didn't know what would make them tick, I knew this was my first chance of almost screwing that up. I think I think my biggest hardship was how the other kids [were going to act]. What they were going to do to make [the students with special needs] tick?

The preservice teachers described the feeling of having a new student in the middle of a lesson was not going to be a reality in a real classroom. One teacher described feeling as if she didn't have enough information on the students with IEPs, a matter she perceived would be addressed in a school setting,

It's that when you have a special needs student, you know them. You know the ins and outs of them, you know what makes them tick, you know how to deal with them and how to teach to them and how to present in a way that they will understand. But [for this lesson] I have no idea how they're going to act. I have no idea.

The presence of these students was received differently by the teachers, with trends varying according to stress profile of the teachers. Overall the low stress teachers were much more purposeful and cognizant in planning accommodations for the students with special needs. One teacher used the internet to find ideas for accommodations and came up with tying a large rubber exercise band around the chair legs for the ADHD student to kick and silently expend energy in addition to having small containers of play-doh for any student who wanted something to quietly keep their hands busy. This group

of teachers spent time researching and making preparations for the student-specific accommodations,

To make accommodations on the fly, you know that takes a lot of planning ahead of time whether it be printing off the slides for them or what not. It's not like I could just fix his visual impairment like that.

The low stress teachers also put much thought into seating charts and grouping to provide for an optimal learning environment,

I set her by Maria because I knew Maria wouldn't touch [the student with Asperger's] and she wouldn't set her off... I think I should have set the room up differently to where they were in rows in rows instead of coming out on the side. I think that might've helped.

When accommodations and plans did not work, or were not sufficient, preservice teachers expressed frustration and confusion. One teacher expressed,

The IEP students really threw me because I thought some of my accommodations would be sufficient. I mean it was just a totally different dynamic adding the IEP students and I feel like my accommodations that I made for them, like creating different recipe list for them with pictures and large font. I feel like those were good, I just wasn't expecting them not to be enough still.

After again reviewing the information about the accommodations needed by the students with special needs provided, I believe most of the insufficiency of accommodations is owed to not reading the information provided by the instructor closely.

Several teachers from the Medium and High stress groups indicated little to no forethought added to the lesson in the accommodations for these students during the

interview for the first microteaching lesson. One of the high stress teachers stated, “I hadn't thought all the way through [accommodations for the student with] low vision and meant to write out notes for him. I didn't because I just kind of ran out of time.” These preservice teachers were also the ones most likely to indicate they had not been provided with sufficient information on the students with IEPs, with comments such as, “I didn't really know how to approach [the student with Asperger's Syndrome].” This lack of information was not supported by the course instructor, as displayed in the document with information provided to the preservice teachers included in Appendix G. Students with special needs provide an interesting challenge for these preservice teachers who range in their personal experience with the learning disabilities presented to them through this microteaching lesson. This challenge was met with increased worry and anxiety and ineffective coping mechanisms, such as the avoidance displayed by the high stress teachers.

Theme 3B: Behaviors of educator stress are observed, but not attributed to stress.

In discussing stress related to teaching, symptoms and behaviors empirically correlated with both acute and chronic stress were often surfaced. However, just because these things were surfaced did not mean the preservice teachers attributed the behaviors to being stress-induced. One of the teachers in the medium stress profile group described memory loss as a function of stress, without connecting it to stress and more as a normal outcome of teaching,

I was even talking about it to my sister and roommates, they were like why was it bad? And I said, „Well they just acted bad.“ [When they asked what happened] I

didn't even know, I couldn't tell you the things that they did because it's just slips your mind. You just kind of close that out when you're up there.

This memory loss was often indicated when viewing the video when teachers would exclaim over a student behavior or language they did not remember occurring while engaged in the microteaching lesson.

In reflecting on the video recording, some teachers described becoming more aware of certain behaviors and thought patterns, but no correlation to experiencing stress was made. A teacher from the low stress group referenced the loss of “global awareness” that occurs in teachers that are stressed, wherein obvious occurrences in the environment are not attended to on a cognitive level,

If anything [watching the video] made me aware that I need to be more aware of the classroom environment and behavior management, and the behaviors that are going. I [experience] tunnel vision of [where I focus on the] content. I wasn't focusing on the students enough to know they were engaged in [inappropriate behaviors].

Tunnel-vision was described by multiple teachers, wherein they became hyper-focused on an aspect of their choosing with global awareness greatly suffering one high stress teacher related catching previously unobserved behaviors in the video review, “Like Derek making faces and throwing his hands around and stuff. I didn't really notice that because I was too focused on certain people who kept causing issues.” This tunnel-vision was attributed to a lack of multi-tasking ability by one student, indicating these phenomena as a component of inherent characteristics and personality, “I guess just inability to multitask and look at the rest of the class and see what's going on.” The

subtheme where behaviors and characteristics of stress were related to individual personality continued with justification for not addressing side conversations that went unnoticed for one of the high stress teachers,

Honestly it's just me and [my personality type]. I think [people of my personality type] just aren't as detail oriented as what [others] might be, typically. That's what I think. I don't know if this is a personal philosophy, but if you're having a side conversation and not following along, this is the information and you need to be catching it.

A teacher from the medium stress profile described her daily state of mind, which was full of statements related to stress and anxiety,

I normally operate on a pretty crazy-crazy level. I'm always just go-go-go, even when I'm sitting down to take a breath. My mind is going-going-going, thinking about all the things I have to do that day. I constantly feel anxious, especially if I have homework due or assignments that are not done. Even if I know but they're not due until the next day, I am anxious until they're done. I feel that way about almost everything, especially when something new pops in my head... that's all I think about.

As in the previous statement, teachers often viewed anxiety, worry, and stress as separate entities, not parallel to each other.

A lack of knowledge and awareness of personal stress varied across the profiles of stress of the teachers, with fewer indications of stress-related behaviors and symptoms by the preservice teachers in the low stress profile. This lack of awareness became

increasingly evident moving across the profiles from low to high stress and was also tied to indications of ineffective coping mechanisms.

I'm one of those people when I get frustrated, I don't say anything, I just hold it in. And then all of a sudden I just [blow up] and it's done. I'll let it all out at once. It doesn't matter who it's at, or if it's their fault or not.

The signs and symptoms of physiological stress on the body and mind were very difficult concepts for the preservice teachers to verbalize and express. When they could be described, they were often attributed wrong to an array of causes, from gender to personality type.

Theme 4B: Concurrently managing the flow of a lesson and student behavior is very challenging.

The job of teaching is inarguably complex and many-layered. The preservice teachers in this study were experiencing the true complexity of this job personally for the first time through these microteaching lessons where they were asked to deliver content, make IEP accommodations, manage behavior all keeping the flow of the lesson going. Behavior management was one of the most stressful components of teaching for some of the teachers, "Management stresses me out to the max. I feel like I won't be able to control a classroom." One teacher described the number of decisions having to be made regarding behavior management and the ensuing chaos,

With Andrea, I tried flipping her the notes because she's dyslexic and that didn't work very well because Jacob had asked questions. I told him he couldn't ask questions because I knew what his question was. In that just kind of set the tone for the whole lesson with Jacob being a grump and the whole class got crazy.

A sense of frustration and almost desperation was almost tangible in the air when the teachers from the high stress profiles described their highest stress time period in their microteaching lesson,

I don't catch the small things, and so when someone calls someone a name I'm kind of just concentrated on getting through the content as opposed to paying attention. When I try and target [one issue and get it] under control, then the rest of the class wreaks havoc because I'm focusing on one or two students as opposed to the whole class.

These time periods were linked to incidences where many aspects of the classroom environment needed attention, when viewing the video and offering a description of the events that may have been stress-inducing, one teacher described,

Because nobody was passing things fast enough. I didn't need them to see everything, I just wanted to see them a few, so we could talk about it. And they were arguing over... Well, I didn't see that...I didn't have time to write that down... I was like well, just keep passing it. Somebody was telling Tony he was slow because he wasn't moving fast enough. And I don't really know if Carla was writing anything.

Both of the high stress teachers are indicating markers of high stress behavior, such as tunnel vision and lack of global awareness, as leading to problems with classroom management.

Teachers found the intersection of managing student behavior and keeping the flow of the lesson going to be particularly challenging, especially when they have a vision in their mind of the lesson going exactly according to plan,

I guess because I still live in this bubble of its gonna be perfect, I'm still trying to grasp that it's not always going to go the way you think it's going to go. You have to leave room for error.

Achieving the ideal balance of behavior management and flow of the content at the beginning of the lesson was described as essential to the rest of the lesson going well, “I feel like when it doesn't start well, it's really hard to make up that ground. It just sets the tone for the lesson.” This theme of behavior problems early in the lesson and “setting the tone” for the remaining portion of the lesson was expressed by many of the teachers.

“Grace under fire” could describe the teacher who seamlessly handles behavior issues without interrupting the flow of class was an aspiration that I observed in my researcher field notes to be achieved in some fashion by only two out of three low stress profile teachers. One of the low stress teachers described the intersection of behavior management and lesson flow as a balancing act, “It’s that equal balance of controlling behavior and keeping engagement so you can relay the content.” Student engagement was often described by teachers across all stress levels as students being quiet, listening, and on task. Preservice teachers described a quiet classroom as one that lowered their stress levels and was meeting their expectations, “...because it is so much easier to feel comfortable in a situation when people are looking at you and quiet. Then when everybody is talking, it’s frustrating because you don't have the respect or attention.”

When prompted to describe what a classroom of engaged students would look like to someone looking through a window, one of the medium stress profile teachers described,

Students participating and raising a hand to offer answers. Students... wouldn’t be talking about what they were going to do later that day, they would actually be

talking about the assignment or problem and offering their answers [when in groups]. Instead of not being able to [get through more content] because we wouldn't have run out of time because of all the behavior problems I had to correct. They would've been following my rules. They would have been respectful and they would've been responsible for the actions and they would've acted like they were ready to learn instead of trying to be rambunctious.

Actually being able to achieve flow while teaching is a great challenge for these preservice teachers, especially those in the medium and high stress profile groups. I felt as if reading in between the lines, they were indicating their lack of ability to manage behavior in a manner not disrupting class was a significant barrier to achieving flow and building a positive classroom environment.

Overall findings.

When the data from both lessons were combined and considered for analysis, four larger themes emerged that could be crossed the microteaching lessons. These themes spoke to the complexity of the nature of teaching, mindfulness, and cognizance regarding stress. The themes included: Inability to live in the present leads to stress; preservice teachers struggle with the complex nature of teaching; preservice teachers lack cognizance in regard to stress and how it impacts the learning environment; and stress profiles and teacher onus regarding negative outcomes in lesson are connected.

Theme 1C: Inability to live in the present leads to stress.

The ability to live in the present moment, without anticipatory worry of the future or anxiety over past events was found to be a great struggle for these preservice teachers while completing their microteaching lessons. The need to keep the lesson moving

forward was very strong for most of them, “I tried to stay one step ahead in my thoughts. Just to keep planning forward.” When I discussed this concept with the instructor, I was informed there was not a prescribed amount of content required to be taught in a lesson, this component was up to the student. The preservice teachers appeared to be setting their own standards for the amount of content needed to be completed, meaning pressure related to this concept was self-inflicted.

The fear of future events, which may or may not come to fruition, was a great concern for some, “I’m always hard on myself. I’m always self-conscious. I don’t know something as well. What if I can’t add $10+5$ in front of them? I always wonder if that’s [going to happen].” There were even indications of this being a problem for many of them in their personal lives as well as they described worrying about their microteaching lesson in unrelated classes they were attending. Several teachers described worry about the upcoming microteaching lesson as causing enough stress their sleeping patterns were interrupted.

Some teachers became almost frantic when relating the thoughts going through their head while they were teaching and experiencing increased stress levels with behavior management problems,

In my head I kept saying, „This is not going well. Why can't I keep a straight face? What is going on? I need to stop this! Why can't this be over? Has it been five minutes yet?” And then afterwards, I was just really upset about how it all went down.

The lack of present-mindedness, or being “in the moment” contributed to a “check-list” mentality where the preservice teachers’ main focus became completing their teaching check-list within the 35 minutes allotted for their lesson.

I guess I'm not paying attention to [a student misbehaving]. I think in my mind I'm thinking about 100 million things. The order of my lesson and questions like, „What is Sisley doing?“ What's this student doing? How much time do I have left?“ And stuff like that. When I tell them to do a task I'm say, „It's done!“ and keep going. They haven't even finished the [last task] yet but I'm like, „Check that off!“

This check-list often became the focus for their stress-induced tunnel vision, leading to an inability in focusing on current events in the classroom. One of the high stress preservice teachers indicated, “I think it was trying to get through it as I wanted to get to the [activity].” Preservice teachers were found to describe feeling the necessity to keep moving through their check-list and through the lesson so they could get to a particular component,

This theme was more prevalent in the medium and high stress groups, with these groups of preservice teachers having almost an obsessive compulsion to complete their lists during the microteaching lessons.

I didn't notice [a student sleeping] until the end and didn't do anything about it. In classrooms, that is something that really happens and I didn't notice because I was preoccupied with trying to take a deep breath and get my things together for the next part after the video. I didn't even notice. In a real classroom, that is something I will have to really be aware of.

The low stress group indicated they had things they wanted to accomplish, but were not as adamant about accomplishing that list, as explained in this statement by one teacher, “I didn’t notice all the activity going on during questions. I was focused on the questions I was going to ask.” While observing them in the laboratory setting, I noted they were much more likely to simply roll with student questions and would take the time to answer them. The medium and higher stress group could be found completely ignoring student comments or questions if they had made the decision as a teacher to move on to the next item on the list.

On the opposite side of the situation, when preservice teachers were describing their thought processes through their lower stress time periods while teaching, they would indicate thought patterns of being more in the moment. One participant described this mental clarity, “That’s why it was low stress, maybe. I don’t think there was anything else going through my head at that time. I was mainly focused on my lesson.” Another of the medium stress preservice teachers described reaching the end of a lesson as stress-reducing through knowing there was nothing else to worry about accomplishing, “It was nearing the end, I don’t think I had anything to think forward to from the lesson planning wise to the preparation wise. So I think that kind of help my stress.” Accomplishing items on their checklist in the allotted time was obviously viewed as a positive, even if it meant rushing students through certain parts, or extending others, was equivalent to educational success for those with the check-list mentality.

Theme 2C: Preservice teachers struggle with the complex nature of teaching.

The challenges of concurrently managing student behavior and maintaining flow of the lesson was previously discussed as a theme in the second microteaching lesson.

When both of the lessons were considered across all of the preservice teachers, a larger theme of the preservice teachers struggling with the overall complexities of the nature of teaching emerged. Sometimes the timeline got messed up and parts of the lesson moved quicker than anticipated, leaving the preservice teachers without planned content by the end of their lesson as described by one of the medium stress preservice teachers,

Maybe if you're in a greenhouse setting it would definitely take longer, but I had a very structured [activity]. So definitely ran out of time and was just kind of winging it. That was stressful, and some discipline problems, and Tony hiding.

One teacher described the flurry of activity in a classroom, “You have 10 million things going on in the classroom at once!” This quote exemplifies the perception the preservice teachers had of teaching being a very chaotic atmosphere. The preservice teachers were also beginning to experience anxiety when thinking about preparing lessons for a full load of classes,

Planning really stresses me out. I know you don't necessarily write a lesson plan every class, every day you teach when a teacher. But just knowing that, especially in student teaching, I have 7 classes every day to prepare for. I have to have something for them to do. Or six classes. I mean it really is just kinda getting to me.

The preservice teachers were actively working through developing their personal style of classroom management, adjusting their concept and comfort level of putting some control into the students’ hands, content delivery style, and accommodating students with special needs. One of the medium stress preservice teachers described struggling with the concept of control,

Things have to go the way I planned or I'm not okay with it. I'm very control freak-ish. I am a person who needs it to go this way. I'm like that in every part of the life. I'm a „my way or the highway“ person. When things arise it's hard for me [to adjust]. It's awful because as a teacher, things pop up all the time.

In essence, the preservice teachers were developing their teacher self-image and working toward becoming professional teachers.

Stress profile was also linked to the level of struggle preservice teachers experienced related to the complexities and intricacies of teaching. Through my observations in my field notes while in the classroom, I noted the medium and high stress preservice teachers seemed only to move about the room when proximity control was absolutely necessary and usually were only focused on the problem students. The tension and anxiety could be read on their faces and a current of unease could be felt in the room. One of the high stress teachers compared the feeling of teaching to playing in a basketball game,

I remember playing basketball in high school and not ever hearing the crowd unless I specifically made an effort to hear it. So I think it's maybe kind of like teaching a little bit, where I just block things out because I know what I want to get done. I think that just makes me teacher focused, and content focused as opposed to student focused. I think I block certain things out.

While observing the teachers, I noted the low stress teachers were much more purposeful in their movements about the room, actually connecting with students as they

Stress profile definitely made a difference in the perceptions of the complexity of the job of a teacher for this group of preservice agricultural educators. Lower stress

teachers were much more reflective in-action and able to adjust as they experienced road blocks while teaching, while the medium and especially higher stress teachers were much more likely to continue barreling through a lesson to accomplish what they had set out to accomplish. The entire group of teachers was continually working through developing their image as a teacher and a professional.

Theme 3C: Preservice teachers stress cognizance and impact on the learning environment vary according to stress profile.

When asked to describe personal symptoms of high stress, low stress, and stress-inducing or reducing events preservice teachers varied greatly across the profiles of stress. Low stress teachers were more readily able to give concrete examples of behaviors and symptoms of increased stress. One of the low stress teachers described the cognitive dysfunctions that occur when experiencing stress in the educational setting,

Very short in my language and my vocabulary decreases. That is my most frustrating reaction. I don't even know if I can call it that. When I'm not well spoken and my vocabulary decreases. I know it's occurring. I want to stop it. Another low stress teacher could readily describe the impact that procrastination had on stress levels, "When I procrastinate, my stress levels increase." The low stress teachers described being aware they were wearing the heart rate monitor, but also indicated they used it as a reminder to check in with themselves periodically and examine their own stress levels,

I found myself once they were working, once I had nothing to do or when I was just monitoring the class. I could really tell that then. So I guess it was like a reaction to after I was doing something involved. When there was a break for me

and the students were working on a paper, I could tell then. Also, I think it was having [the heart rate monitor] was also beneficial. It added a little bit of nervousness and also helped me evaluate where I am right now.

The low stress teachers also described preparing for students and events they knew were likely to cause them increased stress. One teacher recognized a habitual problematic student behavior and described incorporating interventions in the lesson plan, “Every time. I know it's going to happen. I potentially do stuff in my lesson to try to lessen it, but there is only so much you can do.”

When examining the teachers in the medium stress profile, they could describe symptoms and behaviors commonly linked to stress, and occurring during moments of increased stress. However, they often rationalized these symptoms and behaviors as not being correlated with the stress. One teacher described increased sweating, “I do sweat a lot. Normally I sweat all the time because I'm always hot...I'm constantly hot.” Another teacher described a reddening face as exhibiting feelings, with feelings not being indicative of stress, “Yes, very red. It's usually because I feel hot but I don't think it was that hot in the room that day. Any embarrassment, mostly my feelings show on my face.” Even though explicit instructions were provided regarding how the heart rate monitors worked, one teacher felt more stressed than indicated by the heart rate monitor, “I think I may have been more stressed than it will actually show. I don't know why I think that. I worry a lot but I don't think it affects my heart rate or anything.”

Echoing the previous statement, several of the teachers in the middle and high stress profiles described experiencing some form of stress constantly as a normal part of their existence, while almost always also expressing they felt they handled stress better than

most people, "It's natural and normal for me. I think I can function on a high stress level better than some can." A couple of the teachers described adjustments to sleeping necessary to cope with stress. Increased frequency of napping was described, "No wonder I nap so much. It's the only time I can rest." The use of sleep aids was discussed by one of the medium stress profile teachers in order to sleep through the night,

Normally I have to take melatonin. It's natural but sometimes I used to take Nyquil to go to sleep or Tylenol PM if I couldn't get to sleep...my mind is constantly going. Instead of talking to the doctor about it my mom said to try melatonin. It seems to help a lot. I take one and I'm out within 30 minutes. I sleep all through the night. That helps. I'm high stress.

Forgetfulness was also implicated as a part of regular, daily life, also not attributed to stress,

It's happened before. I only have one shoe. How do I only have one shoe? You know what I mean? It's been going on forever. Even something as simple as going home. Did I forget something I will need? My phone charger? Toothbrush?

Through talking to these preservice teachers, stress was obviously a component of every day life for them, beyond the microteaching lesson with implications of stress levels also impacting the teachers' personal lives outside of the academic setting.

The high stress individuals described losing sleep and also more concerning health problems for 22-year olds, such as high blood pressure. One of the high stress individuals described blood pressure causing problems, when asked to describe their personal stress levels, "Probably average to high. I've failed physicals for blood pressure." When asked

if they experienced frequent unexplained headaches, one of the high stress preservice teachers described worry and anxiety leading to headaches and sleep loss,

I keep overthinking things. It makes me more nervous. I get really anxious.

Sometimes if I stress myself out enough I'll give myself a headache. Just because I won't stop thinking about it. I keep replaying things or figuring out how to do things. If I'm really stressed out I don't sleep.

Neither of the high stress teachers could describe what experiencing low stress felt like, "I feel like if you're low stress, you just don't realize it. It's just another day." This comment was very interesting because this particular individual was the highest stress out of all of the preservice teachers interviewed for both microteaching lessons. They also self-identified as a "high stress" person from day to day.

Theme 4C: Stress profiles and teacher onus regarding negative outcomes in lesson are connected.

When the preservice teachers were discussing their high and low stress time periods and overall how they thought the lesson went, onus regarding negative outcomes surfaced often. Differences were observed between the teachers of the three stress levels in regards to reflecting on why activities did not go as planned during the microteaching lesson.

Low stress teachers more likely to took the onus upon themselves when things did not go as expected rather than casting the blame on someone or something else,

I had a whole list of questions, and I just thought we were going to get there and I Leading them to that Ahah! moment and it never happened. I think it was my fault my question just didn't get them there.

They were also more likely to say that students were the reason that things went well, rather than attributing an activity going well to things they did effectively as a teacher, “They were just good, it's easier to teach when kids are good.” The low stress teachers often indicated the teacher as an active agent capable of adapting and adjusting when things did not go according to plan to make for a better lesson the next time they taught, “If I had a problem with the class in my own classroom, I could go over the next day and say okay... And get the points that I wanted to make. And now reflecting when I'm actually in the classroom on how can I make this better. How can I learn from this?” The low stress teachers continued the trend of purposeful planning in regards to their lessons. They described really trying to see the lesson they were preparing from the students’ perspective and the need to make the lesson appropriate and exciting for their students,

I don't feel I will need to be the teacher that needs to be liked 100% of the time, but I do expect them to be enjoying the class and really getting something out of it. That's very much on me about creating interesting lessons that are relevant to them. So that's what I'm most concerned about. Not just lecturing, but being able to involve several components that keep them engaged throughout the lesson and semester.

Low stress teachers more often describe using the reflection form and video feedback process as a way of using constructive criticism to move toward improving their teacher practice, rather than simply being critical of themselves without taking the reflection one step further to the constructive process. One teacher describe the thought process surrounding the completion of the reflection form immediately after the lesson and then reviewing the video,

I felt that immediately after I was really frustrated and nervous and thinking about all the things that went wrong. Then after I watched the video I was thinking about all the things I can improve on and if I did it next time, what I would change. So I went from almost being upset to using it to be helpful tool later on, constructive.

The low stress teachers overall exhibited a deep level of reflection on their teaching behaviors and decisions, using the reflection form and video review to improve their teaching practices.

Medium stress teachers discussed doing certain things differently to cope with the student's behavior if they were to do the lesson again.

I could have done a little more interactive kind of thing in the beginning but then again I needed to show them how to do it, so they would do it... So maybe they just have to suffer through it until I can get to a point where they can have fun.

Lacking were explicit descriptions of measures to prevent behavior problems. These medium stress profile individuals seem to be missing the connection of the teacher contributing to student emotions and behaviors,

The activity didn't go very smoothly, because the behavior, because of the lack of maturity. It made the activity a lot more complicated than it should have been. It was a three-step process that became entirely too difficult.

These teachers often described the students as the reason for plans not meeting expectations.

The high stress teachers took little to no ownership of any problematic situations that arose in the classroom environment. Usually blaming the problems on student issues,

“I don't feel like I really did anything wrong, it's just the way that they were that day.”

Students not listening and general hyper activity were often indicated in problems encountered related to student engagement, “Nobody was listening and it didn't matter what I said. Unless everybody in the class got a detention, there was still going to be issues because everybody was hyper.” These high stress teachers let the atmosphere created by students prior to even beginning the lesson dictate how the lesson was to go, “I was really excited about this lesson. But once I got in there and I could tell they would be a little rowdy it stressed me out. I'm not always knowing how to fix the situation.”

Preservice teachers falling into the high stress profile expressed a powerlessness over the attitudinal current running through the classroom environment. This feeling of not having control extended to student responses to ineffective interventions, “They were rowdy and even though I gave them warnings and stuff nobody really listened.” These teachers were very different from the low stress teachers in that they did not view themselves as active agents in the classroom environment. They seemingly did not view themselves as capable of influencing, let alone changing the environment of the classroom from moving a student to a different seat to getting the class to stop talking when necessary.

Chapter 5: Discussion

Quantitative Data Conclusions and Recommendations

Through analysis of the quantitative heart rate variability data several points of discussion are surfaced. The observed increases and decreases in stress level while teaching indicated a common shift to lower stress in the 20-25 minute time period of the 35-minute microteaching lesson. This observation is indicative of the importance of having the preservice teachers engage in longer microteaching lessons to allow them to experience lower stress levels and “flow” (Gunderson, 2003). This is opposed to the 10-minute microteaching lessons as described in the original conception of microteaching as a teacher education practice (Cruickshank, et al., 1996). Flow in the educational setting has been found to be observed more frequently in highly effective award-winning teachers (Gunderson, 2003). It is recommended teacher educators provide preservice teachers with the opportunity to participate in longer microteaching lessons to allow for the potential to experience the positive effects of flow.

As a collective, the preservice teachers were rarely able to manage their stress levels to a point of parasympathetic recovery while teaching, and most did not achieve this recovery at all during the day of microteaching. This phenomenon is indicative of a group of individuals lacking awareness of stress and to a greater degree a lack of effective stress management practices (Brosschot, et al., 2006; Hall, et al., 2012; Mintz, 2007). Teacher educators should include stress awareness and management in the curriculum for preservice teachers. They should reach out to trained professionals with experience in teaching stress awareness and management on campus and in their communities for help to integrate these concepts into existing curriculum.

When preservice teachers were analyzed for the development of a profile of stress, three separate groups surfaced. Stress levels clustered in three distinct areas on the scale resulting in Low, Medium, and High groups. The low stress preservice teachers experienced higher stress prior to the lesson. Their stress levels were then found to decrease as they completed the lesson and were the lowest following the lesson. This trend seems to indicate the preservice teachers composing the low stress profile find themselves with anticipatory stress while they are mentally preparing for the lesson with relief of the stress as they work through their lesson and moving into recovery from the stress following their lesson.

The medium stress preservice teachers displayed an upward trend where stress steadily increased from the 35 minutes prior to the lesson to the 35 minutes following the lesson. These teachers showed teaching as a stress-inducing activity with qualitatively describing worry about the lesson after they had completed teaching indicated by increased stress levels measured quantitatively.

The high stress preservice teachers showed consistently high stress levels from 35 minutes prior to the lesson to 35 minutes after the lesson had completed. This trend indicates individuals chronically experiencing stress, as they are never nearing the parasympathetic recovery observed in the low stress teachers. This chronic stress can begin to impede cognitive ability and be implicated in health problems (Brenner, Sorbom, & Wallius, 1985; Evers, Tomic, & Brouwers, 2004; Friedman, 1995; Guglielmi & Tatrow, 1998; Hall, et al., 2012; Steinhardt, Smith Jaggars, Faulk, & Gloria, 2011). These health problems can become harmful to quality of life for the individual teacher in

addition detrimental to the quality of education presented to students through decreased cognitive ability of the teacher and potential increased absence.

It appears all of the preservice teachers across the three profiles of stress could benefit from guidance by the teacher educator in methods for reducing physiological stress in the moments leading up to the lesson, such as taking three deep breaths. Through guiding the preservice teachers to reduce stress prior to the start of the lesson, their baseline stress would be lower when they began to encounter challenging situations in the microteaching lesson (Kaldi, 2009; Kyriacou, 2000; McCraty & Tomasino, 2004; Wadlington, Slaton, & Partridge, 1998; Wallace, 2007). Lowered anxiety levels at the onset of the microteaching lesson could prevent a portion of the communicative stress relayed to students resulting in a much more positive overall classroom environment.

Mixed Methods Data Conclusions and Recommendations

First microteaching lesson.

The qualitative themes emerging from the preservice teachers' reflections on the inquiry-based microteaching lesson revealed several sources of stress. One of the most prominent themes was that of questions from simulated students being stress-inducing for the preservice teachers. These preservice teachers found these questions to be unpredictable which caused them anticipatory anxiety regarding not knowing the answer to the questions. As was expected, stressors resulting from the student-teacher interactions were indicated as considerably taxing on preservice teacher stress levels (Brenner, et al., 1985; Burke & Greenglass, 1996; Friedman, 1995; Grayson & Alvarez, 2008). Low stress preservice teachers less often mentioned student-posed questions as problematic for them; however, these preservice teachers also discussed higher levels of

preparation for the lesson. The preservice teachers as a whole did not seem aware of the difference between the content knowledge level and types of questions their peers would be asking in comparison to those of actual high school students. Adequate preparation was indicated in increasing content knowledge and subsequently helped the preservice teachers to better answer student questions.

Preparation level was also indicated in the level of stress experienced by the preservice teachers, with insufficient preparation naturally leading to higher stress levels. The preservice teachers were struggling to learn how to adequately prepare for the microteaching lesson without having it consume what they perceived as an excessive amount of time. This increased preparation was also found to increase the ability of the teachers to manage behavior, believed to be a result of lower stress levels overall. Preparation has been indicated as a coping mechanism for reducing stress; however, teachers rarely view planning as a strategy for coping with stress and more as a duty that is part and parcel of the job of a teacher (Cockburn, 1996; Griffith, Steptoe, & Cropley, 1999). It is recommended that teacher educators work to open dialogue among the students regarding how they plan and how much time they spend planning. This could serve as a motivator for those who find themselves spending significantly less time than others and a tempering force for those who tend to obsess and spend an excessive amount of time on planning. This dialogue could be facilitated in class or by leveraging online technology facilitating discussion through interactive dialoguing platforms (Rich & Hannafin, 2009; Schmidt, 2010).

Due to the ability of the human body to communicate stress in what could be described as an “infectious” manner, a lower stress level in the classroom is essential for

a teacher. When high stress levels were observed in the teachers, only a short amount of time later would find the classroom in a state of disarray. In these instances, behavior management issues quickly escalated to significant events taking away from instructional time. When lower stress levels were observed in preservice teachers, behavior management was taken in stride with little or no disruption to the flow of the lesson. These stress levels of the teachers contributed to an overall feeling perceptible in the classroom laboratory environment. This feeling was detected and commented on by instructors in the instance of some of the low stress preservice teachers' lessons wherein remarks were made to the effect of how "calm" the room was and how well-behaved the students were. Conversely, in the high stress preservice teachers' lesson, the anxiety they were feeling was communicated to the point the perception of rising anxiety levels within myself simply by being present in the back of the room. The phenomenon of communicative anxiety or stress has been documented in the classroom situation by researchers investigating teacher burnout through student and teacher self-assessment of burnout levels (Evers, et al., 2004). Students often indicated a higher level of perceived burnout of their teachers than was indicated by the teachers themselves. This is indicative of a magnified effect of symptoms of teacher stress as perceived by students (Evers, et al., 2004). It is recommended the phenomenon of communicative anxiety or stress be conveyed to preservice teachers through discussions on classroom and behavior management. Knowledge of communicative anxiety could give preservice teachers motivation to become skilled at personal stress management in an attempt to avoid setting the stage for behavior problems in the classroom.

Stress levels were indicated in the level and amount of reflection preservice teachers would engage, with stress profile connected to emotions expressed while reviewing the audio/video recording of the microteaching lesson. Lower stress teachers often had comparatively smoother lessons and, as a consequence, expressed less emotional duress while watching themselves teach. The opposing side of this were the preservice teachers experiencing much psychological pain in “watching themselves fail” as they perceived watching a lesson not meeting expectations. The medium stress teachers had much to say about their distaste for watching the videos and the high stress teachers did not mention actually watching their videos. The teachers experiencing pain in critiquing themselves and being the recipients of the critique obviously took the criticisms as a personal affront. In essence, a criticism of teaching performance became a criticism of the self. This conclusion elicits the recommendation of the use of performance theory—emphasizing the “characterization” of the teacher to allow for more emotional distance from the performance (Wilson & In'Anson, 2006). This will provide for a higher level of reflection because the reflection will be less painful for the preservice teacher (Morgan-Fleming, 1999; Pineau, 1994). One option for teacher educators to consider would be allowing the preservice teacher to choose and describe in detail the role or character that they will be performing, rather than performing as the self.

The final theme for the first microteaching lesson analyzed for this study surfaced the pressure felt by the preservice teachers in performing for their peers. Though their peers were acting in character roles as high school students, the preservice teachers still recognized the fact of peers being present who were suspected of judgment. The risk of

embarrassment was perceived as high by these preservice teachers and seemed to add another component of worry to the microteaching lesson. Interestingly, though they recognized the simulated students as peers, as indicated in an earlier theme they could not seem to distinguish the difference between the questions posed by students during the microteaching lesson and the reality of the types of questions high school students would ask. This problem could also be reduced in significance by the teacher educator adopting a performance theory standpoint, where rather than presenting as one's self, the preservice teacher is acting in a role outside of the self (Wilson & I'Anson, 2006). Through distance from owning the performance as the self, preservice teachers could be less impacted by the emotional duress of putting themselves as a developing teacher on the line in front of the peers who were perceived to be hypercritical.

Second microteaching lesson.

The preservice teachers in the low stress profile groups viewed the microteaching experience as parallel to teaching in a live classroom. However, the medium and high stress teachers were quick to point out how they perceived this setting to not be similar to reality. In most instances, the microteaching laboratory was believed to be more challenging than a live classroom, mainly due to components of behavior management. Teachers often related that actions they took would have a different, more optimal response from students in a live classroom. The division of the microteaching laboratory and a live classroom as discrete microcosms appeared to be a form of projection of blame for a perceived failure or lack of success. To curb some of these beliefs becoming ingrained, teacher educators could have early career teachers communicate the aspects of

teaching where they are currently experiencing struggle to help create a “need to know” for the preservice teachers (Romano, 2005).

Following this first theme was the introduction of simulated students with learning disabilities in the classroom as stress-inducing. Preservice teachers also indicated this microteaching lesson as an exaggeration of the truth. They seemed to feel as if these students with special needs would come with detailed instruction manuals. Often a disposition was displayed while teaching wherein the preservice teachers felt the students should accommodate the preservice teacher’s lack of knowledge and preparation instead of the preservice teacher preparing sufficient accommodations for the students. This disposition was rarely observed in the lower stress teachers and was often evident in the medium and high stress teachers as they voiced frustration over the students with special needs. Once again, the lower the stress profile of the teacher, the higher the level of preparation and forethought in accommodating the students with learning disabilities was found to be a trend. This theme points toward the orientation of the preservice teachers in the preparation of their lessons being student versus teacher. The lower stress teachers were more student-oriented, actually considering their students in the planning and preparation stages. Conversely, the higher stress level teachers were much more self/teacher-oriented, making the lesson and preparations in a manner that most accommodated themselves. Based on this conclusion, it is recommended for the inclusion of practices to move preservice teachers toward a more student-centered orientation in all stages of the educational process from planning to assessment. Teacher educators may want to examine the lesson planning process for preservice teachers to determine if the

lesson planning practices promoted in the teacher development program encourage more student-oriented processing.

An overwhelming lack of knowledge of personal stress was found evident in the preservice teachers. I observed many indicators of stress and anxiety while they were teaching; however, when questioned these signs, such as reddening of the face, sweating, or fidgeting, an increase in stress was rarely mentioned. These happenings were often described as a spontaneous reaction of their body. The preservice teachers also indicated a strong lack of control over these reactions, especially the ability to prevent these reactions from occurring. In an effort to reduce teacher burnout and subsequent attrition, researchers on burnout have recommended development and distribution of stress management methods for teachers (Grayson & Alvarez, 2008). In addition, this research supports the recommendation of beginning focus on stress management in the preservice years through teacher development programs.

Overall conclusions.

With the combined analysis of both microteaching lessons, four themes were found to emerge. The first theme dealt with the preservice teachers' inability to live in the present and the resulting stress from this phenomenon. The preservice teachers were stuck in both the past and the future, with little attention to the present. This could be observed in everything from the minutes leading up to their lesson to occurrences of worry recounted in activity logs. This lack of present mindedness contributed to the tunnel vision and lack of global awareness observed (Brosschot, et al., 2006; Harris, 2011). The preservice teachers were not able to attend to the events occurring in the present because they were more concerned with moving forward to the next instructional

activity in their lesson plan. Understandably, this affected the preservice teachers' ability to engage in deep discussion and attend to student questions (Howard & Johnson, 2004). The resulting outcome was an attitude of annoyance with student-posed questions as these were viewed as impeding progress toward the end of the lesson. In essence, anything interrupting the process of marking things off of their check-list was deemed as inappropriate behavior by students.

Through personal communication with the instructor, I discovered there was no requirement for the amount of content to be shared in the lesson. The preservice teachers had voluntarily established a goal to accomplish a set amount of the lesson in 35 minutes and were determined to meet that goal. They felt pressured to accomplish this goal to the point of rushing students through certain activities when they were running short on time. In other cases this meant extending components of the lesson to the point of boredom on the students' part when the educational objectives were accomplished sooner than anticipated. This trend is indicative of a formal presentation mindset where not completing the full list of objectives would be considered poor time management. This is opposed to a classroom teaching mindset where attention can be given to the "teachable moments" that are presented through student questions and comments. Also indicative of a presentation mindset, was the overarching idea that education was something done to, rather than with the students. The difference between a constructivist and a behaviorist mindset come to mind with this conclusion. This begs the question of where this expectation is founded, have these preservice teachers become too accustomed to the university lecture hall setting or was this disposition borne in their time in the public school setting?

In the reality of an agricultural education secondary classroom, if objectives are not accomplished because of the need for remediation, or the lesson is moved through quicker than anticipated, the plan for the next class period can simply be adjusted accordingly. Interesting student comments were often ignored. Does this stem from a lack of content knowledge? Or is it indicative of a lack of even broader knowledge where the specific content is applied to different contexts and situations? It is recommended that teacher educators should consider the role of content knowledge courses in the development of future teachers to determine if preservice teachers are being adequately prepared in this area. This conclusion additionally has implications for the content of the microteaching lessons, should preservice teachers be allowed to exclusively teach content they are familiar with while they are developing their own teaching methods? Worry concerning potential future events was very disconcerting and stress inducing for these preservice teachers. They invested great amounts of mental energy worrying about questions students might ask or activities turning to chaos. These episodes of worry recorded by the preservice teachers were rarely accompanied with resolution or preventive action regarding the subject of the worry in that lesson plans were not altered or activities changed.

In light of this conclusion regarding inability to be in-the-moment in the classroom, preservice teachers would greatly benefit from training in mindfulness and learning how to cognitively and fully attend to the present moment rather than worrying about the past or future (Harris, 2011; Soloway, 2011). Mindfulness and present-mindedness is a cognitive skill that requires training and practice and should be reinforced by being put to use in a variety of contexts (Harris, 2011). It is recommended

that teacher educators should work to cooperate with individuals in the community, academic and otherwise, who can bring a mindfulness practice to the preservice teachers; especially if the teacher educator is not trained in mindfulness practices.

As expected, the preservice teachers struggled with the many-faceted complex nature of the act of teaching. Time management was a major issue for the teachers from lesson planning and procuring of materials for activities to managing instructional time (Torres, et al., 2009). Conventional research tells us the human brain is only capable of attending to two separate tasks at once by splitting into hemispheres. Our brain is so adept at dual-tasking that when an individual is highly skilled at both tasks, no reduction in performance is noted (Applebaum, Marchionni, & Fernandez, 2008). When a third task is thrown in the mix the brain essentially performs a juggling task as it can only attend to two at one time.

Often, we falsely believe we can become skilled “multi-taskers,” when in actuality there really is no such thing as multi-tasking on a cognitive level. The act of multi-tasking has been shown to cause a drop of IQ similar to losing one full night’s sleep and symptoms akin to those diagnosed with ADHD (Applebaum, et al., 2008). The lack of present-mindedness in these novice educators further muddies the water in regards to complexity of the job of teaching. When the preservice teachers are performing their microteachings they are balancing instructional delivery, behavior management, flow of the lesson, and are often thinking about being evaluated.

Additionally, the preservice teachers were attempting to develop their personal style of classroom management. This involved working at giving up control for the self-admitted “control freaks” when it came to the problem based learning microteaching

lesson. They were also trying to work at developing the ability to prepare lessons that were truly learner centered, a task often causing novice educators struggle (Hammerness, et al., 2005). The preservice teachers were experimenting with behavior management styles, trying out new methods not familiar to them and attempting to find approaches that worked with their personalities and were also effective. Providing instruction in mindfulness and incorporating mindfulness practices into the curriculum and microteaching experience would greatly benefit these preservice teachers. This instruction would teach them how to get over some of the “control freak” tendencies and learn to live in the present moment, even while teaching (Napoli, 2004; Soloway, 2011)

When separated by stress profile, varying levels of stress cognizance and the impact of stress on the learning environment were discovered. The preservice teachers of the low stress profile group were found to have a much higher level of awareness regarding stress-related behaviors and symptoms in addition to the impact of their own stress levels on the classroom environment. They were also much more aware of things, such as procrastination, that tended to increase their own stress levels. This awareness is likely the predecessor for their lower stress levels, by being more in tune with their own physiological symptoms of stress resulted in the ability to self-regulate and take action to reduce elevated stress levels (Rieg, Paquette, & Chen, 2007). Teachers who have participated in mindfulness training as stress management and prevention were found to use their skills while developing and implementing curriculum, when experiencing anxiety and conflict, to improve personal life, and to bring about constructive transformations in the classroom (Napoli, 2004).

The preservice teachers in the medium stress profile were found to be aware of symptoms and behaviors linked to stress. However, when I questioned them further about the cause of these symptoms and behaviors they were often blamed on external factors, such as the elevated temperature of the room. These preservice teachers were also much more likely to describe themselves as very adept at coping with increased stress. Stress was indicated as a constant, every day occurrence for these teachers, and methods of stress management were not indicated as being a part of regular routine.

Not surprisingly, the high stress profile participants were found to indicate life-disrupting effects resulting from chronic stress. Negative health impacts as a result of stress in the lives of teachers has been well documented (Guglielmi & Tatrow, 1998). However, I was shocked at the degree to which chronic stress had impacted the lives of these 21 and 22-year old preservice teachers. These individuals described frequent headaches, high blood pressure, and interrupted sleeping patterns, all of which are a side effect of chronically high stress levels. These preservice teachers also described perseverating on thoughts of worry regarding a stressful situation with indication of the microteaching lesson being one such stressful situation. In a study of the correlation between teachers' perception of stress and coping style, researchers have posited ineffective coping styles lead to a buildup of work through disengagement behaviors. This procrastination and subsequent increased workload lead to a perception of increased stress by the teachers who then withdrew from competing activities such as those with family and friends (Griffith, et al., 1999).

Given these conclusions and implications, I recommend preservice teachers be provided with training in the evaluation of trying situations and effective coping

strategies useful in reducing cumulative and chronic stress (Grayson & Alvarez, 2008; Griffith, et al., 1999; Harris, 2011). Implementation of this practice could result in novice educators equipped with the knowledge and tools necessary to prevent stress from being a limiting factor in reaching their full potential in the classroom. In addition, through the use physiological and behavioral measures of stress, preservice teachers determined to be at an increased risk for stress-related compromises of health and teaching practice could be targeted for intervention in an effort to prevent the negative cumulative effects of chronic stress ranging from prematurely leaving the profession and increased illness, even up to death resulting from compromised health (Guglielmi & Tatrow, 1998).

In the last theme emerging from the combination of both microteaching lessons, a link was found between profile of stress level and the onus for negative outcomes in the lesson on the part of the preservice teachers. This theme is of particular interest to me as a teacher educator because, in providing constructive criticism, if an individual cannot accept ownership for the outcome of situations logically it follows to be difficult to convince this person of the need for change in practice. In feedback sessions following microteaching lessons with the preservice teacher who is less likely to accept onus, the teacher educator could find themselves having a hard time challenging the preservice teacher to do better because they see many things as beyond their control. The ability to critically reflect on one's work as a teacher is essential to improvement of practice and should be adopted as a habit (Burrows, 2012).

The preservice teachers in the low stress profile had no problem taking ownership for the blame when aspects of the microteaching lesson did not go according to plan. These teachers also seemed much more adept at picking up on feedback and using it to

better themselves through an increased level of reflection. They analyzed their performance in the video and studied how they, as a teacher, impacted the classroom interactions. The low stress preservice teachers even went so far as to take the information regarding their personal stress triggers they gleaned from the first interview with me and apply it toward their next lesson, prepping themselves for known triggers of stress. In this first interview, I was conscientious to not provide advice or feedback related to performance or even indicate they should use the information I provided for their next lesson. As has been observed in previous work on preservice teacher reflection, these low stress preservice teachers explicitly indicated they voluntarily reflected on their interview with me and integrated those reflections into their subsequent microteaching lesson (Burrows, 2012). If teachers can be prompted to lower their stress levels prior to teaching and prior to the feedback session with a teacher educator, the level of reflection achieved could increase. Teacher educators could encourage, or even lead a brief period of stress management prior to the microteaching lesson and feedback session to elicit these lower stress levels.

The preservice teachers in the medium stress profile indicated they could have taken different actions regarding student behavior, but often would follow-up that student behavior probably would not have been any different even if they had tried something different. This lack of control and also onus regarding the course of classroom activity was also felt when these preservice teachers would describe student behavior and often lack of maturity as the primary reason for less than desirable outcomes in a lesson. The students were seen as barriers to progress in the lesson, which is problematic as students are the reason for teachers to exist.

The high stress profile preservice teachers held a firm belief of faith in the quality of lesson they provided, with the blame squarely placed on the students for their lessons not going well. This belief was clung to even when a lesson was going awry to the point of the preservice teacher permanently stopping instructional activity and making students write something nice about each other. These teachers did not feel as if they had control to change the attitudinal qualities and atmosphere existing in the classroom when they began their microteaching lesson. Findings from a previous study revealing a divergence between a competence in coping with student misbehavior and levels of personal accomplishment are indicative of the phenomenon being observed in the current study (Evers, et al., 2004).

In summary, the low stress profile preservice teachers placed onus for less than ideal outcomes of the lesson on a controllable internal factor—themselves. Conversely, the high stress profile teachers and often the medium stress profile teachers were found to place responsibility for an unsatisfactory performance on external and uncontrollable factors—the students, the order in which they taught in the rotation, and upcoming events such as Fall Break. Logic would reveal this externalizing of blame on something beyond the individual’s locus of control relieves the preservice teacher from responsibility and control (Dweck, 2006). If the preservice teacher does not have to blame him/herself for the unsatisfactory results, no additional work or improvement is necessary and they can maintain the status quo because the environment is viewed as beyond control.

The preservice teachers in the medium and high stress profiles showed a lower level of competence in dealing with disruptive behavior coupled with an increased level of personal accomplishment regarding the overall lesson. This trend resulted in preservice

teachers identifying a “good enough” teaching performance translating into a lack of perceived need for improvement. Additionally, the previously mentioned study indicated their students did not reinforce the teacher’s optimistic views of classroom performance. This poses the question: Do the opinions of simulated students in the laboratory classroom parallel those of the students in the (Evers, et al., 2004) study?

To answer the previously posed question, the instructors of courses utilizing microteaching lessons with simulated students could implement a standardized system of student evaluation following the lesson. This feedback would provide another point of reflection for the preservice teachers in addition to providing more data to possibly back up the constructive criticism coming from instructors and TAs. Teacher educators should work to specifically instruct preservice teachers in the process of reflection to help them move toward best practices. Administrators at the district level should provide explicit, reflective opportunities for early career classroom teachers, utilizing journaling and audio/video recordings as tools to foster and promote reflective practices (Burrows, 2012).

Future Directions: Recommendations for Further Research

Recommendations for future research in the field of educator reflection and stress both point to the use of mixed methods approaches to expand upon the existing knowledge base. In the area of preservice teacher reflection, more qualitative and longitudinal studies are needed to develop a deeper understanding of how the practice of reflection develops in preservice teachers and the impacts on future reflective practices in the classroom. Multiple means of qualitatively measuring reflective practices including video, observations, and journals would be beneficial (Burrows, 2012). There also begs a

study of the longitudinal effects of practices such as studying videos of effective teachers, professional development seminars, and consuming professional trade journals for promoting reflection in preservice teachers (Burrows, 2012).

In studying preservice teacher stress, more studies using a multimethod approach would help to build a more rigorous empirical knowledge base. The pitfalls of single-method and exclusively self-report measures of teacher stress have been well documented (Guglielmi & Tatrow, 1998). Adding varying measurements of stress to the study of the subject would contribute more objectivity to the current primarily subjective assessment methods; these could include independent observers, archival data analysis, physiological and behavioral measures.

When considering the microteaching lesson and study as a teaching method for preservice teachers, examination into the use of student opinion would greatly contribute. The development of an instrument for students to use in assessing a preservice teacher's performance could help the preservice teacher improve their own practice as well as the instructor of the course to better determine curriculum focus (Evers, et al., 2004). The role of the student in helping a preservice or inservice teacher understand the learning process and teacher performance should not be minimized or understated. The application of Csikszentmihalyi's theory of "flow" should be examined in both preservice and inservice educators to determine how flow impacts the agricultural educator. Increasing the rigor of research on educator stress by introducing more longitudinal studies would greatly inform the knowledge base by following teachers from their preservice years, as they become novice educators, and on into the span of the career. The study of stress in preservice teachers during the student teaching experience could be

completed through replication of the methodology used in the current study independently or as a follow-up to the current study could be beneficial as well. This would allow for interventions on stress management within the preservice time frame while allowing the preservice teachers to put new skills to practice within a live classroom.

Finally, providing preservice teachers with explicit instruction on how to recognize, prevent, and cope with stress presented in the educational context and in the context of the teacher's personal lives is essential. Research should be conducted to determine the best methods for conveying this information to preservice teachers for more positive outcomes (Harris, 2011). In the increasingly technology-based world, newer methods of online systems for support of stress management for teachers have been developed. This technology should be examined for appropriateness and application in the preservice context, such as the student teaching internship (Leung, Chiang, Chui, Lee, & Mak, 2011).

APPENDIX

Appendix A

Agricultural Education 4330/7330 Syllabus
Teaching Agriculture Subjects
Fall Semester 2012



Course Instructor:

Dr. Tracy Kitchel, Associate Professor
URL: <http://aged.missouri.edu>

Lab Teaching Assistants:

Lecture Day, Time and Location:

Monday and Wednesday 10:00 - 10:50 a.m.

1. Lab 1A: Tuesday 2:00 - 4:30 p.m.
2. Lab 1B: Thursday 2:00 - 4:30 p.m.

Essential Question for this Course

When do I know that learning is occurring?

Course Outcomes:

1. Plan for learning in an agricultural education classroom setting
2. Teach in an agricultural education classroom setting
3. Reflect upon your teaching and students'/audiences' learning
4. Discuss the professional and ethic aspects of being an educator

Course Description:

Further investigations into the teaching and learning process, which includes methods beyond direct instruction, classroom and behavior management, and curricular design. Prerequisites: Ag Ed 4320; acceptance into Phase II of Teacher Development Program or permission of the instructor.

Course Requirements:

1. Course Website – We will be utilizing MU's Blackboard website (bblearn.missouri.edu) for course management
1. Ag Ed 4320/7320 course packet and notes – this class builds heavily on that content
2. **NAAE membership – membership comes with liability insurance for the year!**
3. Textbook – NONE – We will utilize various readings available on the course website
4. 4GB SD Card (*you may need a card reader depending on your computer*)

Web-based Course Resources:

1. Problem-Solving Templates (Microsoft Word)
 1. <http://dass.missouri.edu/aged/resources/>
2. Communities of Practice through NAAE
 1. Visit Communities of Practice for new ideas, interesting discussions, and a place to bounce around ideas with other agricultural educators:
www.naae.org/communities
3. Center for Agricultural and Environmental Research & Training Curriculum (complementary access for 1 year) <http://www.myaert.com/>
 1. Assess is your e-mail address as user name and “missouri”, as password
4. Curriculum Profiles for Missouri Agricultural Education Courses
 1. http://www.missouricareereducation.org/index.php?view=content_area§ion=ag
5. Garton, B. L. (Ed.). (2003). *Agricultural education program planning handbook for Missouri schools* (5th ed.). Jefferson City, MO: Joint State Staff in Agricultural Education, Agricultural Education Section, Missouri Department of Elementary and Secondary Education. Available in PDF format at:
 1. <http://dass.missouri.edu/aged/resources/handbook/>

Course Outline and Schedule

Week	Date	Lecture Topic	(Review) and Assignments	Lab Schedule
1	M – Aug. 20	Course Induction Student to Teacher Centeredness Spectrum		Lab Induction
	W – Aug. 22	Building the Instructional Process and Lecturing Effectively		
2	M – Aug. 27	(Review of) Ag Ed 4320/7320		Lab 1A
	W – Aug. 29	Using Basic Active Learning Strategies		
3	M – Sept. 3	No Class – Labor Day		Lab 1B
	W – Sept. 5	Managing Behavior	ASB	
4	M – Sept. 10	Managing Behavior continued	CEE	Lab 1C
	W – Sept. 12	Managing Behavior continued	KMC	
5	M – Sept. 17	Developing and Using Case Studies	LAW	Lab 2A
	W – Sept. 19	Using the Problem Solving Approach	LK	
6	M – Sept. 24	Problem Solving continued	SGC	Lab 2B
	W – Sept. 26	Using Inquiry-based Methods	SMO	
7	M – Oct. 1	Using Inquiry-based Methods continued	SPF	Lab 2C
	W – Oct. 3	Assessing Beyond Tests and Checklists (Rubrics and Scoring Guides)	AF	
8	M – Oct. 8	Integrating Reading Strategies in the Class	AEG	Lab 3A
	W – Oct. 10	Differentiating Methods for Learners with Special Needs	JDR	
9	M – Oct. 15	Using Visual Aids		Lab 3B
	W – Oct. 17	Using Technology-based Methods/Using a Computer Lab	KLP	
10	M – Oct. 22	Field Trips, Guests, Brainstorms, Buzz Groups and Role Plays [Haug/Rice]		Lab 3C
	W – Oct. 24	Using Motivational Games; Differentiating Student-Centered Methods [Haug/Rice]		
11	M – Oct. 29	Defining the Curricular Process	PMMM	Lab 4A
	W – Oct. 31	Conducting and Utilizing a Needs Assessment and Community Analysis	REL	
12	M – Nov. 5	Selecting Competencies and Units	TBAH	Lab 4B
	W – Nov. 7	Selecting Competencies and Units continued	TLM	
13	M – Nov. 12	Developing Teaching Calendars	MJ	Lab 4C
	W – Nov. 14	Developing Teaching Calendars continued		
14	M – Nov. 19	No Class – Thanksgiving Break		No Lab
	W – Nov. 21			
15	M – Nov. 26	Being a Professional and Ethical Educator/Legal Issues as an Educator	Unit Plan with Lessons	No Labs – Release for Lab 5
	W – Nov. 28	Developing Expectations with Learners on the First Day		
16	M – Dec. 3	Working with Parents in the Teaching/Learning Process		No Labs – Release for Lab 5
	W – Dec. 5	Debrief on the Final Lab at Cooperating Site	Curriculum Plan/Calendars	
Finals		No Final Exam		

Note. Schedule is subject to change due to availability of resource persons and students' learning needs; (XXX) = initials of the student reviewing class that day

Course Assignments and Expectations	Percent/ Points	My Scores
Professionalism (attendance, participation, in-class exercises)	100	
Lab Role Play Participation	80	
Curriculum Plan for Two Courses	140	
Unit Plan with Lessons	200	
Micro-teaching Lesson Plan (5 @ 40 points each)	200	
Micro-teaching Delivery (5 @ 60 points each)	300	
Daily Lab Reflections (4 @ 20 points each)	80	
Micro-teaching Post-Video Reflection (5 @ 30 points each)	150	
Review in Lecture	50	
TOTAL	1300	

4330 Grading Scale (Percent)*

A+ = 99.0 - 100.0 %	B+ = 87.0 - 89.9 %	C+ = 77.0 - 79.9 %	D+ = 67.0 - 69.9 %
A = 94.0 - 98.9 %	B = 84.0 - 86.9 %	C = 74.0 - 76.9 %	D = 64.0 - 66.9 %
A- = 90.0 - 93.9 %	B- = 80.0 - 83.9 %	C- = 70.0 - 73.9 %	F = below 64.0 %

*The percents are assigned so there are no rounding discrepancies in terms of the whole number.

7330 Graduate Student Grading Scale (Percent)* ¹

A = 90.0 - 100.0	B = 80.0 - 89.9	C = 70.0 - 79.9	F = below 69.9
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*The percents are assigned so there are no rounding discrepancies in terms of the whole number.

¹ Students receiving graduate credit for this course must complete an annotated bibliography on 5 research journal articles relating to teaching and learning. This is worth 100 points and will be added to your grading scale.

Assignment Description

Professionalism

1. Lecture attendance is important. However, occasions arise where other activities take priority. If you plan to miss a class, you are expected to contact the course instructor prior to class (unless it is an emergency). If the instructor deems the absence acceptable, professionalism points will be awarded *if the make-up work is completed*. It is the student's responsibility to request for make-up. Frequent absences will be dealt with on a case-by-case

basis. **Unexcused absences will result in a 20-point loss in professionalism points.**

2. Lab attendance is equally as important. Again, occasions arise where other activities take priority. If you plan to miss a class, you are expected to contact the lab instructor prior to class, unless it is an emergency. If the lab instructor deems the absence acceptable, you will need to schedule a time to attend another lab. Tardiness rules apply to labs (see next bullet).
3. *Tardiness will not be tolerated* unless it is deemed an emergency. You must plan ahead to show up to class or lab on time, just like you would do if you were teaching at a school. Your grade will be deducted by 10 point for being tardy the first 5 minutes and 20 points for tardies past 5 minutes. Deductions are not limited to your total professionalism points.
4. Quick quizzes (typically unannounced) can be utilized throughout the semester to check for readiness of the student. If a quiz is over a reading for the day, you may use any hand-written notes from the reading for that quiz.
5. In general, on the first day of class, all professionalism points are awarded on the Blackboard grade book. As the course continues, points are deducted when point losses occur due to missing class or lab, being tardy to class or lab, or from quick quiz scores.

Lab Role Participation

Part of doing our best to create the lab experience rests on your shoulders to “act the part.” Points have been designated to serve several functions:

1. When punishments are provided in the classroom, teachers have the opportunity to follow-up. In lab, this is difficult to simulate. Therefore, one purpose of the points will be for role-play “punishment.” If you choose to misbehave in ways that result in a detention, then you will lose 10 points. Just like school, if the teacher does not fill out the proper paperwork the day of lab, you will not be issued your deduction.
1. To provide checks and balances, if you, as the teacher, issue a detention that does not match the severity of the actions provided by your role-playing colleague, this will be reflected in your microteaching score.
2. Sometimes, a variety of roles are provided to simulate a variety of students. If you do not play to your character, then points will be deducted. If minor deviations in character ensue throughout the semester, the deductions may not be represented until the end of the semester.

Micro-teaching Lesson Plan

Part of being a reflective and effective teacher is having the ability to internalize the teaching process. One of the best methods of internalizing the teaching process is lesson planning. One week prior to micro-teaching, you will turn in your lesson plan with the lesson plan rubric scored by you. You will receive feedback prior to the

end of that week and the plan will be graded via a grading rubric. If a micro-teaching lesson plan was submitted on time, it can be re-submitted the day of the micro-teaching for re-evaluation. An average of the old and new scores will be taken and recorded. Attach both old and new versions of the lesson plan.

If turned in late, lesson plan scores are reduced by 20% per day and you may not get the amount of feedback you would have received if turned in on time. If a lesson plan is not turned in the day before your assigned lab (note you would receive zero points if that late), you will not micro-teach and subsequently you will lose microteaching and reflection points.

Micro-teaching

You will implement a portion of your lesson plan (time depends on the particular lesson assignment). Scoring will be based upon the implementation of learning and teaching principles. The lesson will be recorded and graded holistically.

Micro-teaching Reflection

You will prepare reflective notes and submit this paper, after viewing your micro-lesson, during a reflective feedback conference with your lab assistant. The score for your reflection will be based on both the paper and conference. Tardiness to and missing feedback conference appointments are taken into account in the reflection score. *It must be clear to your lab TA that you watched your video!*

Daily Lab Reflection

Part of being a good teacher is learning different forms of reflection. In addition to watching your video, we will ask you to do a short reflection of your teaching right after you teach.

For those times you do not teach, you will write a short reflection about your role-playing. The following questions should be answered with 1-2 prompts:

1. Describe your (character's) behaviors as a student in this lesson.
2. Describe how the teacher worked with you (your character) in this lesson.
3. Describe how you (as a teacher) would have worked with your character in this lesson.

Class Review in Lecture

You will be assigned a day in which you will conduct a review for the last 3-5 minutes of class. You must stop Dr. Kitchel (or instructor for the day), approach the class and proceed to review what had been taught from the day.

Curriculum Plan/Teaching Calendar

You will develop 2 teaching calendars for 2 courses: Agriscience I and another course of your choosing. Details will be provided in class.

Unit Plan

You will develop lesson plans for a unit consisting of at least 10 hours of instruction. The focus of the grade will be on how well you put the unit together, but attention will be given to each lesson, as well. You can utilize one of the lessons you have developed for Ag Ed 4330/7330 lab as a part of the unit plan.

PRAXIS II EXAM

For more information, see: www.ets.org/praxis. You should consider taking your Agriculture exam at the end of the semester or beginning of student teaching.

Academic Honesty

Academic honesty is fundamental to the activities and principles of a university. All members of the academic community must be confident that each person's work has been responsibly and honorably acquired, developed, and presented. Any effort to gain an advantage not given to all students is dishonest whether or not the effort is successful. The academic community regards academic dishonesty as an extremely serious matter, with serious consequences that range from probation to expulsion. When in doubt about plagiarism, paraphrasing, quoting, or collaboration, consult the course instructor.

To clarify, lesson plans developed for Ag Ed 2220, 4320/7320 or any other courses should not be used again for this course. Doing so is considered an issue of academic honesty.

Professionalism Statement

Professionals are guided by certain values and characteristics. Professional characteristics on which you will be judged in this course include punctuality, attendance, collegial attitude, and participation. Because this course relies extensively on discussion and other class interactions, attendance is crucial to your success and that of your classmates. If you are ill or an emergency occurs, contact the instructor prior to the scheduled class time; otherwise, your attendance and participation are firm expectations.

Professionals must also manage their time and expectations. Assignments are due in class the day they are to be turned in to the instructor. Late assignments will be deducted by 10% of the assignment's score, per day the assignment is late (unless otherwise noted – see micro-teachings). Late days INCLUDE weekend days for all assignments.

Accessibility Statement

If you need accommodations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the

building must be evacuated, please inform me immediately. Please see me privately after class, or at my office.

To request academic accommodations (for example, a note taker), students must also register with the Office of Disability Services, S5 Memorial Union, 882-4696. It is the campus office responsible for reviewing documentation provided by students requesting academic accommodations, and for accommodations planning in cooperation with students and instructors, as needed and consistent with course requirements. For other MU resources for students with disabilities, click on "Disability Resources" on the MU homepage

Statement for Intellectual Pluralism

The University community welcomes intellectual diversity and respects student rights. Students who have questions or concerns regarding the atmosphere in this class (including respect for diverse opinions) may contact the Division of Applied Social Science Division Director (dass.missouri.edu); the Director of the Office of Students Rights and Responsibilities (<http://osrr.missouri.edu/>); or the MU Equity Office (<http://equity.missouri.edu/>), or by email at equity@missouri.edu. All students will have the opportunity to submit an anonymous evaluation of the instructor(s) at the end of the course.

Agricultural Education 4330/7330

Teaching Agriculture Subjects

Fall Semester 2012



Lab Addendum Assignment Cycle

One Lab Prior to My Micro-Teaching in Lab	Day I Am Assigned to Micro-Teach in Lab	Before the Next Lab After I Micro-Teach
1. Turn in Lesson Plan 2. Feedback will be provided by 2 weekdays before lab	3. Teach Lesson 4. If desired, turn in revised lesson plan for a re-grade (average of the old and new lesson plans)	5. Watch video 6. Prepare reflective notes Meet with lab TA for feedback conference

Lesson Requirements

You can only teach ONE introductory lesson, which is the first lesson. You must address each of the following areas in your first four lessons:

1. Animal Sciences
2. Horticulture (Greenhouse, Floriculture) or Agronomy (Soils, Crops)
3. Ag Business, Economics or Leadership
4. Environmental Science, Wildlife, Food Science, Forestry

Here are the specific requirements for each lesson:

Lesson 1 – 35 minutes *total*

1. Plan for and teach a lesson that introduces a unit
2. You must include an interest approach

Lesson 2 – 35 minutes *total*

3. Plan for the entire lesson and start with your interest approach
4. Cannot use PowerPoint or computer/projector as a teaching tool

Lesson 3 – 35 minutes *total*

5. Plan for the entire lesson and start after your interest approach
6. Must include the use of the Problem-Solving Approach or Inquiry-Based Learning

Lesson 4 – 35 minutes *total*

7. Plan for the entire lesson and start at the beginning of the lesson with the interest approach
8. You will be accommodating your lesson for students with special needs

Lesson 5 – length of your site’s class or at least 45 minutes; can complete after November 1

9. Teach at your cooperating site and record your lesson
10. Schedule a one-hour feedback conference with your lab TA to view the video with him/her; watch your video prior to the conference and be ready to reflect

<u>Every Lesson Plan Should Include:</u> <ul style="list-style-type: none">. All components of a lesson planned out. Any handout, PowerPoint, etc.. Any assessments (formative/summative) or parts of them	<u>Every Lesson Taught Should Include:</u> <ul style="list-style-type: none">. A review at the end (before time runs out)
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Appendix B

Activity Log

Time of Entry: _____

Please indicate your posture for the most recent time period (seated, standing, lying down, etc): _____

Please indicate the quantity of the following consumed:

Caffeinated Beverage: _____

Tobacco: _____

Alcohol: _____

Please indicate incidences of worry below:

Worry is a chain of negative thoughts, about the same or different topics that can have negative consequences for you in the future. A solution is not yet) reached, and the same thoughts often return. It is difficult to stop when you are thinking these thoughts. They definitely engage you mentally and they are disturbing and intense.

How many times did you worry about your microteaching lesson since you last made an entry and how long did each episode of worry last?

Brief description of content of worry:

Length of time (in minutes) of episode: _____

Brief description of content of worry:

Length of time (in minutes) of episode: _____

Brief description of content of worry:

Length of time (in minutes) of episode: _____

Brief description of content of worry:

Length of time (in minutes) of episode: _____

Brief description of content of worry:

Length of time (in minutes) of episode: _____

Appendix C

Observable Behavioral and Physiological Manifestations of Human Stress

Observable, physical symptoms of anxiety/stress

- _____ Cold chills, feeling cold
- _____ Difficulty speaking, moving mouth, talking, co-ordination problems with the mouth or tongue
- _____ Muscle twitching
- _____ Sweating, uncontrollable profuse sweating
- _____ Urgency to urinate, frequent urination, sudden urge to go to the washroom (similar to urinary tract or prostate infection symptoms)
- _____ Find it hard to breath, feeling smothered, shortness of breath
- _____ Short-term memory impairment, can't remember what I did a few days, hours, or moments ago
- _____ Blanching (looking pale, loss of color in the face or skin)
- _____ Blushing, turning red, flushed face, flushed skin, blushing, red face or skin
- _____ Clumsiness, feeling clumsy, co-ordination problems with the limbs or body

Notes:

Appendix D

Post-Reflection Questions

IRB Project: 1203736

**Reflection Questions
Immediately Following Lesson**

1. What are your overall feelings of how the lesson went?
2. What did you feel went particularly well about your lesson?
3. What do you feel did not go so well or could be improved upon in regards to your lesson?
4. Did you notice feelings of stress today? Before, during, or after your lesson?
5. How would you describe your stress levels regarding the various aspects of teaching and classroom management?
6. What are your most significant concerns related to your teaching?

Appendix E
Physiological Stress and Reflective Awareness in the Preservice Teacher

IRB Project: 1203736

Follow-Up Interview Questions

1. What are your overall feelings of how the lesson went?
2. What did you feel went particularly well about your lesson?
3. What do you feel did not go so well or could be improved upon in regards to your lesson?
4. Did you notice feelings of stress today? Before, during, or after your lesson?
- (Show video clip of critical incident linked to high stress during lesson)
5. Can you describe your emotions and feelings during this time period?
6. Did your feelings about your performance change from immediately following the lesson to when you watched the video of the lesson prior to this session?
7. How would you describe your stress levels regarding the various aspects of teaching and classroom management?
8. What are your most significant concerns related to your teaching?

Appendix F

Research Field Notes

Time Period	Clock Time	Researcher Notes
Start time:		
0:00-5:00		
5:01-10:00		
10:01-15:00		
15:01-20:00		
20:01-25:00		
25:01-30:00		
30:01-35:0		
End time:		

Appendix G

Students with IEP Assignment

Agricultural Education 4330/7330

Teaching Agriculture Subjects

Students with IEP Assignment



College of
Agriculture
Food and
Natural
Resources

Dyslexia (Hearts)

Dyslexia is a language-based learning disability. Dyslexia refers to a cluster of symptoms, which result in people having difficulties with specific language skills, particularly reading. Students with dyslexia usually experience difficulties with other language skills such as spelling, writing, and pronouncing words. Dyslexia affects individuals throughout their lives; however, its impact can change at different stages in a person's life. It is referred to as a learning disability because dyslexia can make it very difficult for a student to succeed academically in the typical instructional environment, and in its more severe forms, will qualify a student for special education, special accommodations, or extra support services.

<http://www.interdys.org/FAQ.htm>

Your case: Student in this particular case has difficulty reading and writing.

Asperger's Syndrome (Spades)

Asperger syndrome (AS) is a developmental disorder. It is an autism spectrum disorder (ASD), one of a distinct group of neurological conditions characterized by a greater or lesser degree of impairment in language and communication skills, as well as repetitive or restrictive patterns of thought and behavior. The most distinguishing symptom of AS is a child's obsessive interest in a single object or topic to the exclusion of any other. Children with AS want to know everything about their topic of interest and their conversations with others will be about little else. Their expertise, high level of vocabulary, and formal speech patterns make them seem like little professors. Other characteristics of AS include repetitive routines or rituals; peculiarities in speech and language; socially and emotionally inappropriate behavior and the inability to interact successfully with peers; problems with non-verbal communication; and clumsy and uncoordinated motor movements. Children with AS are isolated because of their poor social skills and narrow interests. They may approach other people, but make normal conversation impossible by inappropriate or eccentric behavior, or by wanting only to talk about their singular interest. Children with AS usually have a history of developmental delays in motor skills such as pedaling a bike, catching a ball, or climbing outdoor play equipment. They are often awkward and poorly coordinated with a walk that can appear either stilted or bouncy.

<http://www.ninds.nih.gov/disorders/asperger/asperger.htm>

Your case: Your student with AS has proximity issues with others and is sensitive to sound and touch. This student has an obsession with touch – he or she will touch things 4 times in a row. This student is talented in the area of mathematics.

Visual Disorder (Diamonds)

The terms partially sighted, low vision, legally blind, and totally blind are used in the educational context to describe students with visual impairments. They are defined as follows:

- **“Partially sighted”** indicates some type of visual problem has resulted in a need for special education;
- **“Low vision”** generally refers to a severe visual impairment, not necessarily limited to distance vision. Low vision applies to all individuals with sight who are unable to read the newspaper at a normal viewing distance, even with the aid of eyeglasses or contact lenses. They use a combination of vision and other senses to learn, although they may require adaptations in lighting or the size of print, and, sometimes, braille;
- **“Legally blind”** indicates that a person has less than 20/200 vision in the better eye or a very limited field of vision (20 degrees at its widest point); and
- **Totally blind** students learn via braille or other non-visual media.

<http://nichcy.org/disability/specific/visualimpairment>

Your case: Your student has “low vision.”

AD/HD (Clubs)

ADHD is one of the most common neurobehavioral disorders of childhood. It is normal for children to have trouble focusing and behaving at one time or another. However, children with ADHD do not just grow out of these behaviors. The symptoms continue and can cause difficulty at school, at home, or with friends. A child with ADHD might:

- have a hard time paying attention
- daydream a lot
- not seem to listen
- be easily distracted from schoolwork or play
- forget things
- be in constant motion or unable to stay seated
- squirm or fidget
- talk too much
- not be able to play quietly
- act and speak without thinking
- have trouble taking turns
- interrupt others

There are three different types of ADHD, depending on which symptoms are strongest in the individual:

- **Predominantly Inattentive Type:** It is hard for the individual to organize or finish a task, to pay attention to details, or to follow instructions or conversations. The person is easily distracted or forgets details of daily routines.
- **Predominantly Hyperactive-Impulsive Type:** The person fidgets and talks a lot. It is hard to sit still for long (e.g., for a meal or while doing homework). Smaller children may run, jump or climb constantly. The individual feels restless and has trouble with impulsivity. Someone who is impulsive may interrupt others a lot, grab things from people, or speak at inappropriate times. It is hard for the person to wait their turn or listen to directions. A person with impulsiveness may have more accidents and injuries than others.
- **Combined Type:** Symptoms of the above two types are equally present in the person.

<http://www.cdc.gov/NCBDDD/adhd/facts.html>

Your case: You have a student with Predominantly Hyperactive-Impulsive type.

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VITA

Erica B. Thieman

As a researcher and teacher educator, my primary professional goal is to improve the quality of teacher education in an effort to supply the profession of agricultural education with *highly qualified, engaged, multiculturally competent, and resilient* educators. I am seeking to accomplish this goal through continuation of my main line of research inquiry of agricultural educator resilience. I began this line of inquiry with a synthesis of literature, published in the *Journal of Agricultural Education*, related to agricultural educator stress and burnout and educator resilience, "Resilient agricultural educators: Taking stress to the next level." One component of this synthesis was to develop a conceptual framework of agricultural educator resilience to guide future research. The main components of the framework are stress; risks and assets; coping mechanisms; resilience; and burnout and attrition.

Following the development of this framework, I have carried out studies related to the various components of the model. I have examined the role of gender, mentor support, coping mechanisms, and specific stressors of student teachers as they relate to educator resilience. I am also working on a interdisciplinary study with social studies and literacy education faculty members exploring the intersection of an urban context, multicultural competence, and resilience which was presented at the Annual Meeting of the American Education Research Association (AERA) in Vancouver, B.C. in April. I have also applied the framework of educator resilience to preservice teachers in a qualitative phenomenological study that I recently presented at the North Central AAEE

Research Conference in Champaign-Urbana, IL and subsequently received the designation of Distinguished Manuscript.

My future research agenda aims to continue the study of resilience with a focus on preservice and early-career teachers. I plan to seek funding to provide for the continuation of my research, including the purchase a variety of devices that can measure physiological stress in a variety of situations. Through continuing the study of resilience and stress, I hope to develop and implement practices that teachers, administrators, and teacher educators can utilize to enhance resilience and quality of life to keep eager, young professionals engaged and effective for a longer, richer career than trends are currently showing in the field of agricultural education.

Examining physiological stress of preservice teachers while teaching can help teacher educators of content-specific pedagogy courses to identify areas where low self-efficacy and/or low proficiency are promoting increased stress levels while teaching. Teacher educators could then provide preservice teachers with skill-specific remediation, if necessary. In addition, they could supplement information on context specific stress-management prior to entering the classroom in an attempt to mediate the path to burnout in the initial years of teaching. Without understanding the mechanisms whereby a machine works, it is difficult to alter the resulting product. In essence, if teacher educators and preservice teachers do not understand the causes of preservice teacher physiological stress within the educational context, identification of changes moving towards best practices in promoting teacher resilience will be difficult.