TEACHER SELF-EFFICACY: COMMON CORE STATE STANDARDS WITHIN A
21ST CENTURY SKILLS FRAMEWORK

by

John Wallace Wilborn

Liberty University

A Dissertation Presented in Partial Fulfillment
Of the Requirements for the Degree
Doctor of Education

Liberty University
March, 2013
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ABSTRACT

The purpose of this case study was to understand teachers’ self-efficacy in instructing 21st century learning skills in a high school core curriculum. This study examined the impact of three highly qualified teachers’ attitudes toward instructing the Common Core State Standards 4C’s (critical thinking, collaboration, communication, creativity) within a 21st century skills framework. Four research questions guided this study. What attitudes do teachers exhibit regarding instruction of 21st century learning skills? To what extent do teachers seek to engage students in creativity and innovation? To what degree do teachers implement neomillennial learning styles? How will the participants measure their own self-efficacy in teaching 21st century learning skills within the core curriculum? This qualitative collective, instrumental case study examined three core curricular teachers in Georgia. The social cognitive theory, the situated learning theory and constructivism provided the theoretical frameworks as well as symbolic interactionism. Data were collected through survey, four classroom observations and a stimulated recall interview. The study’s findings revealed major themes regarding teachers’ attitudes towards 21st century skills instruction, learning accountability, learning culture, and student learning styles. The findings revealed minor themes with reference to critical thinking, real-world learning, brain-compatible learning and deep understanding of the curriculum content.

Keywords: Common Core State Standards, 21st century skills, learning styles, student engagement, teacher self-efficacy
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List of Abbreviations

Common Core State Standards (CCSS)

End of Course Test (EOCT)

Institutional Review Board (IRB)

Learning Styles (LS)

Neomillennial Learning Styles (NLS)

No Child Left Behind (NCLB)

Multiple Intelligence Theory (MIT)

Partnership for 21st Century Skills (P21)

Real-World Learning (RWL)

Qualitative Data Analysis Software (QDAS)

Social Cognitive Theory (SCT)

Stimulated Recall Interview (SRI)
CHAPTER ONE. INTRODUCTION

America’s potential for achieving global effectiveness may be dependent upon its future educational system. Recent studies (Achieve, 2005; Friedman, 2006; Partnership for 21st century skills, 2006) suggested that business leaders were concerned about issues originally posited nearly three decades ago in A Nation at Risk (National Commission on Excellence in Education, 1983). Approximately forty percent of United States high school graduates were underprepared for the 21st century workplace (Achieve, 2005; Partnership for 21st century skills, 2008). A need existed for improving education so that high school graduates possessed skills required for participation in the 21st century learning and workplace. A persistent standards-based educational forefront continued to measure teacher effectiveness by end of course test (EOCT) standardized test scores (Darling-Hammond, 2010; Olsen, 2010). As a result, teacher effectiveness and educational reform remained a centric educational concern.

Background

Systemic reforms, initiated by No Child Left Behind Act of 2001 (2008), fueled a charge towards a national standards coalition. Recently, CCSSI currently served as a cogent next step in promoting equity and excellence independent of a single test measurement (National Research Council, 2008). The heralded Common Core State Standards (CCSS), a set of research-based and evidential benchmarks, were adopted by nearly every state. These standards were aligned with college and work assumptions, thorough and globally standardized (Common Core State Standards Initiative, 2010).
They included four essential learning and innovation skills, as noted in Figure 1, and were referred to as the 4Cs:

- critical thinking;
- communication;
- collaboration; and,
- creativity.

The 21st century 4Cs outcomes were supported by standards/assessments, curriculum/instruction and professional development. These outcomes were designed to engage student learning and were symmetrical with the Partnership for the 21st century learning and innovation skills (Partnership for 21st Century Skills, 2006).

*Figure 1. Framework for 21st Century Learning (Partnership for 21st Century Skills, 2009).*

Creativity and innovation, identified as fundamental areas to global career readiness, were dismally underrepresented within the CCSS (Partnership for 21st century skills, 2011; Wagner, 2008). A general understanding of identifying creativity and innovation was needed prior to embarking on classroom observations. Determining the standards by which creativity and innovation were measured during instruction posed a quandary. Renowned creativity researcher Simonton (2012) stated, “Creativity is an
extremely complex phenomenon that renders such research rather more difficult than studying a more basic cognitive process, such as attention or memory. Because of these difficulties, the empirical research does not always generate consistent results” (p. 1). No single measurement definitively determined the extent to which one was engaged in creative process or action. Yet, a review of the creativity identified key factors that were evidenced during instruction.

Creativity and innovation were identified as two key components of the CCSS. Framed in the broader research, creativity was defined as the capacity to produce novel and appropriate work (Sternberg & Lubart, 1999). Innovation was described as the realization of new ideas that resulted in the production of something valuable and was demonstrated through its use in the marketplace. Sternberg & Lubart (1999) suggested that innovation was determined to be a first time new idea that was typically overlooked by others.

While creativity and innovation were cited as multi-disciplinary and inter-related factors (European Commission, 2008c), the constituent components were broad and complex. No consensus existed regarding an exact relationship between creativity and innovation (Sternberg & Lubart, 1999). Framing creativity and innovation into the broader purview, a cornucopia of research and connotations often provided fuel for misunderstandings. Ambiguous terminology muddled clear-cut understandings about creativity and innovation.

Ferrari, Cachia & Punie (2009) noted that creativity in the educational arena was seldom clearly defined. As a result, educators held erroneous assumptions about how to
identify creativity during classroom instruction. Problems related to conceptualizing creativity and innovation into the educational mindset included five factors:

- intangible outcomes;
- difficulty in determining evidential practice;
- inherent subjectivity;
- analytical difficulty in comparing data comparison; and,
- educational policies that were not reflected in praxis (Ferrari et al., 2009).

**Theoretical Perspectives**

Various theoretical perspectives on creativity and innovation existed in the literature. These frames of reference provided a foundation for understanding creativity and innovation in relationship to education. The literature supported four distinct theoretical viewpoints.

The psychometric approach (Guilford, 1950; Torrance, 1974) viewed creativity mostly as an innate talent that was found among highly gifted individuals. Creativity was identified as an important component of giftedness (Forehand & Hill, 2005). In general, creativity was recognized as the ability to discover new and workable solutions to everyday problems. Creativity was divided into two constituent parts. “Big C” creativity described traits that existed only among genius minds. “Little C” creativity existed among the general population (Ferrari et al., 2009). Beghetto (2005) noted potential merit for using an equal and egalitarian perspective toward teaching creativity across every age group domain in schools. Based on my teaching experience, I agreed that the democratic perspective worked effectively with 21st century instruction.
The psychoanalytic approach proposed that creativity flowed out of unconscious urges and existed as a by-product of primary processes. According to Freud (1958) individuals expressed creativity unconsciously – versus consciously – as a unique means of producing socially acceptable products. Creativity occurred as by-product of primary processes. Jung (1953, cited by Arieti, 1976) expanded this viewpoint of creativity into psychological art and visionary art. Maslow (1968) categorized creativity as primary creativity, secondary creativity, and integrated creativity. Creativity proceeded from the primary cognitive and conative volitional processes. Secondary creativity stemmed from self-disciplined higher-order processes, an Apollonian concept that involved analysis, discipline and rigor. Integrated creativity joined primary and secondary creativity as the source for great artistic works, philosophy, and systematic discoveries. While I found the information intriguing, this viewpoint did not offer a clear understanding of how to identify creativity during instruction.

The self-expression and mystical approach viewed creativity as the need to uniquely self-express by emphasizing aesthetic and expressive outcomes. This viewpoint was based on common assumptions, implicit theories (Runco, 1999) and connotations, rather than on scientific research. This concept of creativity has often being mingled when associating creativity and innovation with talent and inspiration. Others expressed creativity as a divinely inspired product wherein originality was valued over the creation. Based on this theoretical perspective creativity should not be taught in schools because it must originate from divine illumination. For purposes of this research, I did not assume this position.
Creativity was process driven and led to an end product. Creative experience was rationalized as being antithetical to reproductive experience (Taylor, 1988). The notion that creativity was associated with creative output has long permeated the research literature (Albert & Runco, 1990; Sternberg, 1999a). This perspective provided a clear-cut rationale for recognizing creativity during instruction by focusing on tangible versus intangible behaviors.

Lastly, the cognitive approach – the single most prevalent research perspective – sighted creativity as a thinking skill (Sternberg & Lubart, 1999). Three main schools of thought prevailed in the cognitive approach literature were phase-oriented studies, pragmatic methods and cognitive theories (Ferrari et al., 2009). In the phase-oriented school (Wallas, 1926) preparation, incubation, illumination and verification emerged as distinct stages in creativity development. Rossman (1931) extended the process to include seven stages. The pragmatists focused on issues like problem solving and brainstorming (Osborn, 1953). In general, cognitive theorists evaluated genius (Albert & Runco, 1990), intelligence (Albert & Runco, 1990) and personality traits (Simonton, 2011) as components of creativity. More recent studies examined creativity perception and factors that precipitated or impeded creative potential (Amabile, 1998). This perspective was relevant to this study in that factors surrounding student engagement were examined in light of the literature.

The cognitive approach was well-aligned with the constructivist frame of mind. Recent cognitive-based creativity research (Albert & Runco, 1990; Runco, 2007) fit uniformly into the Partnership for 21st century skills framework (Partnership for 21st
century skills, 2008). I collected data during the classroom observations using a cognitive framework regarding creativity and innovation.

Various theorists examined creativity from an environmental perspective. Sternberg and Lubart (1999) notated that creativity was comprised of six components with three being critical. The critical components were viewing problems in new ways, analyzing ideas to determine their value and persuasion skills. According to Albert & Runco (1999), creative people exhibited strong intellect, a centric factor in understanding creativity instruction. The cognitive approach appealed to me as an educator. It painted a clearer picture of creativity in the classroom. I employed an environmental perspective framework when collecting data because it correlated well with the 21st century framework (Partnership for 21st century skills, 2008).

The Creative Process

The literature generally posited that creative persons possessed unique and creative abilities. Various creativity studies examined the traits and intellectual abilities of illustrious individuals. They affiliated creativity with genius, intelligence (Albert & Runco, 1999) and knowledge (Weisberg, 1999). Two important theories were noted in the literature. First, Sternberg & Lubart (1999) investigated the Investment theory of creativity where creative people sought novelty, expended energy on atypical and unfashionable ideas, and bought low and sold high. This viewpoint helped me to understand the relevance of creative engagement and placing emphasis on value in respect to the end product.

Guilford (1950) posited a link between creativity and intelligence. The Threshold Theory (Guilford, 1950) maintained that a minimum level of intelligence was
required for one to be creative. On the other hand, Runco (2007) suggested that all intelligent people possessed creative skills was erroneous. Debates concerning the nature of creativity focused on domain-specific processes versus nonproprietary and common processes (Simonton, 2011). A longitudinal study of precocious students suggested that ability threshold levels were significant in domain-specific products like patents and books (Wai, Lubinski & Benbow, 2009).

Various professional development strategies stressed the need for academic rigor. They discovered that many “intelligent” students lacked creative ability. Creativity, intelligence and talent were determined to be distinguishable traits (Sharp, 2004). Russ (1996) suggested that an interaction between personality traits, emotional processes and intelligence were needed during creativity.

The concept of intelligence regularly occurred in the literature. The literature defined general intelligence as linguistic and logical mathematical abilities (Stern, 1912). According to Stern (1912), a person’s intelligence quotient existed as a ratio of one’s estimated mental age and his actual chronological age. A single convergent interpretation of the relationship between the components did not exist.

**Intelligence-Creativity Relationship**

Research by Kim & VanTassel-Baska (2010) showed a link between creative potential and IQ among low-income high school students. Their research reflected that approximately 80% of the top 20% of creative students would be overlooked if giftedness were identified only by IQ testing. Their research coincided with earlier research by Torrance (1962). More recently, Gardner (1983) propounded the idea that individuals possessed a range of eight potential intelligences in contrast to Stern’s view. According
to Stern (1912) individuals possessed innate or core intelligence. The relationship between intelligence and creativity held merit for understanding creativity in education settings.

Sternberg (2000) supported a holistic participation in the field. He categorized the research on creativity and intelligence into five frameworks. Understanding the underlying relationship between creativity and innovation helped me recognize and assess creativity and innovation instruction in the classroom.

Simonton’s research supported the concept that individuals must possess comprehensive domain proficiency to be creative. One’s creative productivity increased based on the years one has spent working in their respective field. Therefore, the most prolific contributors typically accumulated greater numbers of creative works in their final years compared to those just starting their careers (Adams, 2005).

According to Amabile (2005), intrinsic motivation enhanced classroom engagement and productivity. Both synergistic (informal/enabling) and non-synergistic (controlling) motivators affected learning. Synergistic extrinsic motivators supported and enhanced intrinsic motivation. Non-synergistic motivators hindered engagement, whereas synergistic extrinsic motivators supported it. The implications were that non-synergistic motivators inhibited creativity in the classroom. The research suggested that most learning assessments should be informal and be used as a tool for improvement learning (Durlak & Weissberg, 2007). According to Adams (2005), typical classroom instructional practices sometimes destroyed creativity and innovation rather than encouraged students to engage in creative practices.

The literature represented creativity in five distinct ways:
Creativity existed as a subset of intelligence. According to Guilford (1958), creativity involved some facets of intelligence, i.e. divergent thinking. Gardner (1983) purported various intelligences that fostered creative results. Traditional core class curricula primarily focused on intellectual aspects rather than creativity. Amabile (1989) found that highly creative students experienced problems and underperformed in traditional schools.

Intelligence existed as a subset of creativity. Creative ability was required more than intellectual ability for intellectual processing. Creativity involved intelligence and other qualities grounding intelligence as part of a complex, many-sided creative process.

Creativity and intelligence existed as overlapping sets. Uniquely, problem-solving existed as a shared component. They were different in that intelligence supported logical attributes of intelligence whereas creativity corroborated unfounded rationale for creativity. This view was supported by IQ tests and implicit theories (Roe, 1976). Implicit theories were ideas or theories that regarded a phenomenon (Sternberg & Davidson, 1986). Self-theories have influenced the educational domain. According to Dweck (1999) intelligence theories existed in two camps. Entity theorists maintained that intelligence existed as a fixed entity while incremental theorists believed that intelligence was malleable (Dweck, 1999). Individuals who held to entity theories tended
toward setting and reaching goals. Those who maintained intelligence based on incremental theories viewed increased abilities as a result of personal effort.

Creativity and intelligence existed as commonly occurring/coincident sets. The foundational constructs for creativity reflected those needed for intelligence. Creative expression resulted as an extraordinary outcome derived from intelligence (Weisberg, 1993). Weisberg (1999) viewed knowledge as a rudimentary, indubitable building block of creativity. This perspective was sensible and useful for conceptualizing knowledge in education. This holistic viewpoint allowed me to understand creativity and intelligence as interconnected components.

Creativity and intelligence existed as disjointed sets. Creativity resulted from constant and deliberate practice in a domain versus personal ability. From this perspective, intelligence had no impact on an individual’s creative function. This perspective was not used in this study. Several key factors that influenced creativity and innovation included:

- motivation, passion and interest (Amabile, 1998);
- ownership (Amabile, 1989);
- discovery or active learning environment (Runco, 2007);
- self-discipline (Runco, 2007);
- holistic engagement in the field (Sternberg, 1999b);
- imagination, uniqueness and divergent thinking (Runco, 1990);
- valuing process over end product (Sharp, 2004);
- adaptability and making connections to different areas of knowledge;
- risk taking and autonomy (Beghetto, 2005);
• skillful learning and assessments that account for creativity; and,
• facilitated and empowered learning.

Understanding problems with student underachievement, boredom and disengagement in learning in relationship to creativity and innovation sparked my interest in knowing how high performance teachers taught creativity in the classroom. A side-by-side comparison of the 4Cs with the P21 Learning and Innovation (L&I) skills (Partnership for 21st century skills, 2007) revealed a precarious deficit in the critical areas of creativity and innovation. Yet, teachers demonstrated uncertainty as how to effectively engage students in the 21st century learning skills (Olsen, 2010) which included learning & innovation skills.

This study presumed that creativity and intelligence were correlated. To better understand creativity, researchers were to examine creativity in light of intelligence. Instructional practices were traditionally guided by specific intelligence measurements. Psychometricians traditionally posited intelligence as a hierarchical multi-faceted framework, wherein general intelligence (“g”) existed as a single factor that supported all intelligent behavior. IQ tests predicted children’s academic success in school (Beliavsky, 2006). The multiple intelligences theory (Gardner, 1983) challenged traditional thinking by positing that intelligence existed as eight unitary and separate entities. Herein, intelligence existed as a bio-psychological capacity (psychological and neuroscience potential) for processing information. When triggered in a cultural setting, intelligence enabled one to engage in problem-solving or to generate culturally valued outcomes (Gardner & Moran, 2006). Although various researchers supported MI theory, skeptics disavowed Gardner’s theory (Pashler, McDaniel, Rowher, & Bjork, 2009; Willingham,
This study examined teachers with respect to the multiple intelligence theory (MIT) wherein individuals possessed innate abilities (Gardner, 1983). The multiple intelligences included eight factors:

- verbal/linguistic, i.e., reading and writing or literary-based learning;
- logical/mathematical, i.e., calculations and abstractions;
- visual/spatial, i.e., imagery;
- musical/rhythmical, i.e., rhythm and melodic creation or manipulation;
- bodily/kinesthetic, i.e., physical action;
- interpersonal, i.e., human relations;
- intrapersonal, i.e., self-awareness; and,
- naturalist, i.e., working in nature.

The two factors “interpersonal” and “intrapersonal” were specific to this study. Intelligence(s) existed as an interaction between one’s organic proclivities and contextual distribution within the learning environment culture (Beliavsky, 2006; Gardner, 1993).

The literature suggested that students possessed intelligence and increased learning by using learning styles (LS) that helped individuals to gain knowledge. The LS research suggested that individuals possessed unique learning preferences that directly impacted learning (Evans & Cools, 2011; Kozhevnikov, 2007; Li, 2008; Zhang & Sternberg, 2006) and they used multitudinous cognitive styles (Coffield, Moseley, Hall, & Ecclestone, 2004b; Li, 2008; Rayner & Cools, 2011; Sadler-Smith, 2009). Significant recent neuroscience research investigated LS (Pashler et al., 2009; Sims & Sims, 2006; Zull, 2011) yet proffered incongruous assumptions and competing ideologies (Coffield et
al., 2004b; Cools, 2009) without establishing a unified theoretical LS position. The 21st century LS research was underdeveloped but emergent.

Neomillennial learning styles (NLS) represented a shift towards a participative technological and media-based construction (Buckingham, 2007; Jenkins, Clinton, Purushotma, Robinson, & Weigel, 2006; Salaway, Caruso, Nelson, & Ellison, 2007). These preferences extended beyond a single milieu and were tailored to individualistic LS preferences (Dieterle, Dede, Perkins, & Russell, 2008). NLS were complex and specific. According to Dede (2005), NLS were characterized by four factors:

- multimedia;
- collaborative learning that was determined by seeking, filtering, and synthesizing experiences versus gathering information individually; and,
- real-world, active learning that was derived from real or simulated experiences, or a combination of the two individualized learning stylized to one’s needs and preferences (Dede, 2005; Dieterle, Dede & Schrier, 2007).

Neomillennials preferred diversified, socially based learning that was implied rather than explicit. This factor was significant to understanding how teachers communicated with their students in this study. Knowledge building occurred best in active learning contexts where knowledge was disseminated among the group and with the individual (Dieterle, 2009). Teachers were monumentally challenged to meet students’ learning preferences based on the NLS literature review. Furthermore, NLS expressions included nonlinearity with richly associated representations where learners co-designed simulations and Web pages. NLS was proposed by Dede (2005) and more broadly developed by others (Dieterle, Dede & Schrier, 2007; Dunleavy, Dede &
Mitchell 2009; Dieterle et al., 2008). The literature noted that students’ technological immersion created blurred lines between the physical and digital realities and created a nearly insurmountable task for some teachers. The 21st century teachers were challenged to teach challenging curricula while simultaneously engaging students in NLS pedagogies. Hadjioannou (2012) determined that teachers accomplished this task only when they possessed pertinent knowledge, instructional skills and the school district’s financial support.

**Situation to Self**

As a researcher, I supported a constructivist pursuit of scholarship that was grounded in both social and experimental learning environments. From this perspective, knowledge was socially and inductively generated through discovery to “develop a theory or pattern of meaning” (Creswell, 2007, 21). The researchers and the participants in this study taught at the same school. The three participants taught core academic subjects with EOCT assessments. As the sole researcher, I differed from the participants by teaching only elective courses and did not assess students using an EOCT. At the inception of this study, I was unaware of each participant’s understanding of the phenomena under investigation.

**Problem Statement**

A universal problem existed in the US educational system. Research reflected that American schools were failing (Patel & Yelland, 2006) in comparison to other nations (Friedman & Mandelbaum, 2011) and that secondary schools were underachieving (Au, 2007). The data reflected that the US could regain competitiveness by increasing its PISA scores by 25 points in 20 years (Paine & Schleicher, 2011). The
Hoover Institute at Stanford University research suggested this increase in PISA scores would provide over forty trillion dollars in the U. S. economy for those persons born in 2010. If the U. S narrowed its achievement gap with other OECD nations, the ensuing results could potentially double. The implication was that U. S. global competitiveness hinged on its ability to increase the quality of education for its citizens. Other research suggested a need for massive school reform and a reconceptualization of school as an entity (Olsen & Sexton, 2009).

Engagement in learning was cited as a key to effective learning (Carini, Kuh & Klein, 2006; Lambert & Cuper, 2008; Partnership for 21st century skills, 2006; Rocca, 2010) and was enhanced by effective learning designs and learning environments (Partnership for 21st century skills, 2007). The literature cited issues regarding student engagement in learning (Carini et al., 2006; Lambert & Cuper, 2008; Partnership for 21st century skills, 2006; Rocca, 2010), improper 21st century instructional designs (Olsen, 2010) and lackluster showcasing of instructional praxis with evidential learning and cognitive theory (Galloway & Lasley, 2010; Tormey & Henchy, 2008; Zelenka, 2007; Zima, 2007). This investigative, qualitative study examined three highly qualified high school core academic teachers at Westtown High School (WHS) in Georgia where each participant had a minimum of three years teaching experience and instructed courses with end-of-course-test (EOCT) scores that were 90% or higher.

Definitions

This qualitative study case study included several unique terms that needed definition. A set of working definitions were included at the inception of the study. Other key terms were developed during the course of the study. Throughout this study,
specific terms were used to explain important components in the research. The following definitions of key terms applied to this study.

*Critical thinking* was an active learning skill that incorporated the conceptualization of information as a guide to establishing one’s beliefs and behaviors. Critical thinking was the examining and testing of propositions in order to determine whether or not they were conformable to reality (Sumner, 1940).

*High school teachers* were identified as full-time, state certified teachers who instructed students in grades nine through twelve in public high schools in the state of Georgia.

*21st century learning* was defined as the area of overlap that existed between areas in the 21st century skills frameworks (Lemke, Coughlin, Thadani, & Martin, 2003; Partnership for 21st century skills, 2007b; Wagner, 2008). These areas were:

- innovation and creativity;
- curiosity and innovation;
- accessing and analyzing information;
- oral and written communications;
- initiative and entrepreneurialism;
- agility and adaptability;
- collaboration;
- critical thinking and problem solving; and,
- information literacy skills.

The CCSS existed as a set of common standards for K-12 students in English/language arts and mathematics. The CCSS represented the pinnacle of a
prolonged endeavor to actualize the demand to generate the next batch of K–12 standards that helped guarantee all learners were prepared for college and were career ready prior to high school graduation (Common Core State Standards Initiative, 2010).

*Creativity* was identified as the capacity to produce novel and appropriate work (Sternberg & Lubart, 1999).

*Innovation* was defined as the realization of new ideas that resulted in the production of something valuable and was demonstrated through its use in the marketplace. Innovation was determined to be a first time new idea that was typically overlooked by others (Sternberg & Lubart, 1999).

*Learning and Innovation skills 4Cs* were recognized as essential building blocks in 21st century. They included critical thinking, communication, collaboration and creativity (Common Core State Standards Initiative, 2010).

*Neomillenials* were identified as persons who were born after 1982 (Dieterle, Dede, Perkins & Russell, 2008; Winograd & Hais, 2011). Approximately one-third of the U. S. population consisted of these persons (Winograd & Hais, 2011).

*Neomillennial learning styles* (NLS) existed as preferred learning styles of neomillennial learners. Their preferences included using a desktop interface, augmented realities, multi-user virtual environments and various types of multimedia (Dieterle, Dede & Schrier, 2007).

*Self-efficacy* was generally defined as the belief one had regarding the capacity to produce a positive academic effect (Bandura, 1997).

**Purpose Statement**

The purpose of this study was to gain a better understanding of teachers’ attitudes...
towards instructing 21st century learning skills and to know the degree that teachers engaged students in creativity and innovation. The study determined to know the extent to which teachers implemented NLS in the core curricular content areas. A final purpose of this study was to ascertain teachers’ self-efficacy regarding their instruction of content neutral 21st century learning and innovation skills.

**Research Questions**

The following four questions guided this study:

Research Question 1. *What attitudes do teachers exhibit regarding instruction of 21st century learning skills?* The literature cited explicit skills necessary for success in the 21st century learning environment and workplace (Partnership for 21st century skills, 2011; Wagner, 2008). These skills were only implied within the CCSS framework (Magner, 2011).

Research Question 2. *To what extent do teachers seek to engage students in creativity and innovation?* The extent to which teachers engaged their students in creativity and innovation skills was determined through data gathering and data analysis.

Research Question 3. *To what degree do teachers implement neomillennial learning styles?* The extent that NLS was implemented in the classroom was initially believed to reflect teachers’ ability to effectively blend recent research findings and understandings of pedagogy.

Research Question 4. *How will the participants measure their own self-efficacy in teaching 21st century learning skills within the core curriculum?* This self-assessment held the potential to portray teachers’ self-efficacy in implementing 21st century learning instruction.
Significance of the Study

This study was significant in that it examined a critical contemporary educational issue. No salient research studies existed that specifically probed into this phenomenon. This study extended an examination of 21st century instructional designs (Olsen, 2010). It could offer insight into understanding teacher metacognition in relationship to NLS (Zull, 2011) and help teachers to more effectively instruct the CCSS in light of 21st century skills.

Delimitations

The parameters of this bounded case (Creswell, 2007) included three core academic high school teacher participants who taught at WHS. The participants were required to have taught three years or more, to teach a core subject with an EOCT and to display 90% or above passing rate on their students’ EOCT scores. The delimitations were the number of participants, the data collection instruments and the location of the study.

Research Plan

I performed a qualitative collective, instrumental case study. According to Creswell (2007), collective case studies were to occur in one or more locations. WHS was selected as a research site based on its historical academic excellence. WHS was recognized as a 2010 Georgia “School of Excellence” (Georgia Department of Education, 2012). Each participant within the school was purposefully selected based on his or her instructional prowess and identification as a highly qualified teacher.

This research study sought to understand individual teacher collective efficacy versus collective teacher efficacy. The collective teacher agency reflected the
measurement of an entire faculty’s influence on student achievement throughout the school. Bandura (1997) noted, “‘Teachers’ beliefs in their efficacy affect their general orientation toward the educational process as well as their specific instructional activities’” (p. 241).

I performed a collective case because it offered a comprehensive overview of several comparable case studies (Stake, 1995). Understanding diverse perspectives on the phenomenon was more important than the case itself (Creswell, 2007). The phenomenon under investigation was critically important to local, state and national education curricular concerns as determined by a review of the literature.
CHAPTER TWO. REVIEW OF THE LITERATURE

The purpose of this study was to examine teacher perceptions of self-efficacy in engaging students in 21st century learning skills development. The problem was that United States secondary schools were underachieving (Au, 2007); yet, no mutually accepted set of content neutral 21st century learning and innovation skills (Partnership for 21st century skills, 2007) was being effectively taught, assessed and implemented in the core high school curriculum (Magner, 2011; Wagner, 2008).

The American educational decline evidenced demands for educational reform, instructional outcomes and support systems (Wagner, 2008). Myriad questions about educational effectiveness stemmed from the demands required by Adequate Yearly Progress (AYP) outcomes (Borkowski & Sneed, 2006). Contemporary concerns about educational effectiveness centered on factors like instructional practices, 21st century literacies and learning designs.

A synthetic analysis of the learning information literacies showed alignment between the CCSS and P21 skills. Wagner (2008) furthermore included essential information assessment/analysis and agility/adaptation as subsequent 21st century survival skills. Teachers’ perceptions of their own abilities to effectively instruct the 21st century learning skills was pertinent to gauging the potential for US education to regain global competitiveness (Friedman, 2006). As a result, the self-efficacy perceptions of highly qualified teachers were undetermined regarding their ability to instruct and assess 21st century learning and innovation skills.
This chapter initialized by examining three theoretical underpinnings of the study and a rationale for implementing each theory. These included: 1) constructivism theory; 2) social learning theory; and, 3) situated learning theory. The chapter continued with a synthetic literature review of six key factors that were specifically related to this study:

- instructional practices;
- 21st century literacies;
- innovation and creativity;
- learning environments;
- instructional designs; and,
- educational leadership.

The instructional practice section investigated issues regarding student engagement, learning styles, cognition/assessment. The instructional design section discussed technology, learning styles, cognition/assessment in light of NLS. The leadership section addressed student-centered teachers, transformational leaders and professional development practice. Lastly, a summary section focused on integrating theory and praxis to best effectuate 21st century learning.

This study examined various gaps that existed. This research focused on LS theory and instructional practices (Rayner, 2011; Kozhevnikov, 2007; Zima, 2007) that were specific to K-12 learning and empirical studies (Evans & Cools, 2011) and investigated three learning styles frameworks in reference to self-regulation, contextual/situational learning and metacognition (self-efficacy). This research sought to clarify and reify neomillennial literacies, especially specific to creativity and innovation (Sternberg, 2006), and addressed the issues of neomillennial support systems that aided
the implementation of learning outcomes. Identified gaps existed regarding effective learning designs that engaged learners in promoting 21st century learning skills.

**Theoretical Framework**

Effective learning strategies were theoretically grounded in frameworks that governed their use in the classroom. Twenty-first century learning skills were grounded in three theoretical frameworks: (a) the social learning theory (Bandura, 1977); (b) constructivism (Vygotsky, 1978); and (c) situated learning theory (Lave & Wenger, 1991). As noted in Figure 2, this threefold cord formulated a theoretical support system for the study. I examined 21st century instructional practices/learning designs, literacies and educational leadership in light of these three theoretical perspectives. A goal was to provide a clearer understanding of factors that affected teachers’ metacognitive processes and self-efficacy in instructing neomillennial skills where creativity and innovation were centric factors.

**Constructivism Theory**

Constructivism theory was identified as a combination of the philosophical constructs evidenced by Dewey, Piaget, and Vygotsky. In constructivistic social learning environments, the teacher served as a facilitator to aid students in generating knowledge through active engagement and personal knowledge construction. It was dissimilar to the traditional non-participative student role in learning (Palko, 2009; Morgan, 2008). In response to didactic pedagogical practices, constructivism promoted learning in an active, contextualized process by which knowledge was created versus acquired (Patel & Yelland, 2007). The learner was not tabula rasa but built upon previous knowledge to construct meaning. Learning was best understood in social contexts (Vygotsky, 1978)
and required that students learned effective communication skills (Anderman & Sinatra, 2009). 21st century learning occurred in contexts that encouraged social interaction, safety and community in an effort to facilitate formal and informal learning (Durlak & Weissberg, 2007).

Constructivistic epistemology was based on adopting the theories of contextualists and social constructivists. The root metaphor of contextualism was act-in-context and existed as a descriptive theory of learning. Knowledge was acquired through interaction with the environment, situated cognition, and social negotiation. “One of the main reasons constructivism is proving to be such a perplexing issue for the instruction designer and technologists is the lack of theoretical clarity and philosophical cohesion in constructivist writing” (Fox, 2006, 6). Matthews (2000) suggested the existence of a dozen constructivist strains. Contextualism existed as a worldview where any event was interpreted as an ongoing act inseparable from its current and historical context and in which a radically functional approach to truth and meaning was adopted.

Constructivism combined the philosophical constructs posited by various theorists, i.e., Vygotsky, Piaget, Dewey, and Bruner. The descriptive theory of knowledge acquisition (Spector, Merrill, Merrienboer & Driscoll, 2007) posited that individuals created knowledge based on the interplay between one’s experiences and ideas (Vygotsky, 1978). It proposed that knowledge construction was actively contextualized and was not imparted or acquired (21st Century Learning Environments, 2007). Learners built upon previous knowledge to construct new meanings by active participation in social environments (Vygotsky, 1978). They derived meaning of knowledge by authentic problem solving (Danielson, 2007; Dewey, 1938; Marzano,
Bruner (1966) posited that student-centered learning occurs through inquiry, or discovery learning, and was linked to problem solving. Knowing was not an end-result in itself; rather, it occurred as a process (Bruner, 1966). Active learning was oppositional to non-participative traditional instruction (Palko, 2009; Morgan, 2008). Constructivism provided a foundation for investigating 21st century learning in this study.

Constructivistic epistemology was grounded in contextualistic and social constructivist theories (Spector et al., 2007) and provided theoretical support to effective 21st century instruction. Contextualism viewed learning as a process that was inseparable from its present and past contexts. Therein a revolutionary functional approach to truth and meaning was espoused (Jonassen & Hung, 2008). Conversely, decontextualized learning was opposed to transferring knowledge to authentic, real-world application. Educators were to focus on academic achievement over test scores. Those opposed to constructivism purported that it lacked philosophical and theoretical coherence (Fox, 2006); yet, others viewed constructivism as essential to 21st century learning (Morgan, 2008; Palko, 2009). This study assumed constructivism was a key component of effective 21st century learning. Constructivism founded this research effort to understand teachers’ attitudes towards 21st century learning. As teachers assessed their abilities to instruct 21st century learning skills, they were challenged during the survey and interviews to rationalize reasons for their instructional methods and praxis. Constructivism theory provided a theoretical platform for analyzing participants’ data and developing a way of understanding their behaviors in the classroom.
Social Learning Theory

Social learning theory bridged behaviorist and cognitive learning theories by incorporating attention, memory, and motivation (Bandura, 1977). According to Bandura (1977), individuals learned from one another by observation, imitation, and modeling. SLT helped link behaviorist and cognitive learning theories. SLT explained human behavior in terms of constant mutually corresponding interaction between the individual’s cognitive, behavioral and environmental effects (Learning Theories Knowledgebase, 2012). Teachers were challenged to inspire student learning. According to SLT, teachers modeled and learned by modeling others. Their instructional strategies potentially mirrored the instructional methods of their own teachers. This study sought to know the strategies teachers used to engage students in the learning process and the extent to which they effectively used learning styles during instruction.

Figure 2. Three theoretical underpinnings.

This study examined self-efficacy of teachers, a theoretical postulate proposed by Bandura (1989). He purported "self-efficacy beliefs function as an important set of proximal determinants of human motivation, affect, and action. They operated on action
through motivational cognition and affective intervening processes" (Bandura, 1989, 1175). This study sought to deeply understand teachers’ metacognition and sense of self-efficacy in pursuit of instructing 21st century skills, a toolbox of unique skills that extended beyond core academic benchmarks. The teachers selected for observation exemplified high standards of excellence in instructing core disciplines. This study determined to understand how efficacious teachers were in instructing neomillennial skills that were distinctly unique and distally positioned from traditional standards.

Self-efficacy represented one’s belief in his capacity to structure and carryout the action steps necessary for producing the given goals (Bandura, 1997). According to Bandura (1993), these beliefs were the end result of convincing oneself, a process dependent upon analyzing multiple viewpoints of efficacy information conveyed through vicarious, cultural, and physical means. Twenty-first century teachers faced immense challenges that could be overcome through a strong sense of self-efficacy.

**Situated Learning Theory**

According to the situated learning theory (Lave & Wenger, 1991), normal learning was situated and operative within activities, contexts and social settings. Active participation allowed novices entrance into a community of practice. Learners became socially engaged in collaborative communities wherein societal beliefs and behaviors were acquired. Furthermore, situated learning occurred authentically and more unintentionally rather than deliberately. Neomillennials desired socially active learning environments (Viilo, Seitamaa-Hakkarainen & Hakkarainen, 2011). The literature posited that 21st century learning was situated in socially active and contextual learning environments. This investigation sought to understand teacher attitudes towards 21st
century learning and their self-efficacy towards 21st century learning skills development. I assumed a neutral position regarding each teacher’s philosophical position on facilitated learning, problem-based learning and situated learning pursuits.

Situated learning theory provided an essential theoretical support for 21st century learning systems (Learning Theories Knowledgebase, 2012) where learners acquired certain beliefs and behaviors through active social interaction and collaboration with one another. Over time, novices gained confidence and assumed an authoritative role. Situated learning, or learning in context, was commensurate with 21st century learning goals (Partnership for the 21st century, 2007b; Wagner 2008; Jonassen & Hung, 2008).

**Instructional Practice**

Instructional practices research formulated an integral part of effective learning (Hattie, 2009). Recent research reported that current instructional practices were mostly traditional and teacher-centered. According to Au (2007), teacher-centered practices were outdated, distally positioned and even polarized from emerging neomillennial pedagogy. Those traditions tended to disengage students from active learning (Carini et al., 2006; Rocca, 2010), an essential component in quality learning.

**Student Engagement**

Authentic engaged learning held strong meaning for learners when they constructed knowledge that was transitional (Splitter, 2009). A recent study reported that engagement in learning was based upon a relationship between the student and five social influences (Yazzie-Mintz, 2010):

- the school community;
- school adults;
• instructional practices;
• peers; and,
• curriculum.

The literature cited student behavior (self-regulation, and motivation) and school structures (class size, attendance, and use of technology) as two integral factors in engagement. It was presumed in this study that students who were actively engaged in learning displayed higher assessment scores on the EOCT. This factor seemed pertinent to each participant in this case study.

While teachers were responsible for instruction, students were required to self-regulate a portion of their learning. According to Bandura (2006), “Self-regulation is the capability of interest. The issue is not whether one can do the activities occasionally, but whether one has the efficacy to get oneself to do them regularly in the face of different types of dissuading conditions” (p. 311). The relationship between self-regulation and engagement showed that both factors potentially affected student learning behaviors in the classroom. In this study, I presumed that self-regulation and engagement were important factors in 21st century learning regarding the overall learning environment.

Yazzie-Mintz (2010) reported that high school students felt disengaged and bored in school. Many students were disinterested in yesterday’s praxis and felt disconnected due to outdated learning environments (Yazzie-Mintz, 2010). This study provided a strong rationale for understanding neomillennial learners perspective. Neomillennials were described as an over-tested group of students who conceptualized traditional education as being impertinent and irrelevant. This problem could have extended from educators’ general lack of current research knowledge, a disconnection between research
and praxis, or misinformation regarding NLS research. It was plausible that teachers were unaware of current praxis and/or research practices, were resistant to change, and/or were given minimal decision-making control regarding instructional practices. Nonetheless, a divide existed between traditional instruction and student engagement.

**Learning Styles**

Understanding the nature of the neomillennial learner was centroidal to understanding effective instruction. Their idiosyncratic thinking processes suggested a link to metacognitive reflection (Dieterle, 2009). According to Sternberg (2006), metacognition was a paramount component of the creative thinking process.

Self-regulated learning was strongly supported in the literature as a key ingredient in long-term learning (Schunk & Zimmerman, 2008) and was highly effectuated when theory and pedagogy were combined (Dignath & Büttner, 2008). As result, cognitive transfer occurred when theory and praxis were coexistent in learning. The self-regulation factor existed as a learning goal in education. Significantly, this same factor was cited as a workplace demand, especially where knowledge work and innovation were involved. This finding bridged classroom learning to the real world, a key factor in this study.

**Cognition**

A review of the LS literature reflected a need for research regarding distributed cognition (Beetham, McGill & Littlejohn, 2009; Rayner, 2011). Distributed cognition purported that cognition and knowledge were shared among individuals within a learning environment (Perry, 2003). Current research suggested a paradigm shift that converged existing theoretical constructs into an effective 21st century learning theory (Sontag,
This case study was framed on theoretical perspectives gained from the literature. Unlike grounded theory qualitative studies, the goals in this study excluded a development of theory. This study pursued an understanding of how 21st century core curricular teachers implemented NLS in the classroom.

**Assessment**

Assessment practices, a foundational learning component, impacted student learning. With the emergence of new learning paradigms, widespread disagreement existed regarding the most effective instructional and assessment methods (Drouin, 2010). Some suggested that alternative assessment practices should replace traditional standards-based assessments (Gülbahar & Tinmaz, 2006). Assessment practices were fundamental to the data analysis in this study. According to Silva (2009), assessment practices unanimity had not occurred. Essentially, teachers were required to measure the learning outcomes that they believed mattered most for the 21st century learner (Silva, 2009). This finding reflected a sense of flexibility in assessment practices versus a narrower, standardized testing mindset among teachers.

**Literacies**

A synthesis of the 21st century learning literature suggested that new literacies had been identified and that others were in development. At this juncture, a generalized consensus was nonexistent regarding a unified definition, framework, and theoretical perspective underpinnings of 21st-century literacies (Coiro & Dobler, 2007; Schrader & Lawless, 2011; Warlick, 2006; Zhang & Duke, 2008). Yet, research suggested that students were required to gain new literacies that would allow them full productivity in
the global economy (Coiro, Knobel, Lankshear & Leu, 2008; Friedman, 2006; Taboada, Guthrie & McRae, 2006; Wagner, 2008). The collective neomillennial literacies incorporated a plethora of essential content and workplace skills necessary for regaining global competitiveness (Wagner, 2008). The evolution of the frameworks and boundaries of 21st century learning literacies presented challenges in this study, especially in the areas of creativity and innovation. A framework for assessing technology that was used in the classroom provided an initial impetus for assessing the participants’ instruction in creativity and innovation (Moersch, 1995). This framework was not used during data collection or analysis.

**Common Core State Standards**

Among the respective identified 21st century skills competencies, the CCSS and 21st century learning skills (Partnership for 21st century skills, 2007) stood at the forefront of current educational initiatives. A 2009 grassroots initiative was designed to create a set of core national standards. A consortium of U. S. governors and state commissioners across 48 states collaborated with educational experts, local administrators, teachers and parents to establish the K-12 common core standards for English-language arts and mathematics (Paine & Schleicher, 2011).

While AYP reports identified many failing schools, annual reports alternatively recognized effective schools that appeared academically strong. In this study, I presumed that notably effective schools employed teachers who were competent in teaching core academic content. The AYP general reports did not delineate the extent that teachers effectively instructed the new literacies (Partnership for 21st century skills, 2008), specifically the CCSS 4Cs. To date, most states voluntarily adopted this new set of
standards that guided instruction and assessment practices beginning 2012 (Common State Standards Initiative, 2010).

This study explored teacher attitudes towards instructing 21st century learning skills, digital contextual literacies (Wynn, 2009), and their relevance to student engagement (Coiro et al., 2008), collaboration (Dede, 2007), and facilitated learning (International Society for Technology Education, 2007). Effective teachers combined a rich body of knowledge and provided application of that knowledge (Silva, 2009) and integrated instruction with technology (Lawless & Pelligrino, 2007; Partnership for 21st century skills, 2007) to engage neomillennial learners.

**Creativity and Innovation**

This case study sought to understand how teachers engaged students in innovation and creativity, two critical neomillennial skills (Partnership for 21st century learning, 2008). The 4Cs briefly identified the need to implement creativity and innovation in learning. Despite their significance, creativity and innovation were nearly unnoticed in the CCSS (Common Core State Standards Initiative, 2010). It seemed pertinent to more fully examine creativity and innovation to gain a deeper understanding of the premises grounded in the literature. To engage students in learning these critical skills, teachers were required to conceptualize and value creativity and innovation. The literature referenced a strong need for developing creativity and innovation where distributed creativity (digital transformation literacy) and innovation (employability skills) were keys to successful living (Beetham et al., 2009; Martin & Grudziecki, 2006; Partnership for 21st century skills, 2008; Wagner, 2008).
Creativity

The CCSS earmarked both creativity and innovation as essential 21st century skills. The CCSS alluded to 21st century competencies, e.g., creativity, rather than stating them implicitly (Magner, 2011). For example, in the areas of mathematics, creativity was not specifically addressed. Implications for implementing creativity existed in the areas of algebra, geometry, statistics and probability. The strongest connection existed in English Language Arts where students engaged in creative writing (Magner, 2011). The CCCS failed to provide a clear definition for either skill. The literature cited that creativity was the manufacturing of unconventional and practical ideas concerning artifacts, services, operations and procedures by a group who worked together (Shin & Zhou, 2007). It played a significant role in engaging learning (Salaway et al., 2007; Picciano & Seaman, 2007; Gardner, 2007). According to Rogers (1970) creative freedom and original thinking were effective keys to problem solving, a key neomillennial skill. Various researchers reflected a new paradigm where students needed to learn creatively, constructively and with wisdom by brainstorming, using ideation, and thinking critically (Partnership for 21st century skills, 2007; Shaheen, 2010).

Innovation

Innovation centered on the implementation of new ideas all through an organization. Innovation principles, which were conceptually different from creativity, included borrowing and implementing new ideas or praxis invented elsewhere (Shin & Zhou, 2007). Creativity and innovation constructs coincided with constructivistic theoretical frameworks (Partnership for 21st century skills, 2008). Craft, Gardner & Claxton (2008) postulated that students needed to gain traditional wisdom (Prov 4:5-7)
while they learned culturally relevant information. This perspective reflected a potential expansion of the curriculum.

Some researchers questioned how teachers would implement the new literacies. Prensky (2009) questioned how the digital skills would be taught and assessed in the new literacies. This factor was realized in this collective case study. The innovative process suggested that participants in this study would instruct their students by incorporating the ideas generated by others.

Unique factors surrounding innovation in the classroom emerged. Traditional assessments were standardized and assumed a single right answer. The 4Cs gave little prominence to the issue of failure, a by-product of creativity and innovation. This reflected a need for building a learning culture where students were willing to learn by discovery and trial and error. Craft et al. (2008) suggested that teachers must ground instruction based on ethical standards that managed Western individualism and ego, right judgment, and alternative truths and contradictions (Craft et al., 2008).

**Learning Environments**

The contemporary learning environment research posited a constructivistic learning design whereby learning was contextualized (Dewey, 1938), problem-based and supported by emergent technology. Constructivistic learning environments were optimally contextual, real world and problem-based (Dewey, 1938; Morgan, 2008; Palko, 2009; Spector et al., 2007). A descriptive overview of NLS showed integrated practices that incorporated participative and collaborative environments, media integration (Geiselhofer, 2010; Seo, Templeton & Pellegrino, 2008) and rigorous deep learning (Dieterle et al., 2008; Ketelhut, Nelson, Clarke, & Dede, 2010; Prensky, 2010). A need
existed for determining the most effective instructional designs (Olsen, 2010). The neomillennial learners’ unique needs demanded that teachers design and implement new curricular and instructional practices like real-world learning (RWL) and problem-based learning (PBL).

**Problem-Based Learning**

The literature suggested that multimedia-assisted PBL provided unparalleled educational advantage to learners over non-multimedia based instruction (Seo et al., 2008). The findings suggested that learning modalities included methodologies that expanded learning beyond the core disciplines, incorporated problem-centered teamwork, and involved complex productions. New learning modalities were non-linear and incorporated new forms of social connection, i.e., Second Life, Facebook, and YouTube (Gardner, 2007). The PBL instructional model promoted hands-on, active and contextualized learning that was authentically centered on organic real-world issues. A recent meta-analysis (Viilo et al., 2011) suggested that PBL provided students with greater learning satisfaction than traditional learning environments (Strobel & van Barneveld, 2009). Therein, students learned more thoroughly when participating in PBL designs and production processes (Strobel & van Barneveld, 2009). This purview provided a data analysis rationale for this case study.

In PBL environments, the teacher-facilitator aided students in acquiring a working knowledge base and promoted self-reliance and deeper independent learning (Gülbahar & Tinmaz, 2006). PBL reflected a paradigm transition from traditional methods that engaged students in creativity (Adams, 2005) and inspired individuals to learn. Self-motivated learners developed persistence when they endeavored to discover answers to
their own questions (Seo et al., 2008). PBL placed students in real-world environments where they gained permanent knowledge and life skills (Gülbahar & Tinmaz, 2006). This factor was significant to this study.

PBL learning reflected open-ended, complex challenges that required students to examine problems from multifarious perspectives, to operationalize prior knowledge, and to adapt new information to the learning environment (Jonassen & Hung, 2008). The holistic nature of PBL interactively involved students in decision-making that could be generalized to the real world (Rubin, 2007). Based on the research, this study assumed that constructivistic problem-based classrooms were the most effective 21st century learning designs.

**Instructional Design**

Effective instructional practices included the implementation and assessment of the neomillennial content neutral skills required for accomplishment in the 21st century (Olsen, 2010). Teachers were to effectively integrate core curricula and 21st century learning skills to effectuate maximal learning. Unique neomillennial instructional designs included technology enhanced learning. Other factors included PBL, differentiation and collaborative learning. Seminal research reflected that instructional effectiveness and assessment scores increased when teachers differentiated learning based on students’ learning styles (Dieterle et al., 2008; Gardner & Moran, 2006). Based on a review of the literature, instructional designs were believed to be key components in maximizing student learning in this study (Hamel, 2007; International Society for Technology Education, 2007; Partnership for 21st century skills, 2008).
Technology

The neomillennial learner displayed an incomparable relationship with information processing. This outcome stemmed from Internet access and an array of technologies made available to him during his brief lifespan (Rodgers et al., 2006). New learning models were needed that incorporated dynamic digital designs that resolved critical learning issues (Hamel, 2007; International Society for Technology Education, 2007; Partnership for 21st century skills, 2008). New media literacies focused on the nature of media, construction of media, and interpretation of media (Coiro et al., 2008).

A problem existed regarding teachers and technology integration. The research identified teachers’ weaknesses with technology integration and their aptitudes with keeping pace with technology. Some suggested that teachers were polarized based on challenges with rapidly developing technology. As a result, a digital divide polarized the mass of teachers (Mullen & Wedwick, 2008). Some teachers were to keep pace with technology demands while others were not. Those teachers who were less proficient with technology could have argued that their primary job was to teach content, rather than teaching with technology. It was probable that some teachers questioned the relevance of attempting to integrate technology beyond local requirements. The findings reflected a major challenge cited in the United States Department of Education’s National Technology Plan (2010). Three factors that impacted teachers’ perspectives stemmed from poor funding, outdated technology equipment and inadequate professional development (U.S. Department of Education, 2010). Some teachers failed to integrate technology into classroom learning primarily due to intimidation with technology integration, lack of technology skills/training and time constraints (Honan, 2008; Stolle,
2008). It was clear from the research that instructional technology was relevant and useful for instructing core standards. The effective 21st century teacher was required to identify integrative technology and to show competence with media literacies.

**Leadership**

Since 2001, high-stakes, standardized test scores were the single determinant regarding the success or failure of United States public schools (Au, 2007). “High-stakes testing” (Au, 2007, 264) led to a narrower curriculum, a focus on lecture and teacher-centered, maladroit practices. Significant debate surrounded the plausibility of using AYP as an accurate measurement of student achievement and teacher effectiveness (Borkowski & Sneed, 2006; Darling-Hammond, 2010).

**Student-Centered Teachers**

The research suggested that effective teachers were student-centered, positive individuals who engaged learners in thinking and learning (Cornelius-White, 2007). The master 21st century teacher possessed a broader talent range than previous generations. He mastered pedagogical content and delivery, instructional learning designs that met NLS and simultaneously kept pace with emergent technologies. Research posited that effective teachers had a plethora of commensurate skills that enabled them to accomplish difficult tasks. Overall instructional effectiveness was determined by the contextual relationship that existed between the individual learner and the environment that holistically met the students’ unique needs (Rayner & Peterson, 2009).

Educators were challenged to prioritize learning goals that focused on the most important issues over issues that held less importance. In a standards-based, over-tested age, teachers had cause to feel unconfident about understanding emerging research and
socio-cultural phenomena. The reasons why the 21st skills were taught or not taught reached beyond the scope of this case study.

**Transformational Leaders**

Significant leadership research identified teachers as leaders. The most effective teacher-leaders showed transformational leadership skills (Kouzes & Posner, 2007). Their ability to influence students in learning was believed to be an essential factor in education. Teachers of neomillennial learners needed to embrace change and the challenges inherent in the uncharted frontiers of future education. The transition from AYP to neomillennial instruction and assessment may have adversely affected the self-efficacy of some teachers. This study examined teachers’ self-efficacy in instructing 21st century literacies. Effective transformational leaders were needed to improve and potentially reform United States education.

**Professional Development**

Teachers who lacked essential skills needed professional development to acquire the necessary skills. Effective teacher-leaders needed to examine the ramifications of cynicism towards political mandates that affected instructional practices. Educators at all levels needed to develop creative funding options to construct appropriate learning environments and to keep pace with emergent technologies. Teacher leaders needed to engage in bringing about positive changes by learning to effectively maneuver within the tiered hierarchical educational systems.

**Summary**

Effective pedagogy critically affected the breadth and depth in students’ learning. Various factors impacted instructional practices relevant to student motivation and
engagement in learning. Teachers were required to make daily choices that affected learning. These factors included: (a) class tasks and homework assignments; (b) reward systems; (c) assessment practices; (d) heterogeneous or homogeneous student groups; (e) level of student autonomy; and, (f) expectations of student performance (Anderman & Anderman, 2009). Learning in the 21st century best occurred in contexts that encouraged social interaction, safety and community. These critical factors helped facilitate formal and informal learning (Durlak & Weissberg, 2007) and were important factors in this case study.

An integration of research and praxis was needed to effectuate 21st century learning. Although much information existed regarding the nature of the learner, much remained unknown regarding the new literacies. A generalized consensus regarding the definition, framework, and theoretical perspective underpinnings of 21st-century literacies was absent in the literature (Coiro & Dobler, 2007; Schrader & Lawless, 2011; Warlick, 2006). Yet, teachers were required to teach new literacies that provided students full productivity in the global economy (Coiro et al., 2008; Taboada et al., 2008). Theoretical perspectives derived from social learning theory, Situated Learning Theory, and Constructivism were commensurate with 21st-century learning goals (Partnership for the 21st century, 2007b; Wagner 2008; Jonassen & Hung, 2008).

The implementation of effective pedagogies and instructional designs was believed to enhance current and futuristic learning. RWL aided students to identify, assess, and provide alternative solutions to problems (Fazarro, Pannkuk, & Pavelock, 2009). This factor was a centric component in this case study.
The disconnection between research and classroom praxis was cited as a strong deterrent to effectuating positive United States educational reform. Researchers and practitioners needed to bridge the gap between knowledge creation and pragmatic dissemination of knowledge that was derived from evidential theoretical perspectives and practical instruction (Cools & Van Den Broeck, 2007). Further research with self-regulatory frameworks, adaptability and situational learning was needed to expand the current understandings of effective 21st century instructional designs. Advanced rationalization and application of knowledge gained through metacognitive studies (Zull, 2011) proffered positive changes for educators. Lastly, the U. S. educational frontier may have remained unaltered unless a transmogrification dispelled the divergence of all learners caught in the grips of the 21st century academic global achievement gap.
CHAPTER THREE. METHODOLOGY

Overview of the Study

This study was a qualitative collective, instrumental case study. Five recent dissertation studies implemented similar methodologies that were used in this research. Each study provided strength to this study’s methodology.

Choi (2007) examined the experiences of three non-native English speaking teaching assistants in an effort to better understand the self-perception of the assistants as English teachers. The proposed study determined to examine three high school teachers’ perception of self-efficacy in instructing specific skills. Ho (2008) studied three secondary school social studies classes. The two criteria that guided the research study were course design and the type of school under investigation. Similarly, this proposed study focused on specific course designs that included EOCT measures and academic achievement levels.

In a collective case study, Penna (2007) examined four social studies teachers from a single historical site in an effort to understand how key practices affected academic outcomes. This study examined teachers whose instruction was guided by the 4Cs. Siccama (2006) engaged in purposeful sampling of four female participants to better understand the work activities of online educational staff members. The researcher collected data through questionnaires, interviews, and site observations. Data collection methods in this study included a pre-observational survey (Appendix D), classroom observations, and stimulated recall interviews.

A collection, instrumental case study examined three Algebra teachers’ attitudes
towards instructional technology (Dartt, 2011). Data were collected through pre-observational surveys, classroom observations, and stimulated recall interviews. In like fashion, this study investigated three core academic teachers using similar data collection strategies.

The purpose of this study was to examine teacher perceptions of self-efficacy in engaging students in 21st century learning skills development. Olsen (2010) suggested that researchers and practitioners must address this generation’s needs with specificity. A confluence of three concepts was addressed to better educate anomalous and idiosyncratic 21st learners. There existed a dire need to: (a) understand issues of student engagement; (b) synthesize and apply meta-cognitive knowledge regarding cognitive styles; and, (c) rigorously analyze instructional design and its evidential implications for 21st century learning. It was appurtenant to investigate teacher perceptions regarding 21st century learning and the extent to which instructional design instruction engages students in nascent 21st century learning skills development. This case study used a holistic investigation of a contemporary phenomenon that occurred within the local school. The research questions were paramount to specific concerns and issues that signified this as an instrumental case study (Stake, 1995). The research questions were significant to the broader at-large educational community.

**Research Questions**

This study will focus on four research questions that will guide this study:

**Research Question 1:** What attitudes do teachers exhibit regarding instruction of 21st century learning skills? Although the 4C’s (Partnership for the 21st century, 2011) were implied within the CCSS framework, the literature cited specific skills necessary for

**Research Question 2:** To what extent do teachers seek to engage students in creativity and innovation? The extent to which teachers sought to engage students in these skills was determined through observational data collection and was analyzed after the coding was complete.

**Research Question 3:** To what degree do teachers implement neomillennial learning styles (NLS)? The extent to which NLS was implemented in the classroom may reflect the degree to which effective blending of research and pedagogy exists.

**Research Question 4:** How will the participants measure their own self-efficacy in teaching 21st century learning skills within the core curriculum? This self-assessment may display teachers’ self-efficacy in effectively designing neomillennial instruction.

**Research Design**

Applied research was used in this study because I sought to understand how these teachers’ views of self-efficacy in engaging students in 21st century learning skills development impacted their instruction. This investigation consisted of case study research. I used a case study because I provided deep description of the phenomena that existed among the three teachers. Data were collected in three separate ways. I performed pre-observational surveys of the participants. Second, I performed observations during instruction. I used stimulated recall interviews with each of the participants.

It was important to identify 21st century learning skills in order to examine teacher efficacy regarding instruction with 21st century learning. According to Wagner
(2008), 21\textsuperscript{st} century learning skills were: (a) critical thinking and problem solving; (b) collaboration across networks and leading by influence; (c) agility and adaptability; (d) initiative and entrepreneurialism; (e) effective oral and written communication; (f) accessing and analyzing information; and, (g) curiosity and imagination. These themes were pervasive threads in the fabric of innovative learning designs. The type behaviors that the researcher desired to capture included instructional techniques that engaged students in active learning, instructional strategies that promoted 21\textsuperscript{st} century learning skills development and instructional strategies that coincided with cognitive styles research (Wagner, 2008; Evans & Cools, 2011).

Students who are engaged in learning were more apt to obtain knowledge than those who were disengaged. It was important to understand student engagement and those traits and characteristics that defined engaged learning. Engagement referred to the time teachers allotted for instructional activities that were designed to engage students in the learning process (Krause, 2005). According to Yazzie-Mintz (2010), student engagement in learning consisted of a relationship that existed between five social factors:

- the student and school community;
- the student and school adults;
- the student and peers;
- the student and instruction; and,
- the student and curriculum.

This study determined to understand how teachers engaged student learning in the classroom.
For purposes of this research, the pre-observational participant survey examined participant’s attitudes toward student engagement in terms of cognitive or academic engagement and participatory engaged learning. The pre-observational survey data were derived from the 2009 High School Survey of Student Engagement (HSSSE), a comprehensive survey on student engagement and other factors that influenced student learning. The survey instrument endeavored to discover student attitudes about their lives at school and to provide survey data to schools. The three main purposes of the HSSSE were to assist secondary high schools in understanding issues regarding student engagement, to help high school teachers and administrators use survey data to promote effective practice, and to research student engagement. For the purposes of this study, the teacher survey items were constructed from concepts that students’ nationwide deemed as most important to their own engagement in classroom learning (Yazzie-Mintz, 2010).

The pre-observational surveys, in-class observations and teacher interviews examined factors of student engagement identified as 21st century learning components (Common Core State Standards Initiative, 2010; Wagner, 2008). The researcher worked to identify instructional practices that instituted cognitive learning styles. Twelve characteristics of brain-compatible learning environments that coincided with effective use of cognitive learning styles included the following characteristics:

- humor and smiling;
- music;
- talking;
- role-playing;
games;
storytelling;
cooperative groups;
knowing the purpose/objective;
high-challenge/low-stress;
ritual and novelty;
movement; and,
positive & high expectations (Tate, 2010).

Description of the Study

The overriding goals of this study were to examine three high school core subject teachers’ attitudes and perceptions of self-efficacy in engaging students in 21st century learning skills development. I explained to each participant that he/she was participating in a doctoral dissertation study at Liberty University. Each of the three teachers answered questions using the researcher designed pre-observational survey. During the observations, I examined how the participants used instructional designs and strategies that were pertinent to this research. Second, I video recorded four 50-minute classes instructed by each participant. Each teacher was notified prior to two out of four observation sessions. The other two sessions were unannounced. Each teacher participated in a stimulated recall session. The research discoveries were shared with all participants once the study was completed.

A variety of coding techniques existed for organizing qualitative data. These techniques included use of heterogeneous techniques: (a) hand coding; (b) color-coding; (c) note cards; (d) notes in margins; and, (e) software (Russell Yocum, personal
communication, June 17, 2011). I used MAXQDA Qualitative Data Analysis Software (QDAS) to aid me in organizing the pre-observational survey data, case study field notes, memos, observation transcripts and participant interview transcripts.

**Participants**

The sample size included three core subject teachers in a single school system in the State of Georgia. The demographic information included two female teachers and one male teacher whose approximate ages ranged from 40-51 years. I used pseudonyms for all of the participants to maintain each subject’s anonymity and identity confidentiality throughout the investigation.

A maximum variation sample was purposefully selected based on knowledge of the selected teacher samples. The conglomerate ensemble represented a broad spectrum of experiences within the core curriculum. The goal of this investigation was to personify and depict a plethora of experiences that related to this study. Resultantly information learned from one teacher was used to enlighten the next step in the journey towards an emergent pathway. As noted by Maykut & Morehouse (2000), this technique was especially effective when using a small sample size. A diverse range of successful teachers assembled a unique sample that held the potential to display much information about issues central to this study. A goal of this study was to find manifestations of a construct of interest, to expound and to more thoroughly examine the construct.

**Andy Adams**

The first instrumental case study focused on Andy Adams. Andy was approximately forty years and had taught for 16 years out of 18 total years at WHS. Andy brought diversity to the instructional scene as a two-time Star Teacher at WHS.
Andy held degrees in both English and History and taught high school students English, Government, U. S. History, World History and Comparative Religions. Andy also worked with disadvantaged students (Project Express) at a nearby school system. His students’ 2010 cumulative EOCT scores in Economics were 94% “meets and exceeds” expectations. Andy’s 2011 first semester EOCT scores in Economics were 91% “meets and exceeds” expectations (Georgia Department of Education, 2012).

**Dana Dunn**

The second instrumental case study focused on Dana Dunn. She was approximately 51 years old and had taught for 28 years. Dana taught Advanced Biology, Physiology and English. She had taught at WHS for four years. Dana currently taught Ninth Grade Literature. Her teaching awards included the Master Teacher Award (2000) and the Golden Apple Award (2002). Dana was recognized as a quality teacher as evidenced by her track record with exceptional EOCT scores. Her students’ 2010 cumulative EOCT scores were 94% “meets and exceeds” expectations. Dana’s 2011 first semester EOCT scores were 91% “meets and exceeds” expectations (Georgia Department of Education, 2012).

**Kate King**

The third instrumental case study focused on Kate King. She was approximately 50 years old and had taught for 26 years. Kate had taught Physical Science at WHS for two years. Her teaching awards were the system-wide “teacher of the year” in a nearby county. Kate was recognized as a quality teacher as evidenced by her track record with exceptional EOCT scores. Her students’ 2010 cumulative EOCT scores were 97%
“meets and exceeds” expectations. Kate’s 2011 first semester EOCT scores were 98% “meets and exceeds” expectations (Georgia Department of Education, 2012).

Setting/Site

At the inception of this study, I began with a vested interest in understanding 21st century learning as an academic concept. Specifically, studies by Olsen (2010) and Dartt (2011) deeply captured my attention. General guidelines and frameworks were derived from these studies as well as various other articles and dissertations. I chose to conduct research at the same school where I taught. Westtown City School System was a city school located in a region of West Georgia. This “single A” high school existed as one of very few high schools in the state who were recognized as a “2010 Georgia School of Excellence”. During the 2011-2012 school year, approximately 600 students attended WHS (Georgia Department of Education, 2012).

All three participants were Caucasian, instructed students in uniquely different academic areas and were recognized for their instructional expertise. Each teacher instructed three classes per day and had a planning block. Each teacher was identified with a pseudonym. Each of the proposed teachers agreed to participation in this study and completed all data collection components from start to finish. Each participant completed an informed consent before collecting the data (Appendix C).

Procedures

The process for beginning this study included various steps. In this section, I listed procedures needed to begin this research project. I followed the Liberty University dissertation guidelines for acquiring the research participants and direction from my dissertation chair. I began this study by forming a research committee of three for the
purpose of guiding each step of the research process. The initial step began with seeking and obtaining IRB approval to conduct this research. Upon receipt of approval (Appendix A), a letter was sent to the local board of education seeking approval to conduct research (Appendix B). A meeting was held with the head principal to explain the goals and procedures of this study. Then, I created a letter of informed consent for the participants to peruse. After receiving permission from the principal, I submitted the proposal and local school research to the IRB. I provided an informed consent form to each teacher. Once each participant had read the form, agreed to it and signed it, I began the research study.

**Researcher’s Role**

In this study, I was actively involved in administering the surveys, recording the observations and performing interviews. I recorded each teacher using a high definition camera and tripod during the classroom observations (Dentley & Bishop, 2010). I audio recorded the SRIs using a USB microphone and Garageband. During the classroom observations, I was a non-participant and attempted to inconspicuously hide behind the camera, where I focused solely on the teacher’s behaviors during instruction. Whenever students appeared to move near the camera’s focus, I repositioned and focused on inanimate objects in an effort to avoid recording the students. The Sony camcorder displayed video footage in hours, minutes and seconds. I used the built-in meter to determine the exact times when teachers were engaged in specific instructional behaviors. This process proved useful when transcribing, coding the data and writing memos. The audio was replayed using iTunes and ExpressScribe. Video clips were replayed using Quicktime.
Data Collection

Data collection occurred in various ways. I performed pre-observational surveys of the participants. Second, I observed the teachers during normal classroom instruction. I used a Stimulated Recall Interview (SRI) technique with each of the participants. I used non-scripted, semi-structured interviews to encourage conversation between the researcher and participant. The pre-observational surveys, in-class observations and teacher interviews were centered on identification of the 4C’s instruction and the supporting 21st century skills components (Wagner, 2008). I investigated how teachers used cognitive learning styles to promote brain-compatible learning engagement (Tate, 2010).

Surveys

The pre-observational surveys helped determine teachers’ attitudes toward instructing 21st century learning skills, learning engagement, implementation of cognitive learning styles and personal self-efficacy towards 21st century learning skills development. Once the surveys have been completed, they were collected from the participants and stored in an off-campus key-locked filing cabinet.

Observations

I observed instruction that engaged students in learning, employed 21st century learning skills instruction and praxis that coincided with cognitive styles research (Wagner, 2008; Evans & Cools, 2011). Engagement was defined as instructional activities designed to engage students in the learning process (Krause, 2005) and consisted of a relationship between five social factors:

- the student and school community;
• the student and school adults;
• the student and peers;
• the student and instruction; and,
• the student and curriculum (Yazzie-Mintz, 2010).

I wanted to know observe how each participant actively engaged students in learning. As a direct observer, I determined to be unobtrusive in the classroom. I desired to observe the instructional process rather than to participate in it (Trochim, 2006).

**Recording Procedures**

I video recorded classroom observations by observing the teacher’s behavior versus recording the students. Although block-scheduled courses last 90 minutes, I recorded in 50-minute sessions. This provided a cushion for teachers to instruct their students without being observed or recorded.

Educational research that spanned two decades used video-stimulated recall (VSR) to investigate teacher decision-making processes during instruction (Lyle, 2003; Powell, 2005). A seminal longitudinal research study by Reitano & Sim (2010) effectuated VSR as a major data collection tool. Recent research posited that VSR helped fill gaps between theoretical understandings and instructional practices (Reitano & Sim, 2010). SRI purportedly increased some participants’ anxiety levels and impacted their ability to accurately recall the observed event (Calderhead, 1981). Conversely, substantive research supported positive responses when using SRI in educational research (Dentley & Bishop, 2010; Schepens, Aelterman, & Van Keer, 2007; Stoffels, 2005).
Field Notes

I recorded observations in the form of descriptive and reflective field notes (Bogdan & Biklen, 2007). The descriptive aspects of my field notes included an exact transcription of the dialogue and a description of the setting. The reflective portion included my thoughts on data analysis, ethical considerations and my personal frame of mind during data collection. Using MAXQDA analytical software I included both descriptive and reflective memos. I safeguarded against personal biases by sharing field notes with my dissertation committee, but not with persons outside the committee (Bogdan & Biklen, 2007).

Stimulated Recall Interviews

I used a flexible semi-structured interview research method that allowed me to ask new questions during the interview based on the interviewee’s comments. As the sole interviewer, I used a prepared thematic framework based on themes to group topics and questions. Using an interview guide, I employed an unconstrained format to tailor questions based on the context and the person with whom I was interviewing at the time (Lindlof & Taylor, 2011). Independent teacher interviews occurred in my classroom and provided an uninterrupted and secluded location. Only the participant and I were present during the SRI. Each teacher was given a copy of each of the interview transcriptions following the interviews. This member check process helped to ensure credibility.

I used guided SRI questions (Appendix E) during the interview process and reserved the right to veer from the interview guide. Through active listening (Lindlof & Taylor, 2011), I determined the need to ask relevant questions that pertained to the interviewee’s responses. SRI provided crucial information regarding teachers’
instructional decision-making. These techniques helped to validate the participant’s responses (Lyle, 2003). I used the stimulated recall interview (SRI) to help the participants vividly relive their instruction (Bloom, 1953) and to aid in providing reasons why specific behaviors occurred in naturalistic environments (Calderhead, 1981). Stimulated-recall interviews (SRI) were preceded with specific task instruction that helped participants rationalize their instructional behaviors. The SRI served as a type of ex post facto verbal report where teachers evaluated their decision-making processes from an earlier occasion. The additional information helped to contextualize classroom observations because it encouraged teachers to explain their perspectives on the classroom behaviors (Calderhead, 1981).

I used applied research in this study to help solve an actual problem in education (Ary, Jacobs, Razavieh & Sorensen, 2006). I determined to better understand how these specific teachers’ views of self-efficacy regarding student engagement in 21st century learning skills development impacted their instructional practices. This investigation consisted of case study research to provide deep description of the unique phenomena that existed among this instructional trio (Stake, 1995).

Data Analysis

Constant Comparison

Once the data had been gathered, I coded each participant’s data using open coding then axial coding. I used employed constant comparison, the process of comparing occurrences of data that were organized by a specific code. This process helped me to discover commonalities in the data that indicated the meaning of the code.
(Appendix F). Common data codes were distinguished from dissimilar codes (Bodgan & Biklin, 2007; Gall, Gall & Borg, 2009).

**Open Coding**

The participants reviewed statements from the research report to confirm their accuracy and thoroughness. Following data collection, data for each individual case study was coded and categorized separately. I read the transcripts and used open coding to identify, name, categorize and describe the events. Beginning with a broad view of the case, I funneled the data into specific themes (Bogdan & Biklen, 2007).

**Cross-Case Comparison**

After I compared results from all three cases, I employed a cross-case analysis and determined if common themes were present. This process reduced existing threats to transferability that included selections effects, setting effects and history effects (Ary et al., 2006).

**Member Checking**

I used member checks to examine the reenactment of the participant’s emic viewpoint and engaged in axial coding to disaggregate existing core themes that made them more abstract. I then created categories by grouping codes that were assigned to words or phrases.

**Audit Trail**

I used an audit trail to retrace the researcher’s course of action and sequences. This action provided sequential step-by-step actions and gave credence to my decision-making and procedures. The audit trial supplied structure and a roadmap of the interrelated components (Rosenberg & Yates, 2007).
**Triangulation**

Data analysis triangulation expedited the data validation by cross verifying with more than two sources to increase the credibility and validity of the results. The iterative nature of triangulation was analogous to a many-sided crystal, versus a three-sided triangle. The “simultaneous display of multiple, refracted realities” (Denzin & Lincoln, 2011, 5) reflected various research processes that were interwoven into the research through discovery and storytelling (Denzin & Lincoln, 2011). The qualitative research existed as bricoleur, a distinctive intellectual institution derived from diverse items so that the analysis inevitably indicated representation (Denzin & Lincoln, 2011).

**Field Notes**

I gathered rich data from multifarious data chunks by taking copious notes on what I observed, heard, and thought (Bogdan & Biklin, 2007). I deliberately composed an authentic representation to match the complexity and specifications of the circumstances. As a result, I emergently constructed a depiction of the facts as accurately as possible.

**Transcription**

I hired a professional transcriptionist to transcribe the interview data. The transcription process required slightly less than 30 hours. Each participant was provided access to his own transcriptions but not the transcriptions of the other participants. Literal transcriptions provided exact word-for-word texts and helped to avoid misinterpretations. Transcriptions aided in preventing reports that showed personal bias towards the field experiences (Bogdan & Biklin, 2007). After reviewing the findings, the participants were provided their case study findings. I asked each participant to review
the findings and to confirm or disconfirm their accuracy. Andy and Dana both confirmed the data’s accuracy without needing corrections. Kate offered nominal corrections that consisted mostly of typographical errors like misspellings of scientific terms.

**Trustworthiness**

I used many processes to strengthen the quality of the study. Nine specific data processes were used to maintain research trustworthiness (Lincoln & Guba, 1985; Shenton, 2004). These processes were:

- field notes;
- transcription;
- open coding;
- axial coding;
- member checking;
- triangulation;
- audit trail; and,
- constant comparison.

During and immediately after the observations, I recorded field notes that described the setting, the interactions, and my perspectives. I used an open coding format to conceptualize the phenomenon in full measure. Once the data were recorded, I employed axial coding through an inductive process. To confirm the accuracy of the data findings and their interpretations, I used member checks with the participants. My journey was recorded daily by using an audit trail. This process allowed any individual to retrace the research study’s pathways. During the data analysis stages, I engaged in constant comparison, a process whereby I compared data occurrences that were
applicable to the themes (Glaser and Strauss, 1967). I integrated the themes until four main themes and four minor themes emerged from the data analysis.

My goal was to understand the participants’ perceptions and to accurately unearth those meanings accurately. Merriam (2009) stated, “What is being investigated are people’s constructions of reality—how they understand the world” (p, 214).

Credibility in qualitative research corresponded to internal validity in quantitative research. I did not hypothesize in this study. Rather, I determined to realize the factors surrounding the described phenomena. According to Lincoln & Guba (1985), the findings must be credible, based upon the data presented in this study. I sought to achieve this aim by providing rich, thick description based on my data analysis.

I dealt with dependability, i.e., reliability in quantitative research, issues by providing consistent rich detail of the context and setting. I embraced the issues regarding the “crisis of representation” (Marcus & Fischer, 1986, 15) by video recording each of the twelve observations. I audio recorded the SRI sessions using a USB microphone, an iMac computer, and Garageband. The SRI sessions were transcribed to maintain accuracy. I typed field notes immediately after the observations, so that I accurately remembered the events and my impressions. My field notes helped to provide a detailed description of the observations. The member checks provided a written description of what I perceived to be the reality of the participants’ intentions. I determined to found my analyses in verisimilitude (Denzin & Lincoln, 2011). Issues of description and representation would have been problematic if I had portrayed reality based solely on my viewpoint and worldview. Therefore, I sought to firmly gain trustworthiness by using field notes, transcriptions and member checks.
I established confirmability by examining the extent to which this research was bias free and objective (Ary et al., 2006). This occurred by founding the findings in broad-based, peer-reviewed research. I used an audit trail as a primary strategy for confirming data accuracy. Through reflexivity and self-reflection, I actively pursued accuracy over potentially presenting personal biases.

The issue of transferability in qualitative research corresponded to external validity in quantitative research. The applicability of the findings in this study were possible to other academic settings, although it was not a certainty. According to Maxwell (2005),

Validity . . . is a goal rather than a product; it is never something that can be proven or taken for granted. Validity is also relative: It has to be assessed in relationship to the purpose and circumstances of the research, rather than being a context-independent property of methods or conclusions (p. 105).

Although it was possible that the research findings were transferrable to another setting, I did not necessarily expect them to be transferrable (Ary et al., 2006). Lincoln and Guba (1985) suggested that “the burden of proof lies less with the original investigator than with the person seeking to make an application elsewhere. The original inquirer cannot know the sites to which transferability might be sought, but the appliers can do.” (p. 298). I established trustworthiness in this study by addressing four essential qualitative research factors. These factors included: 1) credibility; 2) dependability; 3) confirmability; and, 4) transferability (Lincoln & Guba, 1985; Shenton, 2004). Each was addressed separately.
Credibility

The credibility in this case study depended upon the accuracy of the findings and the extent to which the findings correctly detail reality. It was dependent upon the richness of the gathered information, i.e., the data, and the researcher’s analytical abilities. Credibility was identified as a factor that corresponded to internal validity in quantitative research.

Dependability

I dealt with dependability, i.e., reliability in quantitative research, concerns by providing consistent rich detail regarding the context and setting of the study. Effective research practices required that I emphasize the importance of videotaping, recording field notes and member checking in an effort to counter the “crisis of representation” (Marcus & Fischer, 1986, 15). The issue of writing the reality of another person was founded in verisimilitude (Denzin & Lincoln, 2011). Issues of description and representation would have been problematic if I had portrayed reality based solely on my viewpoint and worldview. Therefore, I decided to firmly gain trustworthiness by using field notes, transcriptions and member checks.

Confirmability

My bias could have influenced data analysis based on preconceived pedagogical assumptions. As the sole data collector and analyzer, I intended to avoid personal bias toward 21st century learning skills by incorporating data triangulation.

I examined the extent to which this research was bias free and objective effects (Ary et al., 2006). I used an audit trail as a main strategy for confirming data accuracy. Through reflexivity (self-reflection), I actively looked for potential personal biases that
may have existed.

**Transferability**

Although it was possible that the research findings were transferrable to another setting, I did not expect them to be transferrable (Ary et al., 2006). Shenton (2004) suggested that researchers should provide contextual background information to help establish the setting of the investigation. I provided thick description about the uniqueness of the individual classroom settings and its potential impact on the research.

**Ethical Issues**

I assigned each participant a pseudonym to conceal his personal identity. Each participant completed an informed consent form and performed a pre-observational survey. All documents were stored in an off-campus location to maintain safety. All observations were coded and transcribed. Copies of all hand-written and electronic documents were kept in an off-campus location to maintain safety. All interviews were stored on an external hard disk versus using the camera’s internal memory. The drive was housed off campus for safekeeping.

As a researcher, my purpose was to personally develop into a transformational leader who reflected Christ and challenged conventional thinking in a 21st century learning constructivist environment (Kouzes & Posner, 2007). My goal was to exemplify credibility and excellence in the research process. My ultimate purpose was to glorify God (I Cor 6:19). God existed as the ultimate standard by which all else was measured (Col 1:17). Therefore, my ethical perspectives were held to the highest possible standards. Since first impressions influenced a leader’s credibility (Manderscheid & Ardichvili, 2008), I attempted to accurately perform all research, investigations and
analyses to the best of my ability. I used quality listening skills (Brown, 2009), was proactive, and tried to holistically engage participants in this study (Babintsev, Boiarinova & Reutov, 2008). I synthesized academic understanding by demonstrating Christian values, morals, and ethics (Schultz, 2006). Lastly, I determined to be dependable, professional and relational while showing concern for the participants in this study (Kouzes & Posner, 2007).
CHAPTER FOUR. FINDINGS

The purpose of this case study was to understand teachers’ self-efficacy in instructing 21st century learning skills in a high school core curriculum. This study sought to deeply understand teachers’ metacognitive processes and their sense of self-efficacy in pursuing the instruction of 21st century skills, a unique set of skills that reached beyond the core academic benchmarks. This study examined the impact of three highly qualified teachers’ attitudes toward instructing the 4Cs within a 21st century skills framework. The 4Cs were identified as critical thinking, collaboration, communication and creativity.

This study focused on learning styles and instructional practices (Rayner 2011; Kozhevnikov, 2007; Zima, 2007) specific to K-12 learning and empirical studies (Evans & Cools, 2011). The study investigated learning styles frameworks in reference to self-regulation, contextual/situational learning and integrated approaches to understanding metacognition (Evans & Waring, 2009). Neuroscientists Goleman & Boyatzis (2006) proffered the notion that discerning another’s thoughts existed as a highly regarded talent. Discernment separated persons and allowed them to understand that another person’s intentions were not what were best for that individual. This viewpoint was closely linked to understanding metacognition.

This study sought to clarify, better understand and reify neomillennial literacies, specifically those in relation to creativity (Sternberg, 2006) and innovation. Furthermore, it addressed neomillennial support systems’ issues that aided implementation of learning outcomes. Identified gaps existed regarding effective learning designs that engaged
learners in promoting 21st century learning skills (Partnership for 21st century skills, 2007).

An initial document analysis was performed to identify teachers who met the criteria for participating in the study. Pseudonyms were assigned to maintain confidentiality for the participants during the study. A pre-observational survey was designed and used to determine the participants’ perceptions surrounding self-efficacy in the classroom, the CCSS learning and innovation skills, student engagement, learning styles and creativity and innovation. The survey was conducted to determine the participants’ perceptions about their understanding of cognitive engagement and 21st century learning as well as learning styles and understanding of the CCSS based on their instructional strategies, personal experiences and professional development.

This chapter will be initiated by discussing the four major themes that emerged from each case study participant’s data. I will present and discuss the data collected from the survey, observations and SRI. In staying true to the data, the four major themes emerged after examining the participants’ codes and code patterns. The axial coding process provided a way to aggregate and disaggregate various codes that regularly occurred in groups and led eventually to creating themes. These factors will be presented and discussed independently in this chapter.

Four main themes surfaced from the data analysis:

- When teachers had favorable attitudes towards 21st century skills instruction, it was reflected in their praxis;
- When teachers held students accountable for learning, it was demonstrated in student assessments;
• When teachers created an effective learning culture, they sought to engage learners; and,
• When teachers focused on student learning styles, it was evidenced in their instructional habits.

Major Theme One: 21st Century Skills – Andy Adams

The initial theme reflected that when teachers maintained favorable attitudes towards 21st century skills instruction, it was reflected in their praxis. This theme emerged as Andy’s second most commonly occurring major theme. Two areas within the 21st century skills instruction contained significant codes. Both “critical thinking” and “accessing and analyzing information” (Partnership for 21st century skills, 2007; Wagner, 2008) regularly emerged in the data set. Separating “critical thinking” and “analyzing information” into separate codes was problematic when analyzing the data set. I employed two specific criteria for determining which code to use. First, I used the code “accessing and analyzing information” when Andy required his students to access, read or use information. Second, I used the “critical thinking” code when students were asked to thinking critically about ideas or concepts learned in the classroom.

21st Century Learning

A review of the 21st century learning literature defined 21st century learning as the areas of overlap that occurred between the 21st century skills frameworks Lemke et al., 2003; Partnership for 21st century skills, 2007b; Wagner 2008). A plethora of 21st century skills were identified (Carini et al., 2006; Lambert & Cuper, 2008; Partnership for 21st century skills for 21st Century Skills, 2006; Rocca, 2010). These skills included:

• innovation and creativity;
• curiosity and innovation;
• accessing and analyzing information;
• oral and written communications;
• initiative and entrepreneurialism;
• agility and adaptability;
• collaboration; and,
• critical thinking and problem solving.

Critical Thinking

The critical thinking concept appeared repetitively in the 21st century learning literature review and was confirmed in this case study as a critical component to learning. During the SRI, I asked Andy if he saw a connection between critical thinking skills and test taking skills. I said, “You teach test-taking skills to your students in the next three short clips. Is this part of critical thinking? If so, help me understand how you try to teach critical thinking?” (A. Adams, personal communication, September 13, 2012). Andy stated,

. . . you’re actively reading questions. You’re saying, What’s the most important thing here? What is the key information that they are looking for in the question? You can underline those things. That is a skill that we have to work on all the time (A. Adams, personal communication, September 13, 2012).

In the final data analysis, “critical thinking” was coded with 21st century skills and “test taking skills” parent code group was coded as a subset of “assessment”. During the SRI, Andy described the critical thinking process students used during testing. He asked,

What is the key information that they are looking for in the question? And you
can underline those things. That is a skill that we have to work on all the time.
Okay? So, I should see when I get these back where you’ve underlined things, where you’ve eliminated things (A. Adams, personal communication, September 13, 2012).

Andy’s students studied how the American political system worked. Andy wanted his students to think critically about the underlying premises the speakers at the 2012 Republican convention presented. He stated, “They think America has lost its greatness. Hello? You will hear that preached over and over again. ‘If we don’t do something, we’re gonna be a third world country’. Does that make sense?” (A. Adams, classroom observation, August 28, 2012). Students were required to think critically about the concepts Andy had taught them and to analyze the political rhetoric in light of that knowledge.

Andy encouraged students to read books that caused them to engage their minds in deeper cognitive processing. He claimed that students should link their previous knowledge to new knowledge and understand it accurately by applying critical thinking skills. Andy suggested that knowledge contained the power to change cultures. He stated,

But I will never forget this quotation out of this book. He warned her. He said, ‘Don’t you be teaching people how to read. Reading leads to thinking! Reading leads to thinking!’ So right here. That’s one of the things that Harriet Beecher Stowe really pointed out in that book. ‘Don’t let slaves read. Don’t teach ‘em how to read; or, they will begin to question our whole system that we have set up’ (A. Adams, classroom observation, August 28, 2012).
Andy connected critical thinking to learning effective test-taking skills. During the SRI he stated,

So as I go along teaching, you know, the other critical thinking things that I do in my class. One of the things that I try to work on them is ‘How do you take a test?’ . . . How do I make the best decision? (A. Adams, personal communication, September 13, 2012).

Andy taught students the critical thinking skills they needed for testing. He said, “When you’re taking the test, when you look into these things … you’re eliminating … If it’s a multiple-choice test, you’re looking at those things. Say, ‘Okay, I’m eliminating’” (A. Adams, classroom observation, August 22, 2012). When students asked “purpose” and “why” questions, they were engaged in critical thinking. “Why” was coded as a subcode of the “learning environment”. This viewpoint uniquely demonstrated a potential connection between “brain-compatible learning” and “critical thinking”.

During the SRI, I stated, “You often ask questions of your students that emphasize understanding the purpose and why things happen. Help me understand your goals with that”. Andy responded, “That’s why I want the critical thinking . . . and the creativity. I wanna know ‘why’. I want their brains to click on a different level … I’m glad you spit out the definition; but, why is that so?” (A. Adams, personal communication, September 13, 2012).

Access and Analyze Information

The second factor in 21st century skills instruction was “accessing and analyzing information”. Andy’s taught his students how to formulate an appropriate theoretical description of a Republican Party individual. He asked, “And how do you know . . . if
you had to describe a Republican?” (A. Adams, classroom observation, August 28, 2012). Students were required to first access the knowledge and analytically determine how to formulate an accurate description. Prior to a quiz, Andy stated, “This is just a brief paragraph…I want you to tell me what a Republican is…what they believe” (A. Adams, classroom observation, August 28, 2012). Andy engaged students in analyzing the information and presenting it in written format. Oral and written communications were identified as essential 21st century skills (Partnership for 21st century learning, 2007). Students accessed and analyzed various viewpoints of both United Stated political parties. Andy presented and discussed the various platform arguments that they would later hear from the candidates and helped engage the students in analyzing their arguments.

Andy presented political arguments related to taxation on American businesses in relation to innovation. He engaged the students in an analytical discussion. He demanded, “Why would you raise taxes on job creators and producers? They don’t like that idea. They want you to cut taxes on those people!” (A. Adams, classroom observation, August 28, 2012).

Andy formulated a discussion regarding entrepreneurialism that seemed to fit well into the Economics classroom discussion. Andy inquired, “Why is he entrepreneurship? Talk to me. Don’t just answer the test…It was his idea. He came up with it. He’s innovative. ‘I’m gonna get the right people’. Remember, part of entrepreneurship is managing people…The principal of the school… better know how to manage people. If he can’t manage people, you’re gonna have problems… Put the right people in the right place; let them do what
they do best” (A. Adams, classroom observation, August 22, 2012).

Andy utilized “oral and written communications”, another 21st century skill, as a way for students to demonstrate their creative abilities. Andy elaborated on how he engaged students in creativity. He said,

But I’m looking for them to come up with any kind of idea and . . . or anything like that that will click to the general concept that we’re doing . . . But go beyond the standard instead of a just a basic definition. What other ways can we use this? How can we use it, you know? And I might have a kid in there who . . . who loves skateboards and he’s figured out a different way to make his skateboard faster. And then all of a sudden it clicks with him . . . I could be an innovator (A. Adams, personal communication, September 13, 2012).

Major Theme One: 21st Century Skills Instruction – Dana Dunn

When teachers had favorable attitudes towards 21st century skills instruction, it was reflected in their praxis. Dana’s most prominent parent code groups were “21st century learning skills” with 54 coded segments and “theoretical underpinnings” with 54 coded segments. Uniquely, the data set reflected an equal number of codes in both areas. In staying true to the data, two parent codes were ranked as the top parent code groups. The combined data codes appeared 108 times out of out 208 codes in the total data set. Since both code groups contained 54 codes each, it was ethical to report both code segments with equal importance. “Theoretical underpinnings” were presented and discussed as a component in the “learning culture”.

Three “21st century learning” subcode groups received important levels of coding:

- accessing and analyzing information;
• innovation and creativity; and,
• curiosity and imagination.

The “21st century learning” subcode area “critical thinking” was coded 20 times and was discussed as a minor theme. The literature noted that 21st century learning skills included critical thinking and problem solving (Partnership for 21st century learning, 2007; Wagner, 2008). Separating “critical thinking” and “analyzing information” into separate codes was problematic during data analysis. I used two specific criteria for determining which code to use. When students accessed, read or used information, it was coded as “accessing and analyzing information”. When students were asked to think critically about ideas or concepts learned in the classroom, it was coded as “critical thinking”.

During the SRI, I asked Dana, “What 21st century skills are you teaching at this time?” She commented,

I think uh, with regard to 21st century skills. . . I’m trying to teach them how to be prepared for a specific kind of test. I’m also trying to teach them some problem-solving skills . . . When . . . they have to look at what information they’re given, they have to figure out what they are actually being asked (D. Dunn, personal communication, September 17, 2012).

At no time during the data collection phase did Dana ask for a definition of 21st century learning skills. Speaking authentically, Dana admitted,

Whether that’s officially called a 21st century skill, I don’t know. I do know that in today’s world um, more and more students are going to be asked to be able to solve problems, figure out solutions. . . So I think just in helping them figure out
solutions about how to take this test is probably helping them get better at that (D. Dunn, personal communication, September 17, 2012).

**Accessing and analyzing information**

Both “critical thinking” and “accessing and analyzing information” (Partnership for 21st century skills, 2007; Wagner, 2008) regularly emerged in the data set. The code group “accessing and analyzing information” was coded ten times. During the observations, students were not asked to access information through Internet searches. She provided the students handouts and books. Codes occurred only when students were actively analyzing.

Students were taught to value analysis. Dana noted, “Now most of it is gonna come down to how well you can effectively analyze the passages” (D. Dunn, classroom observation, August 23, 2012). Dana led her A. P. students in an analysis of “Goodman Brown”. She stated, “So you’ve read Young Goodman Brown. Think about this. Three words: moral, nature, psychology. Which one comes to mind in association with Young Goodman Brown?” (D. Dunn, classroom observation, August 21, 2012). She instructed them how to analyze and interpret the information the author presented. Dana described the story in more detail.

But the climate, the weather, the seasons, all of that would play an important part in interpretation. And you’re absolutely right! It sets the stage for this particular story. It would not be the same story if it had been in the middle of the day in a bright sunny, you know, woods with frolicking animals. It would not have been the same (D. Dunn, classroom observation, August 21, 2012).
As Dana presented comparative viewpoints, she challenged them to anatomize the story and to interpret the hidden qualities of the allegory. She suggested, “So he insulates himself from the possibilities of those things happening to him. We don’t know if this is a dream. And we don’t know if we’re supposed to take it literally, since it’s an allegory” (D. Dunn, classroom observation, August 21, 2012).

**Innovation and creativity**

The “innovation and creativity” codes occurred ten times in the code group. In the literature, Magner (2011) suggested that the CCSS alluded to creativity instruction but did not clearly state that it should be taught as an independent skill (Magner, 2011). “Creativity and innovation” was coded whenever new ideas or instructional practices were presented and reflected innovative concepts (Shin & Zhou, 2007). Both these paralleled the constructivist theoretical frameworks (Partnership for 21st century skills, 2008). During the SRI, I asked Dana to describe creativity and innovation in her own words and to tell me what it meant to her. Dana stated,

I think . . . that creativity is a . . . a . . . a way of . . . of expressing your perception of something . . . how it’s meaningful to you . . . You put it in whatever format it seems to be most meaningful and most significant to you. You know, some students are creative . . . creative musically and some in other artistic ways. And some . . . people are more linear in . . . their thinking. But they can still be, you know, creative in that way. That is their creative outlet . . . (D. Dunn, personal communication, September 17, 2012).

Sternberg and Lubart (1999) referenced innovation as the realization of new ideas that resulted in the production of something valuable in the marketplace; these products could
also be a first time new idea that was typically overlooked by others. The literature was inconclusive as how to specifically identify creativity and innovation. Dana’s comments regarding creativity and innovation were aligned with the literature as how to specifically identify and assess creativity and innovation in the classroom. She said,

So it’s . . . it’s hard to nail down what . . . what creativity is. But I guess you . . . I try to go back to the way kids learn and try to make available to them opportunities to use both the way they learn . . . in allowing them to be creative with a product in the classroom (personal communication, September 17, 2012).

Freud (1958) purported that creativity occurred as an unconscious act as a unique means of producing socially acceptable products. The 21st century skills frameworks (Lemke, et al., 2003; Partnership for 21st century learning, 2007b; Wagner 2008) included curiosity and innovation as important learning skills. During the SRI, I asked Dana the extent to which she included creativity and innovation in her instruction. Dana said, “I do try to make my classroom sort of um, visually stimulating and . . . and creative and try to bring connections to what I teach with what I have around in my classroom” (personal communication, September 17, 2012). Dana wanted her students to be imaginative. She supported the students’ efforts to think, to write and to perform creatively.

Curiosity and imagination

Recognizing the factors “curiosity and imagination” was problematic during data coding. This factor was coded nine times during data collection. Dana interjected a simile during one observation when she described a haunting scenario. She said, “It was like they were about to do a sacrifice or something”. After a pause she interjected,
“Makes you wonder. Makes you wonder” (D. Dunn, classroom observation, August 21, 2012). Dana effectively referenced, “Hawthorne builds that suspense deliberately. You don’t really know what’s gonna happen there!” (D. Dunn, classroom observation, August 21, 2012). Dana used imagination to engage the A. P. students in determining the author’s potential intentions and sequencing the story’s events in their 21st century minds. Dana guided her students to imagine the relationship between a married man and his wife in one of Hawthorne’s story. Dana engaged their creative powers by quoting, “‘They looked unmistakably married’. Now from sentence one, we don’t know if that means that they are obviously in love. Their body language and . . . facial expressions show that they’re obviously a perfect couple in love” (D. Dunn, classroom observation, August 27, 2012). Indefinite answers to open-ended questions helped the students to imagine the characteristics and events led to the couple’s scenario.

During the SRI, Dana explained, “I do try to make my classroom sort of um, visually stimulating and . . . creative and try to bring connections to what I teach with what I have around in my classroom” (D. Dunn, personal communication, September 17, 2012). Dana’s classroom reflected her imagination and that of her students. In the right rear corner sat a fern tree dressed in soft green beads that gently dangled from the branches. The leaves, which were most noticeable, nearly obfuscated the fact that the beads were present. These qualities highlighted the unobvious and the embedded opaque qualities inherent in Dana’s classroom.

**Major Theme One: 21st Century Skills Instruction – Kate King**

The first major theme state that when teachers had favorable attitudes towards 21st century skills instruction, it was reflected in their praxis. Kate’s second most
prominent code group was “21st century learning” with 58 codes. Within this primary subcode group, “critical thinking” appeared 22 times. Critical thinking was discussed as a minor theme. Two other significant factors within “21st century learning” were “oral and written communication” and “creativity and innovation”. Each of the remaining code groups contained four or five codes; thus, they were insignificant in comparison to the larger code groups.

**Oral and written communication**

The “oral and written communication” code group appeared 16 times. Kate engaged her students in oral and written communications during the classroom observations. In the pre-observational survey, Kate wrote that developing communication skills was important. Her self-efficacy was lower in this area than in other instructional content areas. During the SRI, she clarified by stating,

... As far as like trying to write the persuasive essays ... we’re supposed to do, I feel a lot less confident with that ... I don’t feel really confident in grading writing and the writing process. And I feel pretty comfortable with grading lab reports ... I believe I am most competent in teaching critical thinking and communication (K. King, personal communication, September 12, 2012).

Kate’s self-efficacy was strongest in technical writing but not as strong in teaching creative writing. She stated,

I am least confident persuasive writing. I am comfortable with it as far as presenting evidence and supporting conclusions. But I do not feel confident in the grading of essay-type persuasive arguments. I tend to get caught up in the mechanics of the writing instead of the overall purpose of the piece. I can’t see
‘the forest for the trees’, so to speak! Therefore, I do not feel I do a good job with creative writing. But I do an adequate job with technical writing (K. King, personal communication, September 12, 2012).

Kate valued written communication skills and required that her students write in various ways. She stated, “This requires good communication skills, which we practice in the form of written responses, which are taken up and marked up once each unit and lab report” (K. King, personal communication, September 12, 2012).

The CCSS identified “communication” (Common Core State Standards Initiative, 2010) as a centric goal and required a literacy component for science classes. Kate engaged her students in learning to write lab reports effectively by thinking critically and analyzing their learning. Kate stated,

As far as my curriculum relating to the Common Core State Standards, the only thing we have are literacy I think that we’re supposed to be doing right now . . . I had written . . . MLA formatting for their citing their sources . . . That applies as a standard for Common Core because when we write, I try to incorporate those into our writing (K. King, personal communication, September 12, 2012).

Kate taught oral communication skills, explained the need for them and facilitated her students in developing those abilities. Communicating orally posed significant challenges for some students. A student struggled to provide a clear answer. Kate asked, “Do you want to explain to us how you started?” (K. King, classroom observation, September 7, 2012). She supported the student’s efforts to verbalize the answers. Dana gently suggested, “You had it correct . . . correct on your paper. You just didn’t write it
up on the board correctly” (K. King, classroom observation, September 7, 2012). Kate asked the class,

What’s harder? Actually balancing the equations? Or, explaining how you balanced it? . . . And that’s typical because you’re learning how to do it . . . But you really know that you understand something when you can explain it in simple terms . . . to somebody else. That means you really understand it . . . So it’ll get easier as we go through the semester easier (K. King, classroom observation, September 7, 2012).

During the SRI, Kate expounded on this idea. She noted,

I just think it’s an important skill to be able to explain and be articulate and tell people what you’re talking about. Now balancing equations is hard to explain. It’s very hard to explain. And so I knew they would have trouble with it . . . I model my thought processes and how exactly in detail how I would go through solving that problem (K. King, classroom observation, September 7, 2012).

Kate uniquely engaged her students in learning effective written communications. She had them write equations on the whiteboard. One student had an academic epiphany and was asked to write her equation on the whiteboard. She stated, “Alexia is going to explain to us, because she had the ‘epiphany’ and figured it out” (K. King, classroom observation, September 7, 2012). She moved to the side and provided the student prominence, thus elevating the student’s confidence before her peers.

Kate incorporated written communications in various ways. She directed, “If you’ve finished reading Chapter Two, you can work on the writing assignment which goes into your composition book” (K. King, classroom observation, August 29, 2012).
While one student wrote an equation on the whiteboard, Kate asked another student to explain another equation. This instructional method simultaneously incorporated both types of communication.

**Creativity and innovation**

This code appeared nine times in the data set. Kate expressed concern about her ability to be creative and to teach creativity. She stated, “I try to find new things to do all the time. I don’t feel that I’m horribly creative. But, other people tell me I am” (K. King, personal communication, September 12, 2012). She identified ways that she taught innovation concepts. She noted,

> We’re reading a book in my honors class, *The Boy Who Harnessed the Wind*, who taught himself how to make a windmill in his village in Africa . . . They have no electricity. And he taught it by going to the public library and reading the three books they had there on science . . . We talk a lot about how important it is to actually be able to do something with the information you have (K. King, personal communication, September 12, 2012).

Kate felt that creativity was stifled somewhat because students were mostly focused on providing correct answers. She felt that creative output was less focused on concrete, definitive answers than her students normally provided.

> And especially ‘our students’ . . . do not like open-ended assignments. They want something concrete. They wanna know how much they have to have . . . how many quotes they need. And I want them to learn that it’s not necessarily an ‘amount issue’. It’s a ‘thoroughness issue’ . . . It’s difficult because of me and them (K. King, personal communication, September 12, 2012).
Kate implied that teaching creativity required a paradigm shift for both the teacher and the typical student.

During the SRI, I asked Kate to define “creativity and innovation” in her words. She stated, “As taking facts and being able to put them together in new and interesting ways, or to come up with a new idea or something else that needs to be explored” (K. King, personal communication, September 12, 2012). I asked Kate the extent that she tried to be creative and innovative when teaching. Kate smiled and commented, “Well, I try to be. And I try to find new things to do all the time . . . I think it’s important and I try to do it. I just don’t know . . . how good of a job I do with it” (personal communication, September 12, 2012). Kate suggested that her self-efficacy was lower in instructing creativity and innovation than in teaching the science curriculum.

I pressed further. I wanted to understand Kate’s self-efficacy with engaging students in creativity and innovation. She politely stated, “It varies. Some students respond really well to it. And some do not. I don’t know if it’s a lack in me, or that they too just feel uncomfortable with it” (K. King, personal communication, September 12, 2012). Kate offered ways that her students creatively expressed their knowledge. Her students produced colorful, visually appealing periodic tables. Students displayed their charts in the hallway for others to see. Kate noted, “I am also comfortable with giving students a choice in how they wish to show mastery of certain concepts. I have a variety of project types for students to choose from” (personal communication, September 12, 2012). She noted that most students were eager to show their artistic periodic tables for an audience beyond the teacher. Kate proffered her reasons for providing creative options. On the survey, she said, “I also feel confident and enjoy hands-on learning
activities. This allows students who do not like sharing out loud to share and show what they are capable of in other ways”. Kate encapsulated her perspective about teaching creativity and innovation in her classroom. She purported,

But is that the most important thing? No. Being able to take those facts and do something with it. That’s what enables us to have all of this stuff that we have in here that we use every day - the lights, the technology . . . So, being able to do something with it, that’s the important part (K. King, personal communication, September 7, 2012).

Major Theme One: Thematic Relevance to the Research Questions

The initial theme reflected that when teachers maintained favorable attitudes towards 21st century skills instruction, it was reflected in their praxis. The first research question determined to understand the teachers’ attitudes toward instructing 21st century learning skills. The first theme was very highly pertinent to research question one.

Andy. Andy’s second most prominent code in the code set was 21st century learning. In the pre-observation survey, Andy confirmed his confidence about teaching engaged learning in a 21st century participatory environment. Codes for “critical thinking” comprised nearly 70% of the subcodes. The subcode group “accessing and analyzing information” was prominent and occurred twelve times. His students were often engaged in knowledge acquisition and analysis.

Dana. Dana’s number one ranking code set was 21st century learning. During the SRI, Dana said that she taught test-taking and problem-solving skills. Both skills were pertinent to the first theme. Her students regularly accessed and analyzed information and were taught how to engage creatively by using their imaginations.
Kate. Kate’s second ranking parent code group was “21st century learning”. The areas of “oral and written communication” and “innovation and creativity” were essential components in her instruction. Based on the survey, Kate’s self-efficacy was lower in teaching written communication. Yet, she reflected that she felt confident with teaching communication skills in general.

The second research question sought to determine the extent that teachers engaged their students in creativity and innovation. “Creativity and innovation” factors were identified in the literature as essential 21st century learning skills. These factors were highly important and relevant to the second research question.

Andy. In the pre-observation survey, Andy did not provide an answer regarding his confidence in teaching “creativity and innovation”. This factor initially provided an unclear understanding of how he felt about instructing 21st century learning skills. Data collection and analysis brought certainty to the concern. During one observation, Andy engaged students in a brief discussion about “innovation and creativity” and “initiative and entrepreneurialism”. Andy suggested that his small town should grow in entrepreneurship, a practice typically not well-supported there. Andy used this idea to engage his students in expressing their ideas about the election. He juxtaposed and contrasted ideologies from both political parties in an effort to analyze each political party’s impact in the lives of individuals (A. Adams, classroom observation, August 28, 2012). Andy tried to understand how well students comprehended the entrepreneurship concepts. He asked,

So are entrepreneurs important in a free market economy? . . . They’re one of the four factors of what? . . . Name an entrepreneur that is pretty famous in our

Later Andy interjected,

When you innovate, when you come up with a different way, you change the way things are done. All right? So . . . you think the United States Congress, the governing body of this country, would wanna protect that, or not? They would. When you get a patent on something, it’s protected for a certain amount of time because you came up with the idea. What if I came up with a great idea all of a sudden? And someone stole it. Just, boom, he’s gone. He got my idea; now he’s rich. I didn’t make any money off of it. Would you? Would you wanna be an innovator in that situation? (A. Adams, classroom observation, August 22, 2012).

I sought to understand the extent to which Andy taught creativity skills. During the SRI I asked, “What strategies do you use to teach your students creativity?” Andy responded, “Well, one of the biggest things, uh, I let them explain it in different ways . . . with their creativity (A. Adams, personal communication, September 13, 2012). In the pre-observational survey, question five addressed “creativity and innovation”, two essential 21st century learning skills (Common Core State Standards, 2010). The question asked the participant to state specific creativity and innovation strategies or techniques he felt most and least confident using when instructing students? Why? Andy did not provide an answer for this question. He left the answer blank. Andy suggested that creativity was a learning environment factor. Creativity occurred when students felt safe and secure. He stated,
So what you do is bait ‘em on. And then it’s a hard thing to do… You have to have some faith in that teacher before I think you get creative, because you’re taking a risk (A. Adams, personal communication, September 13, 2012).

**Dana.** The subcode “creativity and innovation” was coded 10 times during Dana’s instruction. Dana suggested that it was difficult to “nail down” creativity. She correlated creativity with learning styles and with productivity (D. Dunn, personal communication, September 17, 2012). She used visuals to stimulate creativity and to connect learning concepts with the learning environment. Dana encouraged her students to be imaginative and to produce creative end-products.

**Kate.** Kate suggested that she did not believe that she was very creative. She stated, “But, other people tell me I am” (K. King, personal communication, September 12, 2012). This factor was substantive in the data analysis; yet, for Kate, this factor was not dominant. Kate noted that she offered students various opportunities to present their knowledge mastery. Kate did not imply that she focused intently on teaching creativity as a learning skill. She suggested that students needed to provide thorough answers versus thinking only quantitatively about expressing their understanding. Kate stated, “It’s difficult because of me and them” (K. King, personal communication, September 12, 2012). She believed that both the teacher and her students needed to shift their thinking about creative learning skills.

The third research question determined to understand the degree that teachers instructed their students in NLS. This relevant question was addressed in the section regarding the fourth major theme.
The fourth research question endeavored to understand how the participants measured their own self-efficacy in teaching 21st century learning skills within the core curriculum. This theme was highly pertinent to the first theme.

**Andy.** Andy’s self-efficacy was assessed in three ways as suggested by the data:

- students’ EOCT scores,
- students’ learning engagement levels, and
- curricular real-world relevance.

Andy taught his students skills that extended the base curriculum and were designed to aid them in the real world. The main focus for EOCT classes was standardized test scores. Andy’s ultimate measure of effectiveness was predominantly determined by the EOCT. He realized that the local and state boards of education predominantly ascertained a teacher’s success in teaching by test scores. Andy vehemently taught the skills his students needed to master for gaining high test scores.

Andy measured his self-efficacy in teaching 21st century learning skills within the core curriculum through the EOCT scores. He suggested on several occasions that test-taking skills were essential components in finding academic success in Economics. During the SRI, Andy proclaimed, “I know what they’re gonna have to do in the end. They’re gonna have to take a standardized test . . . They don’t know how to take a test” (A. Adams personal communication, September 13, 2012).

Andy focused his instructional practices on developing test-taking skills and mastering the curriculum content. He noted, “. . . One of the things that I try to work on them is, ‘How do you take a test?’ . . . They have to be able to know how most tests are set up” (A. Adams personal communication, September 4, 2012). During the SRI, he
reiterated, “... gonna be made to take the... standardized test. So they have to know how to do it” (A. Adams, personal communication, September 13, 2012).

Second, Andy measured his self-efficacy in teaching 21st century skills by determining how deeply students were engaged in the instructional process. He believed that active engagement strongly impacted the students’ curricular test scores and EOCT scores. Andy persistently demanded that his students look at him during instruction and remain alert. He learned this concept from an unnamed research source. The research suggested that those students who failed to look eye-to-eye with the teacher performed poorly on tests. He stated, “Look at me!” (A. Adams, classroom observation, August 22, 2012). On the same day he proclaimed, “Look at me. Talk to me. Wake up!” (A. Adams, classroom observation, August 22, 2012). He insisted that students remain focused on him during instruction. He persisted by demanding, “Make sure you’re making eye contact with me. Look at me. If you’re not looking, I get nervous... I want you to look right here” (A. Adams, classroom observation, August 28, 2012). On another observation, he demanded, “Look right here! Make sure you’re looking at me” (A. Adams, classroom observation, August 29, 2012). During a memorable observation, Andy firmly addressed this concern. He stated,

And it’s... everybody is like, “Oh, I can’t wake up this morning.” You gotta wake up, okay. If I gotta wake up, you gotta wake up. If we have to stand up and dance, we’ll dance. Okay, but we’re gonna wake up. All right? (A. Adams, classroom observation, August 22, 2012).
Andy believed that his students should focus on skills that reached beyond the basic curricular demands. He wanted them to be independent thinkers and risk-takers. During the SRI, he stated,

Right here, one of the best things that I do in my classroom . . . I want them to think without the fear . . . I want ‘em to take the risk . . . I don’t want ‘em to overlook the test or to downplay the significance . . . Look outside the box. It’s not the worst thing to be wrong (A. Adams, personal communication, September 13, 2012).

Dana. Twenty-first century learning skills ranked as Dana’s number one parent code. During the SRI, Dana said that she taught test-taking and problem-solving skills. Both skills were pertinent to the fourth theme. Specifically, Dana taught her students in three main areas related to 21st century learning. She taught them to be innovative and creative, to access and analyze information and to use curiosity and imagination. Interestingly, all three areas were coded almost equally.

Kate. Kate’s 21st century learning codes suggested that she centered mostly on teaching “oral and written communication”. Yet, Kate was moderately engaged in teaching “innovation and creativity” as suggested by the nine subcodes in this area. The three lowest subcode groups were “collaboration, “curiosity and imagination” and “accessing and analyzing information”. Kate suggested in her survey that she felt weakest instructing persuasive writing. She stated, “. . . I do not feel I do a good job with creative writing” (K. King, personal communication, September 12, 2012). Kate’s self-efficacy was strongest in technical writing.
The first major theme was highly related to research questions one, two, three and four as shown in Table 1. The third research question determined to understand the degree that teachers instructed their students in NLS. This relevant question was addressed in the section regarding the fourth major theme.

Table 1

_Major Theme One – 21st Century Skills_

<table>
<thead>
<tr>
<th>Subcodes</th>
<th>Andy Adams</th>
<th>Dana Dunn</th>
<th>Kate King</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access/Analyze Information</td>
<td>12</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Collaboration</td>
<td>6</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Curiosity/Imagination</td>
<td>2</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>65</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td>Initiative/Entrepreneurialism</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Innovation/Creativity</td>
<td>4</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Oral/Written Communication</td>
<td>2</td>
<td>2</td>
<td>14</td>
</tr>
</tbody>
</table>

The data reflects each participant’s active instruction in teaching 21st century skills.

_Major Theme Two: Learning Accountability – Andy Adams_

When teachers held students accountable for learning, it was reflected in assessment practices. Andy’s third most commonly occurring code was “assessment” and was coded 77 times in the data set. Four key components emerged from the “assessment” code group:

- rigor and repetition;
- test-taking skills;
- accountability; and,
• understanding.

Rigor and repetition. The code subgroup “rigor and repetition” appeared 11 times. The literature suggested that neomillennial students learned best during rigorous, challenging and engaging learning experiences that were shared with others (Dieterle et al., 2008). The literature suggested that “rigor and repetition” strengthened the neural circuits and aided in memorization and mastery learning (Garrett, 2009; Freeberg, 2006). Andy proclaimed the need for repetition in learning when he stated,

What we’ll do is we’ll do that a million times. We will not forget that.

Everything we do in here is we build on, take this scaffold, and continue to do over and over again. We don’t leave something. We just leave it for a little bit and come right back to it . . . Make sure you understand what’s going on (A. Adams, classroom observation, August 22, 2012).

During one observation, Andy stressed the need for rigorous learning versus measuring one’s learning by assessment scores. He stressed,

You cannot simply take a test and be done with and say, “You know what? I did my job, Coach (Adams). I either got it or I didn’t. I passed or failed”. That is not an option in here. That is not an option! We will go over it and over it and over it. We will understand it and we will get it. You understand? Everybody understand? Okay. You got it? (A. Adams, classroom observation, August 22, 2012).

The literature review suggested that creativity was produced from self-disciplined higher-order processes, an Apollonian concept that involved analysis, discipline and rigor (Maslow, 1968). Andy promoted rigorous learning practices with his students. During
an early morning session, he asked a relevant question. He asked, “Now, why are we doing these? ‘Cause we practice. We go back. We fix. We see where you are. And we work on weaknesses” (A. Adams, classroom observation, August 22, 2012).

**Test-taking skills.** The code subgroup “test-taking skills” appeared 12 times. Andy stated, “Make sure you understand what’s going on, all right? It counts ten points. Counts ten points. All right? If you make a seven out of ten, that’s what you make. All right? It’s a daily grade always” (A. Adams, classroom observation, August 22, 2012).

An important learning component included understanding testing strategies. He inquired, “You understand why you got it wrong? Anybody?” (A. Adams classroom observation, August 22, 2012). The test anxiety factor was actual and problematic for many students. Andy addressed this idea by stating,

You’re sitting there second-guessing yourself over and over and over again. All right? You’ve got to go through it. When you’re taking a multiple-choice test and you’re getting in those things, usually your first answer is the best way to go most of the time. Okay, but especially if you get somewhat lost or something like that, and that can happen guys. See the different wording in these things. I want you to know why you missed it or why you got it right. Okay? (A. Adams, classroom observation, August 22, 2012).

During one observation, Andy suggested specific strategies for controlling text anxiety. He said, “. . . when you’re taking a multiple-choice test and you’re getting in those things, usually your first answer is the best way to go most of the time” (A. Adams, classroom observation, August 22, 2012). Assessments and testing were normal protocol for students and workers in the marketplace. Andy stated, “You’re gonna be tested from
here on out. ‘Til eternity. Okay? No matter what job you’re in or whatever. But, it’s just part of it” (A. Adams classroom observation, August 22, 2012).

In reference to the CCSS, Andy compared the traditional class instruction that culminated with an EOCT to the CCSS national curriculum. He wanted to know how deeply the students understood the differences between the two systems. He asked, “If you have a nationalized curriculum, what does that mean? . . . All of the curriculums are going to be the same” (A. Adams classroom observation, August 29, 2012). His question suggested that Andy believed similar test anxieties would arise regardless of the curriculum design.

I wanted to know if Andy saw a connection between “critical thinking skills” and “test-taking skills”. During the stimulated recall interview (SRI), I said, “You teach test-taking skills to your students in the next three short clips. Is this part of critical thinking? If so, help me understand how you try to teach critical thinking?” (A. Adams, personal communication, September 13, 2012). One testing-taking skill component included finding key information in the testing prompt. Andy stated,

... You’re actively reading questions. You’re saying, ‘What’s the most important thing here? What is the key information that they are looking for in the question?’ You can underline those things. That is a skill that we have to work on all the time” (A. Adams personal communication, September 13, 2012). Andy demonstrated his sense of urgency and personal responsibility for preparing his students to test well. He suggested that some students had been improperly prepared for testing by other teachers. As a result, Andy felt a strong need to teach test-taking skills that would arm his students for scoring well on class tests and ultimately on the EOCT.
I have a lot of students, unfortunately sometimes they’ve been, you know, spoon fed . . . They don’t know how to take a test . . . Teachers give ‘em a practice test one day, and then give ‘em the same test again. And that doesn’t teach ‘em anything about how to take a test” (A. Adams, personal communication, September 4, 2012).

During the SRI, Andy made three references to testing-taking skills. He established himself as an expert teacher. He stated, “I know what they’re gonna have to do in the end. They’re gonna have to take a standardized test”. Second, Andy referenced the test design. He stated, “They have to be able to know how most tests are set up . . . What are the key things I can do? I can look for key words” (A. Adams personal communication, September 13, 2012). Third, Andy disciplined his students in test-taking skills. He stated, “. . . You’re gonna be made to take the, uh, standardized test. So they have to know how to do it. So every day we do a little bit of practice on, all right, “How do you eliminate? How do you find these things?” (A. Adams, personal communication, September 13, 2012).

Accountability. The code subgroup “accountability” appeared 22 times. This descriptor was synonymous with “responsibility” when analyzing the data. During one early morning class, Andy clearly defined the fact that his students were responsible for knowing and understanding the information he had taught them. The sound of closing doors in other classrooms reverberated in the hallway, because the door to Andy’s room was left open. This was important because the hall noise seemed to serve as a distractor. During the SRI, Andy confirmed this idea when he said, “Also, one of the biggest things
I look for . . . I don’t want anybody to be distracted” (A. Adams, personal communication, September 13, 2012).

During an observation, as students prepared for a quiz, Andy read from several sheets of notebook paper. On three separate occasions, Andy sat, stood up then slowly paced a well-beaten path across the front of the classroom. Andy’s pacing reminded me of a slow, placing lion. His gate reflected strength and full control of his domain. His demeanor suggested that his students were held accountable for their every action.

Andy communicated this idea in various ways. During his SRI, I asked Andy to explain a hand-written quote he had long before written on the whiteboard. The letters were only half visible. The sentence stated, “Cows never stay milked and the grass never stays cut”. Andy explained its meaning. He said,

There’s always gonna be something to do. Look for work. Don’t just sit there and say ‘Well, I . . . I’m done. It’s over. Can we waste the next five minutes? There’s always something to do. You can always improve. And education is life-long (A. Adams, personal communication, September 13, 2012).

Andy reiterated the fact that students in his class would be held highly responsible for engaging in learning in his class.

Write that down. Nobody buys a ticket in here to sit and do nothing. You come in here. You work. I work-You work. We all work . . . We learn. And we’re fine. But you have to put forth the effort (A. Adams, personal communication, September 13, 2012).

Andy demanded that his students set aside learning distractors during class. He proclaimed, “If y’all are playing Donkey Kong or not, listen to me! Or, I’m gonna kick
you out of here. Does that make sense? Make sure you have the notes . . . I want you paying attention to everything that goes on” (A. Adams, classroom observation, August 29, 2012). As a way to engage his students, Andy was humorous and slightly sarcastic. He said,

You gotta stay with me, son. Okay? We’re not going to school in Haiti or anything like that. We’re okay. We’re gonna make it. You got “air condition” . . . I know we should be jumping and down and doing some kinda lesson where everybody’s coloring and doing all this. Okay? But right here, you gotta understand this! (A. Adams, classroom observation, August 28, 2012).

Andy wanted his students to deeply value the opportunity to earn a free, public education. He challenged his students to assess their own perspectives about learning. He stated,

This is what scares me sometimes. You know used to people would risk death or getting locked up or whipped to try to get an education. “You can’t deny me my education. I’ll do anything. I’ll risk dying to learn how to read”. Okay? Now days, here’s the tragedy. Watch. It’s very spooky. It’s happened to us. Here’s what’s happened to us. Now we’re dying not to read. You understand? All those things that people fought for . . . to give you a chance and me a chance to do it . . . (A. Adams, observation, August 28, 2012).

In one instance, he sarcastically paralleled the students’ learning engagement level to that of preschool students’ levels. He exclaimed, “We can’t ‘Barney World’ it right now!” (A. Adams, classroom observation, August 28, 2012). Andy had clearly explicated various reasons for learning the Economics curriculum and the students’ personal responsibility for accomplishing the established learning expectations. He defiantly
defined the acceptable boundaries for learning engagement in his classroom.

Andy promoted a balance between freedom and responsibility. He maintained that the right to vote was both a freedom and a personal responsibility. He suggested that students must demonstrate personal responsibility for the good of the nation, a cause greater than themselves. He noted, “You’ve got a choice to make. All right? Remember I’m not one side or the other. I don’t like either political party. I encourage you to vote for the best person. Who makes that decision? You do!” (A. Adams, classroom observation, September 4, 2012). Andy powerfully pressed this position by stating,

Those are things that you have to answer as individuals. Okay? But this is what happens. Eventually it creeps this way . . . I told you, “You gotta stand up and fight!” All these people from other countries are trying to “get in your nation and ruin your nation and make it like France”! Hello? . . . We gotta make sure we watch all this. ‘Cause, if we don’t, our country’s going what? Up? Or down? (A. Adams, classroom observation, August 28, 2012).

Andy had directly correlated the freedom to understand American politics with the personal responsibility for being an American citizen.

Andy repeatedly suggested that students were responsible for their own learning. He explained that his students complained to him about fatigue, hunger and their home lives. Some stated that the content “. . . doesn’t mean anything to me. Why am I studying this?” He exclaimed,

It’s your obligation! . . . You can’t blame the politicians if we don’t know how they got there, because it’s our responsibility to be an educated electorate and to, you know, put these people in there to make the best decisions. Do you think this
is good? Do you think it is bad? Uh, would you vote for this stuff again? So that’s what I’m trying to do (A. Adams, personal communication, September 13, 2012).

During an observation he proclaimed, “I want you paying attention to everything that goes on” (A. Adams, classroom observation, August 29, 2012). Andy vigorously preached the idea that seeking out a quality education was critically important to living effectively in the 21st century world. He purported that earning an education was vital to the livelihood of every individual in the classroom. From Andy’s perspective, each individual must take responsibility for becoming an educated person. He proclaimed, “You gotta educate thy brain! . . . An uneducated electorate, all right, leads to the downfall of our complete democratic system . . . We cannot be uneducated and have a democracy” (A. Adams, classroom observation, August 29, 2012). He proclaimed, You can get a Harvard education for a dollar fifty in library fines! Hello? . . . Is there an armed guard up in front of the public library? Or, Mrs. Holmes out there with a machine gun saying, “Don’t you come in here!”? Is she doing that? I’ll tell you, “It’s the ticket. You gotta educate thy brain!” . . . This is your founding fathers speaking, George Washington. ‘An uneducated electorate . . . leads to the downfall of our complete democratic system’. We cannot be uneducated and have a democracy. That’s why some people argue today, ‘We don’t have a democracy’. Okay? ‘Cause there’s only a few people that participate in the process (A. Adams, classroom observation, August 29, 2012).

The literature supported the view that student assessment was an essential learning component. A unified viewpoint did not exist regarding the most effective
instructional and assessment methods (Drouin, 2010). Some suggested that alternative assessment practices must replace traditional standards-based assessments (Gülbahar & Tinmaz, 2006). The voluntary adoption of the CCSS by most states attempted to bring national conformity to instructional and testing practices (Common State Standards Initiative, 2010). According to Silva (2009), assessments were to be centered on essential learning outcomes. Although complete uniformity had not been reached regarding the CCSS, the research supported various assessment methodologies including differentiation. Research suggested that assessment scores increased when differentiated learning occurred based on students’ learning styles (Dieterle et al., 2008; Gardner & Moran, 2006). Though the results were inconclusive regarding testing practices, learning assessments were determined to be critical factors in successful learning. The parent code “understanding” was presented and discussed as a minor theme in a later segment.

Major Theme Two: Learning Accountability – Dana Dunn

Another important theme emerged from the data. It reflected that when teachers held students accountable for learning, it was reflected in assessment practices. After analyzing the voluminous data, commonly occurring codes emerged from Dana’s data set. Both the “theoretical underpinnings” and the “21st century learning” code groups contained an equal number of codes, ranking them equally as the first most commonly occurring code groups. Although the code group assessment ranked third among her main codes, this single area was coded 43 times in the data set. Four coded areas were important in the data analysis:

- understanding;
- test-taking;
• accountability; and,

• rigor and repetition.

The parent code “understanding” was presented and discussed as a minor theme in a later segment.

**Test-taking.** Dana’s students were quizzed during the first class observation. Once the students were seated, she almost immediately interjected, “Here’s your quiz. It shouldn’t take you more than, I’m thinking, 10 to 15 minutes!” (D. Dunn, classroom observation, August 21, 2012). An integral part of accountability included test-taking. Dana addressed the fact that A. P. students felt very nervous about testing, especially the final AP exam that would happen at the end of the semester. Regarding test anxiety, Dana inquired,

How many of you go into a test like this and you have to answer everything in order or it just kinda freaks you out? You’ll have to get over that . . . and not answer things in order; because, on an AP exam there are gonna be some questions that are considered . . . a level five difficulty question. They’re just really hard, and you might not see the answers right off the bat (D. Dunn, classroom observation, August 24, 2012).

She discussed the idea that some students were emotional when they were unable to answer questions in nominal order. She stated, “. . . everything in order or it just kinda freaks you out? You’ll have to get over that!” (D. Dunn, classroom observation, August 21, 2012). Dana acknowledged the students’ concerns about high stress levels. The test anxiety factor was actual and problematic for many students. Dana addressed this idea by stating,
With A. P. exams, one part of doing well on the exam is to learn how to take a test. And there are some strategies that you can practice that will help you regardless of whether it’s prose or poetry . . . your strength or your weakness (D. Dunn, classroom observation, August 17, 2012).

Developing test-taking skills was significant, especially for the A. P. students. Dana suggested,

And sometimes, more often than not, you’re gonna be left with two . . . answer choices that you’re gonna have to determine between. And we’ll talk about today how you can go about making some of that determination. Sometimes there are just little tricks that you can use that will help. Now most of it is gonna come down to help well you can effectively analyze the passages. But, you know a point here or there just by learning some test taking strategies (D. Dunn, classroom observation, August 17, 2012).

**Accountability.** The literature suggested that accountability measures have sought to measure teacher effectiveness by end-of-course-test (EOCT) standardized test scores (Darling-Hammond, 2010; Olsen, 2010). Dana required her students to accept personal responsibility for their own learning. She expressed the idea by saying, “I’m trying to break out of that and have my classes be more student facilitated, put more of the learning responsibility on the student while giving them what they need to be able to do that . . . ” (D. Dunn, personal observation, September 17, 2012). Students were instructed how to justify their test answers. She instructed,

I want us to go back through and look at the correct answers. And I want you to kinda be able to justify why the right answer is the right answer or why your
answer didn’t work. That’s all a part of doing well on this test is figuring out the “whys” of the correct answers (D. Dunn, classroom observation, August 17, 2012).

Teacher accountability was a foremost issue in Dana’s mind. Teachers were accountable by local and state boards of education for engaging students in effective learning. During her SRI, she said, “You know, the job that we do is difficult. There is a huge amount of responsibility . . . and accountability” (D. Dunn, personal observation, September 17, 2012).

**Rigor and repetition.** The standard protocol was practice then test. Dana told her twelfth grade English students, “So you need to make sure that your syntax is maturing as you do. So that’s what this is all about. It’s practice . . . Well, we’re gonna just continue . . . We’ll do it a little at the time” (D. Dunn, classroom observation, August 24, 2012). She clarified the practice protocol when she said, “I’d like for you to work on this grammar all along, so that by the end of the week next week I’d like for us to be able to go back over it all and just recheck it all” (D. Dunn, classroom observation, August 24, 2012). During the SRI Dana reiterated, “So I’m trying to guide them toward practicing the way they take these practice tests, so they’re ready for that” (D. Dunn, personal communication, September 17, 2012).

Dana reiterated the drill etiquette by noting, “We’re gonna do a lot of these . . . And you will see improvement. I promise you. Come tomorrow prepared for us to really examine those rough drafts” (D. Dunn, classroom observation, August 23, 2012). Rigor reigned paramount for those students taking the A.P. class. According to Dana,
“Students dropped like flies when they figured out the amount of rigor that is required for taking this class!” (D. Dunn, personal communication, August 21, 2012).

**Major Theme Two: Learning Accountability – Kate King**

A second important theme emerged from the data. It reflected that when teachers held students accountable for learning, it was demonstrated in assessment practices.

“Assessment” emerged as Kate’s largest parent code group with 70 codes. The four largest subcode groups were:

- understanding;
- accountability;
- test-taking skills; and,
- repetition and rigor.

**Understanding.** This subcode appeared 22 times in the codes, a significant number of designations. Kate went to great instructional lengths to deeply embed the content knowledge. She reinforced the notion that students who understood the content and could apply it would score well on assessments. During the SRI, Kate said, 

> ... from now on you need to make sure you pay attention to all these things I marked, because you’re going to get whatever grade you get. And I just think that’s important because they don’t know me and how I grade and what I think is important (K. King, personal communication, September 12, 2012).

She reiterated the notion that students gained greater depth of understanding by learning to communicate orally. Kate suggested that a connection existed between deep understanding and the students’ learning styles. This idea coincided with LS research. Those students who preferred auditory learning excelled when they were engaged in
auditory learning environments (Coffield et al., 2004b). Kate said, “But saying it out loud helps them to realize what they understand, what they don’t understand” (K. King, personal communication, September 12, 2012). Allen (2008) found that when students engaged in talking about learning, they comprehended it more fully. Kate asked questions that caused students to think and be certain that they had a full understanding of the tasks at hand. During a test preparation quiz, Kate stood quietly as her students completed their assessment. Kate stated, “Remember thinking is important!” (K. King, classroom observation, August 29, 2012).

Students sought ways to get definite answers to their questions. Kate provided cues and prompts that caused the students to engage deeply in inquiry. She stated, “Try to figure out how you know what subscripts to use. It has to do with oxidation numbers . . . on each element . . .” (K. King, classroom observation, August 29, 2012). She looked at her students reassuringly to reaffirm their understanding of prior learning. Yet, Kate wanted her students to learn independently. Within seconds, Kate moved from one student to another to help those who were struggling or needed clarification. Kate fed her students’ knowledge at a rate that they were able to digest it. She interjected, Knowing where those are located will be very, very helpful to you in the next unit when we start putting together elements to make compounds; because a lot of times you’re putting together a metal and a nonmetal. And instead of searching all over the periodic table if you know something is a nonmetal, where’s it gonna be? (K. King, classroom observation, August 21, 2012).

She innately understood when her students needed to ruminate on the content to gain deeper comprehension and when to add content to the mix. She said,
So we’re gonna spend the first part of class looking at those you’ve been working on, talking about it, making sure you understand how to do it, and get your questions answered . . . (K. King, classroom observation, September 7, 2012).

Kate helped her students to contemplate, rationalize, and analyze their understandings and to make connections and transfers with previous learning experiences. Kate structured the students’ learning experiences. She assured her students that she wanted them to fully know, understand and comprehend the content. Kate inquired, “Any questions? Anything I didn’t go over? I tried to remember everything. Everybody think they’re good? All right (K. King, classroom observation, August 23, 2012). Kate wanted to know that her students were confident in their understanding. She inquired, “Does that make sense?” (K. King, classroom observation, August 29, 2012). Kate attempted through drill to deeply embed the curricular content thoroughly into the bedrock of her students’ minds. This instructional component provided evidence as to why her students produced high EOCT scores.

**Accountability.** Kate maintained the idea that students were responsible for their learning only when they had been taught effectively what to learn and how to learn it. During the SRI, I said, “There never seemed to be a moment in any of the four observations where students were unsure what they were to be doing. How does structure like this clip impact student learning?” After observing the instructional clip, Kate stated, “I think it’s important to let them know what’s coming up, what they can expect when they come in class, what they need to be prepared for” (K. King, personal communication, September 12, 2012).

Kate held students accountable during formative and summative assessments.
She effectively engaged students in the formative assessment journey. She inquired. “So tell me why are you thinking you need to do that?” (K. King, classroom observation, August 21, 2012). By understanding the student’s line of thought, Kate guided the individual into using effective learning strategies. All students understood Kate’s personal accountability policies. Kate periodically engaged individual students by asking them questions. Students were responsible for keeping pace with the class. The lecture and review typically happened with a quick pace and displayed Kate’s high expectations of her students. She taught “up” to her students rather than “down” to them. Kate provided assessment prompts and cues. She proclaimed,

    I’m gonna give you about five minutes or so. We’re gonna go over it. I’ll call on people . . . Then we’ll probably move into working on your research and stuff for your book. I’m gonna tell you four of these that you can omit for today. But we’ll come back to those tomorrow; so it’s not that we’re not gonna do them. We’re just not doing them today (K. King, classroom observation, August 29, 2012).

Kate defined the workflow and held individuals responsible for focused learning. She asked, “. . . Now is there any part of that question that we have not talked about? (K. King, classroom observation, August 21, 2012). Her question was designed to engage the students in analyzing the learning components and benchmarks. Rather than stating what they had learned, Kate asked the students to measure their own learning. Kate set high learning expectations and prepared her students for them. She noted,

    Tomorrow when you come in, soon as I check roll, I’ll say, “You got two minutes to get your uh, composition book turned in”. And if it’s 2:15 when you turn it in,
that’s gonna be a minus ten. So you need to be sure you have it ready and you’re ready to turn it in when you come in tomorrow . . . (K. King, classroom observation, August 23, 2012).

Kate required students to understand the grading scale. By reviewing, she focused them on each assignment’s point value. This process kept the students aware of their grades.

And we talked about that being like your tests are 50%, the book you’re reading is 25%, and everything else is 25%. So what do I factor in more heavily when I average your grade? Your tests . . . I’ll keep up with your points even if . . . even if I change you around or you sit with somebody new at some point, I keep up with your points individually. So it won’t be any big deal . . . (K. King, classroom observation, August 23, 2012).

Students were penalized for disobeying assessment guidelines. Kate’s business-like manner suggested that her students were to accept the guidelines without a challenge for that particular activity. A male student’s voice emerged from the classroom asking, “Did we not get it?” Kate responded firmly, “No. You yelled out the right answer” (K. King, classroom observation, August 23, 2012). Upon further discussion, Kate stated that she was primarily talking about atomic mass during the instruction versus grading.

The workflow and assessment strategies seemed to ebb effortlessly for Kate. With the timing skills of a comedic actor, Kate closed one learning part and segued gracefully into the next segment. She challenged her students to focus on the upcoming classroom agendas. These prompts directly impacted the students’ learning quality and ultimately their grades. Those who listened and learned potentially outperformed those who were unfocused. At times, Kate offered several steps in the learning sequence in a
single cue. She put forth a detailed plan by stating,

We’re going to watch Bill Nye. Have you answered your questions? . . . We’re
gonna go over the whole thing after we watch all three parts. We will talk about
these up until . . . we take tests. And I’ll probably be calling people up to the
board up until we take the test (K. King, classroom observation, September 7,
2012).

Kate’s “no non-sense strictness” (K. King, personal communication, September 12, 2012) suggested that her students understood Kate’s intentions. Furthermore, she showed the students how deeply she was willing to work with them to help them attain their learning goals. Kate's tone of voice and caring demeanor were encased with an authoritative directness. She effectively managed a delicate balance between caring for the students and holding them ultimately responsible for their own learning.

Test-taking skills. Kate strongly supported assessing students through testing. She worked diligently with her students to prepare them for various types of quizzes and tests. During the SRI, I stated, “You teach test-taking skills to your students. Is this part of critical thinking? If so, help me understand how you try to teach this skill”. Kate answered, “I do test-taking skills almost every day . . . and they know most days when they come in, they’re gonna have a test prep” (K. King, personal communication, September 12, 2012). Kate worked to help her students understand how test questions were generally designed. She said, “So really that’s what this question is asking you. If there’s one part of a question that you’re not sure about, can you leave that out and work with the parts you do understand?” (K. King, classroom observation, August 21, 2012).

Kate taught them the skills that they needed for taking standardized tests. She
cited a test-taking issue that students normally did not know how to manage. She hypothesized, “. . . So when you’re taking a standardized test and you get four B’s in a row for your answer, should you be concerned? (K. King, classroom observation, August 21, 2012). During the SRI, she suggested,

People on tests . . . five answers in a row D or make most of the answers on the test D. I don’t do it on purpose. It just works out that way . . . I’ll see students do this . . . “Well, I’ve got four B’s in a row. One of these has to be something else” (K. King, classroom observation, August 21, 2012).

Kate engaged students in the process of elimination, a strategic testing skill. She noted, So you know it has something to do with where they’re located on the periodic table. So if you read the first part, “Which two elements have similar chemical properties?” And you really had no idea from that. Then you could use the second part as a clue to something you need to look for to figure out the answer . . . I might give you a multiple question where I say, “Which of the following is the correct Bohr model for potassium?” And you’d need to be able to look at this, and figure out which one is the correct one (K. King, classroom observation, August 23, 2012).

Repetition and rigor. Kate embedded learning skills deeply in her students’ minds through repetition. Kate challenged her young students’ minds to think uniquely and unconventionally about specific learning components. She suggested, “I told you there are no actual rules for balancing equations. It’s a lot of trial and error. But you do figure out what works out easiest for you as you’re practicing them” (K. King, classroom observation, September 7, 2012). This challenged the students to work rigorously to
determine the answers to the problems she posed. Her overarching goals were to develop a deeply-embedded knowledge-based so that the students experienced spiral learning stemming from a solid foundation. Repetition was the normal protocol.

What I would like for you to do now is to complete the periodic table that you started yesterday. And as you complete that and bring it up here to me, I will give you your practice work that goes along with what we’ve talking about that you can start on (K. King, classroom observation, August 21, 2012).

Kate added further rationale for engaging in repetition, practice and drill. She noted,

Practice is what makes you good at balancing equations . . . Just the more you do it, the easier it gets . . . But balancing equations is a little bit different, so we do a lot practice with those . . . you’re gonna do quite a bit of practice with them, balancing them, and telling what kind of reactions they are (K. King, classroom observation, September 7, 2012).

**Major Theme Two: Thematic Relevance to the Research Questions**

This important theme suggested that when teachers held students accountable for learning, it was demonstrated in student assessments. The first research question determined to understand the teachers’ attitudes toward instructing 21st century learning skills. The first theme was very highly pertinent to research question one.

**Andy.** Andy’s third most prominent code in the code set was “assessment” and was coded 77 times in the data set. Four key factors emerged. The data suggested that Andy often engaged his students in academic rigor and used repetition as an instructional tool. Another key factor was “test-taking skills”. Students were taught these skills to effectively pass the EOCT. Andy consistently discussed student accountability for
learning. The most significant factor in “assessment” was the subcode group “understanding” and was analyzed as a minor theme. An analysis of Andy’s codes strongly suggested that the second theme was highly relevant to the first research question.

**Dana.** The fourth highest ranking parent code set was “assessment”. The strongest subcodes in the group were the “understanding” subcodes. Both “understanding” and “test-taking skills” ranked in the top subcode groups.

**Kate.** Kate’s highest ranking parent code group was “assessment”. The subcode “understanding” was the foremost subcode group and was analyzed as a minor code. She engaged students often in “accountability” and “test-taking skills” factors. The data suggested that “assessment” was a critical learning component in Kate’s classroom. The findings across all three participant databases strongly proposed that the second theme was very relevant to the first research question.

This major theme maintained that when teachers held students accountable for learning, it was demonstrated in assessment practices. The second research question sought to determine the extent to which teachers engaged their students in creativity and innovation. “Creativity and innovation” factors were identified in the literature as essential 21st century learning skills. These factors were highly important and relevant to the second research question.

**Andy.** In the pre-observation survey, Andy did not provide an answer regarding his confidence in teaching “creativity and innovation”. I sought to understand the extent to which Andy taught creativity skills. During the SRI, Andy noted that students were encouraged to creatively explain their perspectives on issues. He suggested that
creativity existed only when students felt safe and secure so as to take risks. The survey and observational data reflected that Andy presented and discussed “creativity and innovation”. The implication was that students were to be engaged in creativity and innovative productivity. The data did not suggest that the students were engaged in creative processes that led to end products during the observations. Based on this assumption, the second theme was relevant to the “creativity and innovation” factor in the second research question.

**Dana.** The ten subcodes placed “creativity and innovation” as the second highest ranking factor in “21st century learning” in Dana’s code set. The fact that slightly over 20% of “21st century learning” instruction centered on “creativity and innovation” suggested that Dana valued and regularly engaged students in creative thought. Student’s writing assignments were not analyzed during the observations, nor were they directly discussed. The implication was that the students’ writing assignments were to include creative components. Admittedly, Dana found this factor difficult to “nail down” (D. Dunn, personal communication, September 17, 2012). Dana believed that creativity was closely tied to NLS. Creative elements were embedded in the learning environment and learning culture. The data suggested that Dana modeled the factors more than she assessed them during the observational period.

**Kate.** Kate felt mostly unconfident about her ability to teach creatively. She offered students creative options for demonstrating content mastery. Kate expressed the notion that both the teacher and the students played important roles in producing creative and innovative products. During the observational period, Kate encouraged her students to design colorful periodic charts. The main goal in the assignment centered on
demonstrating content knowledge versus showing creative and innovative abilities. This was substantiated by her reference to the grading scale. Kate suggested that creative processes resulted in the derivation of new ideas or the exploration of problems. She sought to model creative instructional practices as well. The data suggested that Kate demonstrated creativity through instructional designs and her students demonstrated creativity as an extension of curricular assessments.

The participants’ practices suggested that “creativity and innovation” was problematic and challenging to assess. The implication was that Andy’s students were to be engaged in creative and innovative productivity. Yet, the data did not suggest that students were highly engaged in creative processes that led to end products during the observations. The lecture format was not designed to deeply engage students in creative and innovative productivity. Andy suggested that students were to creatively explain their perspectives on issues.

The second theme was relevant to the “creativity and innovation” factor in the second research question. The data suggested that the participants modeled these factors more than they assessed them during the observational period. Yet, the framework existed for potentially greater student engagement in the future.

The third research question determined to understand the degree that teachers instructed their students in NLS. This relevant question was addressed in the section regarding the fourth major theme.

The fourth research question endeavored to understand how the participants measured their own self-efficacy in teaching 21st century learning skills within the core curriculum. This theme was highly pertinent to the second theme. Instruction and
learning was comprised of learning factors and assessment factors. Student assessment was a central instructional habits’ component. The participant’s self-efficacy measurement in teaching 21st century skills within the core curriculum was determined by various factors.

Andy. Andy’s self-efficacy was primarily assessed through his students’ EOCT scores, the students’ levels of learning engagement and real-world relevance of the curriculum. Each of these factors suggested a strong connection between the fourth research question and the participant’s self-efficacy in teaching 21st century learning skills within the core curriculum.

Dana. The code group “21st century learning” skills was ranked first among Dana’s total code groups. Dana focused on teaching essential skills, i.e., “test-taking” and problem-solving skills. The factors “accountability”, “rigor and repetition” and “test-taking skills” were well-aligned with the fourth research question. Dana’s self-efficacy was directly related to the students’ “understanding” levels as evidenced by their EOCT scores.

Kate. Kate’s self-efficacy assessments in teaching 21st century learning skills within the core curriculum were linked to student assessments. Kate’s “21st century learning” codes suggested a correlation between teaching communication skills and technical writing. Her self-efficacy was framed on her belief in the ability to teach the core curricular skills and the students’ EOCT scores.

The second major theme was specifically related to research questions one, two, three and four. The third research question determined to understand the degree that
teachers instructed their students in NLS as shown in Table 2. This relevant question was addressed in the section regarding the fourth major theme.

Table 2

Major Theme Two – Learning Accountability

<table>
<thead>
<tr>
<th>Subcodes</th>
<th>Andy Adams</th>
<th>Dana Dunn</th>
<th>Kate King</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accountability</td>
<td>22</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Assessment</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Responsibility</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Rigor/Repetition</td>
<td>11</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Test-taking skills</td>
<td>12</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Understanding</td>
<td>30</td>
<td>14</td>
<td>22</td>
</tr>
</tbody>
</table>

The data reflects each participant’s active instruction in teaching learning accountability.

Major Theme Three: Learning Culture Engagement – Andy Adams

The data analysis reflected a clearly defined third theme. It suggested that when teachers created an effective learning culture, they sought to engage learners. The data set revealed 74 coded segments in the area of “learning culture”, Andy’s fourth most commonly occurring subcode. Three significant subcodes emerged from an analysis of the data set. They were:

- brain-compatible learning;
- learning environment; and,
- ethics and values.

**Brain-compatible learning.** Andy’s second most prominent code in the “learning culture” code set was “brain-compatible learning” with 36 coded segments. It
was presented and discussed as a minor theme in a later segment.

**Learning environment.** This code occurred 74 times in the data analysis. Andy worked to develop a rapport with his students so that they would understand the learning ethos and culture. Andy wanted his students to understand how to best interact with him to maximum their learning experiences. The learning environment consisted of the physical components and the cultural aspects of the learning environment. The physical learning environment provided little incentive for students to highly engage in 21st century learning.

Twenty-three students sat compactly at brown tabletops while facing the front of the room. Sixteen tables in all were aligned in this commonly-designed rectangular classroom. At the narrow end of the room, a whiteboard stretched nearly the width of the room. Near the center of the whiteboard, a Promethean board loomed. One long wall had windows that stretched eighty percent of the distance from the whiteboard to the rear of the room. The faded metal window blinds were closed and allowed little light to emerge. The whiteboard served to hold the date and a brief bulleted list of items to cover that today. Various quotes hung ruggedly from the typical brown shelves that had served him well for many years.

Andy’s room was the first room that most students passed as they entered school through the “lower hall”. The main school building, constructed in the 1960’s, consisted of three parallel main halls – the upper hall, the middle hall and the lower hall. The tile floors in the hallway served to enhance the sound of a delicate pin drop. The hard concrete block walls were uneventfully painted with a standard off-white and light gray. The two colors were separated nearly equidistant from one another. Near the single
entrance to Andy’s classroom hung a well-used black telephone that amplified accented voices from the office – an extreme thorn in Andy’s psyche. Andy’s extreme bias against this instrument was uncontained. Though only a small contraption, this black box wielded cumbersome and mostly abysmal interruptions. This distraction served mostly as a diversion catalyst for many of Andy’s students who contended with faltering attentions.

**Culture.** Andy was a well-constructed man who extended approximately six feet tall and was not a small built man. Andy’s physicality demanded one’s attention. Understanding Andy’s personality was a key to understanding how he created and developed the learning culture. A pleasant and professionally dressed man, undaunted by a neck tie, Andy invoked a business-like atmosphere in his dealings with his students. Andy’s vocation required that he teach Economics. Actually, his greatest calling led him to teach his students critical life skills of all sorts. His worldview centered on a point where zero disconnection existed between his praxis and real living.

Despite his physicality, Andy’s zealous mannerisms could have intimidated some, if not all, of his students. His raspy proclamations of the good news—the gospel of Economics invoked a dialectical, colloquialism reminiscent of Andy Griffith. Uniquely, the words “Mayberry” provided descriptive décor for a train trestle near the high school. Amidst the sundry overt qualities that separated him from his students, Andy connected magnetically with his students. Only when most all the students presented positive contributions did the ferromagnetic capacities within him become fully engaged. This combined magnetism and connection to his students sometimes fueled Andy’s passion to a roaring rage. His passion could engage students in tossing ideas back and forth to one
another. This reciprocal energy resembled the cantering call and response chants of early America. This passionate intersection of the old and new painted a distinctive coffer. Modernity, in all its incomparable elaborateness, was adorned with the contrite simplicities of age-old, principled values. This complex learning ethos, though a single classroom, proffered opportunities for Andy’s students to live simultaneously in myriad worlds. Interpreting the learning culture was a key for students to understand how to succeed.

Andy’s persona and demeanor were central factors in understanding the learning culture. Andy promoted passionate engagement with his students. He appeared to want his students to often engage in deep interaction, a type of Socratic dialogue, wherein students could present opposing ideas with both other students and the teacher. To Andy, passing or failing was somewhat irrelevant. Andy wanted to know what his students understood and their cognitive processes. The early morning hour wielded its cyclical sultry fog and created a haziness that would challenge the best academicians to engage students in provocative cognition. Andy consistently pounded the nails of pertinent knowledge into these adolescent minds, although it seemed difficult for Andy to fully engage their minds at times.

Andy assessed the students’ interactions with a cognitive yardstick. He desired high cognition from his students and accepted only the students’ best efforts. For the most part, acceptable thinking levels weren’t merely an inch deep and a mile wide. Rather, Andy wanted his students to analyze, synthesize and present arguments during classroom discussions. The learning environment represented a plethora of concepts. Andy believed that his students learned concepts more holistically when concepts were
presented independently. He said, “I told you I can’t put all this on a piece of paper. All right? And say, ‘Look! Here it is’, because it wouldn’t do it justice” (A. Adams, classroom observation, August 28, 2012). He reiterated the idea that students needed to learn how to independently make quality decisions. Andy stated,

It’s a theory. Okay? And you’re gonna hear plenty of debate on which one will win. It’s not my job to decide. It’s my job to educate you so you can make a decision. Okay, ‘cause it is extremely important (A. Adams, classroom observation, August 28, 2012).

The local culture distinctively impacted the classroom’s learning culture. Andy maintained, “You live in a very conservative town”. Andy wanted his students to understand their own local culture in relation to their school’s learning culture. Andy proclaimed loudly, “This won’t be in the books. You’ve gotta understand this!” (A. Adams, classroom observation, August 28, 2012). Andy presented the following scenario that aptly described WHS’s learning culture as a whole. He said,

But what they do here is they’ll . . . I mean in this little bitty town if you’re down in Westtown, Georgia, we’re about to play a football game or a basketball game or something . . . everybody starts saying the pledge of allegiance or you’re singing the national anthem or something like that. Somebody might just tell you to what? “Be still. Take your hat off. Put your hand over your heart”. You ever seen anybody do that around here? They do it all the time (A. Adams, classroom observation, August 28, 2012).

Ethics and values. The “ethics and values” codes occurred 15 times in the “learning culture” parent code group. The learning environment was influenced by the
ethics and values of the embedded local community. Andy posed various scenarios that invoked discussion about ethics and values. He asked his students make qualitative decisions regarding political practices they had observed during the political conventions. He asked, “Is that right or wrong? You gotta get this. This sells!” (A. Adams, classroom observation, August 28, 2012).

Westtown was once a clothing hub of the South. As the industry declined, many of the cultural values remained. Although many people became wealthy, others were not as fortunate. Andy and his family struggled financially during his school years. He encouraged his students to rid themselves of excuses for failure to achieve at a high level. He stated, “It doesn’t matter whether you are poor or rich” (A. Adams, classroom observation, August 28, 2012). During the SRI, Andy confirmed his viewpoint. He said, “You know what? I’ve got some very smart poor kids, you know. Some poor kids . . . are extremely smart” (A. Adams, personal observation, September 7, 2012).

Andy suggested that local cultural and political values were deeply ingrained in the culture. Those who had opposing views could find themselves ostracized by the mainstream. Andy’s perspective on the local culture identified inherent weaknesses. “Sometimes we don’t even want industry to come in here, because we’re afraid it will do what? It’ll change us. We’re very skeptical” (A. Adams, personal observation, August 28, 2012). He challenged a cultural issue that transient students faced. Andy added, Pretty hard to fit around here, isn’t it? Hello? . . . It’s very cliquish. Isn’t it? All right. They don’t like change . . . They’re very weary of strangers. Does that make sense? All right. You can’t just come in and “be somebody”. You gotta fit into “the clique” (A. Adams, classroom observation, August 28. 2012).
He continued by asking, “Do you see any of that happening with adults?” (A. Adams, personal observation, September 7, 2012).

He referenced the culture’s responses to a recent political issue. Voters were determining whether local restaurants would be allowed to serve liquor. He asked,

What happened the last time somebody even mentioned liquor by the drink or selling liquor in Westtown, Georgia? What did everybody do? Everybody freaked out! Everybody had a sign in their yard. People quit going to churches and everything else (A. Adams, classroom observation, August 28, 2012).

Andy feared nothing. He presented opposing viewpoints as a means of prompting engagement. By juxtaposing viewpoints, Andy presented ideas where students were challenged to evaluate their own ethical positions. Andy attempted to avoid stating his personal biases by clarifying the notion that he wanted to present multiple views on the issues. Not all issues had negative connotations. Conversely, Andy identified positive, deeply-engrained values that he admired. Regarding his grandfather’s views, Andy stated,

And that was his belief system — that you took your hat off. That comes out of that Southern idea, you know [of] “showing respect” and all those things like that. If you’re right here, for these folks when you say the pledge of allegiance, you do what? Do you keep walking or do you stop? You stop. You say the pledge of allegiance. You live in a little town that’s very conservative. Understand? (A. Adams, classroom observation, August 28, 2012).

Andy connected with his students by identifying with the inherent challenges he has faced. He continued to live in the same town where he was reared and identified
potential struggles that some students could have similarly faced. Andy posed a hypothetical situation where students were challenged to evaluate their social ethics and values. He said, “Now if you were to go into Atlanta . . . they’re not bad people or anything like . . . not saying that. But it’s a different group of people, different values, different systems” (A. Adams, classroom observation, August 28, 2012). He challenged his students to understand the local culture in relation to different cultures. He stated,

. . . You can agree or disagree with illegal immigration . . . We’re gonna talk about a group of people like they don’t even exist. “Just get rid of them!” Right? Now whether they’re breaking the law or not that’s up to you to decide all that. But the way we talk about people like they’re not really people! (A. Adams, classroom observation, August 28, 2012).

The learning culture was significantly defined by Andy’s set of ethics and values. He constructed the learning environment as an extension of the local community culture. In a discussion regarding the 2012 Republican National Convention, Andy connected Christian heritage with the political viewpoints of some speakers at the convention. He stated,

Right there uh, they’re gonna really push God. You’re gonna hear it in every one of the speeches. You’ll hear it tonight. Oh, you’ll hear it from the Democrats too, all over the place. They’re really gonna do it, Democrats and Republicans, especially Republicans in the deep South because . . . you live in the “Bible Belt”, ladies and gentlemen. Okay? (A. Adams, classroom observation, August 28, 2012).

During an observation, Andy boldly challenged the racial views of the Southern
Caucasians who had lived during the 1960’s. He presented the idea that Christians should maintain similar values, ethics and cultural standards regardless of their cultural identity. Andy said, “If you went to a white Christian church . . . “they” were going to “their” church . . . who believed in the same God. (pause). Does that make sense?” He added, “Does persecution occur today over ethnicity?” (A. Adams, classroom observation, August 28, 2012).

Bandura’s social learning theory (1971) suggested that humans cognitively constructed reality and overtly performed behaviors based on their personal values and expectations. The social learning theory espoused that human behaviors occurred as the result of environmental influences and interpersonal factors that included the mind, emotions and physical processes. Andy maintained the idea that excellence was an essential skill and could be exemplified in the learning culture. Andy worked hard to maintain a balanced learning culture. He sought to create an environment that was equally positioned between personal responsibility for learning and holding high ethical standards.

Andy sought to engage students in viewing politics through an ethical and values lens. He suggested that students needed to understand the problems and issues through the economic lens or social lens. Both lenses contained ethical factors. He said, “If they can’t get you to vote on economics, they’ll get you to vote on the social issue” (A. Adams, classroom observation, August 28, 2012). He presented strengths and weaknesses of the political party’s views so as to engage students in an ethical analysis. Andy suggested, “They are also very quick to tell you, ‘Our guy . . . even though he got into a moral mess . . . Bill Clinton, cut the welfare rolls more than almost any other
President, Republican or Democrat” (A. Adams, classroom observation, August 28, 2012).

Based on his demeanor, Andy suggested that he believed one’s morality was more an essential leadership quality than his ability to engage culture. He wanted both things to occur, but he showed little respect for leaders who had failed morally. Andy’s personal values and ethics emerged as an important factor in defining the “learning culture”.

The cultural framework was uniquely constructed with many components. Andy sought to construct and support an interactive environment. Sometimes the interplay was between teacher and student; whereas, at other times the interaction occurred only between the students. During an observation Andy pressed his students to interact more fully. He stated, “Make sure you’re talkin’. If there’s something you don’t understand, I’m goin’ to ask you in a minute!” (A. Adams, classroom observation, August 28, 2012).

The literature suggested a connection between the learning environment and one’s personal intelligence. Specifically, intelligence(s) existed as an interaction between one’s organic proclivities and contextual distribution within the learning environment culture (Beliavsky, 2006; Gardner, 1993). Engaging students in learning (Carini, Kuh & Klein, 2006; Lambert & Cuper, 2008; Partnership for 21st century skills for 21st Century Skills, 2006; Rocca, 2010) and designing learning environments (Partnership for 21st century skills, 2007) were linked as two keys to effective instructional practices.

**Major Theme Three: Learning Culture Engagement – Dana Dunn**

The data suggested that a third theme existed. It reflected that when teachers created an effective learning culture, they sought to engage learners.
Learning culture. Dana’s third most commonly occurring code was the area of “learning culture” with 38 codes. The learning culture was comprised of two subcode groups. The “brain compatibility” codes occurred 26 times while the “learning environment” codes appeared 12 times. Brain-compatible learning was discussed as a minor theme in a later section. The parent code, “theoretical underpinnings”, was presented and discussed in this section as a component of the “learning culture”.

A coding challenge included accurately interpreting both the environment and the participant’s behaviors while avoiding data skewing based on my personal biases (Merriam, 2009). This factor was alleviated by using a member check to counter the “crisis of representation” (Marcus & Fischer, 1986, 15) and verisimilitude in reflecting the appropriate viewpoint of the participant (Denzin & Lincoln, 2011). The participants served as a sounding board. Their analysis of the data analysis helped me to securely construct a valid conceptualization of their rationales and behaviors.

Learning environment. The “learning environment” emerged as a second component in the “learning culture” code group with 11 codes. This subgroup contained two specific factors. The general “learning environment” code contained eight code instances, while the area of “life-long learning” had three code references. Designing effective learning environments and engaging students in learning were identified as two keys to effective 21st century praxis (Partnership for 21 century skills, 2007).

Understanding the physical ethos helped me to understand a great deal about the learning ethos and culture. Dana put much effort into designing the layout of her classroom, the bulletin boards and virtually every aspect of the room. This neomillennial nimbus resonated with an alarming aura of idyllic idealism and cruel complexities. A
silent CD player rested near the window, while small figurines were bunched together on a lower shelf. Just above the CD player, Van Gogh’s “Starry Night” painting sang its song of serenity. Conceivably the mix of blues – the navy curtains and van Gogh’s night sky meshed in a stroke of iridescent lase – created a dovish doux. Nevertheless, a deafening tranquility quieted the room – a placid and pastoral refuge. Each environmental element composed a symphony of Dana’s personal experiences she had acquired throughout her life.

During the SRI, I asked Dana, “How have your personal experiences in engaging students in learning made you feel more or less confident in effectively engaging the learner”? Dana reflected on how she created the environment. She said,

. . . As you saw with my senior class, with the maturity that they bring to the class . . . it’s easy for me to be more myself with them . . . to loosen up a little bit. As a teacher for, you know, probably, I don’t know, over 20 of the 26 years or so that I’ve taught, I’ve probably been um, more structured. I guess I’ve been more in control . . . in charge, more teacher-facilitated. But I’m trying to break out of that and have my classes be more student facilitated, put more of the learning responsibility on the student while giving them what they need to be able to do that, but then step back away from it (D. Dunn, personal communication, September 17, 2012).

The classroom ethos depicted an environment of curricular diversity and positivity mixed with an undaunted cry for excellence. Alongside a positive and engaging quote was a boldly written cry for excellence. On the outermost wall, four colorful posters quickly composed a quodlibet of literature essentials. These pillars included an overview of the
writing process, using worn-out words, writing résumés and ways to write more descriptively. These reminders insinuated that Dana did not reteach what her students should already know. I presumed that her students were expected to apply what they already been taught.

Dana worked to develop a rapport with her students so that they would understand the learning ethos and culture. Much of the learning environment reflected Dana’s viewpoints toward her students. Regarding her A. P. students, she said, “You’re just dealing with um, an intellect and . . . and motivation and self-discipline that makes teaching so much fun!” (D. Dunn, personal communication, September 17, 2012).

Dana wrestled with the degree of classroom control she assumed over the course of her teaching career. She stated, “Control is a big thing for me in every aspect of my life. So control in my classroom is a big thing for me” (D. Dunn, personal communication, September 17, 2012). On the one hand, she valued her sense of control. Conversely, she innately understood that the 21st century learners needed more control than she had previously offered students in the past. She confirmed this when she said, “As a teacher for, you know, probably, I don’t know, over 20 of the 26 years or so that I’ve taught, I’ve probably been um, more structured” (D. Dunn, personal communication, September 17, 2012).

As the sole investigator, I observed how the Dana, the actor, created meaning during instruction for her students through the explicit and implicit images and symbols. Specifically, I observed Dana’s behaviors and interpreted their meanings. I determined to more fully realize Dana’s classroom ambiance and milieu. Blumer (1969) suggested that one’s overt behaviors were directly impacted by the behavior of other persons within
their environment. Such behaviors were “constructed by the actor on the basis of what he
notes, interprets, and assesses” (p. 49).

**Life-long learning.** Dana highly valued being a life-long learner. During the
SRI, I showed Dana a video of her silently, yet intently, reading while her students were
reading an assignment. I asked Dana, “What is happening in your mind at this point?
How does non-verbal language play a role in your teaching? Do you try to convey
specific ideas through your body language?” She replied,

> It’s part of who I am . . . As far as, you know, sitting there and reading while they
were working, uh, I try to model what I want them to do. And it was important
for me to be engaged in the assignment as much as they were engaged in the
assignment . . . I guess that’s what you saw me doing (D. Dunn, personal
communication, September 17, 2012).

Dana correlated her life-long learning to its potential impact on her students. “It keeps
me sharp. It . . . lets me know that I can’t stagnate because these kids won’t let me . . .
They will get bored, or . . . they will leave me behind” (D. Dunn, personal
communication, September 17, 2012). Dana’s classroom vividly helped define the
learning environment. Several boxes were neatly stacked in tandem just beneath the
small single sink. I never dared to open them. The boxes were perfectly aligned, very
nearly as neat as a carpenter’s chalk line. Dana maintained order and a clear sense of
priority. Everything had its place and purpose. Frivolous clutter was nonexistent.

Dana’s classroom was dressed with character and creativity. Amidst the
academic challenges were enticing metallic letters of every imaginable color. The black
background for one proclamation magnetized my attention. It popped. The remainder of
the bulletin board had a white background on which Dana had posted items of interest for the students. These items included various school schedules and events. There were a few metallic stars and character-like pencils that were used to draw attention to items of special significance. The bulletin board was very organized. Most every schedule had a different color background. The contrast between the stark white printer paper with black letters and the background was appealing. The entire bulletin board had a metallic, navy blue scalloped board that encased the display. Everything was so neat. The busy room was not crowded. Rather, it allured wandering minds to gain greater perspectives on the essentials.

**Theoretical underpinnings.** Uniquely, Dana’s data set reflected a large quantity of codes in the “theoretical underpinnings” area. Fifty-four coded segments emerged. This main code group contained three subcodes. The most often identified codes within the code group, theoretical underpinnings, were “symbolic interactionism” and “constructivism”. The subcode “symbolic interactionism” contained 28 codes and “constructivism” contained 25 codes. Essentially these two code groups were near equally balanced, while the subcode “situated learning” was noted only once.

**Symbolic interactionism.** Codes in the “symbolic interactionism” code group included:

- metacognition;
- non-verbal communication or paralanguage; and,
- confidence.

There were 17 “metacognition” codes, seven “non-verbal communication” codes and only four codes in the area of “confidence”. The subjective nature of data collection
required that I delve deeply and ponder over theoretical aspects before, during and after the data collection. I wanted to be certain that I understood Dana’s intentions and meanings rather than interjecting my opinions or biases into the data analysis.

As the sole researcher, I used symbolic interactionism, a psycho-sociological framework, as an interpretive lens to understand the meanings that individuals gave to various things. I was concerned about how these subjective meanings were acquired and understood. I sought to understand how the participant rationalized reality in relationship to other people, objects and symbols in the classroom (Blumer, 1969).

**Metacognition.** Dana stated in her pre-observational survey that she felt very strongly about her higher-order thinking and cognition. According to Sternberg (2006), metacognition existed as an essential creative thinking process component. Ascertaining codes in the area of “metacognition” proved to be difficult, because coding was predicated solely upon a symbolic interactionism (Blumer, 1969) framework. According to Goleman (2008), the concept of mindsight existed as a metacognitive function that was embedded in interpretation of another’s thoughts. Precisely determining the exact messages that Dana communicated and those that she received from the students could not be pragmatically determined. These factors were primarily perceived and interpreted.

Dana communicated symbolically with students through her physical cues like posture, gaze and expressions. Her postures and poses served as prompts and cues for her students. Typical cues included a postural tempo change, slouching, and sitting erectly. Dana used non-verbal cues to communicate desired student behaviors that centered on cognitive engagement.
Verbal communications were a predominant SI element. Inflection, syllabic emphasis and colloquialism were embedded in her oral communications. A change in pitch sometimes communicated the measure of significance she gave to a particular concept. Dana’s verbal inflections suggested whether the students’ responsive interpretations were correct, incorrect or close in proximity. To confirm accuracy in analyzing the data, I used a member check process with Dana to confirm my interpretive veracity (D. Dunn, personal communication, October 1, 2012).

According to Blumer (1969), symbolic interactionism was grounded in three distinct premises. First, an individual’s behavior toward something was determined by meanings and the significance that these objects held for the individual. Second, meaning was obtained by social interaction with others that provided a foundation for developing meaning towards others. Third, meanings were processed and modified by the individual through a process of personal interpretations during personal interactions with others. Blumer said, “To ignore the meaning of the things toward which people act is seen as falsifying the behavior under study” (p. 3). For the purposes of this study, I interpreted the ways that Dana handled and modified meanings that she signified toward things. This study did not seek to understand symbolic interactionism from the students’ perspectives. Therefore, from this purview, I sought to understand how Dana interacted with her students toward the explicit and implicit classroom objectives.

At WHS, all teachers were required to provide a course syllabus to each student. The syllabus provided very explicit directions and expectations for students during the course. The explicit objectives were expressed without any type vagueness or ambiguity. As a result, Dana’s students could clearly understand her intentions without
interpretation. Specifically, these goals were objective and did not contain subjective qualities. Explicit attitudes were deliberately communicated in ways that expressed Dana’s heart, goals and aspirations for her students. Dana provided ample examples of her explicit assumptions. These were provided through handouts, i.e., assignments, instructional materials and verbal directions.

The implicit objectives were by nature more subjective and interpretive. The coding of these objectives required that I look beyond the obvious and read between the lines for implied meanings. Nosek and Banaji (2009) defined implicit attitudes. They purported,

> Implicit attitudes were not accessed by introspection, and may exist outside of conscious awareness. Implicit attitudes were derived from the basic mental operations of seeing relationships between concepts and evaluations in everyday experience and accumulating those associations into summary assessments (p. 3).

**Non-verbal communications.** I observed how Dana symbolically communicated and engaged her students in understanding her intended goals (Nosek & Banaji, 2009). These factors were identified by noting non-verbal communications like physical posture, movements and facial expressions. These indirect communications occurred by means of the physical environment and Dana’s communications. Dana’s ability to implicitly communicate had the potential to influence how her students grasped the attitudes, values and beliefs that she wanted them to ascertain. These views were derived from the accumulated lifetime experiences and wisdom she had gained from those experiences.

Another symbolic interactionism facet included the role that individuals played in defining their expectations and communicating meaning through modeling (Blumer,
Dana modeled her love and passion for learning to her students. During the SRI, I asked Dana, “How does non-verbal language play a role in your teaching?” She replied, “It’s part of who I am . . . As far as, you know, sitting there and . . . and reading while they were working, uh, I try to model what I want them to do” (D. Dunn, personal communication, September 17, 2012). Goleman & Boyatzis (2008) suggested that people modeled the behaviors of their mentors. As mentors, teachers were to require curricular rigor and high expectations of their students while simultaneously fostering a positive environment. Teachers were to be attuned to their own perspectives. They simultaneously were to be receptive to the moods and perspectives of students to communicate most effectively with them.

Within the symbolic interactionism framework, perception was identified as a pivotal ingredient in communications. The complexities embedded within effective communications included the idea that all individuals must develop skills needed to accurately perceive human interaction symbols (Charon, 2009). I presumed that students reacted differently to Dana’s symbolic interactionism communications based on their personal perceptions. According to Blumer (1969), the students’ significance levels applied to those perceptions and the meanings were perceived with respect to their social and emotional maturity levels.

Dana communicated richly with her students through various avenues. Art provided an alternative mode of communication, an unvoiced song that spoke more clearly than a sonnet. I initially imagined that holistic learning occurred in this environment. Artistic expression became the writer’s paintbrush, a symbolism that reached past mere written words— the logos, the dried ink. Artistry was contextualized
and gave meaning to still life photos through the tools of color and symmetry. The unknown hovered here. For example, the naïveté of “The Looming Tiger”, an original poem and painting penned by a 2008 graduate, housed a haunting appeal (Appendix G).

Assessing the students’ perceptions and apperceptions was not an easy process for Dana. Her soulful values that she communicated through implicit and explicit interactions and the students’ perception of those values were unquantifiable. Time and experience acquired those findings. Dana yearned to help individuals grasp gestalt, holistic understandings and transformations from past experiences to new understandings. The dissention point was relegated to the youthful perceptions and comprehensions of her intended meanings. Yet, Dana’s unmoderated self-expectations subjugated her to the students’ abilities to know, understand and accurately interpret their teacher. She engaged in a reciprocal trust with her students thus signifying a unique learning culture. As supported by the EOCT data, Dana effectively communicated with her students at a high degree. Her previous students had scored above the 90% level, a predetermined criteria for participation in this case study (Georgia Department of Education, 2012).

Using symbolic interactionism as an interpretive lens, it seemed plausible that Dana’s self-efficacy expectations towards teacher effectiveness were extremely high. Dana stated during her SRI, “I feel most confident teaching, I think, is guiding students to understand significance in meaning in literary works” (D. Dunn, personal communication, September 17, 2012). Dana explicated “significance in meaning” and reached beyond the academic arena to produce life-long learners.

I maintained that the symbolic interactionism framework uniquely correlated with the concept of interpersonal intelligence (Gardner, 1983) and social intelligence.
(Goleman & Boyatzis, 2008). Dana exemplified both interpersonal intelligence and social intelligence during her instruction. She used implicit instructions to convey her goals and embedded meanings to her students. According to Goleman (1998), social intelligence reflected an understanding of human relationships. Dana exemplified social intelligence during the SRI. She stated, “I walked over to that group that I feel like is maybe kinda getting off task, wandering a little bit, getting a little, you know, irrelevant, and try to bring them back to why they’re doing it” (D. Dunn, personal communication, September 17, 2012). Conversely, during an A. P. class, one student’s cell phone rang. Dana viewed the incident as merely a failure to turn the phone off. She stated, “Real world here. Sorry”. Dana did not view the ringing of the cell phone as a willful breaking of the rules. Rather, she perceived the incident as an error, an oversight that she too overlooked. Her social intelligence helped Dana to ethically manage the situation. She demonstrated her value for learning above merely keeping the rules and demonstrated a sacrosanct act of grace.

A connection existed between explicit and implicit communications. Dana clearly posted explicit goals throughout the classroom. Although Dana never verbally referenced these goals and expectations during the observations, they were prominently posted in the learning environment. They interjected intentional meanings. Dana posted a motto above the whiteboard just to the right of the inevitable instructional determinant, the clock. The second hand tick tocked silently but consistently. The formidable mantra, “You are who you choose to be”, shouted its lofty refrain from the dusty white walls just above the whiteboard. White was so stark and cold. Yet, the language was hauntingly hot. This learning smorgasbord offered students delicacies unrequired by the curriculum.
guides. The learning culture suggested that hard work often was rewarded with high achievement, a daily determination decided by each student.

Dana modeled her social intelligence by suggesting that she understood her students in correlation to their own RWL experiences. During an AP class observation, Dana deeply engaged her students in the concept of literary characterization, as she dramatized the book’s dried ink. She ardently asked, “What about the woman? . . . ‘Fadingly pretty’. How sad! ‘Fadingly pretty?!’ Think about the connotations. Was she once prettier than she is now? Um, does she maybe seem to sort of fade into the background?” (D. Dunn, classroom observation, August 27, 2012). Dana stressed the words “fadingly pretty” while dramatizing the phrase through her expression and posture. Her raised shoulders and sorrowful demur demonstrated her implicit repudiation for the degrading description of this delightful woman in the literature. Dana displayed an implicit disdain for the author’s description.

In an unforgettable impacting moment, Dana had portrayed her emotions and personal perception of Hawthorne’s intention. Dana’s interpersonal communication skills (Gardner, 2007) prompted her to remember her thoughts and perceptions as a student. She had masterfully blended brittle literary facts with beauty, a bombastic and unavoidable facet of teenage lifestyle. During the SRI, I said, “You often use different emotions when teaching. In this clip, help me understand what you seek to impart to your students. Later on you add the sentence, ‘We know how it felt’” (D. Dunn, personal communication, September 17, 2012). She replied,
I guess I was trying through um, expressing how that would make me feel so that they could actually see a picture of how that . . . I perceived it to feel so that they could more fully understand it. Because they’re young, their prettiness hasn’t started to fade yet (D. Dunn, personal communication, September 17, 2012).

Dana, the actress, reenacted the author’s centric intention and highlighted some of her students’ deepest social and emotional issues that were emergently embedded within their teenage hearts.

Dana purposefully connected history with current learning. Distally positioned pieces— such as the Globe Theatre and a student’s genealogy—suggested commonality and cultural relevance. The old and the new were embedded in a continuum. The classroom ethos reverberated with several of Dana’s learning expectations of her students. Three explicit statements distinctly proclaimed powerful premises to her students. The formidable mantra, “You are who you choose to be”, shouted its refrain from the dusty white walls just above the whiteboard. Then, a message embossed in bright shiny colors glared its challenge across the bulletin board stating, “Unless you try to do something beyond what you have already mastered, you will never grow.” Its shallow simplicity paled in comparison to its profundity. Finally, a potent proverb, “Assume nothing”, peeled its inaudible proclamation from the bland block walls. These explicit, strong statements accommodated implicit assumptions that could be perceived only by the attentive academicians.

The concept of interpersonal intelligence synchronized efficiently with social intelligence. According to Gardner (1983), the concept of interpersonal intelligence reflected an individual’s ability to understand other people’s temperaments, personal
intentions and collaborative capabilities. Dana suggested that she struggled with teaching collaboration; yet, Dana’s student-centered goals prompted her to engage in strategies outside her comfort zone. Students were allowed to work together when they demonstrated the capacity for effective collaboration. During the SRI, Dana noted,

My task for myself this year was to try to have my class be a more student-facilitated class, less rigid, less structured . . . allow the students opportunity to, you know, become more self-disciplined, and . . . um, and allow them to collaborate more (D. Dunn, personal communication, September 17, 2012).

Cultural factors held important consequences for human interactions and learning. Dana sought to help her senior class mature. Her students were to demonstrate maturity by accurately interpreting her implicit cues and assumptions. Dana stated in the pre-observational survey that she “agreed”, versus stating that she “highly agreed”, that her teaching habits aided her students in participatory engagement in learning. The students were required to intently focus on her intended meanings to effectively interpret Dana’s implicit ideas (Nosek & Banaji, 2009).

Dana maintained personal responsibility for managing the learning culture. During the SRI, Dana said,

My self-confidence is directly related to how comfortable I feel with what I’m teaching and whether or not I really feel like I know and I’m prepared . . . I have experiences or things that I can bring to the lesson that helps students see why it’s important for them (D. Dunn, personal communication, September 17, 2012).

Yet, Dana disowned full control of the interpretations and the applications of her intended learning goals for the students. When students failed to accurately interpret implicit
goals, Dana may have assumed that the students’ failure was caused by her inability to effectively engage them in learning. Thus, her feelings about her self-efficacy could have been misleading. The symbolic interactionism framework provided interpretive capacities for understanding Dana’s intended meanings and those that extended beyond pragmatic calculations and assessments.

Dana worked diligently to be highly organized. She hoped that her preparation would allow her to control her own instructional practices and her students’ learning behaviors. Yet, she could not control her student’s personal willingness and motivation to engage in the learning process. Rather, the social interactions in the classroom were controlled by multiple human factors outside the management of the teacher. This viewpoint was substantiated by symbolic interactionism. According to symbolic interactionism (Blumer, 1969), interactions could not be pre-arranged or even self-controlled. Rather the interactions occurred based on the relationships between the individuals, i.e., the teacher and her students.

Dana’s intolerance for the spontaneous and unplanned activities had admittedly been problematic for her until recent years. Recently, she attempted to provide students more self-regulated learning opportunities. This instructional strategy suggested that Dana currently maintained stronger self-trust than in previous years. During the SRI, Dana reflected on this idea by stating said,

I guess I’ve been more in control . . . in charge, more teacher-facilitated. But I’m trying to break out of that and have my classes be more student facilitated . . . Put more of the learning responsibility on the student while giving them what they need to be able to do that, but then step back away from it . . . when that really
comes together in a class is when I feel really confident that, “Okay, that worked . . . It didn’t all blow up . . . Things didn’t fall apart, just because I wasn’t in charge every single step of the way” (D. Dunn, personal communication, September 17, 2012).

Dana demonstrated strong interpersonal intelligence. Gardner (1983) proposed that self-reflection and introspection skills were essential interpersonal intelligence components. These skills were aligned with Goleman’s perspectives on emotional intelligence, whereby individuals were able to accurately self-assess and predict their own personal competencies (Goleman, 1998). Furthermore, Gardner (1983) suggested that critical thinking skills and philosophical tendencies were common among those persons with intrapersonal intelligence. Dana operationalized many of these competencies.

Confidence. Understanding Dana’s personality aided my interpretation of the learning culture. Dana delicately kept her sense of confidence in balance. She was overtly shy, sheepishly short and bombastically bashful to the core. Yet Dana’s strength was exemplified in her philosophically principled approach to her praxis. Her instructional habits suggested that Dana remained centered on preparing her students for reaching their maximum potential. Dana viewed teaching through a glass more than through a mirror. Her personal reflections prompted Dana to make effective instructional changes when they were needed. A calm disquietedness that was overshadowed by her kindnesses signified Dana’s disdain for mediocrity. This unpenned quality was implied in multifarious ways and projected a proclivity for productive excellence.
Gardner (2006) suggested that intrapersonal intelligence helped an individual to better understand himself from a psycho-sociological vantage, thereby aiding him to be more self-productive. One’s sense of self was thus constructed by both interpersonal and intrapersonal factors. The notion that the individual constructed a sense of reality was aligned with constructivism, an epistemological foundation in 21st century learning. This worldview of knowledge acquisition (Spector et al., 2007) determined that knowledge was an interaction between one’s life experiences and his thoughts (Vygotsky, 1978). New knowledge was constructed by using previous knowledge to construct new meanings (Vygotsky, 1978) through authentic problem solving (21st Century Learning Environments, 2007; Danielson, 2007; Dewey, 1938; Marzano, 2007). Dana knew from personal experiences that teaching a man to fish was the right way to instruct learners. She exemplified this constructivistic belief throughout the instructional observations.

Major Theme Three: Learning Culture Engagement – Kate King

The third major theme reflected that when teachers created an effective learning culture, they sought to engage learners. Kate’s data set revealed 56 coded segments in “learning culture” and was Kate’s third most commonly occurring subcode. Significant subcodes emerged from an analysis of the “learning culture” data set. The “learning environment” codes emerged 22 times in the data set. “Brain-compatible learning” codes occurred 33 times. It was presented and discussed later as a minor theme.

Learning environment. Kate defined the overall learning environment as a well-insulated place where students felt protected. She said, “I like to make it a very safe environment so they don’t feel like anybody’s going to say something to them” (K. King, personal observation, September 12, 2012). The literature purported that students were
best engaged in learning when they felt safe and unthreatened (Durlak & Weissberg, 2007).

Her management style helped to dictate the expected behaviors of the students. Kate suggested that her expectations for individuals provided a way to differentiate instruction for her students. Kate differentiated instruction because she had quickly learned specific learning characteristics about each student. She said, “It’s really more their behavior I think because, you know, for one person I might say, ‘That is totally unacceptable. You cannot do that. I want to see you after class’” (K. King, personal observation, September 12, 2012). Kate explained how she defined the learning ethos based on each individual student’s personality and lifestyle. She explained, “And for another person it might be, “I know you’ve had a rough morning . . . but you know you can’t do that. So why don’t you get your stuff together and let’s move on” (K. King, personal observation, September 12, 2012).

She noted that the learning environment was socially created based upon her perception of what each student needed rather than what he deserved (Kouzes & Posner, 2007). Essentially, Kate maintained an affirmative outlook characterized by the presence of a student’s qualities rather than the absence of specific attributes. Such a viewpoint provided Kate many options for creating, defining and reimagining the learning ethos moment by moment. Sousa (2011) suggested that joyful interactions helped students learn. Effective teachers engaged in “positive forces for a climate conducive to learning” (p. 68). Kate said, “So it just . . . it just depends on the student and the situation” (K. King, personal observation, September 12, 2012).
Kate described specific learning moments where an “epiphany” occurred (K. King, classroom observation, August 29, 2012). Such insight into the essential meaning of a common experience, i.e., scientific learning, was somewhat revered as nearly a spiritual insight. Kate allowed a student who had an epiphany to present her findings to the class, a group of her peers. She placed significant importance on the moment by stating, “Alexia is going to explain to us, because she had the epiphany and figured it out” (K. King, classroom observation, August 29, 2012). Kate then stepped aside and provided opportunity for this student to join the ranks of the master teacher. The manifestation in the moment emanated from the student’s ability to have figured it. Kate’s actions suggested that Alexia could demonstrate to her cohorts how she determined this answer to be correct. The prestigious opportunity allowed this student to instruct her peers for a brief moment that lingered deeply in the student’s soul. As a result, the students acquiesced. Kate displayed an instructional giftedness that was not present in many teachers with whom I had met. The ethos reflected a pleasurable and joyful environment, a place to gain understanding, recognition and personal fulfillment.

Once Kate helped her students conceptually understand the scientific concept known as combustion. Kate examined a technical concept in an interesting and novel way. She said,

And a combustion reaction really is a reaction in which sometimes you’ll have flames. Sometimes you’ll have explosions, but not always. If we’re talking about fire, explosions, what kind of energy does it produce? Heat. Usually in the form of heat and what else? Flame. Yeah! (K. King, classroom observation, September 7, 2012).
Whereas Kate potentially engaged female students when she suggested that everyone had swallowed bugs, she probably engaged the young male minds by mentioning fire. During the observation Kate did not specifically state that she intentionally wanted to engage the genders by using the bug and fire examples. Using a member check, Kate confirmed that she had not intentionally differentiated for genders (K. King, personal communication, January 15, 2013). During the observation she suggested,

    So generally if we have a combustion reaction, it is actually something that you can observe. You can see light from it. You can feel heat from it, but not always. But generally the ones that we notice and are impressed by are the ones that give off a lot of heat and light” (K. King, classroom observation, September 7, 2012).

Using the words “we notice” and “are impressed by” provided emotional prompts for her students. This suggested that Kate viewed combustion, a physical science term, in a novel way to engage the imaginations of her young learners. Allen (2008) notated that engaging the imagination was highly effective way to embed learning in the mind.

**Major Theme Three: Thematic Relevance to the Research Questions**

The third major theme reflected that when teachers created an effective learning culture, they sought to engage learners. The first research question determined to understand the teachers’ attitudes toward instructing 21st century learning skills. The third theme was very highly pertinent to research question one.

**Andy.** Andy’s fourth strongest data set was “learning culture”. The most predominant codes therein were “brain-compatible learning” and the “learning environment”. Andy’s ability to create an effective learning culture in the classroom suggested that he highly desired to engage students in 21st century learning. His ability to
present brain-compatible learning strategies created a way to teach important skills like “critical thinking” and the ability to “access and analyze information”. The fourth theme was uniquely relevant to the first research question.

**Dana.** The third strongest theme in Dana’s data set was “learning culture”. Important factors in the culture were “brain-compatible learning” and the general “learning environment”. Other key factors were “innovation and creativity” and “accessing and analyzing information”. These factors formulated the framework for 21st century skills instruction. Dana’s unique ability to define the learning culture uniquely provided a pathway for preparing students with pertinent global skills needed in the workplace.

**Kate.** The parent code group “learning culture” contained only two codes less than the “21st century learning” code group. Essentially, they were nearly equal. The third theme was indelibly connected to Kate’s attitude towards instructing 21st century skills development. It was plausible that Kate displayed a greater connection between the third theme and the first research question than any other participant.

The third major theme suggested that when teachers created an effective learning culture, they sought to engage learners. The second research question sought to determine the extent to which teachers engaged their students in creativity and innovation.

**Andy.** The “learning culture” existed as Andy’s fourth most important parent code group. Critical factors like the “learning environment” and “brain-compatible learning” created a cultural foundation for learning activities. Although “creativity and innovation” were coded a minimal number of times, the factors suggested that Andy
constructed a foundation during the observations for implementing creative and innovative ways of learning in the future. A relatively firm connection existed between the fourth theme and the second research question with potential for futuristic growth connections.

**Dana.** Dana’s third most commonly occurring code was the area of “learning culture” and was comprised of two main subcode groups, “brain-compatible learning” and “learning environment” codes. The “learning culture” was impacted by the physical aspects of the classroom and the academic ethos. She related experiential learning aspects to creative and innovative ways of engaged learning.

**Kate.** The “learning culture” in Kate’s classroom was highly designed for student learning engagement. Brain-compatible learning factors intertwined with effective environmental factors aided her ability to engage students in learning. Kate offered ways for her students to present their understanding and knowledge mastery in creative and innovate ways. As identified, Kate questioned her prowess at teaching creativity and she suggested a need for improvement in teaching creativity. The data suggested that her students were engaged in creative expression of their knowledge and had been exposed to innovative technological findings with online scientists. A relevant connection existed between engaged learning based on an effective learning culture design.

The third research question determined to understand the degree that teachers instructed their students in NLS. This relevant question was addressed in the section regarding the fourth major theme.

The fourth research question endeavored to understand how the participants measured their own self-efficacy in teaching 21st century learning skills within the core
curriculum. This theme was highly pertinent to the third major theme regarding the learning culture and student engagement in learning as shown in Table 3. The participant’s self-efficacy measurement in teaching 21st century skills within the core curriculum was determined by various factors. Instruction and learning was comprised of both learning factors and assessment factors. Student assessment was a central instructional habits’ component.

Andy. Andy’s self-efficacy in teaching the 21st century learning skills was centered on test scores, student engagement and real-world connections. A substantial connection existed between the fourth research question and the participant’s ability to engage students in learning, as defined by the “learning culture” factors.

Dana. The self-efficacy in teaching “21st century learning” skills was well-aligned with the fourth research question for Dana. She found a magnetic connection between her self-efficacy and the “learning culture”. The data suggested that the environment and “brain-compatible learning” strategies aided her ability to teach “21st century learning” skills.

Kate. Kate’s self-efficacy assessments in teaching 21st century learning skills within the core curriculum were partially founded upon test scores. Kate’s “21st century learning” codes suggested a correlation between teaching skills and the environmental factors. Her student management skills provided a foundation for implementing effective 21st century skills instruction.

The third major theme was uniquely related to research questions one, two, three and four across all three participants. The third research question determined to
understand the degree that teachers instructed their students in NLS. This relevant question was addressed in the section regarding the fourth major theme.

Table 3

*Major Theme Three – Learning Culture Engagement*

<table>
<thead>
<tr>
<th>Subcodes</th>
<th>Andy Adams</th>
<th>Dana Dunn</th>
<th>Kate King</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain compatibility</td>
<td>36</td>
<td>26</td>
<td>33</td>
</tr>
<tr>
<td>Ethics/Values</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Learning environment</td>
<td>23</td>
<td>11</td>
<td>23</td>
</tr>
</tbody>
</table>

The data reflects each participant’s instruction in factors regarding engagement in the learning culture.

**Major Theme Four: Learning Styles – Andy Adams**

The fourth theme emerged: When teachers focused on student learning styles, it was evidenced in their instructional habits. The first most often occurring code was learning styles (LS) with 102 coded segments. The two most often identified codes were NLS and “self-regulation”. The NLS area was coded 85 times and “self-regulation” was coded 13 times. The NLS subcode group contained the subcode group “RWL” which was coded 83 times. “Real-world” learning will be presented and discussed later as a minor code. The subcode group “media fluency” was coded only twice and was essentially a non-factor.

This study focused on LS and instructional practices (Rayner 2011; Kozhevnikov, 2007; Zima, 2007) specific to K-12 learning and empirical studies (Evans & Cools, 2011). The area of LS had been exhaustively researched (Coffield et al., 2004; Li, 2008). It suggested that individuals possessed unique learning preferences that impacted their
learning (Evans & Cools, 2011; Kozhevnikov, 2007; Li, 2008; Zhang & Sternberg, 2006) and that learners used many cognitive styles (Coffield, Moseley, Hall, & Ecclestone, 2004b; Li, 2008; Rayner & Cools, 2011; Sadler-Smith, 2009). Significant recent neuroscience research also investigated LS (Pashler et al., 2009; Sims & Sims, 2006; Zull, 2011). Yet non-conformable assumptions and distally positioned viewpoints existed in the literature (Coffield, et al., 2004b; Cools, 2009). Nonetheless, 21st century LS research gained prominence in recent publications.

Gaining deeper comprehension regarding the nature of the neomillennial learner was centric to designing effective instruction. The 21st century learner, or digital native (Prensky, 2001a, Palfrey & Gasser, 2008), was uniquely hardwired (Buckingham, 2007) and engaged in learning in fundamentally different ways than previous generations. The literature suggested the need for a paradigmatic shift in instructional strategies and practices (Dieterle et al., 2008; Jenkins et al., 2006; Salaway et al., 2007). The literature cited the need to produce an integrated model of NLS (Dieterle et al., 2008; Kozhevnikov, 2007) that met the individual student’s LS preferences (Li, 2008; Evans & Cools, 2011; Zhang & Sternberg, 2006). Neomillenials learned best when they were rigorously challenged and engaged in shared learning experiences (Dieterle et al., 2008; E. Dieterle, personal communication, August 8, 2012). Adding to the complexity of the styles literature, the field of cognitive styles lacked a coherent mutually accepted theory. There existed a need to close the gap between evidential LS theory and instructional practices (Rayner 2011; Kozhevnikov, 2007; Zima, 2007) that particularly embodied K-12 learning and empirical studies (Evans & Cools, 2011).

The pre-observational survey contained four sections. In part three, attitudinal
statements were related to items based on students’ LS. Part C contained four attitudinal statements related to items based on the students’ LS. Andy agreed that he understood the meaning of student LS and that his professional development experiences have helped him to effectively implement LS during instruction. He strongly agreed that his instructional strategies and techniques reflected an effective use of the LS of his students, and that his personal experiences helped him to use LS more effectively. Andy noted that he felt strongest about using LS and blending personal experiences with effective LS to engage students in learning.

Question four focused on Andy’s understanding and perception of his ability to use cognitive LS during instruction. The fourth question asked, “What learning styles strategies or techniques are you most and least confident in using when instructing students? Why?” Andy wrote “Auditory” in the margin outside the question. He then wrote, “visual, tactil” in the margin on the right side of the page. Andy later explained that he felt most confident using auditory instruction (lecture) and least confident using visual and tactile instructional strategies (A. Adams, personal communication, August 22, 2012).

Andy’s technology. The subcode area of media fluency was noted only twice. Although the subcodes for media fluency were minimal, the data did not suggest an absence of technology during instruction or in the classroom. The literature suggested that 21st century media fluency involved an evaluative use of digital information and participatory analysis and problem-solving (Dede, 2005; Dieterle, Dede & Schrier, 2007; Jenkins, Clinton, Purushotma, Robinson, & Weigel, 2006). Furthermore, technology could be used in creative ways to generate products or used collaboratively in PBL.
In regard to 21st century learning styles, the NLS showed preference towards desktop interface, augmented realities, multi-user virtual environments and various types of multimedia (Dieterle, Dede & Schrier, 2007). The case study learning environment did not contain the technology tools that were needed for students to be highly engaged in multimedia activities. The learning environment was conducive towards developing various 21st century learning skills necessary for successfully learning and working in the 21st century educational and global workplace (Partnership for 21st century skills, 2011; Wagner, 2008).

Andy often related the curriculum to his own upbringing. He stated that he grew up on the "poor side of town" (Andy Adams, personal communication, September 21, 2012). Andy passionately related the economic struggles that he experienced growing up to the struggles of today’s students. He believed that they shared similar conditions that were separated only by time. When discussing 21st century learning, Andy addressed the fact that outside the school day many students struggled with access to technology, namely computers and/or having access to the Internet. Andy stated,

Did you know a large percentage of the people in your county do not have Internet access? Anybody live out where you can’t get high speed Internet? Boom. Coach Adams makes all this stuff up. Okay? What do y’all use? Satellite? . . . And that’s the way it was for everyone. I was growing up without county water (Andy Adams, classroom observation, August 28, 2012).

During the SRI, I asked Andy about how technology impacted his instructional practices. I asked the question, “To what extent does your use of technology impact student engagement and include various learning styles?” He enthusiastically responded,
I have a Promethean board... I’ll pull in video clips... It’s a much more visual world, and they’re stimulated by that. But I can talk to ‘em all day long... If I can incorporate music and video... all of a sudden there’s a different student in front of me (A. Adams, personal communication, September 13, 2012).

Andy noted that his students used mobile lab computers during instruction. I did not focus on the students’ use of technology during this case study. From his perspective, technology tools effectively aided instructional practices.

I let them do just several things with... the mobile labs in our room... Right now we’re in a stock market game... It’s got feedback... The USA test preps... have immediate feedback on different things... show a movie clip... I’ve already gone over the concepts... It’s like reeling in a big fish (A. Adams, personal observation, September 13, 2012)

The Promethean board was Andy’s strongest technology weapon. It wielded the power to inflict assessment. Yet, it provided the potential for students to gain life-changing information. During instruction, Andy often wrote electronically with the Promethean pen. Andy’s instruction using technology posed a challenge. During an observation, Andy expressed some frustration with the effectiveness of technology. While browsing the CNN website, he stated, “If you come up here, and go ‘issues’... everything’s slow this morning” (A. Adams, classroom observation, August 29, 2012).

The teacher’s use of technology did not substantiate reasons for coding it as “media fluency”. Rather, the participant’s use of technology for instructional purposes was coded as “technology”, a subcode of “instructional designs”. The code “fluency with multimedia” reflected the times that the participant engaged the students in using specific
types of technology. In the final analysis, the codes did not identify “technology” skills as either a significant major code or a minor code.

**Major Theme Four: Learning Styles – Dana Dunn**

A fourth theme reflected that when teachers focused on student LS, it was evidenced in their instructional habits. The fourth most often occurring code was LS with 26 coded segments. The most two often identified codes were “NLS” and “self-regulation”. The “NLS” area was coded 19 times and “self-regulation” was coded 7 times. The subcode group “RWL”, a component of NLS, was coded 10 times. “Real-world” learning will be presented and discussed later as a minor code.

**NLS.** In part C of the pre-observational survey, Dana gave four attitudinal statements related to items based on students’ LS. Dana was very confident that she understood the meaning of LS and that her instructional techniques reflected effective use of it. She also agreed that she felt confident that her personal and professional development experiences helped her to instruct her students. In part D, four attitudinal statements related to items based on the CCSS were presented. Dana agreed to each statement. She felt confident that she knew how to instruct the CCSS and that her instructional strategies aided the instruction of the CCSS. She stated that her personal experiences helped her to instruct the CCSS more successfully and that her professional development experiences have helped her to effectively teach the CCSS. Dana wrote the following comments beneath Part IV questions:

Now that I have attempted to complete this, I feel less than confident about all of my responses. It has been nearly 10 years since my last advanced degree coursework. I truly don’t take issue with the 25-year-cycle of paradigm shifting
that occurs in education. The world changes; and, we need to be certain that we are making changes to help our students be prepared for these changes. I do not, however, keep up the new jargon. So I don’t know that I can answer your questions accurately. But I will try to answer honestly. I believe different students learn in different ways. I am concerned that technology is making it easier for students to think less critically—the answers are so readily available. Some things don’t change—we still need to figure out how to make the connection for students between hard work and success (D. Dunn, personal communication, August 20, 2012).

Question four focused on Dana’s understanding and perception of her ability to use cognitive LS during instruction. The fourth question asked, “What learning styles strategies or techniques are you most and least confident in using when instructing students? Why?” Dana wrote, “most–visual” and “least–kinetic” (D. Dunn, personal communication, August 20, 2012). This reflected a traditional view of using LS in the classroom (Coffield, et al., 2004b).

During the SRI, I said, “Describe how you use cognitive learning styles in teaching”. Dana responded by saying:

So now you’re . . . you’re testing my . . . my knowledge of . . . my subject area here as far as an educator . . . I’m a very visual learner . . . I’m not one who learns so much just by listening. But if I write down what I’m listening to, then I learn it. If I can see it done, if you can give me examples that I can look at, then I can learn. And I know it’s that way for students (D. Dunn, personal communication, September 17, 2012).
Dana understood professionally and as a parent that individuals showed learning preferences. She shared a personal story of how her son demonstrated an auditory learning preference. Dana said,

And it . . . it became very clear to me with my younger son, because it was not until he was grown and out of school that I realized that he’s an auditory learner. That’s why he never wrote anything down in school. And I thought it was just because he was giving teachers a hard time. So I try to take my experience as a parent and translate that to the classroom (D. Dunn, personal communication, September 17, 2012).

Dana expressed her attitudes about letting students make personal LS choices. Her viewpoint was fully aligned with the findings in the literature review. NLS showed preferences towards various LS and succeeded when they were allowed to learn in those modalities (Dede, 2009a; Dieterle, Dede, Perkins, & Russell, 2008). Dana reflected,

There are some kids who don’t have to write things down; and, I have to get over the fact that it looks like they’re not participating or they’re not engaged . . . They’re listening, and that’s just the way they get it. Um, so I try to be more understanding and not take offense, because they’re not engaged in doing it the way I think it oughta be done. I have to let them do it the way it works for them. And as long as I see that it’s working for them . . . then it’s fine (D. Dunn, personal communication, September 17, 2012).

Dana encouraged her students to use visual engagement to learn the information. “If you have a highlighter you’re welcome to get it out; or you can use one of mine” (D. Dunn, classroom observation, August 24, 2012).
A research study examined the relationship between LS and test-taking behaviors when students were given a multiple-choice exam. The study suggested that an association existed between LS and test-taking strategies (McNulty, Espiritu, Halsey & Mendez, 2006). Dana referenced the multiple-choice question component of the A. P. exam that her students had taken the prior year. She said, “Ask anybody who took the class last year. They said doing all the multiple choice really, really helped!” (D. Dunn, classroom observation, August 24, 2012). Dana understood the need to differentiate students’ LS and to allow them to use what worked best for them.

**Self-regulation.** “Self-regulation” existed as the second highest subcode in the parent code group “learning styles” and appeared seven times in the data. General LS codes were minimal and appeared only five times. Dana suggested that students would adapt and grow as they matured in life through the process of repeated self-regulated behaviors. During the SRI, Dana stated,

I was raised by a very strict family in a rural environment . . . I share that with my students sometimes because I want them to see that, you know, the way you are in high school does not necessarily mean that’s the way you’re gonna be the rest of your life. You have opportunity to grow and to change things that you, you know, don’t really like or they’re not really working for you (D. Dunn, personal communication, September 17, 2012).

Dana reminded her students to be self-regulated learners and to be prepared for class the next day. She stated, “Add to your A. P. multiple-choice log what you did today. And we’ll just keep a running record of how you’re doing. Come tomorrow prepared for us to really examine those rough drafts” (D. Dunn, classroom observation, August 23, 2012).
During the SRI, Dana pointed out, “Little things count. You know, your effort counts. The pride that you take... in your work is important” (D. Dunn, personal observation, September 17, 2012).

The literature identified a gap in the area of “self-regulation” research (Evans & Waring, 2009). Self-regulation was aligned with the idea of personal responsibility. Responsibility factors were coded as “self-regulation”. This study did not seek to know the extent that the learners implemented the instruction in their learning practices. As a result, the data analysis did not examine the attitudes or actions of the students.

**Major Theme Four: Learning Styles – Kate King**

The final major theme reflected that when teachers focused on student LS, it was evidenced in their instructional habits. The parent code group “LS” was coded 33 times. Within the parent code group, the subcode NLS appeared 20 times and general “LS” emerged ten times. “Self-regulation” was coded twice and “contextual and situational learning” was singly coded.

Within the NLS subcode group, “RWL” was coded 13 times. This significant subcode will be presented and discussed later as a minor theme. As a result, the remaining NLS codes were minimal. The subcode group “individual preferences” appeared only five times and “collaborative learning” appeared only twice.

In the survey, Kate stated that she was very confident that she understood the meaning of student LS. She strongly agreed her instructional strategies and techniques reflected an effective use of the LS. Kate agreed that her professional learning experiences had helped her to effectively implement LS during instruction. Kate noted that she felt that her students enjoyed using hands-on learning activities and she felt
confident using that learning style. Kate suggested that hands-on learning helped individual students who “do not like sharing out loud to share and show what they are capable of in other ways” (K. King, personal communication, September 12, 2012).

Kate generally implemented her students in auditory, visual and kinesthetic LS. She referenced the fact that her students would observe Bill Nye. This suggested that the students would be engaged in audio-visual learning. During the SRI, Kate referenced the students’ engagement in learning through audio-visuals like movies. She said,

We just finished watching “October Sky” and we talked a lot about the applications to everyday life in that. Uh, we probably will watch “Apollo 13” later and, you know, talk about how the things they discovered then gave us some of the things that we have now that we’re accustomed to using” (K. King, personal communication, August 12, 2012).

None of the classroom observations reflected audio-visual learning connections. Kate’s references to movies suggested that her students engaged in audio-visual learning at various times.

By design, Kate’s lectures were highly auditory. She highly employed auditory learning during lecture and often framed the lecture around a visual, i.e., a handout, a drawing on the whiteboard, or the Promethean board. Kate engaged her students in visual learning to a large extent. Kate projected hangman, an online game, as an interactive visual aid. During a lesson, Kate diagrammed concepts on the whiteboard and placed electrons and neutrons on the appropriate circles. She used different visuals to demonstrate the same concept. She drew Lewis dot structures and a circular diagram on the whiteboard as a visual. Kate understood the need to differentiate her instruction in
small ways like diagramming.

I wanted to understand Kate’s self-efficacy with LS. In her survey, Kate wrote, “I cannot think of a particular strategy or technique that makes me uncomfortable” (K. King, personal communication, September 12, 2012). Kate’s learning design did not lend itself to pervasive talk among the students. As a teacher-driven learning environment, students engaged in traditional learning. Yet, Kate noted that she designed the learning activities to accommodate verbal interaction among her students. She said,

I do let them talk for some things. It depends on what it is. If it’s something that I really feel that they are not gonna be able to do it unless they are not talking and thinking about it on their own, then I make them be silent (K. King, personal communication, September 12, 2012).

Kate offered students various ways to implement learning preferences. She suggested that some students used headsets to listen to music as a way of focusing while reading. Kate provided students optional ways kinesthetic learning. She stated, “You can shade ‘em in, draw a line through them, just indicate them in some way” (K. King, classroom observation, August 21, 2012).

**Major Theme Four: Thematic Relevance to the Research Questions**

The final major theme suggested that when teachers focused on student learning styles, it was evidenced in their instructional habits. The first research question determined to understand the teachers’ attitudes toward instructing 21st century learning skills. This theme was very highly pertinent to research question one.

**Andy.** Andy’s most prominent code in the code set was “LS”. The most prominent subcodes suggested that “NLS”, “self-regulated learning” and “general LS”
were key factors. These factors suggested that Andy showed a very positive attitude towards teaching “21st century learning” skills.

**Dana.** The subcodes that emerged most often were “NLS”, “self-regulated learning” and “general LS”. These key factors suggested that Dana had a very positive attitude towards teaching “21st century learning” skills.

**Kate.** The most emergent subcodes were “NLS”, “self-regulated learning” and “general LS”. All three factors suggested that Kate displayed a most positive attitude towards teaching “21st century learning” skills. The findings across all three participant code sets strongly suggested that the fourth theme was highly relevant to the first research question.

The final major theme suggested that when teachers focused on student learning styles, it was evidenced in their instructional habits as shown in Table 4. The second research question endeavored to understand the extent to which the participants engaged their students in creativity and innovation.

**Table 4**

*Major Theme Four – Learning styles*

<table>
<thead>
<tr>
<th>Subcodes</th>
<th>Andy Adams</th>
<th>Dana Dunn</th>
<th>Kate King</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contextual/Situational learning</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Learning styles</td>
<td>4</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Neomillennial learning styles</td>
<td>85</td>
<td>14</td>
<td>20</td>
</tr>
</tbody>
</table>

The data reflects each participant’s praxis based on students’ learning styles.

**Andy.** The “LS” subcodes suggested that Andy centered LS instruction mostly on NLS, a factor discussed as a minor theme. Subsequently, he implemented “self-
regulated learning” and “general LS”. The “creativity and innovation” factor was mildly represented in the data set. The observational data suggested that Andy planned to engage students in creativity and innovative learning in the future.

**Dana.** The ten subcodes placed “creativity and innovation” as the second highest ranking factor in “21st century learning” in Dana’s code set. The data suggested that Dana modeled these factors more than she assessed them during the observational period. The “LS” subcode sets, i.e., “LS” and “self-regulation” were mildly represented in the code database. Dana suggested that her students made personal LS choices. The data suggested that providing students learning choices was aligned with allowing students to creatively produce end-products.

**Kate.** The “LS” data reflected that Kate mildly engaged students in learning based on their preferences for general LS. The data suggested that NLS was the strongest component, a factor discussed as a minor theme. Kate’s reticence toward self-efficacy in teaching “creativity and innovation” skills in conjunction with the LS data suggested a mild connection between the two factors. While the observations suggested a less than strong confidence in teaching “creativity and innovation”, Kate commented that other people believed that she was a creative person. This subjugation to personal perceptions and other’s opinions created a disharmonious connection between her focus on student LS and the extent to which she engaged her students in creativity and innovation.

The final major theme’s relevance to the second research question regarding “creativity and innovation” was evident. Yet, the data did not suggest as strong a connection to it as to the first research question.
The last major theme noted that when teachers focused on student LS, it was evidenced in their instructional habits. The third research question determined to know the degree to which teachers implemented NLS. This question was analyzed as a minor theme as shown in Table 5.

Research question four endeavored to understand how the participants measured their own self-efficacy in teaching 21st century learning skills within the core curriculum. This theme was highly pertinent to the fourth theme. Instruction and learning were comprised of learning factors and assessment factors. Assessment was a central instructional habits’ component. The participant’s self-efficacy measurement in teaching 21st century skills within the core curriculum was determined by various factors.

**Andy.** The most prominent parent code group was “LS”. The largest factor was NLS and was discussed as a minor theme. The first research question determined to understand the teachers’ attitudes toward instructing “21st century learning” skills. Andy engaged his students in 21st century skills development by teaching critical thinking skills and acquiring and analyzing information. These two parent code groups ranked first and second in the data set. The data suggested LS was a key factor and was highly connected to the first research question.

**Dana.** The data suggested that Dana moderately engaged students in learning based on individual learning preferences. Factors related to 21st century skills development were centric to her instructional practices. This theme was highly connected to the first research question.

**Kate.** The data reflected that Kate engaged her students in learning based on LS to a moderate degree. The most significant factor was NLS and was discussed as a minor
theme. Kate instructed her students to think critically and to use other 21st century skills. This theme was directly connected to the first research question.

Table 5

*Neomillennial learning styles*

<table>
<thead>
<tr>
<th>Subcodes</th>
<th>Andy Adams</th>
<th>Dana Dunn</th>
<th>Kate King</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaborative learning</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Fluency with media</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Individual preferences</td>
<td>0</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Real-world learning</td>
<td>83</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>Self-regulation</td>
<td>13</td>
<td>7</td>
<td>2</td>
</tr>
</tbody>
</table>

The data reflects each participant’s instruction based on neomillennial learning styles.

The last major theme was specifically related to research questions one, two, three and four. The third research question determined to understand the degree that teachers instructed their students in NLS. This relevant question was addressed in the section regarding the fourth major theme. As noted in Figure 3, the major themes showed varying degrees of significance to the research questions. The legend suggested differences in relative significance to the four research questions that guided this study.
<table>
<thead>
<tr>
<th>Themes</th>
<th>RQ #1</th>
<th>RQ #2</th>
<th>RQ #3</th>
<th>RQ #4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Theme #1: 21st Century Skills</td>
<td>VHS</td>
<td>HS</td>
<td>HS</td>
<td>HS</td>
</tr>
<tr>
<td>Critical Thinking, Accessing/Analyzing Information, Innovation/Creativity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major Theme #2: Accountability in learning</td>
<td>VHS</td>
<td>HS</td>
<td>HS</td>
<td>HS</td>
</tr>
<tr>
<td>Innovation/Creativity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major Theme #3: Learning culture</td>
<td>VHS</td>
<td>VS</td>
<td>S</td>
<td>S</td>
</tr>
<tr>
<td>Brain-compatibility, Learning Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major Theme #4: Learning Styles</td>
<td>VHS</td>
<td>S</td>
<td>VS</td>
<td>HS</td>
</tr>
<tr>
<td>Neomillennial Learning Styles, Learning Styles</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 3. The four major themes’ relevance to the research questions.

Minor Theme One: Critical Thinking – Andy Adams

The first minor theme stated that critical thinking was an indispensable part of instruction. An examination of Andy’s codes reflected emergent minor themes. Andy’s second most commonly occurring minor theme was: Critical thinking is an indispensable part of instruction. According to a recent meta-analysis on critical thinking (Abrami, Bernard, Borokhovski, Wade, Surkes, Tamim, & Zhang, 2008), when critical thinking skills were taught as “an independent track within a specific content course”, the greatest learning effects occurred; but, critical thinking maintained the smallest effect when it was treated only as a “by-product of instruction” (p. 1121). Therefore, intentional critical thinking instruction was recognized as the single strongest method for teaching students to use this vital skill. The literature review supported a strong need for 21st century learners to develop critical thinking skills (Common Core State Standards, 2010; Partnership for 21st century skills, 2008; Wagner, 2008).
During an emotional and engaging moment, Andy and his students discussed how
Adolf Hitler was empowered and tyrannically misled his own people. Andy suggested
that Americans could learn from the World War II Germans. By thinking critically about
the holocaust scenarios and issues, these students could learn how to avoid a similar
problem in the U. S. A short segment of the discussion provided insight into the heart of
the instruction when Andy stated,

You will listen to crazy things when you can’t eat, ladies and gentlemen! You
understand? So he says, “Hey! You know why you’re starving? You know why
your babies don’t have enough food to eat? These Jews have polluted the way
our society… They have ruined what made us great. We must get rid of them!”
And all of a sudden you bought into it! (A. Adams, classroom observation,
August 28, 2012).

He implied that students could experience similar life events during their lives.
Therefore, they were to comprehend and correctly interpret how leaders like Hitler had
misled the people. By implementing critical thinking skills, students could develop
higher reasoning skills and may potentially avoid similar circumstances. He interjected
the notion that recent political decisions had placed U. S. citizens’ personal freedoms in
jeopardy. Andy juxtaposed contrasting viewpoints. He stated,

You give up a little bit of this freedom. You know, we had that debate after 9/11,
didn’t we? Talk to me. They were saying. “Look, if you’ll give up your freedom.
You’re gonna have to give up a little bit of your freedom so we can make sure we
don’t have another what?” Terrorist attack. And some people said, “Yes, we’ll
give up some of our freedom”. And some people said what? “No! We don’t
Andy wanted his students to think deeply about the political issues and the implications of their own voting power as citizens.

Andy sought to engage his students in critical thinking by posing various ways for them to view ideas and theories. In one observation, Andy addressed his students by stating, “These two theories are behind everything that they’re arguing about. Okay? It’s not the social issues, but the economic issues. Behind all of ‘em are these two theories” (A. Adams, classroom observation, September 4, 2012). This practice was aligned with the research on critical thinking. According to Sumner (1940), critical thinking involved examining and testing of ideas in order to determine whether or not they conformed to reality (Sumner, 1940).

Andy posed a cause and effect scenario that required students to think critically. Initially, he created a fictional scenario where newly enacted laws and regulations had caused someone to not receive governmental support. Andy proposed that negative economic experiences were based on poor decision-making skills by the electorate. Andy wanted his students to challenge the status quo on Wall Street. He said, “I didn’t make a bad decision. But you’re telling me the market’s gonna punish me for a bad decision when I didn’t make it. Does that make sense? Some of you are getting punished!” (A. Adams, classroom observation, September 4, 2012). He correlated collective marketplace outcomes to the decisions made by only a few people as a “cause and effect” outcome (A. Adams, classroom observation, September 4, 2012).

Students were challenged to deeply ponder the ramifications of following one
political party over the other based on that party’s viewpoints and perspectives.

Regarding public funding of education, Andy noted,

They don’t really like social programs. Therefore, they don’t really like welfare. They’ve even gone as far as calling President Obama “The Welfare President” and different things like that to show their disdain for it. They don’t really like public schools. Okay? One of the reasons they don’t like public schools is taxes . . . It’s the idea that “I’m gonna pay for a school that does not work” . . . Now if the school works, they don’t mind paying taxes for it (A. Adams, classroom observation, August 28, 2012).

Students were challenged to wrestle with the issues, to challenge one another’s thinking, and to rise above mediocre media-fed opinions by formulating an educated decision. Andy did not press his students to demonstrate a political party preference. He was deeply concerned that each student was prepared to justify his belief system based on the facts. By using well-formulated, fact-driven theses and arguments, students were encouraged to vote and to make a difference in public policy. These juniors and seniors were near the voting age. Andy expected that the student’s political decisions were based upon critical perceptions based on research versus personal biases or rumor.

**Minor Theme One: Critical Thinking – Dana Dunn**

The initial minor theme reflected that critical thinking was an indispensable part of instruction. The foremost subcode area, “critical thinking”, was coded 20 times as part of the “21st century learning skills” code group. Critical thinking was the highest ranking subcode in “21st century learning skills” by a margin of two-to-one over “innovation and creativity” and “accessing and analyzing information”. The “innovation
and creativity” and “accessing and analyzing information” subcodes each contained 10 codes. The area of “curiosity and imagination” appeared nine times in the data.

The literature noted that the 21st century learning skills, critical thinking, and problem-solving were important factors (Partnership for 21st century learning, 2007; Wagner, 2008). Critical thinking was correlated with the ability to solve problems.

During the SRI, I asked Dana, “What 21st century skills are you teaching at this time?” She said,

With regard to 21st century skills . . . I’m trying to teach them how to be prepared for a specific kind of test. I’m also trying to teach them some problem-solving skills. Um, when they . . . you know, they have to look at what information they’re given, they have to figure out what they are actually being asked (D. Dunn, personal communication, September 17, 2012).

She noted, “I’m also trying to teach them some problem-solving skills” (D. Dunn, personal communication, September 17, 2012). Dana never asked for a definition of 21st century learning skills at any point during the data collection process. Yet, she seemed unclear about knowing specific factors that constituted 21st century learning skills. Dana authentically admitted,

Whether that’s officially called a “21st century skill”, I don’t know. I do know that . . . more and more students are going to be asked to be able to solve problems, figure out solutions . . . So I think just in helping them figure out solutions about how to take this test is probably helping them get better at that (D. Dunn, personal communication, September 17, 2012).

Dana sought to engage her students in critical thinking by requiring them to
examine the literature through various theoretical lenses. Using analogy as a learning tool, Dana explained how to use critical lens filters.

Another thing that can determine the significance of a literary work is through which critical lens we are viewing it. So if you think about just putting on a pair of glasses and those glasses are gonna make you see that literary work in a particular light . . . (D. Dunn, classroom observation, August 21, 2012).

According to Sumner (1940), critical thinkers examined and tested their ideas to discern whether or not their viewpoints conformed to truth and actuality (Sumner, 1940). This crucial statement summarized Dana’s short and long term goals wherein her students assumed the liberty to develop mature thinking skills. When asked how to proceed with an assignment, Dana replied, “You have to decide, and what format it should take. Everything. It’s up to you. Do what you think” (D. Dunn, classroom observation, August 24, 2012). Dana stressed the phrase, “you think” by lifting her pitch and slowing her syllabic meter and tempo. During the SRI, Dana supported this viewpoint. She noted, “With great literary works and with literary works that are more appropriate to an A. P. setting . . . will come subjects and themes . . . that are more mature um, and more complex” (D. Dunn, personal communication, September 17, 2012). Dana reiterated the notion that critical thinking skills helped students to understand the author’s underlying meaning and intention. Dana suggested, “And that’s when I have to teach them to use all of . . . the stylistic elements that the author does use to try to lead us to his meaning and not just stop at the significance for ourselves” (D. Dunn, personal communication, September 17, 2012).

Dana taught specific critical thinking techniques like how to uncover the obscure
and imperceptible factors found in writing examples. She instructed,

And under “unity” it is important to consider what has been omitted from a piece and examine the writer’s intent in doing so. Sometimes it’s not only what the writer says, it’s what the writer didn’t say that’s important that we need to remember (D. Dunn, classroom observation, August 24, 2012).

She explained how to determine the author’s implications and nuances by associating subjective ideas relative to the literal denotation. Applying textual understanding, its inherent symbolism and associated meanings suggested that Dana engaged her students in significant higher-order cognition. Dana engaged her students in literature analysis. She said,

Connotation involves all the emotional responses and things that a word . . . can cause us to have. . . We can use “house” or we can use “home”. It depends on our meaning and what we want the reader to get—what emotional response we want to evoke. And under “unity”, it is important to consider what has been omitted from a piece, and examine the writer’s intent in doing so. Sometimes it’s not only what the writers says. It’s what the writer didn’t say that’s important – that we need to remember (D. Dunn, classroom observation, August 24, 2012).

Dana taught her students to use a theoretical lens as an avenue for critical thinking. She stated,

Remember you have to suspend your own . . . prejudices . . . Only look at that literary work through that particular lens . . . We see a common thread which leads us to think. So we can look at everything that we’ve talked about here today in terms of symbolism” (D. Dunn, classroom observation, August 21, 2012).
The ability to view from another’s perspective created a highly engaging and cognitive atmosphere. The instructional process displayed ways by which she taught critical thinking skills. Dana stated, “Your questions will contain the clues. And we need to learn how to find those clues . . . So you see the logic that I would use in putting them in order? . . . Make some educated guesses” (D. Dunn, classroom observation, August 23, 2012).

At times Dana specified the author’s intent and explained the literary concepts for her students. Later the students applied their personal skills to determine the author’s intent. “Now there’s something implicit in this prompt–something that the writer of this prompt is expecting you to figure out that’s not given to you. And what is that?” (D. Dunn, classroom observation, August 24, 2012). Dana stated, “Suspend your own prejudices . . .” (D. Dunn, classroom observation, August 24, 2012). Higher order questioning lifted the students’ inquiry levels and pressed them deeper into contemplative analysis.

**Accessing and analyzing information.** Based on the review of the literature, I began this case study with the assumption that effective 21st century learning was centered on technology engagement. This case study learning environment did not contain the technology tools required for achieving high engagement in multimedia. The technology parent subcode group was coded only five times and did not emerge as a major or minor code group. Although the subcodes for media fluency were minimal, the data did not suggest a complete absence of technology in the classroom. During the pre-observational survey, Dana stated that she believed technology allowed students to think less critically. She believed that the answers were easy to access and did not require
them to delve deeply to acquire substantive information.

The learning environment was important. Dana’s classroom was almost as new as it was old. Just inside the door and to the left the Promethean board assumed a large portion of the whiteboard. A DVD player hid beneath the black telephone, a consistent feature found throughout each classroom in the school. A prominent computer cart, holding several laptop computers for students to use, patiently waited with its lid shut. Neomillennial students preferred using desktop connectivity, augmented realities, multi-user virtual environments and multimedia tool when learning (Dieterle, Dede & Schrier, 2007). This electric environment centered less on the digital and more on synaptic brain impulses.

**Minor Theme One: Critical Thinking – Kate King**

The initial minor theme reflected that critical thinking was an indispensable part of instruction. The physical science curriculum required students to use critical thinking strategies. The “critical thinking” code appeared 22 times in the data set as subset of the parent code group “21st century learning”. Kate believed that her critical thinking instruction was solid. In the survey, Kate stated,

> I believe I am most competent in teaching critical thinking and communication. I model critical thinking every day, and expect my students to not only know the correct answer, but be able to explain why it is the correct answer (K. King, personal communication, September 12, 2012).

She modeled the critical thinking processes. Kate stated,

> I try and model the critical thinking, the pathway they would need to follow to arrive at the answer. And I include critical thinking questions on most of my
tests, well all of my tests. And typically at the beginning of the semester, they’re the most missed questions. But by the end of the semester they . . . they do a little bit better with them (K. King, personal communication, September 12, 2012).

During the SRI, Kate expounded on the application of knowledge in relation to critical thinking. She stated, “. . . and so being able to apply those facts is what the critical thinking is all about” (personal communication, September 12, 2012).

Kate offered suggestions for her students to think critically about the management of their own learning. At the end of a lecture, Kate provided her students eight learning options. This prompt provided them personal power to decide what to learn and how they would learn. Kate said,

. . . for the remainder of the class period you can read . . . work on written assignment . . . we’ll just look at your tables . . . you can finish reading Chapter 2 . . . do your vocabulary . . . you can answer your questions . . . work on the writing assignment which goes into your composition book . . . you can get a netbook and you can work on your research . . . you’re either doing an essay or a timeline . . . You’ve got plenty of things that you can do (K. King, August 29, 2012).

Kate taught ionic stability, a scientific concept. She led her students through a cognitive pathway whereby students rationalized their answers through higher-ordering cognition. During the SRI, she said, “I was attempting to get them to think through . . . to take various pieces of information and put it together and use some critical thinking to figure out the answer” (K. King, personal communication, September 12, 2012). Kate correlated critical thinking to using effective test-taking strategies. She said,
If there’s one part of a question that you’re not sure about, can you leave that out and work with the parts you do understand? . . . If there’s a word in a question that you don’t know what it means, you can’t figure out what it means by breaking it down and looking at context clues. Just leave that word out. It’s not helping you anyway (K. King, personal communication, September 12, 2012).

Kate suggested that critical thinking helped scientists discover atomic particles and how they reacted. She said, “. . . they figured most of this stuff out . . . and they figured out how . . . That’s a pretty big deal being able to think like that and do that sort of thing” (K. King, classroom observation, August 21, 2012). Kate esteemed the skills that individuals used to figure things out, to analyze and to think deeply. She suggested that these factors were significant traits among high achievers.

Kate used Socratic learning strategies to engage her students in critical thinking skills. She said, “It has to do with the oxidation numbers. But what are you trying to do with the subscripts and the oxidation numbers?” She answered a student’s initial question with another question to stimulate his thinking process. Kate reaffirmed that engaging questions stimulated critical thinking and potentially produced deep thinking. She said, “And occasionally one person will ask a question and it will actually lead to a really good discussion. Because then a lot of other people start asking questions about other things” (K. King, personal communication, September 12, 2012). Kate assumed the responsibility for guiding the students’ questions so that they remained focused on the lesson’s goals. This study did not seek to specifically measure the effectiveness of Socratic learning in relationship to critical thinking. It was noted that this type questioning appeared in the data set as a “critical thinking” code.
Kate asked her students to analyze the reasons for specific test answers. She helped her students critically evaluate the validity of their test answers. She noted, But some of you put that you would put it with the alkaline metals for what reason? ‘Cause it has the valance electron like the alkaline metals. Some of you said you would put it with the halogens because it’s a gas. And some of you said you put it with the noble gases, because it’s a gas (K. King, classroom observation, August 23, 2012).

Critical thinking often appeared as an important learning tool in Kate’s classroom.

**Minor Theme One: Thematic relevance to the Research Questions**

The first minor theme suggested that critical thinking was an indispensable part of instruction. The first research question determined to understand the attitudes that teachers exhibited regarding the instruction of 21st century learning skills.

**Andy.** The “21st century learning” parent code group was the second ranking code group. Sixty-five “critical thinking” codes emerged from the “21st century learning” parent code. The data suggested that “critical thinking” was the second most predominant individual factor in Andy’s subcode data. The data suggested that Andy’s attitude towards teaching critical thinking skills as a component of 21st century skills development was very strong.

**Dana.** The “21st century learning” parent code group was Dana’s highest ranking parent code group. Twenty “critical thinking” subcodes emerged from the “21st century learning” parent code. This suggested that Dana’s attitude towards teaching critical thinking skills as a component of 21st century skills development was very strong.
Kate. The “21st century learning” parent code group was Kate’s second highest ranking parent code group. Twenty-two “critical thinking” subcodes evidenced from the “21st century learning” parent code. This suggested that Kate’s attitude towards teaching critical thinking skills as a component of 21st century skills development was very strong. The first minor theme was very highly pertinent to research question one.

The first minor theme suggested that critical thinking was an indispensable part of instruction. The second research question determined to understand the extent to which teachers sought to engage students in creativity and innovation.

Andy. The “21st century learning” parent code group was the second ranking code group. Sixty-five “critical thinking” codes emerged from the “21st century learning” parent code. Just four “creativity and innovation” codes were present. The data showed that “critical thinking” was the second most predominant individual factor in Andy’s total subcode data set. This factor was a very strong factor and suggested that Andy had deeply engaged his students in creative and thinking critically. The data suggested that Andy showed strong intentions towards teaching with “creativity and innovation” in the future.

Dana. The “21st century learning” parent code group was Dana’s highest ranking parent code group. Twenty “critical thinking” subcodes emerged from the “21st century learning” parent code. The subcode group “creativity and innovation” emerged 10 times and reflected that Dana’s attitude toward teaching 21st century learning skills was very strong.

Kate. The “21st century learning” parent code group was Kate’s second highest ranking parent code group. Twenty-two “critical thinking” subcodes evidenced from the
“21st century learning” parent code. The subcode group “creativity and innovation” showed nine subcodes and reflected that Kate’s attitude toward teaching 21st century learning skills was quite strong. The first minor theme was very highly pertinent to research question one.

The “critical thinking” factor was the second highest ranking combined code across all three participants. The data suggested that teachers engaged their students in “creativity and innovation” on a mild level. The first minor theme was moderately pertinent to research question two.

The first minor theme noted that critical thinking was an indispensable part of instruction. The third research question sought to know the degree that teachers implemented NLS. The data confirmed the minor theme.

Andy. The data showed that “critical thinking” was the second most predominant individual factor in Andy’s total subcode data set. This was a very strong factor and suggested that Andy had deeply engaged his students in thinking critically. The “LS” parent code group was the most often coded group. The data suggested that Andy very often engaged his students in NLS.

Dana. The “21st century learning” parent code group was Dana’s highest ranking parent code group, where 20 “critical thinking” subcodes existed. The NLS subcode group emerged 14 times and was Dana’s fourth ranking parent code group. The data reflected that Dana moderately engaged her students in NLS activities.

Kate. Twenty-two “critical thinking” subcodes emerged from the “21st century learning” parent code. The “LS” parent code ranked fifth in Kate’s code set while 20 NLS subcodes were identified in the data. Kate showed a strong preference towards
engaging her students in thinking critically. Although “LS” appeared less often than any parent code group, the NLS subcode group ranked moderately high in comparison to other subcodes in Kate’s total data set. The first minor theme was highly pertinent to the third research question.

The “critical thinking” factor was the second highest ranking combined code across all three participants. The data suggested that teachers engaged their students in “creativity and innovation” on a mild level. The first minor theme was pertinent to research question two. The initial minor theme noted that critical thinking was an indispensable part of learning as shown in Table 6.

The fourth research question sought to know how the participants measured their own self-efficacy in teaching 21st century learning skills within the core curriculum.

**Andy.** The subcode “critical thinking” was the second most predominant individual factor in Andy’s total subcode data set. This was a very strong factor and suggested that Andy had deeply engaged his students in thinking critically. Andy’s self-efficacy was primarily assessed through his students’ EOCT scores, the students’ levels of learning engagement and real-world relevance of the curriculum. Each of these factors suggested a strong connection between the fourth research question and the participant’s self-efficacy in teaching 21st century learning skills within the core curriculum.

**Dana.** Dana’s highest ranking “21st century learning” parent code group where 20 “critical thinking” subcodes were evidenced. Dana’s self-efficacy towards “21st century skills” instruction in the core curriculum was moderately high. Each of these factors suggested a strong connection between the fourth research question and Dana’s self-efficacy in teaching 21st century learning skills within the core curriculum.
Kate. Kate highly engaged her students in “critical thinking” as evidenced by the 22 subcodes. Kate showed a strong preference towards engaging her students in thinking critically. Kate’s second highest parent code group was “21st century learning” skills. The first minor theme was highly pertinent to the third research question for Kate. The first minor theme was very highly pertinent to research question four.

Table 6

Critical thinking

<table>
<thead>
<tr>
<th>Subcodes</th>
<th>Andy Adams</th>
<th>Dana Dunn</th>
<th>Kate King</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical thinking</td>
<td>65</td>
<td>20</td>
<td>22</td>
</tr>
</tbody>
</table>

The data reflects each participant’s instruction regarding critical thinking skills.

Minor Theme Two: Real-World Learning – Andy Adams

A second minor theme emerged from the data set. It reflected RWL was essential component of effective teaching. In the pre-observational survey, Andy said that he felt very strongly that his personal experiences helped him to instruct 21st century learning skills. It helped engage students in active learning. This coincided with his views that learning was directly related to the real-world. The coding showed that RWL appeared as a significant minor theme.

The RWL application was fully supported in the NLS literature. According to Dede (2005), the third of four NLS factors suggested that “RWL” was an important component in learning (Dede, 2005; Dieterle, Dede & Schrier, 2007). Andy encapsulated the notion that the Economics content was evidenced in the actual world. He stated, “So you say, ‘Dang, coach! This stuff we’re talking about in here, it really happens?’ Yes. In this class if you walk out the door, it’s happening (A. Adams, classroom observation,
August 22, 2012). After observing a video clip during the SRI, Andy supported this idea as he stated, “I don’t want them . . . just to pass the test. I want them to understand the information and being able to use it in the real world!” (A. Adams, personal communication, September 13, 2012). Andy’s belief that “RWL” was important coincided with the literature. Andy’s code sets suggested that “RWL” appeared as a significant minor theme.

**Real-world learning.** Andy connected learning to the real-world as often as possible. Andy posed as an actor, but not a pretender. Andy was reared in the poor part of town where a meager economy inched along. He personally understood how real-life economics worked. He viewed the lifestyles of some students as a reflection of own youth. The personal references to Andy’s own experiences sometimes upstaged the demand to instruct the core content. The core content was centric to learning, but did not surpass Andy’s greatest inner desires. The economics core content was potentially a platform that he used to help students learn how to succeed in life. Andy wasn’t overly concerned that his students felt emotionally attached to him, although he wouldn’t have resented it. Rather, he demanded that they listened and respected him.

He dramatically communicated the essence of the local culture to a pristine pinpoint. Andy grew up in Westtown. There was a sense of longevity in Andy. He liked to discuss the past but only if possessed the potential to positively affect his students’ lives. All of life seemed interconnected versus being independently constructed. His perspective towards social interdependence compelled Andy to include cross-curricular learning. Isolating curricular elements did not make sense in relation to the real world. His actions suggested that once the students had learned the foundational elements of the
content, only then could they experience real learning. Unless learning was life-applicable, it held no learning relevance.

The RWL codes were signified when the curriculum had direct bearing on the students’ lives. Andy made multiple references to RWL and suggested that political decisions impacted the students’ education. He noted that one political party was responsible for instigating massive testing measures. He said, “They support No Child Left Behind which is really no longer an act. I mean, it’s taking place right now. And that’s why you’re taking what? EOCT. CRCT.” (A. Adams, classroom observation, August 28, 2012). Andy urged his students to be involved in learning at home. He proposed, “We have to turn off ‘The Bachelorette’ and pay attention to what’s going on with the political process. That makes sense? (A. Adams, classroom observation, August 22, 2012).

WHS teachers, like Andy, prepared students for college where possible. These college-bound students were financially affected by political decisions. He argued that raising property taxes increased the students’ college tuition. He said,

That’s what it feels like when you don’t have a voice and you don’t pay attention ‘cause politicians, a Republican or Democrat, made that decision. That affected you. That has affected your family. That’s gonna affect how much food goes on the table. And here, if that doesn’t bother you, that affects whether you stay at home with mama all four years of college or not! (A. Adams, classroom observation, August 22, 2012).

The economy directly affected each student and their families. He suggested, “The number one issue that will be voted on in this presidential election will be the economy,
because the economy is in bad shape right now (A. Adams, classroom observation, August 22, 2012).

And that’s the question that is being asked to you right now, the American people . . . September the 4th . . . the national debt for your country just today hit what? Tell me the number. Sixteen trillion dollars, today! (A. Adams, classroom observation, August 29, 2012).

He stated that the national massive debt negatively impacted his life. He said, “Debt is a big issue for these people . . . But they glorify the past . . . tradition, back in ‘50s, ‘good ol’ days’ (classroom observation, August 28, 2012). He moaned and growled, “I don’t wanna look at the price of my house. I don’t wanna be sick at my stomach . . . ‘cause it’s not anywhere near worth what I paid for it right now (A. Adams, classroom observation, September 4, 2012).

Andy offered opposing viewpoints to more deeply embed real-world problems into their learning. He noted, “the Democrats are gonna say, ‘. . . Wanna go back to good ol’ days when women had basically no rights? When schools were segregated because of the color of your skin? Is that what you’re calling the good ol’ days?’” (classroom observation, August 28, 2012). Andy suggested that political worldviews had negatively affected individuals within various countries. He noted, “Totalitarian states are where individuals lose their ‘rights’” (A. Adams, classroom observation, September 4, 2012).

Andy heated the amber arguments by interjecting racial tensions from previous decades. He said,

It was during this time period that, you know, if you went to a white Christian church—Hey, some people were going over and blowing up, you know, little
black girls in Sunday School that were going to their church who believed in the same God! Does that make sense? (A. Adams, classroom observation, August 28, 2012).

Learning was connected almost universally to some real-world perspective. Andy projected his mantra by stating, “. . . We gotta make this stuff real. Okay?” (A. Adams, classroom observation, August 28, 2012). He engaged students in discussing tough topic discussions. Andy presented the facts by posing at times almost as a court lawyer. The students, as jurors of the classroom, were required to sort through the data and come to a conclusion based on the evidence. Students analyzed how opposing political perspectives stymied an individual’s rights. Then, he paralleled those factors to the students’ experiences.

Always remember this. This is what these far right, far left . . . Both of these things are gonna turn into dictatorships of some type. Complete government control, totalitarian state, military heavily involved, and you lose your what? You lose your rights on both sides (A. Adams, classroom observation, August 28, 2012).

Andy was authentic. He suggested that some students disbelieved his ideologies and curricular accuracy. He purported, “They think Coach Adams is making it up. Do you not see that? . . . They’re playing politics with our future, with your future. Understand? And all of it has to do with your future (A. Adams, classroom observation, August 29, 2012).

He wanted to empower his students to impact their culture through political engagement. He stated, “You guys are gonna be able to vote either in this election or the
next one . . . Your tuition is going through the roof! College costs are going through the roof. And they have a lot to deal with decisions made here and decisions made at the state level. Do you understand that?” (A. Adams, classroom observation, August 28, 2012).

Andy had rationalized the ramifications of the local culture’s influence on the students’ mindsets. The students’ home lives and other influences outside school directly affected the students’ perspectives on reality. The “real-world”, those outside influences, possessed the potential to down-play his deepest goals for the students. Andy faced reality. During the SRI, he purported, “Just because I’m ‘the teacher’ doesn’t fly in 2012, because there may be somebody at home telling ‘em, ‘You know, he’s . . . he’s not really important’. And I have to value that and realize what my students are going through and say, ‘Okay. Why am I gonna go in there and listen to this guy?’ . . . You have to be on your toes 24/7 . . . because they will turn you off (A. Adams, personal communication, September 13, 2012). Andy suggested that in reality, the students were ultimately in control of their own educational destinies based on their personal decisions.

**Minor Theme Two: Real-World Learning – Dana Dunn**

A second minor theme emerged from the data set and suggested that RWL was essential component of effective teaching. During the SRI, I asked Dana, “To what extent would you say your instruction is real-world relevant?” She replied,

I guess, like a lot of teachers, I try to think that . . . that I’m preparing kids for what they’re gonna face in the real world all the way from, you know, making sure that their punctuation and spelling is correct in what they write to giving their best effort (D. Dunn, personal communication, September 17, 2012).
Dana connected collaboration and RWL. The ability to work with another person was viewed as a critical 21st century learning skill and was effectuated in the real world based on the depth of their education. Dana said,

I guess in a roundabout way, that’s trying to explain how I feel about collaboration. I know it’s necessary. I know it’s real-world . . . I know we have to do it for them to be able to develop the skills to do it well (D. Dunn, personal communication, September 17, 2012).

Essentially teachers were responsible for creating RWL rning opportunities that engaged students in using those skills. The teacher’s personal experiences helped students rationalize curricular relevance. During the SRI, Dana stated,

My self-confidence is directly related to how comfortable I feel with what I’m teaching and whether or not I really feel like I know and I’m prepared . . . I have experiences or things that I can bring to the lesson that helps students see why it’s important for them (D. Dunn, personal communication, September 17, 2012).

Dana suggested that a problem existed in that students misunderstood the connection between one’s work ethic and motivation in the classroom and that relationship to job performance in the marketplace. She maintained,

When they turn something in . . . there’s sometimes a disconnect for some students between the importance of doing a good job and being proud of what you do in your school work and how that’s gonna translate to the real world in being proud of what you do every day in your job . . . It . . . doesn’t seem to transfer for them. Now I know that part of it is just a lack of maturity . . . they’re kids (D. Dunn, personal communication, September 17, 2012).
Dana was driven to make her teaching real-world relevant. During the SRI, Dana said,

I spent a day and a half grading essays this weekend . . . I began to get really frustrated because some of the work that was turned in was just so below what I know that they’re capable of . . . I felt that it wasn’t taken seriously enough . . . That final product didn’t really seem to hold enough relevance for them (D. Dunn, personal communication, September 17, 2012).

Dana felt responsible for showing her students the connection between learning and living. This classroom—comprised of four off-white painted block walls—wasn’t just a technical-writing center. It was a place of actuality and real-life events. Mature real-world experience had not yet been manifested, a key factor that most students had yet to fully understand. She believed that understanding another person’s intent was directly related to one’s personal experiences. Dana said,

Sometimes the significance for us might be a little different, because we bring our own experiences into what we read. Sometime if we’ve not had the same experiences as the characters that we’re reading about . . . we miss a little bit of the subtleties maybe of the theme . . . That just changes as we grow and experience life (D. Dunn, classroom observation, August 21, 2012).

Dana effectively translated curricular content through her real-world experiences.

Her forthcoming gall bladder surgery had prompted Dana to search online for quality health supplements. Dana projected the website and asked her students to identify the glaring grammatical errors. Poor punctuation had changed the company’s original intention. She stated that repeated errors lowered her confidence in the company’s credibility. Dana then added, “And I called my son who is a programmer and I said,
‘Eden, please make sure that you check your grammar, because it can cost your company business’” (D. Dunn, classroom observation, August 24, 2012). The notion that individuals lost money because they had failed to master grammar and writing skills seemed very real-world relevant.

**Minor Theme Two: Real-World Learning – Kate King**

A second minor theme reflected that RWL was an essential factor in teaching. “RWL” was coded 13 times as a subcode of NLS. Existing as the largest subcode group in the “learning styles” parent code group, “RWL” emerged as a significant factor.

During her SRI, I asked, “To what extent do you try to make learning physical science connected to the real world that’s beyond the classroom?” Kate responded, “I don’t have a formal approach to it. It’s just any time that we are studying something or talking about something that I could apply to something I think they would be familiar with, I do” (K. King, personal communication, September 12, 2012). Her students had read “The Boy Who Harnessed the Wind”. The book demonstrated real-world application that stemmed from the boy’s education. Kate connected real-world knowledge with learning outside the classroom.

The discovery of chemical elements in the periodic table resulted from the application of scientific learning. She taught that Technetium was created rather than discovered and suggested a real-world connection with the curriculum. Kate explained, “. . . Technetium . . . we’ve never found that one in nature. It probably does occur since everything else, 92 and below, does occur in nature. We’ve just never found it. But everything above 92 is man-made. And we call that ‘synthetic’” (K. King, classroom observation, August 21, 2012).
Kate connected the physical science curriculum with actual scientific world discoveries. She noted that the study of metals was directly linked to the human body’s need for metals. Kate said, “. . . If you look on . . . food products, selenium . . . they’re metals. And . . . iron for your blood. So there are trace metals that we have to have” (K. King, classroom observation, August 21, 2012). Kate suggested, “But all of the rest of those are alkaline metals. They’re not found in nature as elements, because they’re so reactive” (K. King, classroom observation, August 21, 2012). The inability to locate specific scientific components in the environment suggested a counterintuitive connection to the real world. The absence of the alkaline metals validated the importance of the real-world discovery and use of metals in the environment. Iron, silver and gold were functionally used in the students’ daily lives. Iron was required for producing hemoglobin in the human body. Nickel existed as an important component in computers, guitar strings and batteries. Chromium was commonly used in stainless steel products. Kate described the flexible metals as “shiny” and “lustrous” and stated that they were formed into wires (K. King, personal observation, August 21, 2012). This vivid description provided a visual connection to the students’ actual worlds.

One student wondered why chlorine in pool water was not toxicly harmful to humans. She noted, “When it’s dissolved in water, it’s not in the gaseous form. So it’s not harmful . . . But the chlorine, like is in pool water or in water we drink any amount that’s in, there’s not gonna hurt you” (K. King, classroom observation, August 21, 2012). She made learning real and explained that chlorine gas inhalation could damage a human’s lungs. Kate connected the student’s point of interest to the curriculum.
In a seemingly unrelated tangential moment, she authentically answered a student’s personal question about Kate’s required high school required English reading. Kate pointed out, “The worst book I read in my opinion . . . English teachers probably wouldn’t like me saying. But when I was in high school had to read ‘The Sun [Also] Rises’ by Ernest Hemingway. I did not enjoy it. I read it!” (K. King, classroom observation, August 29, 2012). Her commentary evidenced cross-curricular learning and authenticity showed students that all learning may not be enjoyable but it was inherently useful. RWL was further evidenced by assignments that included observing movies that were relevant to learning physical science, reading fictional literature that showed a connection to real living, and general relationships to the human body and its surroundings.

**Minor Theme Two: Thematic Relevance to the Research Questions**

The second minor theme suggested that RWL was an essential component of effective teaching. The first research question determined to understand the attitudes that teachers exhibited regarding the instruction of 21st century learning skills.

**Andy.** “RWL”, a NLS component, was the single strongest factor in the total subcode database and emerged 83 times. “21st century learning” skills ranked as the second largest parent code group. The RWL theme was very strongly relevant to the first research question.

**Dana.** “RWL” occurred 10 times as a NLS factor. “21st century learning” skills was the most predominant parent code group in Dana’s code sets. Therefore, the RWL theme was very strongly relevant to the first research question.
Kate. The “RWL” subcode occurred 13 times in the NLS codes. “21st century learning” skills was the second predominant parent code group in Kate’s code data. As a result, the RWL theme was strongly relevant to the first research question for Kate. The second minor theme was very highly pertinent to the first research question.

The second minor theme stated that RWL was an essential factor in teaching. The second research question determined to understand the extent to which teachers sought to engage students in creativity and innovation.

Andy. “RWL”, a NLS component, was the single strongest factor in the total subcode database and emerged 83 times. “21st century learning” skills ranked as the second largest parent code group. Although “creativity and innovation” were coded a minimal number of times, it was suggested that Andy constructed a foundation during the observations for implementing creative and innovative ways of learning in the future. The RWL theme was relevant to the first research question for Andy.

Dana. The “RWL” factor was the most predominant subcode group in NLS. Although “LS” ranked fourth in the parent code groups, the RWL factor was one of the most often occurring subcode groups within the total subcode data. The “creativity and innovation” skills development comprised approximately 20% of Dana’s “21st century learning” subcode set and was coded 10 times. Therefore, the RWL theme was very strongly relevant to the first research question.

Kate. The “RWL” subcode comprised one-third of the “LS” data. “Creativity and innovation” skills emerged 10 times in Kate’s code data. As a result, the RWL theme was highly relevant to the first research question for Kate. The second minor theme was very highly pertinent to the second research question.
The second minor theme stated that RWL was an essential component of effective teaching. The third research question sought to know the degree that teachers NLS.

**Andy.** “RWL”, a NLS component, was the single strongest factor in the total subcode database and emerged 83 times. This was potentially Andy’s strongest connection between the four minor themes and the four research questions.

**Dana.** The “RWL” factor was the most predominant subcode group in NLS. Although “LS” was the fourth ranking parent code group, the “RWL” codes occurred often in the total subcode set. The NLS subcodes comprised nearly two-thirds of the LS category. The data suggested that RWL and NLS were strongly connected for Dana.

**Kate.** The “RWL” subcode represented one-third of the “LS” data and the NLS comprised nearly two-thirds of the LS category. The LS parent category ranked fourth. The “RWL” subcode group emerged moderately often across the total subcodes.

The second minor theme was very highly pertinent to the third research question. The second minor theme was stated that RWL was an essential factor in teaching as shown in Table 7. The fourth research question sought to know how the participants measured their own self-efficacy in teaching 21st century learning skills within the core curriculum.

**Andy.** “RWL” was the single strongest factor in Andy’s total subcode database. The “21st century learning” parent code group was the second ranking code group. The data suggested that Andy’s attitude towards teaching “21st century learning skills” development was very strong.

**Dana.** The “RWL” factor was the most predominant subcode group in NLS. Although “LS” was the fourth ranking parent code group, the “RWL” codes occurred
often in the total subcode set. The “21st century learning” parent code group was Dana’s highest ranking parent code group and suggested that Dana possessed a strong self-efficacy towards instruction 21st century learning skills within the core curriculum.

**Kate.** The NLS comprised almost two-thirds of the LS category. The LS parent category ranked fourth. The “real-world learning” represented one-third of the “learning styles” data. The “21st century learning” parent code group was Kate’s second highest ranking parent code group. The data suggested that a Kate reflected a moderately strong sense of self-efficacy towards “21st century learning” skills instruction. The second minor theme was very highly pertinent to the fourth research question.

Table 7

*Real-world learning*

<table>
<thead>
<tr>
<th>Subcodes</th>
<th>Andy Adams</th>
<th>Dana Dunn</th>
<th>Kate King</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real-world learning</td>
<td>83</td>
<td>11</td>
<td>13</td>
</tr>
</tbody>
</table>

The data reflects each participant’s instruction regarding real-world learning.

**Minor Theme Three: Brain-Compatible Learning – Andy Adams**

The third minor theme reflected that brain-compatible learning was an important factor in teaching. Recent research neuroscience research and brain-compatible learning research gained significant attention in the literature in recent years (Allen, 2008). The neuroscience research suggested that strengthening the nerve impulses and synapses for forming neural circuitry over a course of time aided in memory retention and critical thinking (Freeberg, 2006; Garrett, 2008). Rigor and repetition strengthened the neural circuitry for long-term memory. Memorization and mastery learning factor (Garrett, 2009; Freeberg, 2006) codes were notated as “brain-compatible learning”. Brain-
compatible learning was well-documented in the literature (Jensen, 2008; Laster, 2008; Tate, 2010; Zull, 2010), but it was not evidenced without its neuroscience challengers (Alferink & Farmer-Dougan, 2010). Some were opposed to linking instructional practices with a baseline, elementary understanding of neuroscience and suggested that the educational community had operated on misguided advice based on incorrect understandings of how the brain actually worked. Instructional practices were supposedly constructed on a nominal understanding of the brain’s anatomical structures. Some suggested that instructional practices were primarily derived from brain scan images (Alferink & Farmer-Dougan, 2010).

Jensen (2007) defined brain-compatible learning as knowledge and instruction founded upon what had been learned directly from neuroscience. Conversely, instructional application derived from that understanding constituted brain-compatible instruction. Zull (2010), a neuroscience researcher, suggested that the human brain formed synapses in various ways. Synaptic firing occurred in one of two effective ways, i.e., analogies or metaphors. These ideas correlated to the concept of designing brain-compatible learning environments (Partnership for 21st century skills, 2007; Shaheen, 2010). Tate (2010) noted a dozen characteristics of brain-compatible learning environments that coincided with an effective use of cognitive LS. These characteristics were derived from over 200 pieces of brain-compatible learning strategies research (M. Tate, personal communication, November 14, 2012).

In light of the continued neuroscience debate, I analyzed the data set based on general evidence that was derived from a broad-based spectrum of brain-compatible learning. In an effort to bring balance to this case study, I centered the data analysis on
the areas where neuroscience concurred with educational best practices.

“Brain-compatible learning” was Andy’s third most common theme. This code appeared 36 times in the data analysis. Uniquely, the data set ranked third and supported the concept that brain-compatible learning was an important factor in learning. During the SRI, I stated, “You often asked questions of your students that emphasized understanding the ‘purpose’ and ‘why’ things happen. Help me understand your goals with that”. Andy replied, “That’s why I want the critical thinking . . . and the creativity. I wanna know ‘why’. I want their brains to click on a different level” (A. Adams, personal communication, September 13, 2012). Andy wanted his students to engage in brain-compatible learning that resulted in higher order thinking skill development.

The data collected during Andy’s observations was comprised of brain-compatible traits and factors (Tate, 2010). Four specific traits were predominant in the code sets:

- knowing the purpose and objective;
- storytelling;
- humor and smiling; and,
- cooperative groups

**Knowing the purpose and objective.** This subcode occurred five times in the data set. During an observation, Andy stated,

The reason we need to know this thing is because . . . it ties into the economics of things. The number one issue that will be voted on in this presidential election will be the economy, because the economy is in bad shape right now (A. Adams, classroom observation, August 22, 2012).
**Storytelling.** On more than one occasion he used storytelling to deepen the students’ understanding. Andy stated,

My granddaddy is probably in-between a Republican and this. I’m not telling you what I am, but I remember he used to tell me all these things, you know. You say, ‘Yes, sir’ and ‘No, sir’. You take your hat off in the building . . . If you sat down at the dinner table with a hat on, you took your hat off. That comes out of that Southern idea, you know, showing respect . . . When you say the pledge of allegiance, you do what? Do you keep walking or do you stop? You stop. You say the pledge of allegiance. You live in a little town that’s very conservative. Understand? (A. Adams, classroom observation, August 28, 2012).

In an effort to clarify his position, Andy used storytelling to create a fictional account of a local event. He said,

What do you do when you ride by somebody’s house and their grass is all nice and neat and everything? What happens? ‘Boy! That must be a goof up. Look how he keeps his grass’. Um, you know, he could be a serial killer. But you ride by . . . look at (his) nice yard. And you could ride by, you know, St. Peter’s yard, and it could be all grown up. And you’re like, ‘Look at that scum bag. He doesn’t even cut his grass’. Is that right or wrong? But does that happen? Yeah. We do it all the time. We have preconceived notions. You gotta get this. This sells! (A. Adams, classroom observation, August 28, 2012).

**Humor.** Humor and smiling were identified in the literature as brain-compatible learning factors (Tate, 2010). Andy created a fictitious, humorous story that potentially reverberated with some of the female students in the classroom. His storytelling was
designed to invoke cognitive engagement. He stated,

Prince Charming is walking down the hall. He’s the best thing you’ve ever seen in your whole life! Okay? Woo-wee! Matter of fact, don’t do that, ladies. Okay? But anyway, he’s walking down the hall and you say, ‘Why get an education? I’m just gonna marry him, because I believe in . . . hey, my husband’s going to work. And I’m gonna stay home. And I’m gonna raise bambinos. And everything’s gonna be wonderful! And he’s gonna be a good man’ (A. Adams, classroom observation, August 28, 2012).

Andy maintained guidelines that helped to define the learning culture. He incorporated humor as a means of engaging students in effective learning. Andy teetered on the edge of his student’s perceptions of cultural understanding. His humor was potentially misunderstood, misconstrued or minded correctly by his students. In an ironic manner, not intended to be taken literally, Andy stated,

I’ve never killed anyone. Okay? Here’s the other thing. The teacher is not always right . . . And you gotta get comfortable to do that. You’re not all the way used to me yet, but look. Do it. Don’t sit there and blindly accept and say, “Well, hey, I guess he’s right. He’s the teacher” (classroom observation, August 22, 2012).

In an effort to regain social balance with his students, Andy humorously suggested that a discussion should move forward. He said, “. . . Let’s go on. Let’s just have a good day. We’ll get to eat breakfast. All right? Make sure right there, you question me. And then, we’ll talk about it (A. Adams, classroom observation, August 22, 2012). He implied that offenses he had caused were to be corrected by eating a meal with his students. By
fostering a positive environment, relationships were to be rekindled. His suggestion was probably intended to be figurative versus realistic. Such interjections possibly confused some students. Research supported the notion that sarcasm was not a brain-compatible learning trait. It had “the exact opposite effect on the brains of students” and hindered higher-order cognition (Tate, 2010).

**Cooperative groups.** Andy engaged students in other brain-compatible learning strategies like forming cooperative learning groups and discussing the content. He said,

> Get with two or three people, no more than three . . . Go back to the front of your notes . . . read your notes to each other. Quiz each other right quick . . . I wanna see you talking to each other groups of three or two . . . preferably two . . . I want you to go over the notes you got right there . . . Make sure you’re talking! (A. Adams, classroom observation, August 28, 2012).

Andy sought to create a brain-compatible learning environment where his students felt safe and unthreatened (Jensen, 2008). He wanted students engaged in deep cognitive thinking, regardless of his daunting size and intimidating façade. Andy was not offended when students corrected him because he was wrong. The school year was young and the Socratic learning ethos was undeveloped. Drawing from previous experiences, Andy wanted his students to be knowledgeable and confident enough to challenge and debate him. Furthermore, Andy wanted his students to use brain-compatible strategies to make quality decisions. He stated, “. . . It’s not my job to decide. It’s my job to educate you so you can make a decision. Okay? ‘Cause it is extremely important” (A. Adams, classroom observation, August 28, 2012). He offered, “You can disagree with me . . . I want you to disagree with me. That’s fine. And I’m not gonna get mad at you” (A.
Storytelling. Storytelling was used as a brain-compatible learning centerpiece in the classroom. Andy interjected a story about Adolph Hitler’s political power. He said, “Hitler’s most powerful thing. When did he talk to ‘em? When Germany was doing well economically or bad economically? They did it when they were terrible economically” (A. Adams, classroom observation, August 28. 2012).

During the Republic National Convention, he delineated the Republican Party’s viewpoints. Andy connected learning to history by telling stories. He stated, “My granddaddy is probably in between a Republican and this. I’m not telling you what I am. But, I remember he used to tell me all these things, you know” (A. Adams, classroom observation, August 28, 2012). Storytelling was incorporated as an instructional tool to help students comprehend diverse and challenging curricular concepts.

Minor Theme Three: Brain-Compatible Learning – Dana Dunn

The third minor theme noted that brain-compatible learning was an important factor in teaching. Dana often used brain-compatible learning strategies. Specifically, Dana used four main brain-compatible learning factors.

Brain-compatible learning. Four specific types of brain-compatible factors were coded under “brain-compatible learning”. These factors were:

- knowing the purpose and objective;
- humor and smiling;
- positive and high expectations; and,
- high challenge and low stress.
Knowing the purpose. When students understood the purpose and objectives for learning, their brains were more fully engaged in the learning process (Tate, 2010).

During the SRI, I wanted to understand more about this concept. I said, “You discuss ‘test-taking strategies’ in this clip. Help me understand the take away for the students”. Dana explained,

That is a specific practice for the A. P. exam, and there are test-taking strategies that will help them do better on the test. And if they understand why a right answer is the right answer, why their answer was the incorrect answer, then they come closer to be able to analyze the questions themselves (D. Dunn, personal communication, September 17, 2012).

When students understood the purpose for their learning, they were more highly motivated to engage in learning (Sousa, 2011).

Humor and smiling. Second, students’ minds were more engaged in learning when humor was incorporated in the learning process. During a jovial moment, Dana stated, “Oh, I have a fun one today! I think you’ll like it. If you haven’t already read it, just wait”. Later in the observation Dana added, “I’m so happy to see that all of you happy well-adjusted lives. None of you have had terrible dysfunctional relationships obviously. Very good (D. Dunn, classroom observation, August 24, 2012). She highly engaged her students in learning by incorporating a humorous grammatical error. Dana connected spelling and punctuation skills to a billboard advertisement that she projected on the Promethean board. It read, ‘Ho made soup’. As the students laughed heartily, Dana remarked, “I think they wanted us to know that was ‘homemade’ soup. But you see
what happens when you leave out these little details” (D. Dunn, classroom observation, August 24, 2012).

Dana projected a “Dear John” letter and asked the students to punctuate it. After a few moments, she presented two punctuation styles that clearly presented opposing viewpoints. The students were highly engaged as demonstrated by their hilarious responses to the punctuations. Dana set up the moments as follows:

I’m so happy to see that all of you happy well-adjusted lives. None of you . . . that none of you have had terrible dysfunctional relationships obviously. Very good. So this is the way most of you responded, pretty closely. ‘Dear John, I want a man who knows what love is all about. You are generous, kind, thoughtful. People who are not like you admit to being useless and inferior. You have ruined me for other men. I yearn for you. I have no feelings whatsoever when we’re apart. I can be forever happy. Will you let me be yours? And it was just signed simply, Jane’ (D. Dunn, classroom observation, August 24, 2012).

Dana used humor to effectively engage her students in learning. She continued,

But look at the difference the punctuation marks make. ‘Dear John, I want a man who knows what love is. All about you are generous, kind, thoughtful people who are not like you. Admit to being useless and inferior. You have ruined me. For other men I yearn. For you I have no feelings whatsoever. When we’re apart I can be forever happy. Will you let me be? Yours, Jane’ (D. Dunn, classroom observation, August 24, 2012).
I wanted to more fully understand Dana’s perspective on employing humor during her instruction. During the SRI, I asked, “Why do you incorporate humor into your instruction?” She replied,

Well, for me humor is a matter of survival. You know, the job that we do is difficult. There is a huge amount of responsibility . . . and accountability. And just in my personal life and in my professional life, I try to use an appropriate sense of humor (D. Dunn, personal communication, September 17, 2012).

**Positive and high expectations.** Dana engaged her students in brain-compatible learning by placing “positive and high expectations” on her students. The data reflected that this code was closely connected to “accountability and responsibility” in learning, which was an “assessment” parent code. Reflecting on the A. P. class, Dana noted that her students needed positive reinforcement whenever they attempted to understand literary master works.

With . . . great literary works and with literary works that are more appropriate to an A. P. setting . . . will come subjects and themes . . . that are more mature . . . and more complex. And many times students might not actually get it, because they haven’t had those experiences. And I wanted them to realize that (D. Dunn, personal communication, September 17, 2012).

**High challenge and low stress.** Fourth, Dana presented high challenge with low stress levels. She offered her students opportunities to engage in high level learning without the pressure of being graded on the exercises. She stated, “Well, we need to start looking for those errors before we turn in those essays. So, this is to help you find those mistakes!” (D. Dunn, classroom observation, August 24, 2012). This gesture helped
students to learn the necessary skills and to identify errors without receiving a lower assignment grade.

**Minor Theme Three: Brain-Compatible Learning – Kate King**

The third minor theme reflected that brain-compatible learning was an important factor in teaching. “Brain-compatible learning” was coded 33 times in Kate’s data set as a subset of “learning culture”. In this case study, the “brain-compatible learning” subset was coded 11 times more than the “learning environment” subset. Four important brain-compatible learning factors were identified:

- positive and high expectations;
- humor and smiling;
- ritual and novelty; and,
- knowing the purpose.

**Positive and high expectations.** Effective brain-compatible teaching practices emerged during the observations through teacher-facilitated learning. Kate consistently required her students to perform at a high level while she simultaneously remained positive. The physical science students were typically ninth graders, the youngest students at WHS. When students struggled to answer questions correctly, Kate helped them to successfully provide proper answers. Kate politely offered a question. She asked, “What are the three criteria it’s asking you for in that question? What are the criteria? You’re right. But you’re saying more than you need to” (K. King, classroom observation, August 21, 2012). When a student had an unusually difficult time, Kate politely prompted him. After a lengthy period of assisting another student to work an equation at the whiteboard, Kate only offered gentle, kind words. She stated, “Very
close. Good job!” (K. King, classroom observation, August 29, 2012). Students applauded. Kate disallowed the student to make self-defacing remarks. She suggested, “You had it correct . . . correct on your paper. You just didn’t write it up on the board correctly. No you’re not. It’s not allowed. All right” (K. King, classroom observation, September 7, 2012).

Kate managed the students’ behaviors in a nearly effortless way. Kate easily communicated the content and confidently provided answers and test-taking techniques designed to increase test scores. She wasted few seconds, especially between activities. Kate often used positive prompts, during which her vocal tone was atypically inviting and mildly pleasant. Her tempo was quite rapid and indicated high expectations for student learning. During a memorable transition, she provided clear directions then paused. In midstream, she said, “I’ll wait ‘til you finish putting things away. Finish quickly” (K. King, classroom observation, August 29, 2012). Her demeanor and vocal tone suggested that her comments were important for the students to hear. She pleasantly redirected the students.

Although it was still the first month of school, her expectations seemed to be firmly grounded and understood by her students. Kate was consistent as day and night as were her expectations and poise. This master teacher knew how to communicate her demands for self-discipline and structure in a most positive and inviting way. Kate used diffusers on several occasions to redirect her students’ behaviors. She asserted, “Raise your hand if you’d like to answer” (K. King, classroom observation, August 29, 2012).

It was crucial to hear Kate’s vocal tone so as not to assume her persona. Kate seemed to proactively design in real time how a specific dialogue would work. Her vocal
tone was firm and inviting, but not degrading. Kate did not complain to her students about their interrupting her teaching. Rather, Kate thought critically and proactively how she wanted her students to behave. She told them how to perform and guided them into a positive learning environment. Emphasizing the aspirates, she hurled three words, “Hush. Hush. Hush” in rapid-fire style. In a pleasant tone she suggested, “Be nice” (K. King, classroom observation, August 29, 2012). Lastly, she ended the moment by saying, “Pay attention”. The overriding goal was to effectuate learning. By setting a positive and sometimes humorous tone at times, Kate created an ethos that was conducive for joyful learning. She mastered the ability to set the tone for her students and reminded them to follow similar protocol.

During a transition, Kate addressed her student talking. She stated, “Having a rash of whispering while I’m talking. Any questions?” (K. King, classroom observation, August 29, 2012). She turned a potentially negative moment into a positive situation by suggesting that the whispering was centered on the curricular content. Once, Kate overtly led her students in clapping for a student’s accomplishments. Kate’s elevated hands that were positioned just in front of her chin prompted the students’ applause. She demonstrated high value for the student’s effort and knowledge. Conversely, Kate also offered a round of applause for those students who struggled. She asserted, “Dale had a hard time writing that up there. But, she knows how to do it. All right. Let’s give everyone who volunteered today a round of applause!” (K. King, classroom observation, September 7, 2012).

**Humor and smiling.** Kate innately understood the power of positivity. She demonstrated this factor by smiling and being appropriately humorous. Her positive
demeanor was highlighted with an effervescent authentic smile on most occasions. During the SRI, Kate stated, “I think humor is a very, very, very important tool. I always have . . . It gets your students’ attention. It makes them listen to you, because they don’t know what you might say next…” (K. King, personal communication, September 12, 2012). Sousa (2011) determined that the human brain produced endorphins in response to positive learning. Kate found ways to lightly chuckle or to simply offer a reassuring smile. She maintained a learning atmosphere bounded by seriousness, yet encased in humor and an airy lightness that seemed to lift one’s spirit.

Kate added, “It gives a safe environment as long as the humor, of course, is good clean humor and it’s not . . . insulting to anyone. And I just think it makes for a good happy environment in general, not just a learning environment . . .” (K. King, personal communication, September 12, 2012). The safe environment included the sense that students felt safe and provided answers without being ridiculed by others. She noted, “And I don’t let other students comment if they make what they think is a ‘not good answer’” (personal communication, September 12, 2012). Research suggested that smiling or laughing increased neurotransmission and caused the brain to engage in higher-order thinking and facilitated learning (Jensen, 2007; Allen, 2008).

One humorous and unforgettable moment happened during a hangman game. Students were determining periodic table words by guessing the next letter in the sequence. The word “potassium” was being spelled letter by letter. As fate would have it, the first two letters chosen were “A” and “S”. Realizing that the word “ass” would appear on the screen, Kate determined to be humorous so that her students would not be offended. She hesitated. Then she stated with a smile, “Y’all don’t laugh”. After a brief
pause, the word “ass” appeared on the Promethean board for all to see. Kate smiled very big and the students laughed effervescently. Soon the completed word emerged as the students guessed the remaining letters. Her humorous approach to the situation was designed to help them yearn to learn even more.

During a lecture, Kate apparently inhaled a bug. She calmly said, “I think I just inhaled a bug. Yes . . . may have swallowed it . . . I think I did actually. I may have to go outside here in a second . . .” (K. King, classroom observation, August 23, 2012). Kate’s calmness kept the students under control. She suggested that swallowing bugs was somewhat a normal protocol for humans. She noted, “That’s okay. We all swallow lots of bugs in our lifetime!” (K. King, classroom observation, August 23, 2012). The mere suggestion that every student had ingested various type bugs seemed to invoke a powerful response, especially from the female students. By stressing the word “all”, she implied that each student had been and would be futuristic bug recipients during their lives. Kate seemed to enjoy using humor as a way of normalizing the audience and bringing relevance to their learning. She made learning fun but not trivial.

**Ritual and novelty.** Novel learning components contained unusual or unfamiliar experience. New learning opportunities were considered novel only when students were engaged in the learning process (Sternberg & Lubart, 1999). Ascertaining novel learning experiences was problematic. According to Costa (2008), humor encouraged one’s personal creativity and higher-level thinking skills, like thinking with expectations about novel situations. Without knowing the students’ previous learning experiences, I was challenged to know whether specific experiences were novel to some students or to none of the students. The data were coded when the instructional practices suggested that Kate
believed she had engaged students in novel learning experiences. Kate intentionally defined classroom management protocols and instructional expectations. Students excelled in an environment with rituals and standard methods of operation.

I wanted to understand how Kate viewed technology use in relation to learning. Her responses correlated specifically to novelty, a brain-compatible learning component. As stated in her survey, she felt less than confident using technology during instruction. Kate said, “I often tell my students, ‘I am technologically backward’. I am comfortable with the internet, DVDs, video tapes, and the occasional game. I am nowhere near where I need to be with the use of technology in my classroom” (K. King, personal observation, September 12, 2012). During the SRI, I asked Kate to specifically address how she used technology. She viewed technology implementation as a novel privilege versus a ritualistic constant in the learning environment. Kate suggested that her students preferred learning with technology on a few occasions, rather than using it every day. Kate explained,

But I think with my class relying on it too much, they would . . . it would just become old hat. And they would rather not do it . . . I think it engages them pretty well to do something like this every so often. And then, they get to where they come in and say, ‘Can we play hangman today?’ (K. King, personal observation, September 12, 2012).

The interactive game required a few seconds to download between the different hangman games. Despite having a single computer in the classroom, neither Kate nor the students seemed to be frustrated with having just one computer. Rather, this whole group ritual appeared to be standard protocol in a type of family-style gathering. Kate’s ability to
convince her students to view learning from her perspective suggested that she had powerful persuasive abilities. These neomillennial learners, a technologically-driven group of students (Wagner, 2008), appeared content to learn without digital devices – except the one computer and Promethean projector.

This study did not seek to gain understanding from the students’ perspectives. Kate managed to engage learners in a whole-group online game with minimal behavioral issues or student complaints during the observation period. This factor must be attributed to Kate’s effective managerial skills. She believed that an occasional whole-class participation in an online game was a novel experience. Based on her teaching experiences, Kate maintained, “I think it engages them pretty well to do something like this every so often” (K. King, personal communication, September 12, 2012).

**Knowing the purpose.** Kate wanted her students to succeed in learning. This notion appeared as a predominant overarching instructional goal. Kate communicated learning goals through the learning environment, a daily agenda and her demeanor. At no point in the data set did a student ask “why” they were learning specific concepts. Kate provided a rationale for learning in a variety of ways. She showed them the reasons, the “why”, for knowing the content. Namely, students were held responsible for demonstrating their understanding of the content.

The students understood that Kate could ask them at any time to explain or to demonstrate their understanding. This occurred in the forms of public discourse or open writing at the whiteboard. She presented the serious and eerie idea that any student could be called to the head of the class and be held academically accountable before his fellow
constituents. With eyebrows raised, she slowly stated, “Be kind. ‘Cause next time, it’ll be . . . you!” (K. King, classroom observation, September 7, 2012).

Kate defined the learning environment as a place of great importance. She insinuated that nothing should take precedence over learning physical science, at least when they were in her class. Her relentless efforts to engage students spoke loudly. Learning was to occur from bell to bell. Following the resonating tardy bell’s tintinnabulation, with near immediacy Kate trumpeted,

Today we’re going to practice naming. Naming is easy for ionic compounds, because as you just figured out it’s the exact same as it was for covalent that you did yesterday and that you did for your homework. Except you’re not doing what? (K. King, classroom observation, August 29, 2012).

Kate implied that high achievement was expected. Deep learning was the norm. Her ability to implicitly and explicitly control learning in her classroom specified reasons and purposes for gaining knowledge. In Kate’s classroom, few extraneous activities survived or subsisted other than those that involved learning.

**Minor Theme Three: Thematic relevance to the research questions.**

The third minor theme reflected that brain-compatible learning was an important factor in teaching. The first research question determined to understand the attitudes that teachers exhibited regarding the instruction of 21st century learning skills.

**Andy.** Andy’s second most prominent code in the “learning culture” code set was “brain-compatible learning” with 36 coded segments. This constituted approximately fifty percent of the “learning culture” parent code. Andy stated, “You gotta educate thy brain!” (A. Adams, classroom observation, August 29, 2012). Andy’s second most
prominent code was “21st century learning”. In the pre-observation survey, Andy confirmed his confidence about teaching engaged learning in a 21st century participatory environment. Codes for “critical thinking” comprised nearly 70% of the subcodes.

**Dana.** Dana’s third most commonly occurring code was the area of “learning culture” and was comprised of “brain compatibility” and “learning environment” codes. Dana’s number one ranking code set was 21st century learning. During the SRI, Dana said that she taught test-taking and problem-solving skills. Both skills were pertinent to the third minor theme.

**Kate.** “Brain-compatible learning” was coded 33 times as part of “learning culture”. The “brain-compatible learning” comprised approximately sixty percent of the “learning culture” data set. Kate’s second ranking parent code group was “21st century learning”. Based on the data set, the third minor theme was highly relevant to the first research question. This code appeared nine times in the data set. Kate expressed concern about her ability to teach creativity skills. She stated, “I don’t feel that I’m horribly creative. But, other people tell me I am” (K. King, personal communication, September 12, 2012).

The third minor theme noted that brain-compatible learning was an important factor in teaching. The data confirmed the minor theme. The second research question determined to understand the extent to which teachers sought to engage students in creativity and innovation.

**Andy.** Andy’s second most prominent code in the “learning culture” code set was “brain-compatible learning” with 36 coded segments. This constituted approximately fifty percent of the “learning culture” parent code. Andy suggested that creativity was a
learning environment factor. Creativity occurred when students felt safe and secure. He stated, “You have to have some faith in that teacher before I think you get creative, because you’re taking a risk” (A. Adams, personal communication, September 13, 2012). The creativity factor was emergent.

**Dana.** Dana’s third most commonly occurring code was the area of “learning culture” and was comprised of “brain compatibility” and “learning environment” codes. Dana suggested that creativity was a way of expressing one’s perceptions about things that were meaningful and were formatted in significant ways (D. Dunn, personal communication, September 17, 2012). Creativity codes comprised about twenty percent of Dana’s “21st century learning” data set.

**Kate.** The “brain-compatible learning” comprised approximately sixty percent of Kate’s “learning culture” data set. Kate suggested that she and her students needed to develop greater creativity and innovation in her classroom. The third minor theme was significantly pertinent to the second research question.

The third minor theme suggested that brain-compatible learning was an important factor in teaching as shown in Table 8. The data reflected the minor theme. The third research question sought to know the degree that teachers implemented NLS.

**Andy.** Andy’s second most prominent code in the “learning culture” code set was “brain-compatible learning” with 36 coded segments. Approximately eighty-three percent of LS codes were derived from NLS factors. This reflected NLS’s significance.

**Dana.** Dana’s third most commonly occurring code was the area of “learning culture”. It was comprised of “brain compatibility” and “learning environment” codes. Over fifty percent of Dana’s LS factors emerged from NLS codes.
Kate. The “brain-compatible learning” comprised sixty percent of Kate’s “learning culture” data set and was a significant factor. Approximately two-thirds of the LS factors were derived from NLS codes. The third minor theme was very highly pertinent across all three participants to the third research question.

The third minor theme was reflected that brain-compatible learning was an important factor in teaching. The fourth research question sought to know how the participants measured their own self-efficacy in teaching 21st century learning skills within the core curriculum.

Andy. Andy’s second most prominent code in the “learning culture” code set was “brain-compatible learning” and formulated approximately fifty percent of the “learning culture” parent code. Andy measured his self-efficacy in teaching 21st century learning skills within the core curriculum through the EOCT scores, student engagement and real-world relevance.

Dana. Dana’s third most commonly occurring code was the area of “learning culture” and was comprised of “brain compatibility” and “learning environment” codes. Twenty-first century learning skills ranked as Dana’s number one parent code. Specifically, Dana instructed her students to be innovative and creative, to access and analyze information, and to use curiosity and imagination. These three factors were coded in nearly equal amounts.

Kate. The “brain-compatible learning” comprised approximately sixty percent of Kate’s “learning culture” data set. The “21st century learning” parent code ranked second and highlighted factors like thinking critically and communicating. The “brain-
compatible learning” factors were more predominant than the “critical thinking” factors.

The third minor theme was very highly pertinent to the fourth research question.

Table 8

*Brain-compatible learning*

<table>
<thead>
<tr>
<th>Subcodes</th>
<th>Andy Adams</th>
<th>Dana Dunn</th>
<th>Kate King</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperative groups</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Games</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>High challenge/low stress</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Humor</td>
<td>2</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Positive expectations</td>
<td>33</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Purpose</td>
<td>14</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Ritual/Novelty</td>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Role Playing</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Storytelling</td>
<td>9</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The data reflects each participant’s instruction regarding brain-compatible learning.
Minor Theme Four: Deep Understanding – Andy Adams

A fourth minor theme emerged from the data set and suggested that deep understanding was a key component in learning praxis. The code “understanding” was presented and discussed earlier. It appeared 30 times as a subcode of “assessment”. Two key factors were evidenced. Understanding the curriculum deeply allowed students to not only pass the test but to reach peak levels on the EOCT. Knowledge must be applicable to real-world and actual life experiences outside the classroom. Andy asserted,

What we’ll do is we’ll do that a million times. We will not forget that.

Everything we do in here is we build on, take this scaffold, and continue to do over and over again. We don’t leave something. We just leave it for a little bit and come right back to it . . . Make sure you understand what’s going on. All right? (A. Adams, classroom observation, August 22, 2012).

The research literature suggested that students should learn the curricular content deeply as evidenced by standards and assessments (Drouin, 2010; Silva, 2009). According to Andy, responsible learners would demonstrate their knowledge as citizens. He exclaimed,

It’s your obligation! . . . You can’t blame the politicians if we don’t know how they got there, because it’s our responsibility to be an educated electorate and to, you know, put these people in there to make the best decisions. Do you think this is good? Do you think it is bad? Uh, would you vote for this stuff again? So that’s what I’m trying to do (A. Adams, personal communication, September 13, 2012).
Andy held students personally accountable for deep learning. During one observation he proclaimed, “Make sure you have the notes . . . I want you paying attention to everything that goes on” (A. Adams, classroom observation, August 29, 2012). Each student was expected to take responsibility for becoming an educated person. He stated, “You gotta educate thy brain! . . . An uneducated electorate, all right, leads to the downfall of our complete democratic system . . . We cannot be uneducated and have a democracy” (A. Adams, classroom observation, August 29, 2012).

Andy encouraged his students to comprehend, analyze and synthesize the curricular concepts on a profound level versus a cursory level. He formatively quizzed his students. He queried, “You understand why you got it wrong?” (A. Adams, classroom observation, August 22, 2012). Andy astutely asserted, “And I’m begging you not to just pass a test, but to be able to walk out of here and say, ‘This is why I support this candidate’” (A. Adams, classroom observation, August 22, 2012).

The synchronous nature of testing and assessments was designed to help students. By gaining a deep understanding of the curriculum, students were positioned to perform well on all types of assessments. Andy protected his students from events that he could monitor and control, so that they could acquire the depth of learning he desired. He believed that assessments very most important. On several occasions, he paced the room during a quiz. I asked Andy during the SRI to explain his pacing behaviors. He highlighted the notion that broad-based learning was essential to comprehending issues that extended past the required curriculum. He stated that he felt passionate about learning and why shallow understanding led to faulty conclusions in the real world. He wanted his students to have a thorough understanding of problems and issues that they
would find in life such as the power of electing the next President of the United States of America. Andy proclaimed, “You have got to understand this!” (A. Adams, classroom observation, August 29, 2012).

Andy reiterated the curriculum’s real-world relevance by saying, “. . . This is something that affects you . . . You got to wrap your brain around it, and understand what goes on. This will greatly affect your life!” (A. Adams, classroom observation, September 4, 2012). He showed how current local and national issues were centric to the students’ holistic educational pursuits. Solid decision-making skills were to be developed and evidenced by deeply understanding the underlying issues. He hoped that students viewed consequences as the result of making good or bad decisions.

**Understanding.** The code “understanding” was a subcode of the parent code “assessment” and appeared 30 times in the data set. Andy sought to help his students understand the curricular content so that they could successfully pass the EOCT. Furthermore, he wanted to teach real-world application. He purported that his students would have multiple opportunities to acquire the required knowledge through scaffolding (Vygotsky, 1978). Andy stated,

> What we’ll do is we’ll do that a million times. We will not forget that. Everything we do in here is we build on, take this scaffold, and continue to do over and over again. We don’t leave something, we just leave it for a little bit and come right back to it . . . Make sure you understand what’s going on. All right? (A. Adams, classroom observation, August 22, 2012).

Students were diverse. They learned at different speeds and at various levels. Andy wanted to know what his students comprehended and where they needed help. He
asked, “How many of you guys have it right? Okay. You understand why you got it wrong?” (A. Adams, classroom observation, August 22, 2012). Andy wanted is students to learn deeply versus superficially. In a near militaristic fashion, Andy implored,

And I’m begging you not to just pass a test, but to be able to walk out of here and say, ‘I’m gonna vote for this candidate because of these economic reasons or this economic reason. This is why I support this candidate’ (A. Adams, classroom observation, August 22, 2012).

From Andy’s perspective, assessing and testing worked in synchrony. Students needed deep understanding in order to perform well on the forthcoming quizzes, tests and EOCT.

Andy monitored the learning environment. He paced the room during quizzes. I asked Andy during the SRI to explain his pacing behaviors. He stated,

The message I’m sending here is ‘I wanna make sure that we’re on task . . . I wanna get finished, you know, within a certain time frame and with understanding’. And then, ‘Everything that we’re doing is important’. And I don’t wanna make it seem like, you know, ‘This is not a big deal. It’s just a quiz’. I don’t want anybody to be distracted. I don’t want another student to stop and talk with another student. So I have to be, you know, kinda prowling to use ‘the lion’ (A. Adams, personal communication, September 13, 2012).

Andy deeply believed that the curriculum could be life-changing for those students who wanted to learn. He accentuated the fact that learning content was broad-based and required knowledge acquisition that surpassed the required state curriculum mandates. He proclaimed,
I get passionate about these things, ‘cause I want you to learn it. And, also we’re gonna go it over; but you’ve gotta have it explained. Show me where it is in a book right there that you can explain it . . . Do you think it’s back there? Half this stuff right here . . . You are a regular economics class, and we’re going over stuff that most people say, “You shouldn’t go over” (A. Adams, classroom observation, September 4, 2012).

Andy suggested that the shallow understanding of the curriculum could be misleading and cause students to have misconstrued viewpoints. Andy said,

> It is important that . . . I pour myself out to you so you can make sure you understand it . . . If you don’t believe me that people don’t understand this, come to the barber shop. Okay? Just come to the barber shop on Saturday and sit with me, and keep your mouth shut and listen to what is said (A. Adams, classroom observation, August 29, 2012).

Andy suggested that the students’ political decisions directly impacted their personal lives. Regarding the potential election of Governor Romney to the presidency, he suggested, “If he’s elected he will work to repeal Obama what? Obamacare. That’s exactly what’s going on . . . You have got to understand this!” (A. Adams, classroom observation, August 29, 2012).

Andy sought to engage students in thinking processes to deepen their level of understanding and to aid them during academic tests and real-world tests. During the SRI, Andy substantiated his position on curricular real-world relevance by stating, “What I’m telling ‘em overall is that, once again, ‘this is something that affects you’” (A. Adams, classroom observation, September 4, 2012). During an observation Andy asked,
“Why are we talking about this in here? Because, it’s the most important issue. And you are taking this class. You understand?” (A. Adams, classroom observation, August 29, 2012).

Andy taught that problem solving must be founded upon rational decision-making skills. During the SRI, I asked Andy, “How do you try to teach decision-making skills, Andy?” He replied,

What I’m trying to do is to make sure that they understand the consequences of those decisions, and what is a “good decision”. You know, you have a decision . . . What’s the consequence of the decision of not voting? Not paying attention to the political process? Not being involved in it? (A. Adams, personal communication, September 13, 2012)

The literature supported assessments that measured the student’s depth of understanding the curricular content. The 21st century and CCSS outcomes were supported by standards, assessments, and curriculum and instruction. Professional development and learning environments were designed to engage students in learning. The 4Cs were aligned with the P21 learning and innovation skills (Partnership for 21st century skills, 2006). The literature suggested that instructional and assessment practices affected student performance outcomes. Drouin (2010) suggested that no single measurement of assessment had yet received full endorsement nationwide. Some recommended that alternative assessments were more effective than traditional standards-based assessments (Gülbahar & Tinmaz, 2006). Essentially, teachers were required to assess the 21st century learning outcomes that they believed mattered most (Silva, 2009).
Minor Theme Four: Deep Understanding – Dana Dunn

A fourth minor theme reflected that deep understanding was a key component in learning practice. During the SRI, Dana reflected on the various literary concepts that her students needed to understand. She pondered the students’ cognitive processes used to gain knowledge in rigorous courses. She said, “I think about how students go about understanding, comprehending, you know, what they’re learning” (D. Dana, personal observation, September 17, 2012). Dana was keenly aware that she was responsible for teaching the necessary skills. Reaching minimal benchmarks were insufficient standards for producing high-level writings to Dana. Quality writing resulted from a fully operative understanding of the writing rules. Dana taught that the misapplication of common punctuation rules altered the writer’s intentions. She demonstrated how shallow understanding of punctuation rules had completely changed the connotation and meaning of a pertinent paragraph. After reading a poorly punctuated paragraph, she proclaimed, “. . . Look at the difference the punctuation marks make!” (D. Dunn, classroom observation, August 24, 2012).

Interpreting classical writing required a deep understanding of literary tactics. Dana hoped to increase the students’ depth of understanding by learning how to apply a theoretical lens when reading a literary work. Their interpretive skills were predicated on their applicable understandings of how to use theoretical perspectives. Regarding the A. P. students, she said,

And so I wanted them to understand that in literature there are critical theories or critical lenses through which they can read and interpret. And it depends on
which one of those that they are using at the time [as to] how they will interpret what they read (D. Dunn, personal observation, September 17, 2012).

The ability to recognize literary terms gave students advanced tools for understanding and interpreting writings. She noted that a single conjunction evoked emotions when readers comprehended its function. Dana presented the idea,

Think about childlike exuberance that’s created by repeating that “and”. And it moves us along faster. It accelerates the pace right there, which also changes the mood a little bit. So there’s excitement right there, and maybe a little apprehension. And there’s a literary term for that. It’s . . . called a polysyndeton, which is the repetition of a conjunction . . . (D. Dunn, classroom observation, August 21, 2012).

Dana taught the A. P. students how to better understand a writer’s intent by viewing the work through various interpretive lenses. She dramatically discussed a Puritan literary work through a naturalistic lens. This perspective allowed the students to think about literary writings from an earth science viewpoint. She said, “That’s kinda like the life cycle of plants. And like, when the devil touched the staff and . . . the leaves died, like withered up instantly. And I don’t know. It was like representative life cycle” (D. Dunn, classroom observation, August 21, 2012).

Dana facilitated her students in acquiring a broad spectrum of knowledge. She suggested that the students would need her knowledge base and expertise; otherwise, students would not need her intellect if they already understood every literary concept. She demonstrated this by analyzing a writing sample. Dana stated, “It’s not wrong. It’s just not well developed” (D. Dunn, classroom observation, August 23, 2012). Her deep
understanding demonstrated to students how to think beyond a novice level. Thus, students were challenged to read the unwritten and to ascertain the unstated ideas. Dana offered, “. . . Distinguish between what is stated and what is suggested” (classroom observation, August 23, 2012). This notion suggested that students were to delve into the contextual core, rather than to merely grasp the superficial context.

A challenge existed in getting students to grow beyond basic knowledge and to creatively apply knowledge through writing. Teaching writing effectively posed a specific challenge for Dana. During the SRI, she noted, “I still grapple with . . . trying . . . to teach students to be better writers, because writing is so complex (D. Dunn, personal observation, September 17, 2012). Teaching students to recognize writing styles was also problematic. She noted, “Hemingway writes like a journalist. Faulkner writes very, very descriptively with lots and lots of imagery and very long, complex sentences” (D. Dunn, classroom observation, August 23, 2012). Dana though that the students’ ability to differentiate between classical writing styles demonstrated their depth of understanding. Mature writing skills stemmed from multifarious skills. Deep understanding and the application of those skills were acquired through repeated analytical experiences with classical literary works. “Understanding” existed as an important minor theme.

**Minor Theme Four: Deep Understanding – Kate King**

The fourth minor theme noted that deep understanding was a key component in learning praxis. The subcode “understanding” appeared 22 times in the code set as a component of “assessment”. It appeared more often than any other subcode in “assessment”. Kate engaged her students in deep understanding of the curriculum in various ways. She asked questions that caused students to think and to be certain that
they had a full understanding of the tasks at hand. During the SRI, Kate suggested that when students orally communicated their knowledge, it helped them to evaluate “what they understand… what they don’t understand” (K. King, personal communication, September 12, 2012). During observations, she used this tool as a type of formative assessment.

Kate engaged her students in focused thinking as an essential learning component. She used various strategies to aid their focus. During a quiet moment, Kate lingered near the front of the class. While the students completed their test preps, Kate stated, “Remember thinking is important!” During one observation she redirected the students’ attention by asking them to focus on her. “Okay. This way please” (K. King, classroom observation, August 29, 2012). By focusing the students’ eyes on Kate, she was positioned to examine their expressions. This brief encounter potentially helped Kate to perceive whether or not her students understood the content.

Kate focused the students on specific learning strategies as a way to engage them in deep understanding. Kate encouraged interactive communication, higher-order learning and inquiry as strategies for engaging students in deep learning. Furthermore, when students were learning the periodic table, Kate provided strategies for comprehending its layout and functionality. Regarding a group of specific elements she stated, “Knowing where those are located will be very, very helpful to you” (K. King, classroom observation, August 29, 2012). Learning was framed upon previous knowledge constructs. The cumulative effect of gaining understanding helped students to acquire a deeper knowledge base. Kate said,

So you know it has something to do with where they’re located on the periodic
table. So if you read the first part . . . and you really had no idea from that, then you could use the second part as a clue to something you need to look for to figure out the answer (K. King, classroom observation, August 23, 2012).

She strategically asked, “Does that make sense?” (K. King, classroom observation, August 29). Kate reaffirmed this notion by interjecting, “So we’re gonna spend the first part of class looking at those you’ve been working on, talking about it, making sure you understand how to do it, and get your questions answered . . . be prepared to answer questions (K. King, classroom observation, September 7, 2012).

Kate often used higher order questioning and inquiry to measure the students’ knowledge. She probed, “If it’s a synthesis reaction, what do you think is happening in it?” (K. King, classroom observation, September 7, 2012). Students were required to synthesize their understanding. Kate asked, “But from the other two . . . should you be able to answer the question?” (K. King, classroom observation, August 21, 2012).

Interestingly, Kate wanted every student to engage in deep learning, not just the higher achieving students. She added, “Somebody else weigh in. What do you think?” (K. King, classroom observation, August 21, 2012).

Kate discussed her expectations with the students. She expressed the need for them to become independent learners, as their understanding levels increased. Kate offered, “I hope you’ll start seeing the trends more without me actually having to point them out to you” (K. King, classroom observation, August 21, 2012). Later she stated, “You’re gonna hopefully discover some of that for yourself today” (K. King, classroom observation, September 7, 2012). During the SRI, Kate explained how she helped the students to learn more deeply. She said, “I give them time to think about it, and answer,
and not rush (K. King, personal communication, September 12, 2012). Kate’s historical record in teaching physical science and her students’ high EOCT scores suggested that her students did comprehend and apply what they learned at a high level.

**Minor Theme Four: Thematic Relevance to the Research Questions**

The fourth minor theme stated that deep understanding was a key component in learning practice. The first research question determined to understand the attitudes that teachers exhibited regarding the instruction of 21st century learning skills.

**Andy.** The code “understanding” was the strongest factor in the “assessment” parent code group and emerged 30 times in the data set. Andy’s attitude towards instructing “21st century learning” was very positive. The fourth theme was highly pertinent to the first research question.

**Dana.** The parent group “assessment” ranked second in Dana’s code set. One-third of the “assessment” code group was comprised of “understanding” codes. The data suggested a strong thematic relevance between the fourth theme and the first research question.

**Kate.** Slightly over thirty percent of Kate’s “assessment” codes were “understanding” subcodes. Since “21st century learning” emerged as the dominant parent code group, the fourth theme was highly relevant to the first research question. Based on the data, the fourth theme showed very strong relevance to the first research question.

The fourth minor theme purported that deep understanding was a key component in learning. The second research question determined to understand the extent to which teachers sought to engage students in creativity and innovation.
**Andy.** The “understanding” factor existed as the strongest factor in the “assessment” parent code group having emerged 30 times in the data set. Although “creativity and innovation” were coded a minimal number of times, it was suggested that Andy constructed a foundation during the observations for implementing creative and innovative ways of learning in the future.

**Dana.** The “assessment” parent code group ranked second in the code set. One-third of the “assessment” codes were “understanding” subcodes and emerged 14 times. Dana suggested that creativity was a way expressing one’s perceptions of things that were meaningful and were formatted in significant ways (D. Dunn, personal communication, September 17, 2012). “Creativity and innovation” comprised about twenty percent of Dana’s “21st century learning” data set.

**Kate.** Slightly over thirty percent of Kate’s “assessment” codes were “understanding” subcodes. Kate suggested that she and her students needed to develop greater creativity and innovation in her classroom. The fourth minor theme showed a pertinent relevance to the second research question.

The fourth minor theme showed that understanding was a key component in learning praxis. The third research question sought to know the degree that teachers implemented neomillennial learning styles (NLS).

**Andy.** The code “understanding” was the strongest factor in the “assessment” parent code group and emerged 30 times in the data set. NLS was the strong “learning culture” subcode set.

**Dana.** The parent group “assessment” ranked second in Dana’s code set. One-
third of “assessment” codes were comprised of “understanding” codes. The NLS subcode group emerged 14 times and was Dana’s fourth ranking parent code group. The data reflected that Dana moderately engaged her students in NLS activities.

Kate. Slightly over thirty percent of Kate’s “assessment” codes were “understanding” subcodes. Approximately two-thirds of the LS factors were derived from NLS codes. The fourth minor theme was highly pertinent to the third research question.

The fourth minor theme suggested that deep understanding was a key component in learning as shown in Table 9. The fourth research question sought to know how the participants measured their own self-efficacy in teaching 21st century learning skills within the core curriculum.

Andy. The code “understanding” was the strongest factor in the “assessment” parent code group and emerged 30 times in the data set. NLS was the strong “learning culture” subcode set. The “21st century learning” parent code group was the second ranking code group. Sixty-five “critical thinking” codes emerged from the “21st century learning” parent code. The data suggested that “critical thinking” was the second most predominant individual factor in all Andy’s subcode data. The data evinced that Andy’s attitude towards teaching critical thinking skills as a component of 21st century skills development was very strong.

Dana. The parent group “assessment” ranked second in Dana’s code set. One-third of the “assessment” code group was comprised of “understanding” codes. The NLS subcode group emerged 14 times and was Dana’s fourth ranking parent code group. The data reflected that Dana moderately engaged her students in NLS activities. The “21st
century learning” parent code group was Dana’s highest ranking parent code group and suggested that Dana possessed a strong self-efficacy towards instruction 21st century learning skills within the core curriculum.

**Kate.** Slightly over thirty percent of Kate’s “assessment” codes were “understanding” subcodes. Approximately two-thirds of the LS factors were derived from NLS codes. The fourth minor theme was highly pertinent to the fourth research question. The “21st century learning” code group was the second predominant parent code group in Kate’s code data. The data suggested that the fourth minor theme was very pertinent to the fourth research question.

Table 9

**Understanding**

<table>
<thead>
<tr>
<th>Subcodes</th>
<th>Andy Adams</th>
<th>Dana Dunn</th>
<th>Kate King</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep understanding</td>
<td>30</td>
<td>14</td>
<td>22</td>
</tr>
</tbody>
</table>

The data reflects each participant’s instruction towards deep understanding.

**Cross-Case Analysis**

Commonalities that existed across all three cases were analyzed in this section. The four major themes that existed among the three participants were presented and compared. Then, the four minor themes that occurred among the three participants were presented and compared. The four major themes contained common factors that existed between the three case studies. Both the major and minor themes were comprised of categories determined by the number of codes that emerged in each subcode. The cross-case analysis suggested that common factors existed among the three teachers.

The analysis accounted for factors that were present in both the major and minor...
themes. The minor themes were determined by identifying the most often recurring subcodes in each parent code group. When analyzing the subcodes across all parent groups, the largest subcode group factors comprised the minor themes. For example, the factor “critical thinking” existed as the largest “21st century learning” collective subcode. It was also the largest independent subcode for all three teachers. In the cross-case analysis, the minor theme codes, i.e., critical thinking, were discussed independently of the major themes. Although these codes comprised the largest subcode groups, they were analyzed separately to more fully understand them as independent factors.

21st century learning. The first major theme was: When teachers had favorable attitudes towards 21st century skills instruction, it was reflected in their praxis. The parent code “21st century learning” was collectively coded 206 times. The largest subcode group was “critical thinking” and will be discussed as a minor theme. Two common factors emerged from the data.

The first common factor was “accessing and analyzing information”. This factor was the second largest “21st century learning” subcode group with 26 total codes. Andy had 12 codes and Dana had 10 codes, while Kate had only four codes in this group. This finding suggested that the students were engaged in accessing information on a minimal to moderate level. The “accessing and analyzing information” component was closely related to critical thinking in premise. Therefore, codes emerged only when students both accessed and analyzed information together. Teachers did not engage their students in research at any point during the observations. This factor may have been more substantial if teachers had actively engaged students in online research. The teachers implied that their students were engaged in research at other times in their classrooms.
The second common factor was “innovation and creativity”. This factor was the third largest 21st century subcode group with 23 total codes. This factor was the third largest subcode for Kate with nine “innovation and creativity” codes. Andy had four “innovation and creativity” codes, while Dana had 10 “innovation and creativity” codes.

This major theme was closely related to research question one that determined to know attitudes that teachers exhibited regarding instruction of 21st century learning skills. “Critical thinking” was the largest “21st century learning” subcode group. The parent code “21st century learning” was collectively coded 206 times. Based on the data, all three case study participants highly valued teaching 21st century learning skills. This factor was directly related to research question two that sought to understand the extent that teachers determined to engage students in creativity and innovation. Based on the research data, all three teachers instructed their students in learning “creativity and innovation” skills on minimal to moderate levels.

Assessment. The second major theme reflected that when teachers held students accountable for learning, it was demonstrated, it was reflected in assessment practices. The parent code “assessment” was collectively coded 190 times. The parent code “assessment” ranked first among Kate’s parent code groups with 70 total codes. The “assessment” parent code ranked third among Andy’s parent code groups with 77 total codes. The “assessment” parent code ranked second among Dana’s parent code groups with 43 total codes. Within the “assessment” parent code group, “understanding” was the largest collective “assessment” subcode with 66 total codes. This code was significant and was discussed as a minor theme.

Two common factors emerged from the “assessment” data. The first common
factor was “accountability” with 49 total codes. The “accountability” factor accounted for approximately 70% of the combined “assessment” parent code group. This factor was very significant for Kate with 18 codes. Kate used 25% of her instructional time teaching the students assessment accountability. This code appeared 22 times in Andy’s data set. This factor reflected that Andy spent just over 30% of his assessment instruction teaching the students to be accountable. Dana had nine “accountability” codes and spent approximately 20% of her assessment instruction teaching accountability to her students. This factor suggested that EOCT teachers felt a strong need to engage students in learning and to be accountable for their learning.

The second common factor was “test-taking skills”. This factor was the third largest “assessment” subcode group with 23 total codes. Kate had 15 “test-taking skills” codes. This suggested that that approximately 20% of Kate’s assessment instruction centered on learning skills needed for testing. Andy had 12 “test-taking skills” codes. This suggested that Andy spent approximately 15% of assessment instruction in developing test-taking skills. Dana had 11 “test-taking skills” codes and indicated that 25% of Dana’s assessment instruction was spent on learning how to test effectively.

Three out of four classroom observations with Dana were held with the A. P. class. This factor potentially impacted her instructional habits. Furthermore, it insinuated that A. P. students needed more instruction in learning advanced test-taking skills than students in regular EOCT classes. Only those students who possessed advanced academic skills took the A. P. class. This view was contrasted with the notion that as students increased in critical thinking, they grew more independent of the teacher and needed less direct instruction (Owoyemi & Olowofela, 2013). The notion that A. P. students needed more
instruction in learning advanced test-taking skills did not suggest that Dana required more time to teach like or similar skills to those skills that were taught in the other case study classes. Conversely the application of previously acquired skills and the acquisition of new skills that were specific to A. P. testing demanded that Dana spend more time teaching testing skills.

The second major theme was directly related to research question one that determined to know the attitudes teachers exhibited regarding instruction of 21st century learning skills. “Critical thinking” was the largest “21st century learning” subcode group. The parent code “21st century learning” was collectively coded 206 times. Based on the data, all three case study participants highly valued teaching 21st century learning skills.

The research suggested that instructional and assessment practices affected student outcomes. Drouin (2010) purported that no single method existed for determining the best forms of formative and summative assessments. The observations showed that all three teachers mostly engaged their students in traditional standards-based assessments. This factor was opposed to the idea that traditional testing was less effective than alternative forms of testing (Gülbahar & Tinmaz, 2006). A recent study suggested that students’ assessments must measure those factors that teachers determined were most important in 21st century learning (Silva, 2009). Therefore, based on the observations, all three teachers tended towards more traditional assessment methods and tended nominally towards 21st century forms of alternative assessments.

Learning Culture. The third major theme suggested that when teachers created an effective learning culture, they sought to engage learners. The parent code “learning culture” was collectively coded 168 times. “Learning culture” ranked first among Kate’s
parent code groups with 70 codes, and ranked second among Dana’s parent code groups with 43 codes. This parent code ranked third among Andy’s parent code groups with 77 codes. Within the “assessment” parent code group, “understanding” was the largest collective assessment subcode with 66 total codes. The “assessment” code was significant and was discussed as a minor theme.

Two common factors emerged from the “learning culture” data. The first common factor was the “learning environment” with 57 total codes. The “learning environment” factor accounted for approximately one-third of the combined “learning environment” parent code group. This factor was very significant for Kate with 23 codes. Kate used over 40% of “learning culture” instruction teaching the students about the environment. This code appeared 23 times in Andy’s data set. This reflected that Andy spent just over 30% of his “learning culture” instruction teaching the students about the environment where they learned. Dana had nine “learning culture” codes and spent slightly under 30% of her “learning culture” teaching her students about their learning environment. This factor reflected that EOCT teachers felt strongly about teaching their students about the learning environment. Specifically, this factor seemed vital to understanding the “learning culture”, because the teachers were still developing their learning environments in August. It appeared that Kate needed to spend more time defining and developing the “learning environment” with younger students than Andy and Dana did with older students.

**Learning Styles.** The fourth major theme noted that when teachers focused on students’ LS, it was evidenced in their instructional habits. Three common factors emerged from the data. The parent code “LS” was collectively coded 161 times. “LS”
ranked first among Andy’s parent code groups with 102 total codes. “LS” ranked third among Kate’s parent code groups with 56 total codes. “LS” ranked fourth among Dana’s parent code groups with 26 codes.

Two common factors emerged from the “LS” data. The first common factor was the “NLS”. Within the “LS” parent code group, NLS was the largest collective assessment subcode group among the participants with 119 total codes. When teachers focused on students’ LS, it was evidenced in their instructional habits by effectively incorporating NLS. This substantial factor accounted for approximately 74% of the combined “LS” parent code group.

The NLS factor was coded 20 codes during Kate’s observations. Approximately two-thirds of Kate’s LS instruction was centered on NLS. The NLS codes appeared 85 times in Andy’s data set. This reflected that Andy spent just over 80% of his assessment instruction centered on the NLS framework. Dana had 22 NLS codes and spent approximately 54% of her assessment instruction teaching her students based on NLS factors. The NLS factor suggested that EOCT teachers felt a very strong need to engage students in learning that was framed on the students’ individual LS. The most significant component in NLS coding was RWL. Furthermore, this subcode emerged as a minor code construct and was discussed as a minor code. It comprised 119 out of 161 total “LS” codes. Therefore, the parent code group “LS” was mostly constructed in “RWL” components.

The second common factor was “self-regulation” and emerged 22 times in the total coding. The “self-regulation” factor was Kate’s third largest “LS” subcode group with only two codes. Kate engaged students in “self-regulation” less than 1% of the time
during the observation period. The “self-regulation” factor was Andy’s second largest “learning styles” subcode group with 13 codes. Andy engaged students in “self-regulation” instruction around 13% of the time during the observation period. This factor was moderately significant. The factor “self-regulation” was Dana’s second largest “learning styles” subcode group with seven codes. Dana engaged students in “self-regulation” instruction slightly less than 27% of the time during the observation period.

This factor was directly related to research question three that determined to understand the degree that teachers implemented NLS. The research suggested that 21st century learners needed to receive instruction that was based on their individual LS (Evans & Cools, 2011; Kozhevnikov, 2007; Li, 2008; Zhang & Sternberg, 2006) and cognitive LS (Coffield, et al. 2004b; Li, 2008; Rayner & Cools, 2011; Sadler-Smith, 2009). While it was evident that all three teachers sought to engage their students based on NLS, it was pertinent to note that the students were nominally engaged in learning with technology. Research also strongly suggested that neomillennial students preferred learning when they were deeply engaged in participative technological and media-based construction (Buckingham, 2007; Dede, 2009a; Dieterle, Dede, Perkins, & Russell, 2008; Jenkins, Clinton, Purushotma, Robinson, & Weigel, 2006; & Salaway, Caruso, Nelson, & Ellison, 2007).

All three participants’ codes revealed that NLS was the most common “LS” factor that the teachers implemented during their instruction. The main factor in NLS was “RWL”, a minor code. Subsequently, “self-regulation” was most significant to Andy. This code appeared only twice with Kate, suggesting that it was not very significant, whereas “self-regulation” was a moderately significant factor for Dana.
Minor themes.

Four minor themes occurred among the three participants and contained common factors that existed across the three case studies. The first minor theme suggested that critical thinking was an indispensable part of instruction. The parent code “21st century learning” was collectively coded 206 times. The subcode “critical thinking” was the most often coded “21st century learning” subcode group among all three participants with 107 total codes. Kate had 22 “critical thinking” subcodes while Andy had 65 codes “critical thinking” subcodes. Dana had 20 codes “critical thinking” subcodes. All three participants’ codes revealed that critical thinking was the most common 21st century learning factor that these teachers implemented during their instruction.

The “critical thinking” factor was substantiated in the literature. Critical thinking skills were required skills for gaining success in the global marketplace (Wagner, 2008). The fact that Andy was coded 65 times was very significant. His strategies suggested a 3:1 margin over Kate and Dana based on the total number of codes per teacher. The “critical thinking” codes comprised approximately two-thirds of Andy’s “21st century learning” codes. “Critical thinking” codes comprised about one-third of Kate’s 21st century learning codes and approximately 60 percent of Dana’s 21st century learning codes. An examination of the subcodes based on percentages suggested that teachers increased “critical thinking skills” instruction as their students matured. This suggested that the teachers expected their students to think more independently and to apply their learned skills on their own.

All three participants’ codes revealed that “critical thinking” was the most common 21st century learning factor that teachers implemented during their instruction.
This factor was aligned with the literature review as one of the most needed skills in the global marketplace (Wagner, 2008). 21st century learning was defined as the overlap that occurred between seven 21st century skills frameworks (Lemke et al., 2003; Partnership for 21st century skills, 2007b; Wagner 2008).

Critical thinking was identified as a 21st century Learning and Innovation skill (Common Core State Standards Initiative, 2010). This finding was specifically related to research question one that sought to understand the attitudes that teachers exhibited regarding instruction of 21st century learning skills. Based on the data, all three teachers in the case studies exhibited very positive attitudes towards 21st century learning skills. Specifically, all three teachers displayed very positive attitudes towards instructing “critical thinking” skills.

The second minor theme noted that RWL was an essential component of teaching. The parent code “LS” was comprised of various subcode groups. The most significant subcode group was NLS. The most often occurring subcodes within NLS were “RWL” with 106 codes.

Within “RWL”, Andy was coded 83 times out of 106 total “RWL” code entries. Just over 80% of Andy’s NLS instruction was RWL. The RWL factor was Kate’s largest “LS” subcode group with 13 codes. Slightly less than 40% of Kate’s NLS instruction was focused on RWL. The RWL factor was Dana’s largest “LS” subcode group with 10 codes. About 38% of Dana’s NLS instruction was focused on RWL. This theme was directly connected to research question three that determined to understand the degree that teachers implemented NLS. The data suggested that Kate and Dana strongly connected their curricula to RWL. It also suggested that Andy very strongly connected
the Economics curriculum to RWL. The literature reflected that students who learned in real-world environments related learning acquisition to the real world and identified, assessed, and provided alternative solutions to problems (Fazarro, Pannkuk, & Pavelock, 2009).

The third minor theme suggested that brain-compatible learning was an important factor in learning. When students were engaged in an effective learning culture, teachers created a brain-compatible learning environment. Within the “learning culture” parent code group, “brain compatibility” was the largest collective assessment subcode group among the participants with 95 total codes. The factor “brain compatibility” was Kate’s largest “learning culture” subcode group with 33 codes. This reflected that slightly less than 60% of Kate’s instruction in the “learning culture” was focused on brain-compatible factors. The factor “brain compatibility” was Andy’s largest “learning culture” subcode group with 36 codes. This showed that slightly less than 50% of Andy’s instruction in “learning culture” was focused on brain-compatible factors. The “brain compatibility” factor was Dana’s largest “learning culture” subcode group with 26 codes. This reflected that slightly less than 70% of Dana’s instruction in “learning culture” was focused on brain-compatible factors. Jensen (2007) suggested that brain-compatible instruction aided student learning. Beliavsky (2006) and Gardner (1993) noted that intelligences were affected by the learning culture. Other research correlated brain-compatible learning environments to successful learning (Partnership for 21st century skills, 2007; Shaheen, 2010; Tate, 2010).

The final minor theme noted that deep learning was a key component in learning praxis. When students were assessed, teachers wanted to know the students’ levels of
understanding. Within the parent code group, “understanding” was the largest collective assessment subcode group among the participants with 66 total codes.

The “understanding” factor was Kate’s largest “assessment” subcode group with 22 codes. This reflected that one-third of Kate’s instruction in “assessment” was focused on developing deeper level understanding. Andy’s largest “assessment” subcode group was “understanding” and was coded 30 times. This reflected that slightly less than 40% of Andy’s instruction in “assessment” was centered on developing deeper cognition. Dana’s largest assessment subcode group was “understanding” and emerged 14 times. This suggested that 1/3 of Dana’s assessment instruction was designed to teach deep understanding in her students.
CHAPTER FIVE. DISCUSSION

Chapter five consists of five sections: (a) a summary of the findings, (b) a discussion of the findings and the implications in light of the relevant literature and theory, (c) an outline of the study’s limitations, (d) an implications section (methodological and practical), and (e) recommendations for future research.

The purpose of this case study was to understand teachers’ self-efficacy in instructing 21st century learning skills in a high school core curriculum. The literature purported that 21st century skills were essential components to one’s effectiveness as a learner and as a worker. This suggested that today’s educators were responsible for identifying 21st century skills, mastering specific skills and equipping learners with those skills (Mullen & Wedwick, 2008). The study contained a literature review of related factors.

The CCSS essential “learning and innovation” skills 4Cs were identified as:

- critical thinking and problem-solving;
- collaboration;
- communication; and,
- creativity and innovation.

These skills were designed to engage students in learning and were symmetrical with the P21 learning and innovation skills (Partnership for the 21st century, 2006). Research suggested the need for massive school reform (Olsen & Sexton, 2009) and a reconceptualization of the school as an entity. Currently no mutually accepted set of content neutral 21st century learning and innovation skills (Partnership for 21st Century
Skills, 2007) were effectively taught, assessed and implemented in the core high school curriculum (Magner, 2011).

A qualitative, collective instrumental case study method was used to gather and analyze data. The data were obtained through a pre-observational survey, four classroom observations and a stimulated recall interview (SRI). This applied research study sought to help solve a critical and current educational problem (Ary et al., 2006).

**Summary of the Findings**

This study examined a critical contemporary educational issue. Significant LS research was prevalent in the literature and the CCSS was emergent. While 21st century learning research and the CCSS research existed separately, salient research was non-existent when both factors were examined conjunctively. This study sought to evaluate 21st century instructional strategies (Olsen, 2010) and to potentially offer insight into understanding teacher metacognition in relation to NLS (Zull, 2011). As a result, this study may have helped teachers to more effectively instruct the CCSS.

This study was guided by four research questions that were stated in Chapter One and reiterated in Chapter Three. These research questions were:

Research Question 1. *What attitudes do teachers exhibit regarding instruction of 21st century learning skills?*

Research Question 2. *To what extent do teachers seek to engage students in creativity and innovation?*

Research Question 3. *To what degree do teachers implement neomillennial learning styles?*

Research Question 4. *How will the participants measure their own self-efficacy*
in teaching 21st century learning skills within the core curriculum?

Methodology

Data were collected from three primary sources during each case study in the collective study. The data collection and data analysis processes proceeded concurrently. The participants’ self-efficacy levels were initially ascertained by their responses to the survey questions. The classroom observations and stimulated recall interviews were transcribed and coded to further determine the factors that influenced the participants’ sense of self-efficacy.

After reviewing the classroom transcriptions, specific video clips were aggregated into a single video for each participant’s review during the SRI. According to Morse (2008), the interviewer’s skills affected the quality of the data collection and the ability to reach a saturation point. Therefore, I determined to carefully ask pertinent questions that were relevant to the study and specific to the individual participant. I asked a question then showed the participant a single video clip of him or her teaching. The participant was provided ample time to answer the SRI question and to elaborate on each answer. Each of the participant’s SRI data were later transcribed and analyzed.

Following the data collection, transcriptions of the observations and SRIs were read and re-read to determine repeating ideas. These repeating ideas were then categorized. The emergent categories reflected repeating patterns that were conceptually interrelated. As a result, the categories formulated the emergent themes (Glaser and Strauss, 1967). These themes reflected implicit ideas that “a group of repeating ideas have in common” (Auerbach & Silverstein, 2003, 62). The themes for this study were identified through the literature review and codes were filtered through the literature
information. According to Auerbach and Silverstein (2003), the literature review provided a strong framework for deciding which repeating ideas were appropriate as themes. Once the themes were identified, the data were re-examined to approach the point of saturation where new codes, categories or themes were non-emergent. The goal was to deeply examine the data and to accurately interpret the participants’ intended meanings. Bowen (2008) noted that various qualitative research reports suggested reaching saturation. Yet, most reports were “without any explanation of what it means and how it occurred” (p. 137) and often lacked explicit methods for determining the point of saturation.

During observations, I explored the conditions and contexts of the classroom as well as the participant’s behaviors and instructional strategies. I wrote copious field notes that included comments about the setting, the participant and my reflective thoughts. I began interpreting the data using open coding that later emerged into axial coding. I examined the data and made new connections among the categories and subcategories.

Themes

The data collection and data analysis suggested four major themes and four minor themes. The four major themes were:

- When teachers had favorable attitudes towards 21st century skills instruction, it was reflected in their praxis;
- When teachers held students accountable for learning, it was demonstrated in assessment practices;
• When teachers created an effective learning culture, they sought to engage learners; and,
• When teachers focused on student learning styles, it was evidenced in their instructional habits.

The four minor themes were:
• Critical thinking was an indispensable part of instruction;
• Real-world learning was an essential component of effective teaching;
• Brain-compatible learning was an important factor in teaching learning; and,
• Deep understanding was a key component in learning praxis.

**Interpretation**

The data were also interpreted through a symbolic interactionism (SI) lens. Using the SI framework, I analyzed the participant’s communications methods and how the participants’ ideas were communicated symbolically toward the students. I examined the exogenous effects. I interpreted the implicit and explicit verbal and nonverbal messages that the participants sent to their students in the classroom and what I believed were their intended goals (Blumer, 1969). The subjective nature of interpreting the participant’s viewpoints created the need to confirm accuracy of my interpretations. I used a member check to counter the “crisis of representation” issue (Marcus & Fischer, 1986, 15) and to increase the verisimilitude in reflecting the appropriate viewpoints of each of the participants (Denzin & Lincoln, 2011; Richardson & St. Pierre, 2005).

**Triangulation**

Although multiple investigators were not involved in this case study, I did employ an “external observer” (Yin, 2009, 122) throughout the study to evaluate the data
collection, data analysis and interpretive aspects of the study, i.e., symbolic interactionism. My goals in triangulating the data were to incorporate case study findings with respect to their strengths and weaknesses and to acquire evidential convergence. A final goal was to ascertain the study’s conclusions.

I triangulated the data to validate the findings. Flick (2009) stated that data triangulation afforded researchers the ability to view the data from more than two perspectives. Triangulation was substantiated through various theoretical approaches. Using an a priori perspective, I linked the data and theoretical viewpoints that were applicable to the data. This provided an extensive volume of knowledge. Triangulation provided information on different levels that would have otherwise not been possible. Denzin (2009) noted four primary types of triangulation. The three types that I used in this study were data triangulation, theoretical triangulation and an outside observer who reviewed the data collection and analysis processes.

An audit trail reflected the daily journey that began with data collection and ended with the written analysis phase. This process showed the comprehensive pathways that I journeyed throughout the study. A Google spreadsheet was used to store the daily activities.

As each new interpretation surfaced, I compared it to existing findings that had emerged earlier in the data analysis process. Those iterations required inductive reasoning processes that occurred primarily after the data collection, since the goal was to reach a conclusion. I analyzed the data across all of the cases to identify similarities and to gain understanding of the issues that were relevant to this study. Furthermore, I built a
logical chain of evidence to increase the reliability in this study (Miles & Huberman, 1994; Yin, 2009).

The external observer trailed my derivation of the evidence and retraced the pathways of the study. This methodology allowed him to examine conclusions based on the research questions and vice-versa (Yin, 2009). Herein, the content was linked to the study questions determined at the inception of this research study.

**Discussion of the Findings and Implications of the Study**

A goal in cross-case analysis was to determine similarities that occurred across all three case studies. I performed a cross-case comparison and synthesis to present “rival explanations that might have been alternative reasons for the observed outcomes” (Yin, 2012, 191). Various factors influenced the participants on different levels. The data suggested that four major themes existed. In the cross-case analysis, the four most prominent parent code groups emerged. These findings provided the foundation for determining the themes. They were presented in descending rank order as:

- 21st century learning;
- assessment;
- learning culture; and,
- learning styles.

**Theoretical Perspectives**

I examined the phenomenon under investigation from multiple theoretical perspectives. The data for each case study was interpreted using multiple perspectives that were derived from the literature and were examined in light of different theoretical
lenses. Effective learning strategies and twenty-first century learning skills were inextricably grounded in a three-fold theoretical framework.

**Social Learning Theory**

An examination of the findings in light of the social learning theory (Bandura, 1977), reflected that the participants often modeled the desired behaviors in their students. The social learning theory purported that learning best happened within social contexts where individuals, i.e., students learned by observing others’ habits (Bandura, 1977). The data suggested that all three participants effectively modeled ways to use the curriculum in real-world relevant ways.

The participants’ interactions with their students demonstrated that each participant evaluated the cognitive, behavioral and environmental effects of his instruction on learning. Kate observed students during science classes to determine the degree that students applied the knowledge they had been taught. Dana interacted with her A. P. students and provided implicit and explicit learning cues during instruction. Some of the participants questioned whether their instructional practices were accurately aligned with the current research literature. Dana questioned whether her answers were accurately aligned with 21st century learning skills. Kate was reticent to affirm her self-efficacy in teaching creativity skills. Andy suggested that he needed to engage his students more deeply in creativity and innovation. The data reflected that all three teachers modeled the desired behaviors in social contexts.

**Constructivism**

An analysis of the data, through a constructivist lens, suggested that each participant generously facilitated student learning through active participation. Andy
posed Socratic questions and sought to show a vivid and clear connection to RWL. Dana helped students contextually found knowledge based on the interplay between the students real-life experiences and the ideas (Vygotsky, 1978) presented by great writers. Kate led students into new knowledge acquisition by accessing previous knowledge to construct new meanings. All three participants sought to actively engage their students in the classroom social environments (Vygotsky, 1978). This study did not examine the students’ perspectives. Therefore, the data only reflected the participants’ constructivist instructional behaviors.

The data showed that the participants actively monitored their students as a catalytic guide for learning engagement. The learning environments were atypically founded upon constructivist principles. Although all three participants used didactic pedagogical practices, the lectures were designed to provide foundational, pertinent and contextualized information. The data did not generally suggest, as explained by Patel & Yelland (2007), that knowledge was being created versus being acquired. The dissemination of factual information during the observations seemed pertinent and served to provide students an accurate knowledgebase, critical thinking skills and a broad-based purview of perspectives that I believed most students did not already possess.

The contextualized instructional strategies linked past and present contexts so that students were rigorously challenged to determine fact from fiction and truth from error in meaningful ways (Jonassen & Hung, 2008). Dana connected her past learning experiences to the present and ageless issues, i.e., love and marriage, discovered within the curriculum. Andy connected his own life-long learning experiences as well as his students’ life experiences to the curriculum.
All three participants exemplified active communication skills development (Anderman & Sinatra, 2009) in oral and written traditions. Kate engaged students in appropriate social interactions and provided an emotionally safe community wherein she formally and informally assessed their learning (Durlak & Weissberg, 2007). All three participants displayed significant commitment to designing authentic learning opportunities that promoted meaningful learning experiences for their students.

**Situated Learning Theory**

The situated learning theory (Lave & Wenger, 1991) stressed social practice principles founded on socially acquired knowledge and shared knowledge. The pivotal issue was that the individuals who were involved cooperated virtuously and shared a common bond of mutual benefits. Their subordination and cooperation created avenues for the apprentices to eventually become experts. According to Lave and Wenger (1991), “shared participation is the stage on which the old and the new, the known and the unknown, the established and the hopeful, act out their differences and discover their commonalities, manifest their fear for one another, and come to terms with their need for one another’ their thesis stressed regularity in the outcomes of practice” (p. 116).

At its inception, this study determined to understand the phenomena in relation to these three theoretical perspectives. I assumed that the participants would engage their students in collaborative learning and value it as an instructional practice. My jejune and errant assumption seemed palpable at the beginning of the study. A discontinuity existed between my theoretical findings in the literature and evidential instructional practices pertaining to cooperative learning. Andy suggested that advanced students normally disliked collaboration because the student cohorts were typically incompatible
intellectually. The data did not reflect that any of the participants fully engaged learners in shared learning experiences as identified by the 13 combined “collaboration” codes. While the data did not reflect a disharmonious social atmosphere, the findings suggested that the participants did not generally determine collaborative learning to be a highly effective learning tool in their respective instructional settings at the time of this study.

**RQ1**

The first research question determined to understand the attitudes that teachers exhibited towards instructing 21st century learning skills. This question was addressed by determining commonalities that existed between the CCSS and the P21 century learning skills. These factors helped bound and guide the data analysis process.

**21st century learning skills.** The 21st century learning literature was imbued with ideas that defined 21st century learning as the areas of overlap that occurred between the 21st century skills frameworks (Lemke et al., 2003; Partnership for 21st century skills, 2007b; Wagner 2008). A plethora of 21st century skills were identified (Carini, Kuh & Klein, 2006; Lambert & Cuper, 2008; Partnership for 21st Century Skills, 2006; Rocca, 2010). The 21st century learning literature reported that neomillennial learners needed specific skills (Wagner, 2008; Partnership for 21st century learning, 2007) to find success in the academic arena, the workplace and the global market.

Centric to the findings in the literature were apposite key component factors:

- innovation and creativity;
- curiosity and innovation;
- accessing and analyzing information;
- oral and written communications;
• initiative and entrepreneurialism;

• agility and adaptability;

• collaboration; and,

• critical thinking and problem solving.

These factors bounded this case study that was framed upon 21st century learning and sociological theoretical perspectives. The data analysis also centered on key factors assimilated in the LS literature. The first major theme stated that when teachers had favorable attitudes towards 21st century skills instruction, it was reflected in their praxis. The data summary showed that the combined “21st century learning” code group contained 206 codes. Dana’s subcodes suggested that she placed the highest value on “21st century learning” skills development. Andy and Kate ranked “21st century learning” as the second highest code group. Overall, the three participants displayed a very positive attitude towards instructing the 21st century identified skills.

Critical thinking. An essential 21st century learning factor, critical thinking, emerged as the first minor theme. It stated that critical thinking was an indispensable part of learning. “Critical thinking” codes appeared 107 times in the aggregated data and reflected that all three participants highly valued this learning factor.

Assessments. Assessment practices were highly debated in the literature in light of 21st century learning. The research recommended the use of informal learning assessments designed to improve learning (Durlak & Weissberg, 2007). Adams (2005) noted creativity and innovation were often destroyed by traditional pedagogical practices. Some traditional practices were inimical to innovation and promoted disengagement in creative and innovative productivity. Some suggested that traditional standards-based
assessments should be replaced by alternative assessment practices (Gülbahar & Tinmaz, 2006). While widespread disagreement existed regarding the most effective instructional and assessment methods (Drouin, 2010), the data in this study suggested that the participants were highly engaged in traditional testing and assessment methods. This was aligned with the findings of Razzouk & Shute (2012) who suggested that 21st century assessments were “beyond the capabilities of most traditional assessment formats” (p. 344).

While 21st century instruction was comprised of learning and assessment factors, “assessment” was a central instructional habits’ component. The second major theme reflected that when teachers held students accountable for learning, it was demonstrated in assessment practices. The “assessment” group contained 190 total codes. This suggested that teachers highly valued assessing student learning. Kate’s codes indicated that she placed the highest value on student assessment. Dana’s codes showed this parent code group as the second most prominent code group, while Andy’s codes showed this parent code group as the third highest ranking group.

The fourth minor theme purported that deep understanding was a key component in learning praxis. Assessments helped teachers determine whether their students learned superficially, moderately or on deeper levels. The data suggested that each of the participants determined to instruct and to assess learning at a deep level. Examining “assessment” in light of 21st century learning skills allowed me to better understand instructional practices and why the participants interacted and performed as they did. Both these factors were byzantine, reciprocal and mutually constituted in nature.
**Culture.** The literature cited engagement in learning as a primary factor in effective learning (Yazzie-Mintz, 2010). The learning culture greatly impacted the participants’ instruction as evidenced by the data. McCollum & Yoder, (2011) determined that the teacher’s role significantly defined the learning culture. This was corroborated by the data in this study. The participants centered primarily on instruction versus behavior management. This reflected that the each participant had created an effective learning culture. The third major theme stated that when teachers created an effective learning culture, they sought to engage learners.

Recent learning culture research denoted that teachers mediated the students’ academic goals and the learning culture within the school and had a profound impact on their academic achievement levels (Meece, Anderman, & Anderman, 2006). A Harvard meta-analysis synthesized the learning goal structures literature and determined that the learning culture was positively impacted when teachers demonstrated strong emotional, instructional and social support of their students (Rolland, 2012). The data reflected that the “learning culture” parent code group ranked third for Kate, third for Dana and fourth for Andy. The “learning environment” factor emerged 57 times in the combined participant codes and was situated next in line to “brain-compatible learning”. The data in this study suggested that the “learning culture” served as pillar in the overall learning framework in this study.

The third major theme stated that when teachers created an effective learning culture, they sought to engage their learners. “Learning culture” emerged at the third highest ranking parent code group with 168 combined codes. Although this factor was quite important in the instructional design, it emerged with 22 codes less than
“assessment”. The “learning culture” group ranked as the third highest code group for Kate and Dana. This code group was ranked as the fourth highest factor for Andy. Interestingly, “learning culture” codes emerged with only three less codes than the “assessment” codes for Andy. This suggested that Andy placed less importance on these two factors than on “21st century learning” skills development and “learning styles”.

A final “learning culture” factor was “brain-compatible” learning. Ninety-five “brain-compatible” codes emerged from the data. The third minor theme noted that brain-compatible learning was an important factor in teaching learning. Findings regarding cognitive LS, memorization and mastery learning factors (Garrett, 2009; Freeberg, 2006) were well-documented in the literature (Jensen, 2008; Laster, 2008; Tate, 2010; Zull, 2010). I examined instruction that was correlated to brain-compatible learning environments (Partnership for 21st century skills, 2007; Shaheen, 2010). In the words of Andy, “You gotta educate thy brain!” (A. Adams, classroom observation, August 29, 2012). This phrase was deemed highly pertinent to the noetic goals and pursuits of all three participants.

RQ2

The second research question determined to know the extent that teachers sought to engage students in creativity and innovation. This study examined the impact of three teachers’ attitudes toward instructing critical thinking, collaboration, communication, and creativity within a 21st century skills framework.

Creativity and Innovation. I was challenged to recognize creativity and innovation components during instruction and to understand how to assess them. A single measurement was non-existent that specified the degree to which teachers were
engaged in creative processes or when they engaged in teaching creativity. All three participants discussed the need to increase their “innovation and creativity” skills instruction and practices. The “innovation and creativity” factor was identified as a “21st century learning” code; yet, the participants interrelated “innovation and creativity” with the parent code “assessment”. This explained the rationale for interrelating “21st century learning” with “assessment”.

A connection existed between “assessment” and “creativity and innovation”. The three participants encouraged their students to demonstrate their content understanding by using creative presentation methods. Andy and Kate suggested that future instruction and assessments would include creative and innovative practices. Dana exemplified the strongest “innovation and creativity” codes among the three participants and reflected a high level of engagement even during the first weeks of school, especially with the A. P. students.

The literature confirmed the inherent challenges in assessing creativity. Gardner, Claxton and Craft (2008) suggested a “value-neutrality” outlook in a broader purview of diverse understandings of creativity. Their perspective provided esoteric and less determinent guidelines for evaluating creativity. Vygotsky stated, “Creativity is present, in actuality, not only when great historical works are born, but also whenever a person imagines, combines, alters, and creates something new, no matter how small” (Vygotsky, 2004, p. 10). He noted that creativity was strongly associated with personal and social experiences. I determined to assume creativity as a thinking skill (Sternberg & Lubart, 1999), an approach that was well-aligned with the constructivist frame of mind.
Craft (2008) suggested that multiple issues emerged from the “incommensurate mix of underpinning perspectives that inform on creativity in education” (p. 6). The participants generally viewed creativity as the ability to discover new and workable solutions to everyday problems. The data in this study did not reflect that the participants were currently highly engaged in “creativity and innovation” skills productivity output. Yet, the data suggested that the teachers were somewhat engaged in creative thought processes. This was evinced when Andy engaged his students in thinking creatively about political ideologies. He challenged the status quo and helped students to formulate arguments surrounding the election process.

Kate encouraged her students to engage in “Little C” creative products that exemplified their current levels of understanding (Ferrari et al., 2009) as evidenced by their hallway displays. Dana used creative assignments to demonstrate punctuation principles and suggested that her students could invalidate their intentions by using improper punctuation. In general, all three participants maintained a healthy respect for the creativity factor. They viewed creativity in a positive light, yet without a clear and unified definition of the term.

**Metacognition.** Current cognitive-based creativity research (Albert & Runco, 1990; Runco, 2007) was conceptually parallel with the 21st century skills framework (Partnership for 21st century learning, 2008). Brain and cognition research (Tate, 2010; Zull, 2010) purported scientifically grounded definitions and perceptions regarding best practices in education. The literature coalesced brain-compatible learning traits that aided in coding the participants’ data.
Cognition, metacognition and creativity were closely related. Ascertaining codes in the area of “metacognition” proved to be difficult, because coding was predicated upon a symbolic interactionism framework (Blumer, 1969). According to Blumer (1969), symbolic interactionism was grounded in distinct premises. An individual’s behavior toward something was determined by the meanings and the significance that these objects held for an individual. Its meaning was obtained by social interactions with others that provided a foundation for understanding meaning towards others.

The symbolic interactionism factor was conceptually unified with social learning theory (Bandura, 1977) perspectives, wherein meanings were processed and modified by the individual through a process of personal interpretations and interactions with others. The symbolic interactionism theoretical underpinnings proved highly pertinent to understanding Dana’s instructional practices, the learning processes, and the ethos. The symbolic interactionism lens reflected that Dana creatively engaged students in critical thinking and problem-solving. This framework was comprised of metacognition, non-verbal communication and confidence factors. Although Andy’s data and Kate’s data did not suggest a strong theoretical symbolic interactionism tendency, I suggest that future examinations may indeed find stronger symbolic interactionism magnetic propensities in both classrooms.

RQ3

The third research question determined to know the degree that teachers implemented NLS. The LS literature was well-founded, whereas the NLS literature was emergent and less verbose. In a personal interview, Ed Dieterle (personal communication, August 3, 2012) suggested that the term “neomillennial” was not
commonly used now as it once was. He suggested that its tenets remained pertinent in the literature, but they typically were referenced as 21st century learning factors. It seemed reasonable to assume that NLS factors were proximally related to LS factors.

**Learning styles.** The fourth major theme suggested that when teachers focused on students’ LS, it was evidenced in their instructional habits. The “LS” parent code group emerged as the fourth highest ranking code group with 161 total codes. The data showed a wide discrepancy among the participants. The codes for both Kate and Dana reflected that “LS” ranked as the fourth most prominent code group. This demonstrated that neither Kate nor Dana placed as strong an emphasis on this factor as they did on “21st century learning” or “assessment”. The codes very strongly showed that “LS” was Andy’s highest ranking code group with 102 total codes.

**Real-world learning.** The second minor theme stated that RWL was an essential component of effective teaching. The single greatest subcode factor for Andy was “RWL” with 85 codes. The data reflected that Andy was driven to make a connection between instruction and its real-world relevance. This single factor dominated the NLS codes. This undeniable factor was evidenced by an average of over 20 references per observation to the real-world relevance factor.

**Divided camps.** With the understanding that all major four themes were vitally important to the participants, an analysis of the overall combined participants’ data reflected an interesting factor. A set of polyvocal discourses was emergent and presented a different purview of the data. A deeper analysis of the data suggested that the data placed the major themes in two distally positioned groups. An analysis of the overall codes indicated that the participants placed the strongest values on teaching “21st century
learning” skills and “assessment” of learning. The data showed only a sixteen-point spread between the two groups and suggested that the participants placed only a nominal value difference between the two factors overall. This calculation provided a measurable means of evaluating and analyzing the data.

A qualitative purview did not suggest that the participants definitively placed greater importance on one instructional factor over the other. Rather, the proximal data suggested that both factors were nearly equal in importance. The data reflected that the “21st century learning” skills were most likely assessed in a cyclic process. Based on the observational data, it appeared that all three participants used a “teach-test” method of instruction and assessment. This study did not determine to measure the frequency of specific instructional practice habits and their interrelated reciprocities. Yet, these two factors appeared to be predictably integrated.

The third highest ranking code group, “learning culture”, emerged with 168 combined codes. The “LS” parent code group emerged as the fourth highest ranking code group with 161 total codes. Both code groups were nearly equal in their frequencies with merely a seven-point difference in their total appearances. The data suggested that the participants highly valued the “learning culture” and the students’ LS. Yet, these factors did not hold precedence over “21st century learning “skills development and the assessment factors. Whereas the codes reflected that the culture and the student’s style of learning were important factors, they were not equally important to the two most prominent parent codes.

Assuming the notion that the three participants placed greater importance on “21st century skills” instruction and “assessment”, it seemed plausible that the classroom
“learning culture” and LS factors helped to influence the learners through environmental factors. The physical environment and the ethos served as frameworks upon which the participants structured learning. This conveyed that the culture and LS factors may have had greater importance than the data reflected. Since the data collection occurred approximately one month into the school year, all three teachers may have placed strong emphasis on defining the “learning culture” during the preceding weeks. During the observations, the participants spent minimal amounts of time defining established classroom routines and procedures. They focused their instructional times on teaching the curricular content instead of instructing routine behaviors and standard protocols.

**Neomillennial learning styles.** The literature purported that the 21st century digital native (Prensky, 2001a; Palfrey & Gasser, 2008) learner was unique (Buckingham, 2007) and learned very differently from his predecessors. The neomillennial learner preferred a participative technological, media-based learning environment (Dieterle et al., 2008; Jenkins et al., 2006; Salaway et al., 2007). Specific research noted that teachers needed to acquire and use specialized pedagogy to engage students in rigorously challenging and shared learning purposes (Dieterle et al., 2008). The research mentioned that a vast majority of instructional practices did not meet those conditions. Thus, the research called for a paradigm shift to promote an integrated model of NLS (Dieterle et al., 2008; Kozhevnikov, 2007).

**Instructional design.** The literature cited a need for effective instructional designs that were effectively implemented and assessed the neomillennial content neutral skills required for success in the 21st century (Olsen, 2010). Teachers needed to integrate core curricula and 21st century learning skills to effectuate maximal learning. Unique
neomillennial instructional designs included technology-enhanced learning and PBL as well as differentiation and collaborative learning. Research supported the view that instructional effectiveness and assessment scores increased when teachers differentiated learning based on students’ LS (Dieterle et al., 2008; Gardner & Moran, 2006).

While the data suggested that various NLS factors were present during instruction, Andy’s voluminous RWL codes may have skewed the data. This single factor may have suggested a stronger engagement in NLS among the collective participants than actually was evidenced. Dana’s codes reflected 20 NLS codes and Kate’s data showed only 14 NLS codes. Most importantly, the “LS” parent code group, of which NLS was included, ranked at the fourth highest parent code group. While the literature strongly supported the need to engage students in NLS learning, neither Kate nor Dana extensively engaged their students in NLS praxis during the observations. Their individual SRIs did not strongly suggest that either teacher engaged her students in media-based learning or integrated NLS models of learning. The NLS literature suggested that students needed to interact with specific technology. Yet, the participants combined engagement with “media fluency” reflected only two total codes among the three participants. A longer single observation period, or one that occurred over a broader time frame, may have exhibited much stronger NLS activities.

**Technology.** My presuppositional bias towards technologically-enhanced instruction led me to presume that NLS was virtually improbable and essentially impossible without substantial engagement in technology-enhanced instruction. The mere presence or absence of technology tools in the classroom did not assure automation in NLS practices. Ferguson (2011) suggested, “Without appropriate ethos and pedagogy
in place, a virtual world is nothing more than a more technically complicated way of learners and teacher continuing to do what they were doing before” (Ferguson, 2011).

The factors surrounding a lack of engagement in technology-enhanced learning were unclear in this study. A distinction was made regarding technology use during instruction. Teaching with technology was not synonymous with hands-on interaction, where students were engaged with technology learning. The NLS research clearly signified a need for students to be engaged with technology (Ferguson, 2011).

The research suggested that some teachers were weak with technology integration and were unable to keep pace with technology advancements (Mullen & Wedwick, 2008). Thus, some teachers existed in a challenging digital divide that may have polarized them as participants in this study (Mullen & Wedwick, 2008). This notion was unproven in this study, but the overall findings supported this perspective.

Research evidenced the notion that instructional technology was relevant and useful for instructing core standards. Some teachers failed to integrate technology into classroom learning primarily due to intimidation, lack of technology skills, and time constraints (Honan, 2008; Stolle, 2008). It was likely that some participants in this study may have questioned the relevance of technology integration that extended beyond the local school’s suggestions. It may have existed as a result of poor funding, outdated equipment and/or inadequate professional development. Andy addressed the fact that many students struggled to gain access to technology outside school, because they did not have personal computers and/or they could not access the Internet. Both Dana and Kate noted that they were not technology-driven teachers. Kate said, “I often tell my students, ‘I am technologically backward’. I am comfortable with the internet, DVDs, video tapes,
and the occasional game. I am nowhere near where I need to be with the use of technology in my classroom” (K. King, personal observation, September 12, 2012).

During the SRI, Kate said that technology implementation was a novel privilege versus a ritualistic constant in the learning environment. Kate suggested that her students preferred learning with technology on a few occasions, rather than using it every day. She explained,

But I think with my class relying on it too much . . . it would just become old hat. And they would rather not do it . . . I think it engages them pretty well to do something like this every so often. And then, they get to where they come in and say, “Can we play hangman today?” (K. King, personal observation, September 12, 2012).

Dana confirmed technology integration. She said, “I try to use technology every day” (D. Dunn, personal communication, September 17, 2012). The data were equivocal and ambivalent regarding the degree that the students were engaged in technology pursuits during instruction. The data suggested that Dana would more fully engage her students in accessing online information in forthcoming instruction.

Neomillennials preferred diversified, socially-based learning that was implied rather than stated. Knowledge building occurred best in active learning contexts, where knowledge was disseminated among the group as well as the individual (Dieterle, 2009) and more broadly developed by others (Dieterle, Dede & Schrier, 2007; Dunleavy, Dede & Mitchell 2009; sub et al., 2008). As noted in Figure 4, NLS positively associated the interaction of contemporary LS theories with specific technologies. To accomplish this monumental task, teachers needed the knowledge base, instructional skills and the school
district’s financial support to effectuate those goals (Hadjioannou, 2012). The data did not reflect that during data collection any of the participants fully implemented or broadly developed the type Neomillennial learning environment described by the research. I present an alternative and rival view (Yin, 2012) to explain why this may have occurred. NLS specifically centered neomillennial learning in technologically-engaged learning environments and cited new literacies that demanded technology tools. Although the technical complexities were non-existent during this study, I did not presume the participants to have maintained an atheoretical tenor regarding technology integration. While the technological tools were unavailable during the observations, some of the tenets and theoretical aspects of NLS were evidenced.

Figure 4. Neomillennial learning styles preferences (Dieterle, Dede, Perkins & Russell, 2008).

The overarching “creativity and innovation” and “accessing and analyzing information” factors were central to the premises of those engagements. These same factors were evinced by all three participants in varying degrees while accumulating 119 combined NLS codes. The data reflected that the participants, whose effectiveness
measurements were mostly determined by their students EOCT scores, used 21st century skills to promote higher-order learning. Although the broadly research-based CCSS had been adopted by the Georgia Department of Education, the instructional paradigmatic shift had not yet completely occurred on the local level. Therefore, while the participants demonstrated significant engagement in instructing 21st century learning skills, the looming EOCT remained the centerpiece of all instructional practices.

**RQ4**

The fourth research question sought to understand how the participants measured their own self-efficacy in teaching 21st century learning skills within the core curriculum. The participants’ perceived self-efficacy was generally defined as the belief they had regarding their capacity to produce a positive academic effect (Bandura, 1997). All three participants exuded measurable self-confidence in conveying and communicating the curricular content. Each individual measured his personal self-efficacy in terms of student learning engagement levels, assessments and EOCT exams. Dana’s self-efficacy was directly correlated to the students’ “understanding” levels, as evidenced by their EOCT scores.

Twenty-first century teachers faced immense challenges that demanded a strong sense of self-efficacy. Bandura (1997) noted, “Teachers’ beliefs in their efficacy affect their general orientation toward the educational process as well as their specific instructional activities” (p. 241). Andy’s self-efficacy was directly focused on his acumen with making the curriculum real-world relevant to his students. Self-efficacy represented one’s belief in his capacity to structure and carryout the action steps necessary for producing the given goals (Bandura, 1997), a process dependent upon
analyzing multiple viewpoints of efficacy information conveyed through vicarious, cultural, and physical means (Bandura, 1993). According to Bandura (2006), “The issue is not whether one can do the activities occasionally, but whether one has the efficacy to get oneself to do them regularly in the face of different types of dissuading conditions” (p, 311).

All three participants displayed a very strong sense of self-efficacy towards effectively instructing and managing their classrooms. The data reflected that the teachers were developmental regarding their perceptions of their ability to teach some 21st century learning concepts, especially those that focused on technology integration. The data intimated that all three participants had strong self-efficacy towards instructing critical thinking, understanding, and real-world application. They showed very strong self-efficacy towards teaching test-taking skills and developing strong brain-compatible learning cultures in their individual classrooms. The four research questions showed correlation to the major themes and minor themes as noted in Figure 5.
Another theoretical factor. A missing ingredient posed a quandary when performing data analysis. The literature touted problem-based learning (PBL) as a highly effective, 21st century instructional methodology. Prior to the study, I believed that PBL was centric to 21st century learning, and supposed that constructivist PBL classrooms were among the most effective learning environments. A recent meta-analysis (Viilo et al., 2011) suggested that PBL provided students with greater learning satisfaction than traditional learning environments. Students learned more thoroughly when participating in PBL designs and production processes (Strobel & van Barneveld, 2009). Important factors were highlighted as prototypical models of 21st century learning, like multimedia activities (Seo et al., 2008), where problem-centered teamwork incorporated new forms of social connection (Gardner, 2007) through hands-on, active and contextualized learning. As noted in Figure 6, specific intelligence factors emerged in this study.

Figure 5. Research questions correlation to the major themes and minor themes.
Figure 6. Four intelligence factors emerged in this study (Gardner, 1983).

Teacher-facilitator learning models promoted self-reliance and deeper learning independence (Gülbahar & Tinmaz, 2006). These models projected a transitional paradigm for learners to create authentically (Adams, 2005), to use RWL strategies (Rubin, 2007) in open-ended complexities (Jonassen & Hung, 2008), and to make decisions based on real-world issues (Strobel & van Barneveld, 2009). A PBL meta-analysis reflected that PBL provided a “robust positive effect from PBL on the skills of students” (Dochy, Segers, Van den Bossche & Gijbels, 2003, 533).

PBL data were nominally represented in this study. An examination of Andy’s data suggested that he attempted to engage students in Socratic debate, presented opposing viewpoints, and stimulated critical thinking by asking questions and answering his students’ questions. Andy primarily modeled the desired traits for his students.

Although “RWL” was loosely linked to problem-solving and served as the linchpin in NLS, the data did not definitively suggest that PBL was highly manifested during the observations. Rather, the observational data suggested that critical PBL elements were being developed for student engagement in PBL at a later time.

The assignments were formulated around traditional test measurements and did not suggest an alternative type assessment with Andy. On the other hand, Dana and Kate
showed strong tendencies toward engaging students in PBL. Kate’s classroom learning design was primed to engage her students in scientific inquiry and discovery through upcoming lab assignments. Even still, the data did not suggest that discovery learning was equated with PBL. Based on a variance in qualitative perspective regarding PBL, the data could have suggested that creativity and innovation factors actually engaged students in PBL. Rather than proposing a different set of standards for determining the teacher’s level of engagement in PBL instruction, for the purposes of this study the data reflected that the participants did not fully engage their students in PBL.

The Limitations of the Study

Several factors were identified through the literature review and framed this case study’s delimitations and boundaries (Creswell, 2007; Stake, 1995). The parameters of this bounded case included core academic high school teacher participants who were located within a single school. Selected participants were required to have had three years teaching experience and ninety percent or above EOCT scores. The delimitations in this study were the number of participants, the data collection instruments, and the school site under investigation.

A small sample was purposefully selected in an effort to gain deep understanding of a select group of uniquely qualified participants. Guest, Bunce & John (2006) suggested that the greatest value measurement of data lay in the quality of the data collected rather than the sample size. Myriad qualitative researchers suggested a wide range of acceptable sample sizes that ranged from a single subject to hundreds of participants (Bowen, 2008; Mason, 2010). Three high school teachers from the same high school were selected to participate in this study.
According to Miles and Huberman (1994), in applied research like this collective case study, purposive samples were the most common sample types. Patton (2002) noted that most participants were chosen prior to the beginning of the study based on relevant research criteria. In a review of the literature, Guest et al. (2006) stated that purposive sample sizes were inductively determined and that the sampling process continued until the point of saturation occurred. Significantly, the review suggested that most recommendations required researchers to initially provide the number of participants in the study, as was the case in this study. Their findings suggested that applied researchers were “stuck with carrying out the number of interviews they prescribe in a proposal, for better or worse” (Guest et al., 2006, 61). This small sample of three provided me the opportunity to delve deeply into each case study. It was possible that using a small sample posed potential weakness and did not offer various perspectives that could have been derived from a larger sample. My rationale for selecting three participants was to examine high performance teachers in a recognized excellent academic setting. I determined to understand their perspectives in light of the findings in the literature.

If I were to perform this exact same study again, I would pursue two things differently. Provided that the same participants taught the same courses, I would collect data during the second semester. I believe that students are more settled in their routines midway through the school year. Based on my thirty-year experiences as a teacher, I propose that this single factor would provide deeper levels of instruction. For example, Andy could have potentially engaged students in deep Socratic discussions, because they were more readily entrenched in the learning environments. I would perform this study in three separate school departments with two or three participants in each department.
Teachers are leaders who independently affect the classroom learning environment. Yet, I have reason to believe that classroom culture is affected by the collective learning culture within individual departments like science, mathematics and history based on the department leadership. As a result, high performance core curricular teachers may perform differently based on departmental leadership.

Given the opportunity to pursue this same study in the future, I would consider other options that were not present in this study. Using the same EOCT requirement, subsequent studies would examine participants in separate school locations. The data reflected that the learning culture was a seminal factor in 21st century learning. An investigation of three teachers from different schools would provide the opportunity to investigate individual classroom cultures in light of unique school cultures. Whereas this study did not determine the broad-based issue of collective school culture, this factor may have been a powerful contributing factor in a multi-school study. The literature suggested that school leadership had significant impact on individual classroom cultures (McCollum & Yoder, 2011). As a result, data collected from high-performing teachers in different school cultures may present a variance in the findings and suggest other perspectives on the research questions formulated in this study.

The three participants represented a populace that excluded first decade teachers. A subsequent similar study, that includes participants across each three teaching decades who teach at the same location, may proffer different instructional foci among the participants. Thus, the sample would include one digital native participant and two digital immigrant participants (Prensky, 2001a). The analysis could examine the same issues across three groups with broader instructional experiences. I presume that first
decade teachers are typically twenty-two to twenty-three years old. A post hoc evaluation may suggest that first decade teachers demonstrate a greater dependence on socially-derived instructional practices, i.e., blogs, online collaboration and interactive gaming. Based on the participant’s proximal age with high school students, the first decade teachers may potentially have a deeper understanding of the students’ learning culture. A subsequent study should examine teachers who are in their twenties, thirties and forties.

A final optional study may include teachers across distinct racial parameters. This study did not determine to examine teachers based on gender, age or race. Yet, a representative sample of one Caucasian, one Hispanic and one African-American teacher may provide distinctive findings regarding the learning culture. This study could occur within the same setting, or across multiple settings, while holding to the 90% or above EOCT standard. An investigation in three separate locations may provide opportunity for researchers to examine the same issues based on race. Based on the sampling population, a qualitative collective case study could include both race and teacher’s experiential levels as unique criteria for understanding the participants’ perspectives on the four research questions that bounded this study.

While the literature provided strong frameworks, guidelines and boundaries regarding the conceptualization of the study, the data represented only a small slice of reality respective to myriad settings. I speculate that the research principles of this study were transferrable. Furthermore, the findings regarding the four major themes may find relevance in a number of settings where core teachers were concerned. Patton promoted the notion of extrapolating, rather than making generalizations. “Extrapolations are
modest speculations on the likely applicability of findings to other situations under similar, but not identical, conditions. Extrapolations are . . . problem oriented rather than statistical and probabilistic” (Patton, 2002, p. 584). The naturalistic settings of the participants provided a platform of established academic excellence. Herein lay factors relevant to classrooms, where excellence existed not as a goal but as fact. Transferability could be relegated to similar academic settings where the learning culture, assessment goals and expectations were analogous.

Potential weaknesses in the study may have included the need to examine teachers based on their gender, ethnicity or educational degree. Two participants were female and one was male. If a larger sampling was used, the issue of gender balance could have become a factor. Furthermore, this study could have examined a single gender or could have been replicated with gender preferences. The participants in this study were all Caucasian teachers. This factor limited the study, by focusing only a single race of participants. The literature did not suggest that 21st century learning skills were pertinent to particular races or cultures; therefore, it did not initially seem pertinent that I consider the participants’ race as a relevant factor in this study.

A limitation was the age span of the participants. Two participants were in their third teaching decade, while one participant was near the middle of his career. The study may have been limited by not having a participant who had taught 10 years or less. A larger sample size may have examined participants based solely on the decades in which they had taught. An examination of teachers with experience levels between three and ten years, 11-20 years and 21-30 years may have provided great insight, especially in relation to technological integration levels with their students. A comparison of decade-
based teachers in dissimilar schools may have produced data that suggested differing perspectives on any number of the issues under investigation.

The study may have been limited by studying teachers who did not have either a specialist’s degree or a doctoral degree. One participant had earned a bachelor’s degree, while the other two participants had earned a master’s degree. A study that included bachelor’s level teachers, master’s level teachers and doctorate level teachers may have presented different results due to the participants’ educational levels. It would be noteworthy to ascertain how recently each of the participants had received their last degree. As in my case, I presumed that recent graduates may have had deeper online learning experiences than those who earned degrees in non-recent years. This factor may have impacted engagement in NLS.

Collegial familiarity could have posed concern for the participants. I explained my research intentions to the participants on many occasions and in various ways. I assured the participants that I was not an administrator. My goals were to observe and to learn from them, versus placing a value judgment on their instructional capacities. I reiterated the notion that each participant had been selected as a highly qualified teacher based on their EOCT scores and that each participant was part a 2010 Georgia School of Excellence. I often expressed my sincere thanks to the participants for allowing me to learn from them. My relaxed approach with them seemed to encourage each participant to act and to teach normally, while I was present as an investigator. Although I did not perceive the participants to be nervous or reticent about my presence during the observations, all three master teachers could have felt some measure of stress.
A limitation may have included the fact that the teachers knew me as a faculty member and a collegial peer. On the other hand, as an electives course teacher, I was not required to administer an EOCT in my courses. This factor separated me from the three participants and potentially made me less threatening. Even though I may have misapprehended the participants’ perceptions about this study, I did not presume that this limitation was a factor in this study.

A potential limitation was the data collection time period. Most all the data collection occurred in August, during the first month of school. Although standard routines and procedures appeared to be in place, it was possible that the data would have shown significant alterations if the research had been performed near the end of the semester or during the second semester.

A final limitation was the researcher’s bias regarding 21st century learning skills and technology. I began this study with a significant interest in 21st century learning. My classroom instruction included a significant use of technology and problem-based learning applications. At the inception of the study, my interests and experiences led me into the study. Furthermore, based on the literature review, I believed that 21st century learning best occurred when students were deeply engaged in technology (Dede, 2007; Dieterle, 2008). This supposition did not curtail my ability to view the data with an open mind and in light of the extensive literature review.

**Methodological and Practical Implications**

The findings in this study may provide a clearer understanding of a current and critical educational phenomenon. Specifically, this study addressed an issue that heretofore was unrepresented in the literature and dissertation research. While both the
21st century literacies literature and the CCSS literature abounded as separate entities, a single study that blended both critical issues was non-existent.

The findings were mostly consistent with the literature regarding the need for teachers to demonstrate positive attitudes towards 21st century skills instruction and to show progression towards implementing those goals. It seems probable that learning accountability will be perpetuated through learning assessments in all academic institutions. This study may have suggested ways to create a paradigmic shift among experienced core teachers towards a more defined 21st century learning modality.

Alternative assessment strategies, like PBL and collaborative learning models, may emerge in settings where teachers were once reluctant to make the shift from traditional teacher-centered instruction to learner-centered instructional designs and practices.

The learning culture was a significant finding in this study. The data suggested that 21st century learning skills development and assessment practices were founded in the learning culture and LS. This factor may be applicable in many learning environments, not only in schools where academic excellence prevailed. The themes suggested that learners were more highly engaged in learning when the teachers created a brain-based learning environment and learning culture. The connection between research and practice was evident in many respects. Based on this data, the learning culture created opportunities for deep learning habits and real-world application.

The literature addressed maladroit practices that impeded learning and disrupted the learning process. These practices were not evidenced in this study. Yet, while participants explicated the emergence of various LS theory concepts (Rayner 2011; Kozhevnikov, 2007; Zima, 2007) and effectuated them in the high school core classroom,
the implications were that each of the participants wanted to expand their current instructional practices and to increase their practices based on empirical findings.

While this study examined teachers’ self-efficacy regarding their instructional habits, the participants’ metacognitive processes were difficult to ascertain and to reify. The implications were that teachers were highly active in self-evaluation, used advanced cognition processes during instruction, and engaged to some degree in implicit and explicit communications with their students. Furthermore, the participants identified technology in relation to creative and innovative learning aspects and some teachers determined to more fully engage students in technology-enhanced learning in the future.

The methodological implications were that case study research was a valid approach to examining relevant current issues in education. The collective case study provided data that extended across multiple participants and created voluminous data. The data collection process created cogent, authentic and well-founded evidence. The analytical aspects accented the naturalistic and holistic nature of qualitative research practices. Filtering the data through three social theories provided greater clarity and made analysis impervious to personal bias. The symbolic interactionism filter provided the greatest methodological challenge. The interpretive aspects required a more thorough examination of the participants’ implicit and explicit communications with their students. This deductive process reified their intentions and more accurately elucidated their overt interactions and covert surreptitious communications. The transferability of these implications to other locations indicated that these abstractions held potential for generalizability, where it was useful under an entirely new set of circumstances.
Constructivism founded this research effort to understand teachers’ attitudes towards 21st century learning. Constructivism combined the philosophical constructs posited by various theorists, i.e., Vygotsky, Piaget, Dewey, and Bruner as a descriptive theory of knowledge acquisition (Spector et al., 2007). Therein individuals created knowledge based on the interplay between one’s experiences and ideas (Vygotsky, 1978). Knowledge was actively contextualized versus being imparted or acquired and was oppositional to non-participative traditional instruction (Palko, 2009; Morgan, 2008).

Dana engaged her students by stating, “You have to decide, and what format it should take. Everything. It’s up to you. Do what you think” (D. Dunn, classroom observation, August 24, 2012). Dana afforded the students opportunities to make personal learning decisions.

Andy reiterated his facilitative instructional role, wherein students created their own opinions based on what he had taught them. He said, “. . . It’s not my job to decide. It’s my job to educate you so you can make a decision” (A. Adams, classroom observation, August 28, 2012). Constructivistic epistemology was grounded in contextualized and social constructivist theories (Spector et al., 2007), where learning was inseparable from its present and past contexts (Jonassen & Hung, 2008). Andy demonstrated a viable tendency towards constructivistic learning by focusing his instruction on RWL opportunities. He pinpointed how rising tuition costs were affecting students’ lives. He said,

That affected you. That has affected your family. That’s gonna affect how much food goes on the table. And here, if that doesn’t bother you, that affects whether
you stay at home with mama all four years of college or not (A. Adams, classroom observation, August 22, 2012).

RWL demonstrated the financial impact that governmental decisions had made in the students’ lives as well as that of their families.

The data suggested that all three teachers sought to engage their students in deep levels of “understanding”. Information assessment and analysis were identified as necessary 21st century survival skills (Wagner, 2008). A new set of standards would guide instruction and assessment practices beginning 2012 (Common State Standards Initiative, 2010). For instance, Prensky (2009) purported that digital wisdom should be assessed within the new literacies. Mayrath (2012) suggested a need for quicker and more demanding ways to perform 21st century skills assessments. Mayrath (2012) suggested that “evidence centered design” (100) was a reputable way to reach those requirements. The tasks and assessments were to be correlated to specific skills and understandings previously identified for mastery learning. Resultantly, theoretical perspectives guided the assessment formation. Mayrath (2012) purported, “... first there needs to be some agreement on the skills to be measured”, even though the skill set existed as a “moving target” (p. viii). In a personal interview, Ed Dieterle suggested that the term “neomillennial” held less relevance with the passing of time. Yet, the constructs within the term were highly relevant in the current literature. He suggested that “21st century learning” had replaced the term “neomillennial”. Therefore, I suggest that this study could be replicated by another researcher replacing “neomillennial” with “21st century learning” while upholding its original constructs (E. Dieterle, personal communication, August 8, 2012).
An overlay between the CCSS and the 21st century learning skills suggested that creativity and innovation criteria were amoeba-like and evolutionary. The creativity literature identified several theoretical perspectives. Yet, a general collective consensus was inconclusive. While the parallel between creativity and constructivism emerged in this study, I realized the extreme difficulty that teaching creativity and innovation skills posed for the participants. This was most clearly discussed during Dana’s SRI, when she said,

I think . . . that creativity is . . . a way . . . of expressing your perception of something . . . how it’s meaningful to you . . . You put it in whatever format it seems to be most meaningful and most significant to you (D. Dunn, personal communication, September 17, 2012).

It seemed pertinent that the CCSS failed to implicitly explicate 21st century competencies, like creativity (Magner, 2011). The strongest connection existed in English Language Arts where students engaged in creative writing (Magner, 2011). This was evidenced by the fact that Dana, an English teacher, seemed to readily articulate creativity, although it did not occur without critical thinking during the SRI.

Other content areas, like physical science, possessed little ambiguity regarding content mastery. Contrarily, some of the 21st century skills were obscure and unclear. Therefore, as suggested by Silva (2009), teachers determined those skills based on their own premonitions and goals. In this study Kate reflected this same idea when she stated, “I am also comfortable with giving students a choice in how they wish to show mastery of certain concepts (personal communication, September 12, 2012). Kate determined to
implement creative assessment strategies for students to demonstrate their levels of content mastery.

**Recommendations for Future Research**

Future research may examine K-5 or 6-8 teachers to determine the degree to which the student’s age affected teachers’ perceived abilities to engage students in 21st century learning. Future research should examine schools on a statewide or national level and compare teachers across specific experiential domains. While a small sample provided me the opportunity to delve deeply into each case study, it may have also presented a potential weakness.

Widespread disagreement existed regarding the most effective instructional and assessment methods (Drouin, 2010). Some suggested using alternative assessment practices over traditional standards-based assessments (Gülbahar & Tinmaz, 2006). Future research studies should compare traditional learning environments, where schools are recognized for excellence, employ non-traditional learning methods and assessments, and are recognized for academic excellence.

In 2001, high-stakes, standardized test scores became the single determinant regarding the success or failure of United States public schools (Au, 2007). “High-stakes testing” impacted instruction by narrowing the content (Au, 2007, 264). It was unclear how the CCSS would affect future assessment practices at WHS. Constructivism founded this research effort to understand teachers’ attitudes towards 21st century learning. In a standards-based, over-tested age, teachers have cause to feel unconfident about understanding research regarding emergent issues and socio-cultural phenomena.
The reason(s) why and how the 21st skills are taught should be examined in subsequent research.

A transition from AYP to neomillennial instruction and assessment could have adversely affected the self-efficacy of some teachers. This study determined to understand teachers’ self-efficacy in instructing the new literacies. An examination of these factors regarding effective transformational leadership would provide deeper insight into understanding effective 21st century instructional praxis. The implementation of effective pedagogies and instructional designs may well enhance current and near future learning. Thus, students who learn in real-world environments relate to the real world and are able to identify, assess, and provide alternative solutions to problems (Fazarro, Pannkuk, & Pavelock, 2009).

Researchers and practitioners need to bridge the gap between knowledge creation and its dissemination that is pragmatically founded on both evidential theoretical perspectives and practical instruction (Cools & Van Den Broeck, 2007). Further research regarding self-regulatory frameworks and adaptability and situational learning is needed to aid in designing instruction that is founded upon evidence-based metacognition (Zull, 2011). Lastly, the U. S. educational frontier may remain unaltered unless a transmogrification dispels the economic divergence that exists between the low-income majority and the affluent minority as well as the 21st century academic global achievement gap.
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Sage Publications, Inc.


April 10, 2012

John Wilborn

Dear John,

We are pleased to inform you that your above study has been approved by the Liberty IRB. This approval is extended to you for one year. If data collection proceeds past one year, or if you make changes in the methodology as it pertains to human subjects, you must submit an appropriate update form to the IRB. The forms for these cases were attached to your approval email.

Thank you for your cooperation with the IRB and we wish you well with your research project.

Sincerely,

Fernando Garzon, Psy.D.
IRB Chair, Associate Professor
Center for Counseling & Family Studies

(434) 592-5054
APPENDIX B
Local School Research Request Form

LOCAL SCHOOL RESEARCH REQUEST FORM

Name of School: Bremen High School
Name of Researcher: John Wallace Wilborn
Position or Grade: Teacher

A. Research Project – Qualitative Collective Case Study
   1. Title: Teacher Self-Efficacy: Common Core State Standards Within a 21st Century Skills Framework
   2. Purpose: The purpose of this study is to understand teachers’ perceptions of self-efficacy in instructing content neutral 21st century learning and innovation skills.
   3. Subjects or population for the study: This investigative, qualitative study will examine three highly qualified high school core academic teachers in Bremen City Schools. Each participant has a minimum of three years teaching experience and instructs students whose end-of-course-test (EOCT) scores are 90% or higher.
   4. Reason for doing this research: Doctoral research at Liberty University
   5. Dates research will be conducted: August-September 2012

B. All research and researchers must:
   1. Protect the rights and welfare of all human subjects
   2. Inform participants that they have the right not to participate in the study
   3. Adhere to board policies and applicable laws which govern the privacy and confidentiality of students records

C. Superintendent and Principal need to approve Local School Research Requests. The copy sent to the BCS BOE Office is for filing purposes only. No further approval is necessary.

[Signatures and dates]

Superintendent’s Signature
Date of Approval

Principal’s Signature
Date of Approval
APPENDIX C

Informed Consent Form

Liberty University IRB approval

Principal investigator: John Wilborn
817 Valley Run Drive
Bremen, Georgia 30110
770-363-3004

Co-investigator: Dr. Russell Yocum, Ed. D.
1971 University Blvd.
Lynchburg, VA 24502
434-582-2000

Institutional Review Board:
Fernando Garzon
IRB Chair
Campus North Suite 2400
1971 University Blvd Lynchburg, VA 24502
434-582-2000

Section I: Description of the Study

The participant understands that he/she is voluntarily participating in a research study where John Wilborn is a doctoral student at Liberty University. This study is a requirement for completion of the Educational Doctorate dissertation. This study provides the researcher the opportunity to understand how three teachers’ views of self-efficacy in engaging students in 21st century learning skills development impact their instruction. The three teacher participants will perform one pre-observational survey, two
stimulated recall interviews, and four teaching lessons. Each lesson will be video recorded by the researcher. The participants will be informed of the findings from this study.

Section II: Risks and Benefits to Students, Teachers, School Staff, and School District

Each participant realizes that potential risks to participants are negligible. All participants’ actual names will be protected. I will provide each participant a pseudonym. Collected data from surveys, interviews and observations will be kept confidential. All materials will be stowed in a locked school vault. This includes video SD card data, interview transcriptions, and any other recorded data or media acquired during the data collection processes. Following the study, the researcher will store materials off-campus for three years. At that time, the participants may request the materials, or a copy of the materials to keep in their possession. By participating in this study, the participant will have the perquisite to gaining more substantial understandings of how his/her views of self-efficacy in engaging students in 21st century learning skills development impact their instruction. If the participant has concerns about the risks or benefits of participating in this study, he/she may contact John Wilborn or the IRB office.

Section III: Costs and Payments to the Participant

The participant understands that no emolument, reimbursement or payment of any type will be made to him/her for participating in this study. There will be no cost to the participant other than the amount of time required to perform the survey, observations and interviews.
Section IV: Participant’s right to withdraw from the study

The participant understands that he/she may withdraw from the study at any point in time without deleterious or adverse effects.

Section V: Right to Terminate Participation

The participant understands that or she can be removed from the study. If the participant does not engage in one or more components in the study, the principle investigator could select a new participant to participate in the study.

Section VI: Voluntary Consent by the Participant

The participant has read the foregoing informed consent form. The participant wholly understands the subject matter contained in this document. He/She intentionally agrees to participate in the research study entitled, “Teacher Self-Efficacy: Common Core State Standards within a 21st Century Skills Framework”. The participant has been given every opportunity to ask questions about the research and is settled with the responses given by the researcher. As a result, the participant agrees to engage in this study. Future participant questions may be directed to the principal researcher, John Wilborn. Each participant has received a duplication of this form. His or her approval concludes at the culmination of this research project.

By signing the informed consent form, you give assent to using “your” school to perform the intended research study:

Consenter's Signature: ___________________________ Date: _________

Witness's Signature: ______________________________ Date: _________
APPENDIX D

Pre-observational Survey

Section I - Personal Information

Directions: For questions one through four, circle the letter that best applies.

1) What is your gender?
   A) Male  B) Female

2) What is your age range?
   A) 20-29
   B) 30-39
   C) 40-49
   D) 50-59
   E) 60-69

3) How many years have you been teaching?
   A) 0-3 years
   B) 4-5 years
   C) 6-10 years
   D) 11-15 years
   E) 16-20 years
   F) 21-25 years
   G) 26-30 years
   H) Over 30 years
4) What is your highest earned degree?

A) Bachelor

B) Masters

C) Specialist

D) Doctorate
Section II - Instructional Attitudes

Directions:

For questions 1-4 in each section, place an “x” in the box that best applies. This section is divided into four parts. Each part contains four attitudinal statements related to teacher’s role in instructing and engaging students in learning. For each statement, please determine whether you strongly disagree, disagree, agree, or strongly agree.

Part 1: The following attitudinal statements relate to items based on students’ cognitive or academic engagement.

<table>
<thead>
<tr>
<th>Attitudinal Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am confident that I understand the meaning of cognitive or academic engagement.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident that my instructional strategies challenge students to engage in higher order thinking and cognition.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident that my personal experiences help me to engage students in active learning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident that my professional development experiences have helped me to involve students in the learning process.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What additional attitudes related to items 1-4 would you like to share? Write them in the space below:
Part II: The following attitudinal statements relate to items based on students’ social, behavioral or participatory engagement.

<table>
<thead>
<tr>
<th>Attitudinal Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am confident that I understand the meaning of 21st Century participatory engaged learning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident that my personal experiences help me to engage students in behaviors that enhance learning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident that my professional development experiences have helped me to involve students in effective social interactions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident that my teaching habits aid students in participatory engagement in learning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What additional attitudes related to items 1-4 would you like to share? Write them in the space below:

Part III: The following attitudinal statements relate to items based on students’ learning styles.

<table>
<thead>
<tr>
<th>Attitudinal Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am confident that I understand the meaning of student learning styles.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident that my instructional strategies and techniques reflect effective use of the learning styles of my students.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident that my personal experiences help me to use learning styles more successfully.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident that my professional development experiences have helped me to effectively implement learning styles during instruction.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part IV: The following attitudinal statements relate to items based on your understanding of the Common Core State Standards (CCSS). The Common Core State Standards (4Cs) include four essential *Learning and Innovation* skills: (a) critical thinking; (b) communication; (c) collaboration, and (d) creativity.

<table>
<thead>
<tr>
<th>Attitudinal Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am confident that I understand how to instruct the CCSS.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident that my instructional strategies aid the instruction of the CCSS.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident that my personal experiences help me to instruct the CCSS more successfully.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident that my professional development experiences have helped me to effectively teach the CCSS.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section III: Self-Efficacy Questionnaire

Directions: The following questions relate to specific concepts that pertain to this study.

Answer each question to the best of your ability.

Self-Efficacy

1. How would you describe teacher “self-confidence” in relation to your classroom instructional practices?

The Common Core State Standards

2. The Common Core State Standards (4Cs) include four essential Learning and Innovation skills: (a) critical thinking; (b) communication; (c) collaboration, and (d) creativity. In what CCSS area(s) are you most and least confident in teaching? Explain.

Student engagement

3. What instructional strategies or techniques are you most and least confident using when seeking to engage students in learning? Why?

Cognitive Learning Styles

4. What learning styles strategies or techniques are you most and least confident in using when instructing students? Why?
APPENDIX E

Stimulated Recall Interview Questions

1. Describe your “self-confidence” as a teacher in regard to your teaching habits.

2. As you observe your own teaching, what role does “self-efficacy” play in instructing the core curriculum?

3. In what specific content area(s) of your curriculum do you feel most confident? Why?

4. Are there areas that you feel less confident? Why?

5. After watching yourself teach, describe your effectiveness in engaging students in learning.

6. How have your personal experiences in engaging students in learning made you feel more or less confident in effectively engaging the learner?

7. How have your professional development experiences impacted your ability to engage students in learning?

8. Describe how you use cognitive learning styles when teaching.

9. Explain how your personal experience and/or professional development have impacted how you use of cognitive learning styles in teaching.

10. How would you assess your self-efficacy towards teaching 21st century learning skills?

11. To what extent do you try to be creative and innovative when teaching?

12. How successful are you at engaging students in creativity and innovation?
APPENDIX F

Coding Sheet

The coding performed during video sessions and during interviews included open coding and axial coding processes.

- Open coding – the process of breaking down the data obtained from the surveys, classroom observations and interviews.
  - identifying
  - naming
  - categorizing
  - describing events

- Axial coding – the process of disaggregating the core themes. This process confirmed that the categories accurately represented the participant’s perspectives.
  - core themes
  - sub themes
APPENDIX G
The Looming Tiger

There is a tiger in my room from time to time.

All he does is sit at the foot of the bed, his eyes locked with mine.

I wish all day that he would just go away,

But he has made no effort to make way; this tiger looming over me.

Mother says I’m just plain silly, but I always stress that it might kill me.

She gives a sigh and sends me to my room;

And the tiger is there waiting in its ominous loom.

Still he sits at the foot of the bed - his eyes aglow, his feet like lead.

I soon grow tired and turn off the light;

And whisper a soft, quiet goodnight to this tiger looming over me.

(Megs, 2008)