21st CENTURY LEARNING SKILLS IN EDUCATION AND EMPLOYABILITY

William Xavier Toro

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21st CENTURY LEARNING SKILLS IN EDUCATION AND EMPLOYABILITY

A dissertation submitted in partial fulfillment
of the requirements
for the degree of
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ABSTRACT

21st CENTURY LEARNING SKILLS IN EDUCATION AND EMPLOYABILITY

William Xavier Toro

The purpose of this mixed-methods study was to research a diverse school in Westchester County, New York to analyze whether it is aligned to 21st century practices. This study used both qualitative and quantitative data from focus-group interviews, surveys and non-participant observations with administrators, teachers and department chairpersons to determine whether the school is aligned with 21st century practices to create an employable 21st century student. Furthermore, this study attempted to determine what gaps exist to make a student employable according to the needs of today and the future.

By analyzing the literature review, the researcher developed a conceptual framework. By examining studies by Tony Wagner, Linda Darling-Hammond, Thomas Friedman, Ken Robinson, Yong Zhao and other researchers, the data were then aligned to the conceptual framework, which answers the research questions.

This study revealed that the school being researched implemented and practiced many components of the researcher’s conceptual framework. The study of the data then revealed gaps in the researcher’s conceptual framework regarding funding and socio-emotional support.

The data revealed that the school was faithfully implementing the teaching of 21st century skills, utilizing some 21st century learning environments, developing a 21st century curriculum and had 21st century teachers implementing 21st century pedagogical practices. The data further revealed that the majority of the components were being implemented or utilized.
This study demonstrated that the school has implemented structures and is maintaining practices that support a student becoming employable in the 21st century.
ACKNOWLEDGEMENTS

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Chapter 1 – Introduction to the Study

Introduction

The current educational model is fundamentally based on an outdated system from the 1800s. According to Clarke (2014), “we are behind other nations in international comparisons of academic achievement.” The current education system, regardless of decades of politically motivated reform, has remained, in a sense, “traditional.” The changing conditions and exponential growth of the world’s technology constantly require countries to transform their learning and teaching (Derya Orhan & Kurt, 2017).

To adapt to the changing world, students must become 21st century students and be equipped with 21st century learning skills. Such students must be taught by a teacher who is a 21st century teacher. The student and the teacher must be in a 21st century school. Students entering the workforce require 21st century skills leading toward employment and entrepreneurship opportunities, job training programs and/or military service (Davis, 2016).

There is a significant gap between the skills students needed to be competitive in the global market and economy and what is being taught in schools. This disconnect is known as the global achievement gap (Ellis, 2012; Wagner, 2008). The long-term survival and success of individuals in a society depends on a “top-flight education system” (Darling-Hammond, 2010, p. 24). The younger generation are facing numerous, difficult challenges for achieving economic success, independence and life satisfaction (Miyamoto, del Carmen Huerta, Kubacka, Ikesako, & de Oliveira, 2015). The OECD
(2014) states, “The transition from school to work has become increasingly more difficult for the new generations, irrespective of their level of education.”

According to Cataldo (2014), 21st century technology and new developments are changing the operations and functions of industry, government, education and the culture of citizens around the world. Education is imperative for preparing students to enter the work force; therefore, the K-12 STEM education and curriculum must be reformed to meet the needs of the digital workforce (Cataldo, 2014). The OECD (2013a) states, “learning needs to be put at the center of the reform and design process, whether at the micro level or when addressing larger developments and system change.”

Denmark, Finland, Australia, and New Zealand are ranked as the best education systems in the world. These statistics are based on their tests scores in reading, math and sciences (Programme-for-International-Student-Assessment, 2012). These specific countries focus less on standardized testing, do not require students to undertake hours of homework, and focus more on retention-based hands-on learning. These systems provide students with the necessary innovative problem-solving skills needed for today’s work needs (Taylor, 2012).

Current educational policies and practices are misaligned for helping children to develop transferable skills. Children need to be supported in not only retention, but also the application of skills and knowledge. Students today can meet the future challenges of the world if they are prepared properly in school to become analytical citizens, employees, managers, parents, volunteers and entrepreneurs (Pellegrino & Hilton, 2012). According to the Partnership for 21st Century Learning Skills (2013), 21st century curricula should include, “mathematics, science, history, geography, English, reading,
world languages arts, economics and government and civics” (Partnership-for-21st-Century-Skills, 2013).

**Problem Statement**

Students graduating from high school are deficient in many important skills needed to compete within the global market. The “traditional” classroom approach is students sat in rows and responding back and forth with the teacher to memorize content and pass assessments. This is an outdated model; students who graduate from such a model are at a substantial disadvantage and lack the ability to adapt to the ever-changing global market (Wagner, 2008; Zhao, 2012). The competencies for workers have shifted over recent decades. “Blue collar” jobs have declined substantially in the United States over the past 40 years, from approximately one-third of all jobs in 1979 to only one-fifth in 2009 (Pellegrino & Hilton, 2012). Furthermore, white-collar administrative jobs, such as secretaries and clerks, have also declined (Pellegrino & Hilton, 2012). The rapid decline in middle-class skill jobs and middle-wage jobs has an inverse correlation with increasing wages and educational requirements (Autor, Katz, & Kearney, 2008). According to Harvey Cohen, almost 10 million low-skill manufacturing jobs were lost due to automation (Gioia & Herman, 2005).

Unemployment rates are high in most OECD countries (Figure 1.1). Many countries remain at record low levels of employability, and individuals with low educational attainment are ranked highest in unemployment. According to the OECD (2013a), youth unemployment rose 12% to 16.3% between the years of 2007 and 2012.
There was an attempt to close the gap between curriculum standards and 21st century learning skills through the integration of the Common Core Learning Standards (CCLS). According to Zhao (2012), “The CCLS initiative represents the increasing trend of national homogenization of student learning in the world.” This homogenization is achieved through increased national content of what children should learn. Such control is exercised through three interconnected measures (Zhao, 2012):

1) The identification of core subjects
2) The development of centralized curriculum standards
3) The use of high-stakes testing to enforce standards of core academic subjects

The CCLS mission statement reveals the attempt to bridge 21st century learning skills with curricula: “The common core state standards provide a consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them. The standards are designed to be robust and relevant to the real world, reflecting the knowledge and skills that our young people need for success in college and careers. With American students fully prepared for the future, our communities will be best positioned to compete successfully in the global economy” (Standards, 2011).
According to Wagner (2008), “higher-level thinking skills, technology and information literacy, and flexible and productive work habits are now required by all employers, not just the elite.” Business leaders are in need of and expect workers to be able to ask questions, think critically and problem-solve (Ellis, 2012). If the education system continues along its current path, students will not be competent regarding the needs for the jobs of the future. Students are currently being prepared for jobs that are becoming obsolete (Ellis, 2012).

Cataldo (2014) states, “In the digital age, students need to learn how to use applications such as the Microsoft Office Suite; Google Docs, Sheets and Slides; Apple’s iWork Suite, Cloud computing as well as the numerous digital media tools because they are fundamental to all areas of curriculum as are literacy and numeracy . . . Our nation is
doing a poor job of promoting interest in, let alone formally educating K-12 to harness these vital fields that are the foundation of the present and the future of the digital age.”

According to Pellegrino and Hilton (2012), “current educational policies and associated accountability systems rely on assessments that focus primarily on recall of facts and procedures, posing a challenge to wider teacher and learning transferable 21st century competencies.”

Although the United States leads the world in several industries, there is a shift in the economy that has more substantial international competition in areas of innovation (Ellis, 2012). To be more competitive, the United States needs to develop deeper, more prevalent skills (21st century skills) (Ellis, 2012). In addition to economic growth, other countries are demonstrating substantial achievements in education in comparison with the United States. Many countries, such as Denmark, Finland, South Korea and Singapore, have 90% graduation rates, compared with 70% in the United States (Ellis, 2012; Wagner, 2008).

Wagner (2008) states that, according to a survey of college instructors, students entering college were underprepared in thinking analytically, understanding complex and advanced reading, research and writing at college-academic level, and in applying their learning to real-world scenarios.

**Purpose Statement**

The purpose of this study is to determine what 21st century learning skills are taught and practiced within a diverse suburban school district. In addition, this study identifies the gaps and challenges to bridge the misalignment in skills that are essential in today’s
global market with current pedagogical practices and resources. The study utilized the Partnership for 21st Century Learning as a theoretical framework, as well as a conceptual framework designed by the researcher that combines the theories of Tony Wagner, Linda Darling-Hammond, Thomas Friedman, Ken Robinson, Yong Zhao and other researchers. These theorists all share common visions of what changes need to occur in education to develop 21st century citizens who can compete in the global market of the present and future. This study concludes with an analysis of whether there is alignment between the 21st century skills being taught and the gaps and misalignments for students to be competitive in the global market.

**Research Questions**

Students graduating from high school are deficient in many important skills needed to compete within the global market. The “traditional” classroom approach, in which students sit in rows and respond back and forth with the teacher to memorize content and pass assessments, is an outdated model. Students who graduate from such a model are at a disadvantage and lack the ability to adapt to the ever-changing global market (Wagner, 2008; Zhao, 2012). The following questions were used as the basis for inquiry:

1. What skills do administrators and teachers identify as necessary for the 21st century workplace?
2. What 21st century skills do administrators and teachers identify as part of the educational process in their schools?
3. To what extent are the skills taught aligned with the skills needed for employment in the 21st century?
4. What do administrators and teachers believe are the gaps and challenges to bridge the misalignment?

**Significance of the Study**

This study determines whether there is an alignment between the perceptions of what educators (administrators, chairpersons, teachers) think 21st century learning skills are and what the research found regarding what employers expect from students. This study used the Partnership for 21st Century Learning framework as a theoretical framework and a conceptual framework designed by the researcher. This study acts as a framework for schools to craft their curricula, resources, classroom environments, teacher pedagogy and the skills needed to teach students.

**Overview of Methodology**

This case study used a mixed-methods approach that utilized focus-group interviews, non-participant observations and a survey with Likert scales and open-ended responses. The interviews and survey quantified and captured the perceptions of teachers, chairpersons and administrators regarding 21st century skills being taught in the school, as well as the gaps and misalignments. This methodology allowed the researcher to establish a baseline assessment of teachers, administrators and chairpersons that could be used to reform school policy, resources, learning environment, curricula, professional development and teacher best practices. Non-participant classroom observations took place with random subjects to further triangulate the data.

**Definitions of Key Terminology**

21st Century Learning – The combination of cognitive skills, interpersonal skills and content knowledge needed by student to be competitive in globalization (Wagner, 2008).

21st Century Teacher – A teacher who is versed in 21st century learning skills and who teaches students those skills with 21st century learning in mind.

21st Century Classroom/School – A school that is focused on 21st century learning and that teaches 21st century skills.

Creativity – The process of having original ideas that have value (Robinson & Aronica, 2015).

Entrepreneurship – A process that results in creativity, innovation and growth (Zhao, 2012, p. 3).

Focus School – A school with a low academic performance that is not improving (NYSED, 2018b).

Globalization – The “shrinking” of the world due to an increase of human interaction that adds to the spread of influence of human impacts and results in greater interdependency (McIntyre-Odoms, 2015).

High-Needs Population – Students who are economically disadvantaged. A population in which many students are Students with Disabilities and English-Language Learners.

Imagination – The root of creativity, which has the ability to bring new concepts and ideas to our senses (Robinson & Aronica, 2015).

Innovation – Putting ideas into practice (Robinson & Aronica, 2015).
Learning Environment – A holistic eco-system that functions over time and, in context, includes the activity and outcomes of learning (Taylor, 2012)
Chapter 2 - Literature Review

Introduction

The world is in the process of a third industrial revolution. Cataldo (2014) states that we are in the midst of a digital revolution that is bringing great changes to the world. In this digital revolution, the driving force that will bring competitive members to contribute to the process is the educational system. Educational systems must produce and educate 21st century learners to become competitive members of the digital revolution.

According to Cataldo (2014), the first industrial revolution, which occurred in the 18th century, changed the allocation of various resources, energy, people and raw materials. The second industrial revolution gave rise to the technology that residents of the 21st century are accustomed to, such as automobiles, phones, planes and microprocessors. That revolution also brought computer-aided machines, computer-aided design, biogenetics, lasers and fiber optics (Cataldo, 2014).

Ironically, the digital age has put modern societal and economic systems at the mercy of technology. Cataldo (2014) states, “In this digital age, government, professional, and education institutions that extensively utilize computing technologies have reached the point of no return in which they can no longer function, and be successful without them.” As a result of the dependency on technology in the digital revolution, the educational systems must educate students to meet the future challenges to prepare them to be adult role models, employees, managers, parents, volunteers and entrepreneurs (Pellegrino & Hilton, 2012).

The digital revolution has created a situation in which schools must produce a different type of student with different kinds of worker competencies. According to
Pellegrino and Hilton (2012), “blue collar jobs have shrunk dramatically over the past 40 years, declining nearly one-third of all jobs in 1979 to only one-fifth of all jobs in 2009. Over the same time-period, white collar administrative support jobs such as secretaries and clerks has also declined. This rapid decline in middle-skill, middle-wage jobs has been accompanied by rapid growth at the top and bottom of the labor market.” This ongoing situation must be combated by schools preparing and graduating students with modern skills.

Advances in technology, globalization and other changes have created a demand for more highly educated workers. According to Pellegrino and Hilton (2012), “Across much of the 1980’s, the inflation-adjusted earnings of high school graduates plunged by 16 percent, while the earnings of college-educated workers rose by nearly 10 percent.” During the following decades, the same pattern is apparent: low-skill worker earnings fell, while college-educated workers salaries increased (Pellegrino & Hilton, 2012).

Educational systems must develop students to be 21st century learners, so that they can achieve their full potential as adults. Schools must “develop students with a range and knowledge that facilitate mastery and application of English, mathematics, and other subjects” (Pellegrino & Hilton, 2012). Furthermore, “business and political leaders are increasingly asking schools to develop skills such as problem solving, critical thinking, communication, collaboration, and self-management, often referred to as 21st century skills” (Pellegrino & Hilton, 2012).

The ever-changing and evolving conditions in the world have caused transformations in teaching and learning environments (Derya Orhan & Kurt, 2017). Furthermore, the world and economy have changed dramatically due to technological
developments and international job markets (Ellis, 2012). Advancements in information and communications technology have boosted global collaboration and interconnectedness: “The changes in technology and the interconnected nature of the global market has resulted in a significant transformation of the competencies necessary to be successful in the 21st century” (Ellis, 2012). Technology is being used as the primary format for interaction; people are expanding their network of friends and colleagues through technology (Ellis, 2012; Wagner, 2008).

The 21st century student must be flexible and able to adapt quickly to the changing job market and global needs. According to Gioia and Herman (2005), many younger people will have jobs in their lifetimes that do not exist today. Employers are looking for candidates with a broad and interdisciplinary background. “This trend is likely to continue as more professionals are called on to promote an increasingly expanding range of tasks” (Gioia & Herman, 2005). The United States needs to ensure that its students are being educated and trained to meet the demands of the 21st century economy (Ellis, 2012).

**Theoretical Framework**

This study used the framework from the Partnerships for 21st Century Skills (P21) (see Figure 2.1) to correlate what skills are needed to thrive and succeed in the global market (Partnership-for-21st-Century-Skills, 2013). The framework identified the core components for 21st century learning skills that are needed to be a successful member of the current global market (Partnership-for-21st-Century-Skills, 2013). The framework defines the following four themes:
1. Key Subjects – 3 Rs (Reading, Writing, Arithmetic) and 21st Century Themes

2. Learning and Innovation Skills

3. Information, Media and Technology Skills

4. Life and Career Skills

(Partnership-for-21st-Century-Skills, 2013)

_Figure 2.1_

**P21 Framework for 21st Century Learning**

Figure 2.1 P21 Framework for 21st Century Learning (Partnership-for-21st-Century-Skills, 2013)

**Key Subjects – 3 Rs (Reading, Writing, Arithmetic) and 21st Century Themes**

The P21 defines the following subjects as essential for all students in the 21st century: English (reading or language arts), World Languages, Arts, Mathematics, Economics, Science, Geography, History, Government and Civics. In conjunction with the key subjects, students must become versed in 21st century interdisciplinary themes within the

**Global Awareness** – 21st century students must understand and address global issues. Students must be able to work in a collaborative setting and have mutual respect for diverse cultures, religions and lifestyles. They must be sympathetic and tolerable of other nations and cultures, including non-English languages (Partnership-for-21st-Century-Skills, 2013).

**Financial, Economic, Business and Entrepreneurial Literacy** – 21st century students must be able to make appropriate economic choices. Students must understand the role of the economy in society. In addition, students must use entrepreneurial skills to strengthen productivity in the workplace (Partnership-for-21st-Century-Skills, 2013).

**Civic Literacy** – This is essential for 21st century students, who must know and understand government processes. Students must exercise the rights and obligations of citizenship on all levels. In addition, 21st century students must understand the local and global implications of decisions (Partnership-for-21st-Century-Skills, 2013).

**Health Literacy** – 21st century students must obtain and interpret health information and services to enhance their own health. Students must understand preventative measures to stay physically and mentally healthy. They should be able to use information to make optimal health-related decisions. In addition, they must have the skills to monitor personal and family health goals while understanding national and international health issues (Partnership-for-21st-Century-Skills, 2013).

**Environmental Literacy** – 21st century students must be able to demonstrate knowledge and comprehension of the environment and the conditions affecting it
regarding air, climate, land, energy, etc. They must know how society impacts the environment and they must have the skills to investigate and analyze environmental issues and to propose effective solutions.

**Learning and Innovation Skills**

According to the P21 Framework, “learning and innovation skills increasingly are being recognized as those that separate students who are prepared for a more complex life and work environment in the 21st century, and those who are not” (Partnership-for-21st-Century-Skills, 2013). For a student to be prepared for 21st century challenges, they must be equipped with the abilities to think critically, to communicate and to collaborate (Partnership-for-21st-Century-Skills, 2013).

**Think Creatively** – Students should possess a wide range of idea-creation techniques, including brainstorming and the ability to create new and innovative ideas. According to the P21 Framework, students should be able to “elaborate, refine, analyze and evaluate their own ideas in order to improve and maximize creative efforts” (Partnership-for-21st-Century-Skills, 2013).

**Work Creatively with Others** – 21st century students should be able to communicate new ideas effectively with each other. They must be open to different perspectives, to criticism and be able to incorporate feedback. Additionally, students must be able to view failure as a learning opportunity (Partnership-for-21st-Century-Skills, 2013).

**Implement Innovations** – Students must be able to create new ideas and act on them to contribute useful input to the field in which the innovation occurs (Partnership-for-21st-Century-Skills, 2013).
Communication and Collaboration

Twenty-first century students must have the skill to communicate their ideas to all stakeholders within a given project, either at work or at school. Furthermore, they must be able to work well in a group setting.

Communicate Clearly – 21st century students must be able to articulate their thoughts and ideas using oral, written and non-verbal communication skills within different settings. They must be able also to listen effectively and to use communication for a range of purposes, such as being able to inform, instruct, motivate and persuade others. Additionally, students must be able to communicate in diverse multi-language environments (Partnership-for-21st-Century-Skills, 2013).

Collaborate with Others – Students who are 21st century learners must be able to work effectively in diverse teams while being flexible and willing to make compromises toward accomplishing a common goal. They should be able also to share responsibility for collaborative work (Partnership-for-21st-Century-Skills, 2013).

Information, Media and Technology Skills

The world of the 21st century is media and technology driven. According to the P21 Framework, the world is “marked by various characteristics, including: 1) access to an abundance of information, 2) rapid changes in technology tools, and 3) the ability to collaborate and make individual contributions on an unprecedented scale” (Partnership-for-21st-Century-Skills, 2013).
**Information Literacy** – 21st century students must be able to access information effectively from trusted sources in a timely manner, and then evaluate that information critically and competently. Students must be able to use the information accurately and creatively for the project or issue they are working on. Additionally, students must be able to understand the ethical and legal issues of the information they access (Partnership-for-21st-Century-Skills, 2013).

**Media Literacy** – Students of the 21st century must be able to understand the purpose of media messages and to understand how individuals interpret messages differently and be able to understand the ethical and legal issues of the media they access (Partnership-for-21st-Century-Skills, 2013).

**Information, Communications and Technology (ICT) Literacy** – 21st century students must be able to use technology as research, organizational and communication tools. Students must be fluent with digital technologies, such as computers, PDAs, media players, software and hardware. Additionally, students must understand the ethical and legal issues of the ICT they access (Partnership-for-21st-Century-Skills, 2013).

**Life and Career Skills**

**Flexibility and Adaptability** – 21st century students must be able to set success criteria and have long- and short-term goals. Students must monitor, define and complete tasks without constant monitoring. Additionally, students must explore and expand their own capabilities to gain expertise and advance their skills toward a professional level (Partnership-for-21st-Century-Skills, 2013).
**Social and Cross-Cultural Skills** – Students of the 21st century must be able to distinguish when it is appropriate to speak and to listen. Students must be able to conduct themselves in a respectable and professional manner, as well as respecting each other’s cultures and being tolerant of each other’s backgrounds. It is important that students are open-minded and receptive toward different ideas and feedback (Partnership-for-21st-Century-Skills, 2013).

**Productivity and Accountability** – Students of the 21st century must be able to manage their own projects by setting and meeting goals while facing difficulties and setbacks. Students must produce results. According to the P21 Framework, students must, “Demonstrate additional attributes associated with producing high quality products including the abilities to: Work positively and ethically; Manage time and projects effectively; Multi-task; Participate actively, as well as be reliable and punctual; Present oneself professionally and with proper etiquette; Collaborate and cooperate effectively with teams; Respect and appreciate team diversity; Be accountable for results” (Partnership-for-21st-Century-Skills, 2013).

**Leadership and Responsibility** – 21st century students must be able to guide others toward an end goal and leverage the strengths of one another to accomplish this goal. Students must be able to inspire others to reach their full potential and to demonstrate integrity. Additionally, a 21st century student must act responsibly, with the interests of the entire group in mind (Partnership-for-21st-Century-Skills, 2013).
The 21st Century Student

The 21st century student must encompass the many skills and characteristics needed for the 21st century global market. According to Taylor (2012), “21st century competences generally refer to such skills as the ability to apply meaningfully-learned, well-integrated knowledge in different situations and the ability to cope with the social, communication, and emotional demands of rapidly-changing environments.” Taylor explains further that social competences have a prominent place in the 21st century (Taylor, 2012). A 21st century learner must be able to transfer and integrate the information they learned to new situations. According to Pellegrino and Hilton (2012), 21st century skills must be transferred or applied in new situations and must be transferable to answer questions and to problem-solve. Children need a balanced set of cognitive emotional and social capabilities to acclimate to the ever-changing world. Those students who can adapt to the economic, social and technological difficulties of the 21st century will have a higher probability of achieving prosperous, healthy and happy lives (Miyamoto et al., 2015).

Pellegrino and Hilton (2012) assigned 21st century skills to clusters of competencies and, together with a committee, they developed the following classification scheme:

- The Cognitive Domain includes three clusters of competencies:
  1) Cognitive processes and strategies
  2) Knowledge
  3) Innovation
- The Intrapersonal Domain includes four clusters of competencies (these clusters include competencies such as flexibility, initiative, appreciation for diversity, and metacognition):
  1) Intellectual openness
  2) Work ethic
  3) Conscientiousness
  4) Positive-core self-evaluations

- The Interpersonal Domain includes two clusters of competencies (these clusters include competencies such as communication, collaboration, responsibility and conflict resolution):
  1) Teamwork and collaboration
  2) Leadership

The changing society has caused a shift from the skills taught to previous generations to the skills needed for the 21st century (Dede, Korte, Nelson, Valdez, & Ward, 2005). Dede et al. (2005) state, “the core problem is that our education and training system were built for another era, an era in which most workers needed a rudimentary education.” In today’s classrooms, students need to be instructed with relevant information that is rich in the skills that they will need in their future (McIntyre-Odoms, 2015).

For students to be successful citizens in the 21st century, Wagner (2008) states that students must be prepared with the “Seven Survival Skills for the 21st Century.” These skills are as follows:

  1) Critical thinking and problem-solving
2) Collaboration across networks and leading by influence
3) Agility and adaptability
4) Initiative and entrepreneurialism
5) Effective oral and written communication
6) Accessing and analyzing information
7) Curiosity and imagination

In a study by Davis (2016), a survey was conducted to research the essential 21st century skills needed to enter the workforce. The results reveal that one of the most significant skills required to obtain entrance into the workforce is critical thinking, with a mean of 3.64, which was the highest of all the responses. Then came collaboration and problem-solving, with a mean of 3.57 each. The third highest skill was oral communication, with a mean of 3.50. The researchers conclude that collaboration, communication, assessing and adaptability are the most significant skills (Davis, 2016).

Theorists such as Zhao believe that students should be trained in entrepreneurship skills to be ready to partake in the 21st century job market. The term “entrepreneur” originates from a French term that means, “someone who undertakes a significant project or activity” (Dees, 1999). Zhao (2012, p. 8) states, “Everyone needs to be entrepreneurial in the 21st century.” Tony Wagner’s seven survival skills in *Global Achievement Gap: Why Even our Best Schools Don’t Teach the New Survival Skills our Children Need* (Wagner, 2008, p. 8) are similar to the entrepreneurial skills that Zhao emphasizes. Zhao (2012, p. 3) mentions that the World Economic Forum defines entrepreneurship as “a process that results in creativity, innovation and growth. Innovation entrepreneurs come
in all shapes and forms; its benefits are not limited to startups, innovative ventures and new jobs. Entrepreneurship refers to an individual’s ability to turn ideas into action and is therefore a key competence for all, helping young people to be more creative and self-confident in whatever they undertake” (World-Economic-Forum, 2009, p. 9).

Children are born with eight basic characteristics that can be developed to become 21st century learners:

1) Curiosity and the ability to learn
2) Different capacities for learning the same things
3) In school, they have different levels of cognitive, emotional, physical and social development due to a combination of nature and nurture
4) In school, they have different needs, interests and abilities
5) Active learners with unique needs
6) Bear the responsibility of learning
7) Learn best when intrinsically motivated
8) Are motivated when respected, encouraged and exposed to opportunities that capture their interest, as well as building on their previous experience, and are recognized for their accomplishments.

(Zhao, 2012, p. 156)

As 21st century learners, students must take ownership of their learning. This process can be done only when children learn what they would like to learn and take responsibility for their learning. Students then become truly engaged and motivated in the learning process. When students are forced to learn a topic they do not consider relevant, they become disengaged and uninterested (Zhao, 2012, p. 171). Zhao (2012, p.173) states
that by allowing students the freedom to choose what to do in school and take initiative – “a necessary quality of the entrepreneurial spirit” – then students take the initiative to set goals and accomplish their task.

Twenty-first century learners must be taught myriad skills and competencies before completing their education. Students become “deeper learners.” According to Pellegrino and Hilton (2012), deeper learning is the process through which learners can take skills and knowledge and transfer them to new and different situations. Students must be able to adapt and transfer what they know to the changing world. Pellegrino and Hilton (2012) state that, “the product of deeper learning is transferable knowledge, including content knowledge in a domain and knowledge of how, why, and when to apply this knowledge to answer questions and solve problems.”

Levy and Murnane (2004) argue that the demand and need is growing for “expert thinkers” (non-routine problem-solving, complex communication competencies, and non-routine interactive skills) (Levy & Murnane, 2004; Pellegrino & Hilton, 2012). According to Levy and Murnane (2004), “the demand is growing for verbal and quantitative literacy. They view reading, writing, and mathematics as essential for enabling competencies that support individuals in mastering tasks that require expert thinking and complex communication production processes. Predicting that jobs requiring low or moderate levels of competence will continue to decline in the future, the authors recommend that schools teach complex communication and non-routine problem-solving competencies, along with verbal and quantitative literacy to all students” (Levy & Murnane, 2004; Pellegrino & Hilton, 2012).
According to Derya and Kurt (2017), “critical thinking and problem solving skills reflect the skills of testing the accuracy of the acquired information, questioning the usability of this information, and adequately using acquired knowledge or knowledge to be acquired in solving problems.” Students must be able to collaborate across all forums and networks leading to being 21st century learners (Derya Orhan & Kurt, 2017). Derya and Kurt (2017) define initiative and entrepreneurialism as the utilization and self-management and self-control strategies to resolve problems faced in the process of the acquisition of knowledge. Effective communication and oral skills mean that students can use their skills daily in all situations.

Research by McIntyre-Odoms (2015), regarding perceptions of 21st century skills, revealed that 62% (41 of 62 participants) believed critical thinking was the most important skill category, with an average response ranking of 1.52 (SD = .72). About half the participants (48%) (32 of 66) felt that communication and collaboration ranked as the second most important skill, with an average ranking of 1.70 (SD = .65). Moreover, 70% (46 of 66) felt that creativity and innovation was the least important skill, with an average ranking of 2.61 (SD = .65). Furthermore, “Despite the highest mean score rank order of importance; critical thinking and problem solving had the largest standard deviation (SD.72) compared to communication and collaboration (SD = .65) and creativity and innovation (SD = .65). Conversely, when looking at rating of importance, the category of creativity and innovation had the largest standard deviation (SD = .33), whereas when asking the question in a manner that participants were asked to rank order of the skills, there was a different consensus, the category for critical thinking and problem solving had a larger standard deviation (SD = .72). There was more of a variety of opinions
regarding ranking critical thinking and problem solving as their first choice” (McIntyre-Odoms, 2015).

Ellis (2012) states that 21st century jobs need employees who are critical thinkers and have mastered strong communication skills, innovation skills and creativity (Ellis, 2012; Wagner, 2012). Doctor Teresa Amabile, who is a professor of business administration and Director of Harvard Business school, developed a framework to illustrate the capacity of creativity to develop a 21st century innovator (Wagner, 2012). The framework by Doctor Teresa Amabile is displayed in Figure 2.2

*Figure 2.2*

*Framework for Components of Creativity*

![Figure 2.2 – Framework for Components of Creativity (Wagner, 2012, p. 24)](image)

The framework is represented as a Venn diagram, with the three main circles representing expertise, creative-thinking skills and motivation. The circles overlap, and from the three components comes creativity (innovation).

1) *Expertise* – the relevant information and knowledge that a person can bring to a situation
2) **Creative-thinking skills** – the ability to generate ideas that are unique and of high quality and task appropriate. Creative thinking consists of the following components:
   a. Comfort in disagreeing and attempting different solutions
   b. Synthesizing different experiences to solve a problem
   c. Persevering through difficult situations
   d. Ability to step away and to refocus with a fresh perspective

3) **Motivation** – the want and need to complete a task, whether it is of intrinsic or extrinsic motivation

   (Wagner, 2012, pp. 24-25)

Research by McIntyre-Odoms (2015) revealed that 89% of the participants in their study felt that creativity and innovation were “very important”, and critical thinking and problem-solving received a rating of 97% “most important.” Creativity and innovation had the largest standard deviation (SD = .31) when compared with critical thinking and problem-solving (SD = .17) and communication and collaboration (SD = .24), which demonstrates a variety of opinion (McIntyre-Odoms, 2015).

According to Wagner (2012), Dr. Amabile believed motivation was more important than expertise and creative thinking. Amabile stated that, “Expertise and creative thinking are an individual’s raw materials – his or her natural resources, if you will. . . [and] will determine what people actually do” (Wagner, 2012, pp. 24-25). To create and enhance motivation, students must be able to connect the content and the subject of lessons to their own personal lives, through engaging students in collaborative problem-solving, and rewarding students with the knowledge as skills being developed as
opposed to just grades or scores (Taylor, 2012). The outside force encompassing the framework is a *culture of innovation*, which includes interdisciplinary problem-solving, exploration, intrinsic incentives, exploration, play, teamwork and empowerment (Wagner, 2012, p. 58) (see Figure 2.3).

*Figure 2.3*

*Culture of Innovation Framework*

As the 21st century progresses, according to Wagner (2012, p. 142), “what you know is far less important that what you can do with what you know. The interest in and ability to create new knowledge to solve new problems is the single most important skill that all students must master today. All successful innovators have mastered the ability to learn on their own in the moment and then apply that knowledge in new ways.”
The 21st Century Teacher and Learning Environment

To create the 21st century student and learning environment (classroom), there needs to be a shift in teacher pedagogy and practice to 21st century classroom instruction and a definition of what a learning environment truly is. According to the OECD (2013), the term “school” is problematic because it connotes that all learning should take place in there and only there. The OECD (2013a) states, “The term may also be helpful when the focus is on learning if it suggests the starting point should be educational institutions rather than the organization of learning.” The learning environment encompasses both the physical and digital setting in which students carry out their activities, including all the resources found in that setting. This environment is an organic and holistic concept that synthesizes the learning taking place and the setting. It is an “eco-system” of learning that incorporates the activity and outcomes of learning (OECD, 2013a).

Research by the OECD (2013a) concludes that the “classroom level” and the “teacher effects” are highly influential, rather than the “school effects.” The innovative learning environment (ILE) principles frame effective 21st century teacher traits as follows:

- Make learning and engagement central
- Ensure that learning is social and often collaborative
- Be highly attuned to the learners’ motivations and emotions
- Be acutely sensitive to individual differences
- Be demanding for each learner but without excessive overload
- Use assessments consistent with learning aims, with strong emphasis on formative feedback
- Promote horizontal connectedness across activities and subjects, in and out of school

(OECD, 2013a)

There is extensive research on the different aspects of learning that were synthesized to create seven principles to develop a learning environment for the 21st century (Dumont, Benavides, & Istance, 2010). The seven principles serve as guidelines for the design of diverse learning activities. A 2010 report by Dumont, Benavides and Istance concludes that the learning environment should:

1) Recognize the learners as its core participants, encourage their active engagement and develop in them an understanding of their own activity as learners (self-regulation)

2) Be founded on the social nature of learning and actively encourage group work and well-organized cooperative learning

3) Have learning professionals who are highly attuned to the learners’ motivations and the key role of emotions in achievement

4) Be acutely sensitive to the individual differences among the learners in it, including their prior knowledge

5) Devise programs that demand hard work and challenge from all without excessive overload

6) Operate with clarity of expectations and deploy assessment strategies consistent with these expectations: there should be strong emphasis on formative feedback to support learning
7) Strongly promote “horizontal connectedness” across areas of knowledge and subjects, as well as the community and the wider world

(Dumont et al., 2010; OECD, 2013a)

The OECD developed this framework for the 21st century teacher and learning environment. As defined by the OECD, a learning environment is a “holistic eco-system that functions over time and in context and includes the activity and outcomes of learning. The framework through which to understand this needs to be based on a conceptual architecture that does not immediately refer to the “innovative” or “effective” or “powerful”. Instead, the basic conceptual framework should be applicable to traditional, as well as innovative models in which additional criteria applied to assess how appropriate any particular case is for the 21st century circumstances” (Taylor, 2012). The term “classroom” does not offer a proper framework for a learning environment. The framework in Figure 2.4 is portrayed as a circle with four quadrants labeled as follows: Educators, Resources, Learners and Content.

Figure 2.4

The Elements of the Pedagogical Core
The components of learners, teachers or educators, resources and content are the basis for this framework and provide the core of a learning environment (Taylor, 2012). With these components intertwined, a learning environment is best defined. Although the elements are in their respective quadrants, they do not work in isolation from one another. The “organization” and the organizational relationships allow for the components of the pedagogical core to work together. Figure 2.5 displays the organization and dynamics of linking the elements in the pedagogical core.

*Figure 2.5*

*Organization and Dynamics Linking the Elements in the Pedagogical Core*

The organization and pedagogy comprise three indicators that create a learning environment that includes the grouping of students, the use of time within a scheduled lesson, and pedagogy and assessment.
According to Taylor (2012), educators play a complex role and are orchestrators of learning settings in complex, contemporary learning environments. Educators should be open to bringing in different “experts,” adults or peers to work in collaboration with each other to enhance a classroom environment and lesson (Taylor, 2012). Taylor (2012) goes onto describe the concept of “authentic learning” and how “it is a common feature of many innovative learning environments to make the learning experience authentic and meaningful by engaging students with real-life problems, offering hands-on experiences and incorporating students historical, natural, and cultural environment in learning activities.” Through authentic learning, inquiry and collaborative work will help prepare students for future learning (Taylor, 2012).

Sweet (2014) states that, “the most common method for implementing 21st century skills is project based learning.” Zhao (2012) believes that, “according to the definitions found in PBL (Project Based Learning) handbooks for teachers, projects are complex tasks, based on challenging questions or problems, that involve students in design, problem-solving, decision making, or investigative activities; it gives students the opportunity to work relatively autonomously over an extended period of time; and culminate in realistic products or presentations.” Project-based learning enhances learning and student creativity and innovation (Pearson, 2014). Furthermore, Zhao (2012, p. 194) states that, “project based learning has been said to have many benefits, compared with traditional instructional approaches.” Zhao (2012) also states that, “characteristics that define project based learning include: authentic content, authentic assessment, teacher facilitation but not direction, explicit educational goals, cooperative learning, reflection and incorporation of adult skills.”
According to Zhao (2012, p. 199), there are three models for project-based learning, which are the academic model, the mixed model and the entrepreneurship model. The academic model, which is also known as the traditional model, is an effective way to teach curricula and skills and is the most common method used in schools today. The academic model is teacher-led and is used primarily in the classroom (Zhao, 2012, pp. 199-200). The mixed-model method puts the teacher in control of the entire process. The teacher can allow for student input, but the teacher ultimately decides what project is appropriate for the students. There is a student-teacher collaboration, and the project can be completed in a single classroom, multiple classrooms or within the community. The teacher decides what products the students will create and how the project will be completed. Students are given some degree of freedom to be creative and specialize in areas within the project (Zhao, 2012, p. 201). The final model is the entrepreneurial model, which builds upon the mixed model. According to Zhao (2012, p. 203), “They [students] need to convince the teacher to approve the project and need to convince their peers to become partners. And for that they need to create a business plan, complete with documentations and analyses of targeted audiences and needs, a feasibility analysis, and marketing strategies.” Thus, students are developing a product, the project is student-led and it takes place either within the school or community (Zhao, 2012, p. 199). Research indicates that student-centered instruction is a regularly practiced strategy to enforce 21st century learning skills. Clarke (2014) conducted a survey of teachers, and the results for the question, “How often do you use a student-centered format for instruction?” were 10% always, 48% almost always, 38% sometimes, 4% rarely, 0% never.
Project-based learning changes a student from being a recipient and consumer to becoming a creator and provider. The teacher’s role changes from the sole source of knowledge and authority to a motivator and coach (Zhao, 2012, p. 240). Research indicates the “coach” framework is a regularly practiced strategy to enforce 21st century learning skills. In Clarke’s (2014) survey, the results for the question, “How often do you act more like a coach or guide to your students than an information provider?” were 31% always, 34% almost always, 28% sometimes, 7% rarely, 0% never.

Furthermore, project-based learning is a regularly practiced strategy to enforce 21st century learning skills. For the question, “How often do you use either project or problem-based learning?” the results were 24% always, 28% almost always, 38% sometimes, 10% rarely, 0% never (Clarke, 2014). Wilbert (2017), conducted a qualitative study with interviews. The interviews reveal the teachers’ perspectives regarding project-based learning:

- “The best way we’ve found at this point is a project, a well-designed product, but an inquiry-based project. This idea that it’s around relevance and meaningful experiences and these experiences are messy as they’re built together with other things and other content.”
- “The best level of it, the highest aspiration of it, is that we’re able to write a driving question that has some authentic purpose in the students’ lives and maybe some real impact on the community or on global conversations or needs like world hunger or cancer, where we have kids do projects like that.”
- “Ultimately, I think the part that’s about engagement is having authentic problems, hands-on work, having understanding, having purpose for that work, and then being accountable to share that work with others. No matter what those things are, we make sure we have those elements to it.”

(Wilbert, 2017)

The digital lifestyles of today require learning to become personalized, collaborative, interactive and creative. Learning must become more authentic in context, which will produce more thorough understanding (Sweet, 2014). Pearson (2014) states,
“Through collaboration with fellow students, students will have learned how to work in teams becoming more adaptable and agile under complex conditions. As more schools throughout the United States begin to implement 21st century skill learning, the prospect of students across the United States receiving an equitable education is more likely regardless of socio-economic status.” The role of teachers will transition from teaching-standards-based information to more skills standards (Pearson, 2014). According to Pearson (2014), “21st century skills learning disrupts the way teachers have previously taught and students have learned.” Twenty-first century skills are moving students from lower-level Bloom’s Taxonomy questioning to higher-level thinking with relevance and application to real-world scenarios (Pearson, 2014).

To transform the classroom experience at every level is essential to develop the capacities and skills for students to become innovators (Wagner, 2012, p. 202). Teachers must be regarded as “coaches” rather than facilitators. Innovators need coaching at every age and state (Wagner, 2008, p. 242). According to Robinson and Aronica (2015, p. 88, 90, 93), teachers and schools should be enabling students to pursue their own interests, adapting the rate at which students learn, and are in need of assessment that supports personal progress and achievement.

Robinson and Aronica (2015, pp. 45-51) state that education should enable students to fulfill four responsibilities:

1) Education should enable students to become economically responsible and independent.

2) Education should enable students to understand and appreciate their own cultures and to respect the diversity of others.
3) Education should enable young people to become active and compassionate citizens.

4) Education should enable young people to engage with the world within them as well as the world around them.

According to Robinson and Aronica (2015), formal education has three elements: curriculum, teaching and assessment. The standards movement is focused on curriculum and assessment; whereas, teaching is a way to deliver the curriculum. Robinson and Aronica (2015, p. 100) state that, “these priorities are entirely back to front. It doesn’t matter how detailed the curriculum is or how expensive the tests are; the real key to transforming education is the quality of teaching.” The core role of a teacher is to facilitate learning. A large amount of time is wasted by administering tests, clerical tasks, attending meetings, writing reports and tending to disciplinary issues. For Robinson and Aronica (2015, p. 101), “When those other tasks distract from that job, the real character of teaching profession is obscured.”

Expert teachers must fulfill four main roles: they must engage, enable, expect and empower (Robinson & Aronica, 2015, p. 104):

- **Engage** – “They (teachers) need to engage, inspire and enthuse students by creating conditions in which those students will want to learn. Great teachers achieve results by bringing the best out on their students” (Robinson & Aronica, 2015, p. 105).

- **Enable** – Robinson and Aronica (2015) state that, “there is an essential place for direct instruction in teaching. Sometimes it’s with a whole class, sometimes with smaller groups and sometimes one-on-one with individual students. Expert
teachers constantly adapt their strategies to the needs and opportunities of the movement. Effective teaching is a constant process of adjustment, judgement and responding to the energy and engagement of the students. Children are naturally curious. Stimulating learning means keeping their curiosity alive. This is why inquiry-based teaching can be so powerful.” According to Taylor (2012), technology is a tool for inquiry-based learning and that, “Engagement and motivation, student-driven learning and inquiry, interactivity and collaboration, personalization and flexibility are enabled and enhanced with technology.” Clarke (2014) indicates that the use of technology is a regularly practiced strategy to enforce 21st century learning skills. In response to the question, “How often do you use technology to enhance instruction?”, teachers answered as follows: 17% always, 28% almost always, 55% sometimes, 0% rarely, 0% never (Clarke, 2014). Expert teachers provoke questions in students, so they are inspired to explore them (Robinson & Aronica, 2015, pp. 106-108).

- *Expect* – Teachers expectations have radical implications for the achievement of their students. If teachers convey to students that they expect them to do well, it is much more likely that they will. If they expect them to do badly, that is more likely, too. The key to raising achievement is to recognize that teaching and learning have a strong relationship. Students need teachers who connect with them and, above all, teachers who believe in them (Robinson & Aronica, 2015, pp. 108-109).

- *Empower* – The best teachers are not only instructors; they are mentors and guides who can raise the confidence of their students, help them find a sense of
direction, and empower them to believe in themselves. Have students work in groups and encourage them to believe in their extraordinary levels of potential. Guide them through a process of discovery. Build lessons on open-ended questions, urging students to learn by reasoning rather than by memorizing information. Encourage conversation and questions, urging students to learn by reasoning rather than by memorizing information. Encourage conversation and collaboration. These elements will create a passion for learning. Learning power is based on three fundamental beliefs:

1) The core purpose of education is to prepare young people for life after school; helping them to build up the mental, emotional, social and strategic resources to enjoy challenges and to cope with uncertainty and complexity.

2) This purpose for education is valuable for all young people and involves helping them to discover the things that they would really love to excel at, strengthening their will and skill to pursue them.

3) This confidence, capability and passion can be developed since real-world intelligence is something that people can be helped to build up.


Robinson and Aronica (2015, p. 118) define creativity as, “the process of having original ideas that have value.” There are two concepts within creativity that have to be kept in mind: imagination and innovation. According to Robinson and Aronica (2015), imagination is the root of creativity, which has the ability bring new concepts and ideas to
our senses: “creativity is putting your imagination to work. . . Innovation is putting ideas into practice” (Robinson & Aronica, 2015, p. 118).

Robinson and Aronica (2015) state that, “great teachers are the heart of great schools.” Teachers fulfill three essential purposes for students:

1) Inspiration – Teachers inspire students with their own learning and teaching passion of their discipline.

2) Confidence – Teachers assist students in obtaining the skills and knowledge necessary to develop confidence within themselves.

3) Creativity – Teachers enable their students to ask questions, experience, inquire and develop the skills necessary for original thinking.

(Robinson & Aronica, 2015, p. 127)

Students learn best when they are actively engaged and doing things. When their curiosity is encouraged, when they ask questions and discover new ideas, students become excited about the content (Robinson & Aronica, 2015, p. 127). Robinson and Aronica (2015) claim that, to create such students, teachers need to develop the following characteristics within a student:

- “Curiosity – the ability to ask questions and explore how the world works.
- Creativity – the ability to generate new ideas and apply them in practice.
- Criticism – the ability to analyze information and ideas and to form reason arguments and judgements.
- Communication – The ability to express thoughts and feelings clearly and confidently in a range of media and forms.
- Collaboration – the ability to work constructively with others.
- Compassion – The ability to empathize with others and to act accordingly.
- Composure – The ability to connect with the inner sense and develop a sense of personal harmony and balance.
- Citizenship – The ability to engage constructively with society and to participate in the process that sustain it.”

(Robinson & Aronica, 2015, pp. 135-140)

A more recent innovation in teaching and learning is known as design thinking. Many organizations and a number of schools are currently using this strategy (Robinson & Aronica, 2015, p. 147). According to Robinson and Aronica (2015, p. 147), design thinking “draws on creative and analytic techniques of professional designers in identifying and solving problems and in conceiving a new product and series.” Linking industry to education makes learning relevant and interesting. Robinson and Aronica (2015, p. 123) state that, “things have moved on so much from the textbook” and that students need to see real-life examples of what they are learning.

According to Miyamoto et al. (2015), “Raising children’s levels of cognitive skills – measured by literacy, academic achievement tests and academics grades – can have a particularly strong effect on tertiary-education, attendance and labor markets. Raising levels of social and emotional skills – such as perseverance, self-esteem and sociability – can in turn have a particularly strong effect on improving health-related outcomes and subjective well-being, as well as reducing anti-social behaviors.” Nine studies by the OECD indicate that both cognitive and social and emotional skills are significant factors for improving economic and social outcomes (Miyamoto et al., 2015).
Miyamoto et al. (2015) state that, “education can contribute to raising motivated, engaged and responsible citizens by enhancing skills that matter.”

**Current State of Education**

School reform accountability has been connected to political motives, high-stakes tests and graduation. Recent school reforms have increased accountability for schools based on high-stakes test scores and other major factors. Such reform policies include the No Child Left Behind Act (NCLB) of 2001, the Race to the Top Fund of 2010 (RTTT) and, most recently, the Every Student Succeeds Act of 2015 (ESSA). These reforms have been in the center of political campaigns and have brought national attention to school reform.

The NCLB was signed into law by former President George W. Bush. The overall objective of the NCLB was to create competitiveness and close the achievement gap between minority and economically disadvantaged students and more affluent students (Klein, 2017). The NCLB was essentially an update of the 1965 Elementary and Secondary Education Act (Klein, 2017). The NCLB increased the role and accountability of schools for all students. It placed greater emphasis on increasing performance scores for students such as English-language learners (ELL), the economically disadvantaged, students with disabilities (SWD) and minority students.

Under the law, schools must test students throughout Grades 3 through 8 in reading and mathematics, and again in high school. Student scores must be reported as a whole and in “subgroups,” such as ELL and SWD (Klein, 2017). All states were required to bring 100% of their students to “proficient levels” as defined by the state. However, every state failed to meet the 2015 deadline. Under the NCLB, schools tracked their goals
and were monitored through “Adequate Yearly Progress” (AYP). If schools did not meet AYP two years in a row, the NCLB allowed students to transfer to a better-performing school in the same district (Klein, 2017). Furthermore, if a school missed the AYP three years in a row, the school must offer free tutoring, and if targets continued to be missed, there is the potential for state intervention, meaning the school could be shut down, turned into a charter school, or taken over (Klein, 2017).

Following the NCLB, the RTTT act was signed into law in 2010 by former President Barack Obama. The RTTT allocated 4.35 billion dollars for educational reform. For states to participate in the RTTT and to be allocated money, they needed to meet certain requirements, such as, “including a teacher evaluation based in part on student outcomes, beefed-up state data systems, and aggressive school turnarounds.” According to Wagner (2012, p. 151), “[the] RTTT received strong bipartisan support. One of the central elements of the plan calls for states to design programs for evaluation of teachers based on how well their students score on standardized tests.” States also had an advantage for adopting rigorous common standards (Week, 2014, p. 1). The rigorous standards most chosen were the CCLS.

To be awarded the RTTT grant money, states were asked to create a comprehensive action plan with six standards in mind for a total of 500 points. Each standard awarded different point values, such as State Success Factors 125 points, Standards and Assessments 70 points, Data Systems to Support Instruction 47 points, Great Teachers and Leaders 138 points, Turning Around the Lowest-Achieving Schools 50 points, and General Requirements 55 points ("Race to the Top Scoring Rubric," 2010).
Following the RTTT, the ESSA was signed into law on December 10, 2015 and took full effect for the 2017–2018 school year. The ESSA made major changes to the NCLB. According to Klein (106, p. 1), “States can pick their own goals (accountability goals), both a big long-term goal, and smaller, interim goals. These goals must address: proficiency on tests, English-language proficiency, and graduation rates.” States must include a minimum of four indicators in their accountability systems. For elementary and middle schools, Klein (2016, p. 1) states that, “The menu includes three academic indicators: proficiency on state tests, English-language proficiency, plus some other academic factor that can be broken down by subgroups, which could be growth on state tests.” States must add an additional indicator, such as engagement, educator engagement, access to advanced coursework, post-secondary readiness, or school climate/safety (Klein, 2016). Furthermore, states must consider participation rates in state tests. High schools are assessed in the same manner as elementary and middle schools, but graduation rates are assessed as an additional indicator.

States must test students in Grades 3 through 8, and in high school. The ESSA requires 95% student participation in all the exams. Data from the whole school and subgroups, such as ELL and SWD, are assessed and monitored as well (Klein, 2016).

If schools fail to display growth after four years, the state can take over the school and implement its own plan, fire the principal or turn the school into a charter school (Klein, 2016). According to Dede (2005), the NCLB, the RTTT and the ESSA all focus on high-stakes testing, which has resulted in teachers using drill and lecture strategies that do not promote 21st century skills.
If education continues along its current path and in its current form, students will continue to be unprepared for employment opportunities (Dede et al., 2005; Ellis, 2012). Friedman (2016, pp. 488-486) states, “There are now roughly fifty million students in K-12 public schools in America, and in 2015 – for the first time ever – the majority were minority students: primarily African Americans, Hispanics, and Asians. At the same time, students on free and reduced-price lunch programs hit an all-time high in 2016.”

Robinson and Aronica (2015, p. 14) state that, “Overall, 7,000 young people drop out of the nation’s high schools every day, close to one and half million a year. . . In 2012, 17 percent of high school graduates in the US were unable to read or write fluently and have basic problems with spelling, grammar and punctuation (below 2 on the PISA scales). More than 50 percent of adults were below level 3 of reading.” In 1970, the United States had the highest rate of high-school graduation in the world, now it is among one of the lowest. The OECD states that the overall United States graduation rate is now approximately 75 percent, which ranks the US 23rd out of 28 countries surveyed (Robinson & Aronica, 2015, p. 20).

According to Wagner (2012), educational institutions are deeply passive. Strauss (2006) notes that the current education system was created around the time of the Industrial Revolution, when the United States needed employees to work on assembly lines and in mass production factories. This change resulted in an education system focused on memorization (Strauss, 2006; Zhao, 2012). Wagner (2012, p. 142) states that, “one problem with the traditional approach (students seated in rows, teacher-centered instruction) is the exponential growth of information. One cannot possibly cover all the academic content in a given area. . . The result is that far too many of our students
graduate from high school and college knowing how to pass tests, but less motivated to learn while lacking essential skills.” With the traditional approach, information is memorized, with few opportunities for students to engage in asking questions and discovering concepts on their own (Wagner, 2012, p. 141).

According to Wagner (2012), learning is passive in schools. As students consume knowledge, they often experience it as disconnected random information. Students then must recall that knowledge for tests and essays. Often, the knowledge they acquire is without any real-world connection, and they do not understand why they are learning it. Many students then forget what they learned/memorized as soon as the test is over (Wagner, 2012, pp. 174-175). According to Darling-Hammond (2010, p. 176), the United States has been reducing the time spent on teaching subjects other than reading and mathematics.

According to Robinson and Aronica (2015), traditional teaching is focused on fact recall and teaching information through direct instruction to the entire class. In a traditional high-school classroom, students sit at desks facing front while the teacher directly teaches to the students. Robinson and Aronica (2015, pp. 75–76) state that, “the mode of learning is predominantly verbal or mathematical: that is, students mainly write, calculate, or discuss with the teacher. The curriculum is a body of material to be learned. It is arranged into various subjects, usually taught by different teachers. There are frequent tests and a lot of time spent preparing for them . . . The school day is typically divided into regular blocks of time of forty minutes or so, which are allocated to different activities in a repetitive weekly schedule. At the end of each period, there is a signal – often a bell or a buzzer – for everyone to stop what they’re doing and move on to the next
activity with a different teacher in another class.” The routine and rituals of schools are not fixed in law, many schools are organized the way they are because they have always been, not because they must be (Robinson & Aronica, 2015, p. 191).

According to Zhao (2012), students are bored in school. A longitudinal survey of over 350,000 high-school students in 40 states throughout the United States reported that only 2% of students surveyed have never been bored in school. Sixty-six percent of students reported being bored at least once every day in class. According to the survey, 81 percent of students stated that, “the material wasn’t interesting” and 42 percent claimed a “lack of relevance of the material.” Over 50% of the high-school students surveyed said they had skipped class, and one in five students considered dropping out because they “didn’t like school.” Forty-two percent of students surveyed said, “I didn’t see the value of the work I was being asked to do,” and 39% said, “I didn’t like the teachers” (Yazzie-Mintz, 2010; Zhao, 2012).

Zhao (2012, pp. 173–174) claims that, “the more prescribed the work, the less opportunity children have to exercise their own will. And the more prescribed, the less risk is involved. As a result children become followers who learn to conform, to find the correct answers expected by adults.” Thus, student engagement or lack thereof has plagued the traditional education model (Zhao, 2012, p. 172). The traditional model reduces the possibility of cultivating uniqueness by forcing students to repeat the same repetitive steps. The traditional model has been found to suppress creativity (Zhao, 2012, pp. 174-175).
Nations That Are Implementing 21st Century Learning Structures

According to Darling-Hammond (2010), other nations are reforming and changing their school systems to meet the new demands of the 21st century. Such nations are expanding their educational access to more people, revising curriculum standards, instructional strategies and assessment to support the skills needed for the 21st century (Darling-Hammond, 2010, p. 8). Thomas Friedman and Michael Mandelbaum summarize the challenge in the education in countries as follows: “going forward, we are convinced, the world increasingly will be divided between high imagination-enabling countries, which suppress or simply fail to develop their people’s creative capacities and abilities to spark new ideas, start up new industries and nurture their own” (Wagner, 2012, p. 3).

International studies confirm that the United States’ educational funding system is unequal. European and Asian countries, in contrast, fund their schools centrally and equally. In the United States, the wealthiest school districts spend nearly 10 times more than the poorest (Darling-Hammond, 2010, p. 12). According to international statistics, 60% of United States high-school graduates go to college, but only half of those students are prepared well enough educationally to earn a degree. About 35% of an age cohort in the United States earn a college degree, compared with about 50% in European countries and over 60% in South Korea (Darling-Hammond, 2010, p. 16). These results mean that, “the United States is standing still while more focused nations are moving rapidly ahead” (Darling-Hammond, 2010).

Finland, South Korea and Singapore are very different countries, but all have made significant advances in their educational system over the past 30 years and share the following characteristics:
- Funded schools adequately and equitably
- Eliminated examination systems
- Revised national standards and curriculum
- Developed national teaching policies
- Supported ongoing teacher learning
- Pursued consistent, long-term reforms

(Darling-Hammond, 2010, p. 193)

Finland – Finland is an example of a country whose reform policies have placed it as one of the leading contenders in global education. Beginning in the 1970s, Finland launched reforms to equalize educational opportunities by removing the different tracks a student is classified as based on test scores and the associated examinations. Furthermore, a common curriculum was developed throughout the entire nation. Social support for children and families was also enacted during this time, including health dental care, special education services and transportation. Focus then shifted to curriculum reform in science, technology and innovation. Emphasis was placed on teachers teaching students how to think creatively and to manage their own learning. Investment in teachers was an additional focus; teachers’ education programs were improved (Darling-Hammond, 2010, pp. 168-169).

According to Darling-Hammond (2010, p. 168), “Finland has not adopted standardization of curriculum enforced by frequent external tests, narrowing of the curriculum to basic skills in reading and mathematics, reduced use of innovative teacher strategies, adoption of educational ideas from external sources, rather than development of local internal capacity for innovation and problem solving and adaption of high-stakes
accountability policies, featuring rewards and sanctions for students, teachers and schools.” Finland has shifted from a highly centralized system emphasizing external testing to a more localized system in which teachers create and design curricula centered around national standards. All assessments are school-based and designed by teachers to evaluate performance skills and higher-order thinking skills; whereas, in contrast, the United States has been imposing external testing, rather than developing local assessments and internal capacity (Darling-Hammond, 2010, p. 167).

Finland believes in a core set of principles that include resources for those who need them most, high standards and support for special needs, qualified teachers, evaluating education and balancing decentralization and centralization. The curriculum is designed to ensure access to a “thinking curriculum” for all Finnish students (Darling-Hammond, 2010, p. 167).

**South Korea** – According to the Program of International Student Assessment (PISA), in 2003, South Korea (Korea) was ranked first in problem-solving, second in reading, third in math and fourth in science. Since 2003, Korea continues to rank among the top nations in those subjects (Darling-Hammond, 2010, p. 173). In 1985, the Korean Commission for Educational Reform created a set of policies and innovations for “Cultivating Koreans to Lead the 21st Century.” The Commission expanded education investment, secured highly qualified teachers, upgraded facilities and infrastructure, improved the curriculum and teacher pedagogy, promoted science education, and established life-long learners (Darling-Hammond, 2010, p. 175). Darling-Hammond (2010, p. 175) states, “Unlike the United States, which has started, stopped and often ignored its reform ideas, these
measures have been pursued on a continuous basis, and many have been substantially accomplished.”

Current curriculum reforms in Korea are designed to reduce the total number of instructional hours and the amount of subject matter that students need to cover within a term and year (Darling-Hammond, 2010, p. 178). According to Darling-Hammond (2010, p. 178), although a Korean student attends school 220 days per year, which is significantly higher than a United States student, a Korean student has fewer instructional hours. Furthermore, an increase in optional activities in school encourages students’ independent study skills and other creative activities.

Korea implemented the framework for education set forth by Delors (1996), with the notion that education should develop diversity and richness of talent in human beings. The framework consists of four pillars of education: learning how, learning to do, learning to be, and learning to live together (Darling-Hammond, 2010, p. 177). The Korean curriculum devotes the large majority of its instructional time to liberal arts, social studies, physical education, music, the arts, moral education, foreign language (English), practical skills and extra-curricular activities (Darling-Hammond, 2010, p. 175). The Korean Commission of Educational Reform emphasizes four key goals for Korean education:

- The balanced development of mind and body and the development of a mature sense of self-identity.
- The abilities to recognize and to solve problems in daily life; to engage in logical, critical and creative thinking; and to express their own feelings and ideas.
- Attitudes for appreciating tradition and culture in a way appropriate for the global setting.
- The development of knowledge and skills for engaging in the diverse world of work, fostering love for neighbors and country and an overall awareness as global citizens.

(Darling-Hammond, 2010, pp. 175-176)

According to Darling-Hammond (2010, pp. 177-179), teachers are much more respected in Korea than in the United States, ranking equivalent with priests, and are considered to be the most trusted members of society in an opinion poll. Teachers are highly qualified, with 100% of teachers having completed a teacher education program and a set of written and performance-based certification tests. Evaluations of teacher performance are teacher-designed and administered within the school.


As part of its reform strategy, Singapore has moved toward open-ended assessments that require reasoning and critical thinking. Examinations are accompanied by school-based tasks, such as research projects and experiments that are student-created (Darling-Hammond, 2010, p. 188). The nation has a bilingual policy, adopted in 1996, in which all instruction and education is in English, but all students must maintain their “mother-tongue” language also (Darling-Hammond, 2010, p. 181). Students work in pairs
and small groups on problems that involve real-world situations. Students are expected to explain their answers, question one another about their findings and reasoning and create strong academic discourse that supports their reasoning. Furthermore, they are expected to derive their own conclusions after they understand the concept and to create their own problems to test their classmates’ understanding (Darling-Hammond, 2010, p. 185).

Ng Pak Tee, from Singapore’s National Institute of Education stated, “Syllabi, examinations and university admission criteria were changed to encourage thinking out of the box and risk-taking. Students are now encouraged in project work and higher-order thinking questions to encourage creativity, independence and inter-dependent learning” (Darling-Hammond, 2010, p. 185). Syllabi were cut by 30% of their original content and incorporated more project-based learning. Prime Minister Lee Hsien Loong said, during the 2004 National Day Rally, “We have got to teach less to our students so that they will learn more” (Darling-Hammond, 2010, p. 185).

Minister of Education Tharmin Shanmugaratnam said to Parliament that the goal of education is, “to give students themselves the room to exercise initiative and to shape their own learning. The students have to become engaged learners, interested learners and proactive agents in the learning process” (Darling-Hammond, 2010, p. 186). Shanmugaratnam urged a shift in priorities, with “less dependence on rote learning, repetitive tests and a ‘one-size fits all’ type of instruction, and more on engaged learning, discovery through experiences, differentiated teaching, the learning of life-long skills and the building of character through innovative and effective teaching approaches and strategies. As well as, a holistic learning approach so that students can go beyond
narrowly defined academic excellence to develop the attributes, mindsets, character and values for future success” (Darling-Hammond, 2010, p. 190).

Singapore created a “classroom for the future” to provide educators with a vision of what learning should be and will be like in the 21st century. The classroom included U-arranged computer stations, a coffee bar where students can meet around a table and work on educational video games, a library where students can communicate electronically and work on projects with students from other countries, and tables surrounded by chairs where students are engaged in more inquiry and problem-solving (Darling-Hammond, 2010, p. 190).

**Schools That Are Implementing 21st Century Learning Structures**

**Montessori Schools** – Montessori schools’ educational philosophy and methodology are characterized by a set of didactic materials, multi-age classrooms, student-selected work, longer time blocks, a collaborative environment with student mentors, no testing or grades, and individual and small-group instruction in academic and social skills (OECD, 2013a).

**Waldorf or Steiner** – Waldorf schools are based on the educational ideas of the philosopher Rudolf Steiner and Montessori education and considered an alternate form of education. Waldorf education is designed to develop the young into free, moral and whole individuals through integrating artistic, practical and intellectual approaches into teaching all subjects (OECD, 2013a).

**Round Square Schools** – Round Square schools are based on the framework developed by Kurt Hahn, who believed schools should prepare students for life through authentic
learning situations. These situations are taught to the students through work projects, community involvement, leadership training, international collaboration, outdoor experience and adventure. The schools emphasize that every student should be developed physically, culturally and spiritually (OECD, 2013a).

**Escuelas Nueva** – Escuelas Nueva is based on the idea of improving rural and urban education for students in low-income families. According to the OECD (2013a), “The schools’ pedagogy emphasizes respect for the rights of children and is based on innovative educational projects involving a range of educational materials that encourage collaborative, participatory and personalized teaching methods, involving the wider community as well as students’ families.”

**Lok Sin Tong Leung Wai Fong Memorial School (Hong Kong, China)** – This school places great emphasis on the development of the following four 21st century competencies:

1) Teamwork and collaboration are demonstrated between students during academic subject lessons in Caring Groups and other activities.

2) Capacity for problem-solving is a major pathway for learning in all lessons. Capacity is developed through collaborative problem-solving activities.

3) Knowledge transfer to new problems in which learned knowledge is applied to examples.

4) Digital and media literacy is emphasized by leveraging the latest technologies for student use during lessons.

(OECD, 2013a)
**REOSCH (Bern, Switzerland)** – REOSCH has developed an educational concept to emphasize attentive learning. According to the OECD (2013a), attentive learning is, “the ability to consciously control one’s own attentiveness. They [the schools] offer learners structures through which to learn how to deal sensitively with their resources: mental training, martial arts, trekking trips, and specifically adapted teaching methods and tools (weekly plan, working journal and energy diary).”

**Zakladni Skola Chrudim (Czech Republic)** – Zakladni Skola Chrudim has students attend a wide range of seminars on social-emotional development. The goal is to build a well-functioning team of peers and teachers to practice communicative and social skills. The school focuses on mutual knowledge of their own differences, mutual respect, confidence and responsibility. Furthermore, they emphasize effective verbal and non-verbal communication and activities that include role-playing and relaxation activities (OECD, 2013a).

**High Tech High School (San Diego, United States)** – High Tech High (HTH) emphasizes the importance of students and teachers as creators and collaborators who must demonstrate what they know through portfolios, projects and examples of mastery. The majority of the time spent by students is working with a mentor in a school setting, similar to that of a medical student working in their residency. According to Wagner (2012, pp. 191-192), “Theory is learned at HTH as part of an extensive action research project – an inquiry into a particular learning problem that each student identifies in his classroom context and studies intensively during the second year of their program.”
Current Job State and Skills Needed

According to Friedman (2016, p. 28), “The Market” stands for the acceleration of globalization which consists of commerce, finance, credit, social networks and connectivity. Markets, banks, communities and individuals are more closely connected than ever before. The world is becoming not only interconnected, but hyper-connected. The three largest forces on earth are technology, globalization and climate change, and they are all accelerating. The result is that our society, workplaces and politics must be reshaped and reinvented (Friedman, 2016, p. 3). Wagner (2008) states that, “a reality of the 21st century is that most people will not retain a position within the same organization for their entire career.”

Brynjolfsson, in Thank You for Being Late, states, “We are beginning to automate a lot more cognitive tasks, a lot more of the control systems that determine what to use that power for. In many cases today artificially intelligent machines can make better decisions than humans” (Friedman, 2016, pp. 26-27). According to research by Montgomery, Manzo, Decker and Viadero (2017a), 47% of today’s jobs will be able to be performed by machines within the coming decades. Montgomery et al. (2017b) state, “In 2014, the Pew Research Center surveyed 1,896 experts. Nearly half said they “envision a future in which robots and digital agents displaced significant numbers of both blue and white-collar workers.”” As technology progresses, software-driven machines are becoming substitutes for humans. The force causing this phenomenon is known as Moore’s Law: “the theory first postulated by Intel cofounder Gordon Moore in 1965 that the speed and power of microchips – that is, computational processing power –
would double roughly every year, which he later updated to every two years” (Friedman, 2016, pp. 26-27).

The acceleration of technology has opened a wide gap between the pace of technological change, environment stress and globalization and the ability of people to manage and govern the change. The only choice is to learn to adapt to the change of pace; the work place, geopolitics, ethics and communities must enable more citizens to keep pace with the acceleration of technology (Friedman, 2016, p. 213). Darling-Hammond (2010, p. 2) states, “The top ten in-demand jobs projected for 2010 did not exist in 2004. Thus, the new mission of schools is to prepare students to work at jobs that do not yet exist; creating ideas and solutions for products and problems that have not yet been identified and using technologies that have not yet been invented.” Byron Auguste, a former adviser to President Barak Obama said, “In today’s knowledge-human economy it will be human capital-talent, skills, tacit know-how, empathy and creativity. . . These are massive, undervalued human assets to unlock. . . and our educational institutions and labor markets need to adapt to them” (Friedman, 2016, p. 221)

According to Darling-Hammond (2010), at least 70% of US jobs require specialized knowledge and skills, compared with 5% at the beginning of the 1900s when the current school system was established. These specialized skills include the following:

- Design, evaluate and manage one’s own work so that it improves
- Frame, investigate and solve problems using a wide range of tools and resources
- Collaborate strategically with others
- Communicate effectively in many forms
- Find, analyze and use information for many purposes
Develop new products and ideas  

(Darling-Hammond, 2010, p. 2)

Sweet (2010) states that, “one of the main causes for stagnation of the United States economy issues is its educational systems’ inability to prepare students to be globally competitive.” There is a widening skills gap between what schools are teaching and what the global economy actually needs (Robinson & Aronica, 2015, p. 16). Higher levels of thinking skills, technology and information literacy, and flexible and productive work habits and skills are now required by employers (Wagner, 2008). According to Ellis (2012), “Business leaders are consistently describing a need for employees to be able to ask questions, think critically and problem-solve.” The evolving and ever-changing economy requires the ability to integrate new learning to put into action (Ellis, 2012). Top-down solutions from heads of companies are no longer the solution to problems; instead, employees must work together as a team to problem-solve (Wagner, 2008).

The growth of technology and the economy has created the need to develop individuals to become global citizens. Individuals are now required to collaborate with others from diverse cultures, and global awareness is imperative (Ellis, 2012). According to Wagner (2008), “in order to successfully work in collaborative teams composed of diverse members, individuals need to understand and appreciate other cultures.”

The Digital Equipment Corporation (DEC) developed a problem-solving and decision-making system to understand what the mind-frame of a 21st century worker should look like:

1) The individual is ultimately the source of ideas and entrepreneurial spirit.

2) Individuals are capable of taking responsibility and doing the right thing.
3) No single individual is smart enough to evaluate his or her own ideas, so others should push back and get buy-in. In other words, the truth cannot be found without debate, and there is no arbitrary method of figuring out what is true unless one subjects every idea to debate among strong and intelligent individuals, so individuals must get others to agree before taking action.

4) The basic work of the company is technological innovation, and such work is, and always should be, “fun.”

5) We are one family whose members will take care of each other (implying that no matter how much of a trouble-maker an individual is in the decision-making process, the person is valued in the family and could be ejected from it).

(Schein, 2010, pp. 41-42)

**Conceptual Framework**

The conceptual framework (Figure 2.6) identifies the essential elements needed to develop a 21st century employable student. The following framework was developed by reviewing the research of Tony Wagner, Linda Darling-Hammond, Thomas Friedman, Ken Robinson, Yong Zhao and other researchers. The framework consists of the following five equal elements to create an employable 21st century student:

- **21st Century Skills**
  - Motivation
  - Critical Thinking
  - Ability to Collaborate
  - Self-reflective
- Economically Responsible
- Entrepreneurship
- Curiosity and Imagination
- Transference of Knowledge
- Effective Oral and Written Communication
- Agility and Adaptability

- **21st Century Learning Environment**
  - Group Setting
  - Technology
  - Engaging
  - Classroom Layout

- **21st Century Curriculum**
  - Balanced Curriculum
  - Real-Life Applications
  - Skills to Engage in Diverse World
  - Connection of Activities to the World
  - Project-based Learning
  - Assessment

- **21st Century Teacher**
  - 21st Century Pedagogical Practices
  - Promote the four Roles
    - Engage
    - Enable
• Expect
• Empower
• Develop the 8Cs
  • Curiosity
  • Creativity
  • Criticism
  • Communication
  • Collaboration
  • Compassion
  • Composure
  • Citizenship
• Learning and Student Engagement Centered

• Resources
  • Technology
  • Networking
  • National/International Partnerships

After the researcher completes the study, the framework may be altered to serve as a model for developing all the critical components to create an employable 21st century student.
Figure 2.6

Conceptual Framework

Employable 21st Century Student

Resources
- Technology
- Networking
- National / International Partnerships

21st Century Curriculum
- Balanced Curriculum
- Real-Life Applications
- Skills to Engage in Diverse World
- Connection of Activities to the World
- Project-based Learning
- Assessment

21st Century Teacher
- 21st Century Pedagogical Practices
- Promote 4 Roles
- Develop 8Cs
- Learning and Student Engagement Centered

21st Century Learning Environment
- Group Setting
- Technology
- Engaging
- Classroom Layout

21st Century Skills
- Motivation
- Critical Thinking
- Ability to Collaborate
- Self-reflective
- Economically Responsible
- Entrepreneurship
- Curiosity and Imagination
- Transfer of Knowledge
- Effective Oral and Written Communication
- Agility and Adaptability
Chapter 3 – Methodology

Introduction

The purpose of this study is to research what 21st century learning skills were taught and practiced within a diverse suburban school district and its alignment to the needs of the global market. In addition to the perceptions of employers and what skills students should possess, the purpose of this is study is to research the gaps in skills that need to be filled for students to be successful in today’s global market. The study utilizes the Partnership for Learning 21st Century Learning as its theoretical framework, and the conceptual framework was designed by the researcher using the theories of Tony Wagner, Linda Darling-Hammond, Thomas Friedman, Ken Robinson, Yong Zhao and other researchers. This study concludes with an analysis of whether there is an alignment between the skills that are being taught and the gaps.

Rationale for Research Approach

The research method for this study was a mixed-methods case study. Creswell and Poth (2018) state that, “mixed method’s designs are procedures for collecting, analyzing, and mixing both quantitative and qualitative data in a single study or in a multiphase series of studies” (Creswell, 2012, p. 22). Qualitative researchers study naturally occurring phenomena and attempt to interpret and make sense of them (Creswell & Poth, 2018, p. 7). Quantitative research involves describing a problem through a description of trends or a correlation among variables (Creswell, 2012, p. 13).
Qualitative research uses theoretical and conceptual frameworks to inform the study (Creswell & Poth, 2018, p. 42) and is conducted when a problem or issue needs to be explored. Creswell and Poth (2018, p. 45) state, “This exploration is needed…because of a need to study a group or population, identify variables that cannot be easily measured, or hear silenced voices. . . We conduct qualitative research when we want to empower individuals to share their stories, hear their voices, and minimize the power relationships that often exist between a researcher and the participants in a study.”

This study conducted a survey of teachers using Likert scales and open-ended questions, held two focus-group interviews with administrators and department chairs, and performed non-participant observations in classrooms in all subjects. A Likert scale has equal theoretical intervals among the population being studied, and it is assumed, and is common practice, that the scale from strongly agree to strongly disagree is proportioned in equal intervals (Creswell, 2012). A focus group is used to collect shared experiences from several individuals. Creswell (2012) states that, “a focus group interview is the process of collecting data through interviews with a group of people, typically four to six.”

This data collection allowed for the researcher to triangulate the data. This methodology answered the following research questions:

1. What skills do administrators and teachers identify as the skills required for the 21st century workplace?

2. What 21st century skills do administrators and teachers identify as part of the educational process in their school?
3. To what extent are the skills taught aligned with the skills needed for employment in the 21st century?

4. What do administrators and teachers believe are the gaps and challenges to bridge the misalignment?

**Research Setting/Context**

The suburban high school chosen for this research has a diverse population. There has been much turnover in the administration. The principal of the high school is currently in his third year in the job. There have been four principals in the past seven years, and the school district has had four superintendents in the past seven years. As of July 2, 2018, the school district has a new superintendent. According to NYSED (2018), there are approximately 1000 students enrolled, of which, 57% are Hispanic, 30% are African American and 10% are Caucasian. The 2017–2018 school year yielded a graduation rate of 66%. Data from NYSED (2018) reveal that 68% of students qualified for free lunches, and 8% qualified for reduced lunches. Regarding test scores, 70% passed the English Language Arts Common Core regents exam, and 40% passed the Algebra 1 Common Core regents exam (NYSED, 2018a).

**Research Sample**

The sample was taken from a diverse high school in Westchester County. Two focus-group interviews were conducted, and a survey was distributed. The first focus group consisted of four administrators: one principal and three assistant principals. The second focus group consisted of seven department chairpersons who oversee all their content
teachers. The department chairpersons consisted of Mathematics Chairperson, ELA Chairperson, Language other than English Chairperson, Physical Education Chairperson, Science Chairperson, Social Studies Chairperson and Special Education Chairperson. A survey was distributed to approximately 70 teachers in the school. The researcher engaged in non-participant observations with four teachers from different subjects. The subjects were chosen at random to observe a wide spectrum of pedagogy, classroom environments and curricula.

**Data Collection Methods**

The focus group of administrators and department chairpersons was recorded and transcribed using the Rev Voice Recorder app. All interviews were coded and analyzed using Dedoose.com. The survey was conducted using SurveyMonkey.com, and the data were analyzed and displayed using Microsoft Excel. The non-participant observations in classrooms took place in random classes and were recorded using MyLearningPlan.com.

**Data Analysis Methods**

Data analysis was conducted using Microsoft Excel. Data from the survey were imported into an Excel file and analyzed. The researcher coded and determined themes and patterns from the transcribed manuscript from the focus-group interviews. The survey and focus-group data were triangulated to draw conclusions.

The survey included questions that contain Likert scales, nominal interval scales and open-ended questions. Nominal interval scales, according to Creswell (2012), "provide response options where participants check one or more categories that describe
their traits, attributes, or characteristics. These scales do not have any order.”

Furthermore, “interval scales or continuous scales provide continuous options to questions with assumed equal distances between options. These scales may have three, four, or more response options (for example ‘strongly agree’ to ‘strongly disagree’)” (Creswell, 2012). An open-ended response allows the participants to respond freely to a question; the researcher does not give the participant a fixed response option (Creswell, 2012). A focus-group interview can be used to collect shared experiences and understandings from several participants.

The question responses within the survey were analyzed using Microsoft Excel. Open-ended responses were recorded and coded to determine themes and patterns (Salkind, 2017). Focused coding was used for both the open-ended responses in the survey and the focus-group interviews (Saldaña, 2016). According to Saldaña (2016), focused coding “categorizes coded data based on thematic or conceptual similarity. Searches for the most frequent or significant Initial Codes (breaks down qualitative data into discrete parts, examines them, and compares them for similarities and differences) to develop the most salient categories in the data corpus.” The coding and analysis of the text were conducted using Dedoose.com.

The non-participant observations in different classes of different courses helped triangulate the data. The observer recorded all 21st century skills, pedagogy, resources, classroom environment and curricula on Mylearningplan.com.

Each survey question and focus-group question was assigned to a variable from the conceptual framework and the research questions (see Table 3.1).
Table 3.1

Variable Map

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Conceptual Framework Variables</th>
<th>Survey Questions</th>
<th>Focus-Group Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ1</td>
<td>21st Century Skills</td>
<td>3-13,30</td>
<td>What are the skills you identify as the 21st century skills students should possess? Where do you feel there are gaps to fill to make a 21st century student employable?</td>
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<tr>
<td>RQ2</td>
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<td>RQ3</td>
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<td>RQ4</td>
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<tr>
<td>RQ1</td>
<td>21st Century Teacher</td>
<td>4-13,25-29,31</td>
<td>How should teachers be implementing and teaching such 21st century skills? Where do you feel there are gaps to fill to make a 21st century student employable?</td>
</tr>
<tr>
<td>RQ2</td>
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<td>RQ4</td>
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<tr>
<td>RQ1</td>
<td>21st Century Curriculum</td>
<td>15-21,32</td>
<td>How should teachers be implementing and teaching such 21st century skills? What change needs to be made to make the curriculum support 21st century learning skills? Where do you feel there are gaps to fill to make a 21st century student employable?</td>
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<td>RQ2</td>
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<tr>
<td>RQ1</td>
<td>Resources</td>
<td>14,22,24</td>
<td>What resources are needed to implement 21st century learning skills? Where do you feel there are gaps to fill to make a 21st century student employable?</td>
</tr>
<tr>
<td>RQ2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ1</td>
<td>21st Century Learning Environment</td>
<td>23,24</td>
<td>What types of learning environment support 21st century learning skills? Where do you feel there are gaps to fill to make a 21st century student employable?</td>
</tr>
<tr>
<td>RQ2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RQ4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Issues of Trustworthiness**

To establish trustworthiness within a study, Creswell and Potts (2012) claim that the triangulation of data from various sources, methods and investigators establishes credibility within a study (Creswell & Poth, 2018). Data were collected from two focus-group interviews, one of administrators and the other of department chairpersons. A survey was distributed to teachers. Furthermore, the researcher partook in four non-participant observations of random classes. This method of collecting data allowed the researcher to triangulate the data and to analyze themes and draw valid and reliable conclusions. The researcher piloted the survey and interview questions to receive feedback.

**Limitations**

This study is limited to the methodology of the data collection and the timeframe in which the data were gathered. The validity of the data gathered is based on the reliability of the instrumentation (Brathwaite, 2011). Additionally, the data are limited to one diverse suburban school district with select administrators and teachers. Due to the limited time factor, data were collected from February 2019 to March 2019. Thus, a longitudinal data was not used for this study.

**Delimitations**

The delimitations of this research study included defining 21st century skills and the school in which the study took place. This study used the Partnership for 21st Century
Learning as its theoretical framework and baseline for 21st century skills and the conceptual framework designed by the researcher.

The school in which this study took place was a suburban high school on the focus list with a diverse student population. The current principal was in his third year in the job and is also the third principal in seven years. The majority of the staff were untenured and, for some, this was their first teaching assignment. According to NYSED (2018), there are approximately 1000 students enrolled, of which, 57% are Hispanic, 30% are African American and 10% are Caucasian. The 2017–2018 school year yielded a graduation rate of 70%. Data from NYSED (2018) reveal that 68% of students qualified for free lunches, and 8% qualified for reduced lunches. Regarding test scores, 70% passed the English Language Arts Common Core regents exam, and 40% passed the Algebra 1 Common Core regents exam (NYSED, 2018a).

**Summary**

This study was a mixed-methods case study in which the researcher analyzed what 21st century learning skills are taught and practiced within a diverse suburban high school. In addition, the purpose of this study was to research the gaps in skills that need to be taught for students to be successful in today’s global market. The study utilized the Partnership for Learning 21st Century Learning as its theoretical framework, and the conceptual framework was designed by the researcher using the theories of Tony Wagner, Linda Darling-Hammond, Thomas Friedman, Ken Robinson, Yong Zhao and other researchers.

The researcher conducted two focus-group interviews, one with administrators and the other with department chairpersons. Teachers in the school were given a survey
with Likert scales and open-ended responses. The researcher conducted non-participant observations in random classes. The data were studied and triangulated to determine themes and patterns. Furthermore, the focus-group interviews were coded and studied to determine patterns and themes, as well as the open-ended responses from the survey. The non-participant observations in classes with different subjects helped to triangulate the data.
Chapter 4 – Findings

Introduction
The researcher conducted focus-group interviews with administrators and department chairpersons. The researcher was able to interview all the administrators, which included three assistant principals and one principal. The researcher interviewed four of the seven chairpersons in the subjects of English Language Arts, Mathematics, Special Education and Foreign Language. The researcher was unable to interview the remaining department chairpersons due to scheduling conflicts. The transcripts were coded using Dedoose.com. The researcher coded themes and patterns based on his conceptual framework and other themes that became apparent. A co-occurrence analysis was conducted to find patterns within the themes.

The researcher sent 70 invites to teachers to complete a survey; 54 teachers responded and completed the survey. The researcher conducted four non-participant observations in the subjects of English Language Arts (Teacher A), English as a Second Language (Teacher B), Mathematics (Teacher C), Foreign Language – Spanish (Teacher C).

The findings were organized by each research question and the conceptual framework created by the researcher. Each research question was subdivided by the researcher’s conceptual framework. The data were identified and categorized according to the research questions and the components of the conceptual framework that apply to the research question.
Research Question 1

What skills do administrators and teachers identify as the skills required for the 21st century workplace?

The survey asked the teachers to rate, from 1 to 10, the skills that they felt were most important. The survey used skills from the researcher’s conceptual framework, which consisted of motivation, critical thinking, ability to collaborate, self-reflective, economically responsible, curiosity and imagination, transference of knowledge, effective oral and written communication, and agility and adaptability. The highest average score (see Table 4.1) was motivation, with a mean score of 7.69, and the lowest was entrepreneurship, with a mean score of 3.00.

Table 4.1

Most Important to Least Important Skills 1-10

<table>
<thead>
<tr>
<th>Skill</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>48%</td>
<td>15%</td>
<td>2%</td>
<td>6%</td>
<td>8%</td>
<td>2%</td>
<td>0%</td>
<td>6%</td>
<td>6%</td>
<td>6%</td>
<td>7.69</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>18%</td>
<td>29%</td>
<td>16%</td>
<td>18%</td>
<td>2%</td>
<td>0%</td>
<td>2%</td>
<td>8%</td>
<td>2%</td>
<td>4%</td>
<td>7.53</td>
</tr>
<tr>
<td>Ability to Collaborate</td>
<td>2%</td>
<td>8%</td>
<td>21%</td>
<td>10%</td>
<td>19%</td>
<td>17%</td>
<td>17%</td>
<td>2%</td>
<td>4%</td>
<td>0%</td>
<td>6.13</td>
</tr>
<tr>
<td>Self-Reflective</td>
<td>2%</td>
<td>12%</td>
<td>16%</td>
<td>8%</td>
<td>20%</td>
<td>8%</td>
<td>12%</td>
<td>12%</td>
<td>6%</td>
<td>2%</td>
<td>5.82</td>
</tr>
<tr>
<td>Economically Responsible</td>
<td>4%</td>
<td>2%</td>
<td>6%</td>
<td>4%</td>
<td>12%</td>
<td>6%</td>
<td>8%</td>
<td>12%</td>
<td>33%</td>
<td>12%</td>
<td>3.88</td>
</tr>
</tbody>
</table>
The teachers were asked to choose the three skills that are most important in the workplace. Effective oral and written communication and critical thinking received the highest response, with 64.81%. Ability to collaborate was second highest, with 53.70%, followed by motivation, 55.56%. The least important was economically responsible, with 1.85% (see Graph Figure 4.1).

<table>
<thead>
<tr>
<th>Skill</th>
<th>2%</th>
<th>6%</th>
<th>4%</th>
<th>2%</th>
<th>2%</th>
<th>8%</th>
<th>10%</th>
<th>6%</th>
<th>17%</th>
<th>44%</th>
<th>3%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrepreneurship</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curiosity and Imagination (Creativity)</td>
<td>4%</td>
<td>8%</td>
<td>17%</td>
<td>8%</td>
<td>13%</td>
<td>19%</td>
<td>15%</td>
<td>10%</td>
<td>4%</td>
<td>2%</td>
<td>5.7%</td>
</tr>
<tr>
<td>Transference of Knowledge</td>
<td>12%</td>
<td>2%</td>
<td>4%</td>
<td>10%</td>
<td>4%</td>
<td>20%</td>
<td>14%</td>
<td>20%</td>
<td>8%</td>
<td>6%</td>
<td>5.0%</td>
</tr>
<tr>
<td>Effective Oral and Written Communication</td>
<td>8%</td>
<td>14%</td>
<td>10%</td>
<td>14%</td>
<td>14%</td>
<td>10%</td>
<td>6%</td>
<td>8%</td>
<td>14%</td>
<td>2%</td>
<td>5.9%</td>
</tr>
<tr>
<td>Agility and Adaptability</td>
<td>2%</td>
<td>4%</td>
<td>6%</td>
<td>17%</td>
<td>8%</td>
<td>10%</td>
<td>15%</td>
<td>17%</td>
<td>6%</td>
<td>15%</td>
<td>4.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
According to the focus group, critical thinking was the most important 21st century learning skill, co-occurring 23 times. Consider the following quote: “the number one skill that I think in a 21st century learning environment students need to possess is the ability to think critically; being able to synthesize; being able to consider different points of view; being able to consider that there are multiple answers or ways of solving or coming to a conclusion; a student being able to rationalize with evidence to justify and support their claims.”

The focus group identified effective oral and writing skills as the second most important 21st century skill, with a co-occurrence of 17 times. Administrator 3 said, “the ability to read, write, speak, and listen on a digital platform, as well as interpersonally, as well as on paper and pencil.” Chairperson 2 said, “students should be able to communicate better both orally and in writing.” The focus group then identified transference of knowledge as the next most important skill, with a co-occurrence of 14 times. Chairperson 1 said, “apply[ing] skills to the real-world applications. . . Or various
ways beyond just technology, but being able to create and demonstrate their learning, I think, is critical”.

Regarding the question of whether teachers had an excellent understanding of 21st century learning skills, the teachers answered as follows: 18.52% Strongly Agree, 50% Agree, 22.22% Neither Agree nor Disagree and 9.29% Disagree.

The teachers were asked what two components of curriculum they believed to be the most important to support 21st century learning: 20.37% responded that a balanced curriculum was essential; 46.30% answered that a curriculum must contain real-life applications; 46.30% that a curriculum must teach the skills needed to engage in a diverse world; 55.56% the activities must connect to the real world; 25.93% that a curriculum must contain project-based learning; and 16.67% that a curriculum must contain continuing and ongoing assessment.

Research Question 2

What 21st century skills do administrators and teachers identify as part of the educational process in their school?

In the survey, there was a question that asked whether teachers had an excellent understanding of 21st century learning skills. Although this question was used to answer Research Question 1, it is also applicable to Research Question 2. The teachers answered as follows: 18.52% Strongly Agree, 50% Agree, 22.22% Neither Agree nor Disagree and 9.29% Disagree.

The teachers were then asked if they utilize the following skills in their lessons: motivation, critical thinking, ability to collaborate, self-reflective, economically
responsible, curiosity and imagination, transference of knowledge, effective oral and written communication, and agility and adaptability (see Table 4.2).

Table 4.2

21st Century Skills Used Within Own Pedagogy

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neither Agree nor Disagree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I engage students in learning experiences that promote motivation.</td>
<td>33.33%</td>
<td>55.56%</td>
<td>9.26</td>
<td>1.85%</td>
<td>0%</td>
</tr>
<tr>
<td>I provide students with learning experiences that promote critical thinking.</td>
<td>53.70%</td>
<td>46.30%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>I involve students in learning experiences that promote collaboration.</td>
<td>48.15%</td>
<td>40.74%</td>
<td>7.41%</td>
<td>3.70%</td>
<td>0%</td>
</tr>
<tr>
<td>I engage students in learning experiences that promote self-reflection.</td>
<td>27.78%</td>
<td>51.85%</td>
<td>9.26</td>
<td>11.11%</td>
<td>0%</td>
</tr>
<tr>
<td>I involve students in learning experiences that promote economic responsibility.</td>
<td>11.11%</td>
<td>16.67%</td>
<td>38.89%</td>
<td>27.78%</td>
<td>%</td>
</tr>
<tr>
<td>I engage students in learning experiences that promote entrepreneurship.</td>
<td></td>
<td></td>
<td></td>
<td>13.2</td>
<td>%</td>
</tr>
<tr>
<td>I provide students with learning experiences that promote curiosity and imagination.</td>
<td>5.66%</td>
<td>13.21%</td>
<td>37.74%</td>
<td>30.19%</td>
<td>1%</td>
</tr>
<tr>
<td>I involve students in learning experiences that promote transference of knowledge.</td>
<td>46.30%</td>
<td>48.15%</td>
<td>3.70%</td>
<td>0%</td>
<td>%</td>
</tr>
<tr>
<td>I engage students in learning experiences that promote agility (stamina) and adaptability.</td>
<td>25.93%</td>
<td>53.70%</td>
<td>14.81%</td>
<td>0.56%</td>
<td>0%</td>
</tr>
<tr>
<td>I involve students in learning experiences that promote agility (stamina) and adaptability.</td>
<td>23.37%</td>
<td>50.00%</td>
<td>29.63%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
The teachers were asked whether they use technology within their lesson: 100% responded that they do; 70% answered that they utilize technology regularly; 28% responded they use it sometimes; and 2% do not use it regularly.

The teachers were asked the different types of grouping and seating arrangements they use within their classrooms: 72.22% responded they have grouped their students in pairs; 64.81% have grouped their students in groups of three to four; 20.37% have grouped their students in groups of five or more; 24.07% have seated their students in parallel rows; 25.93% have seated their students in a U-shaped formation; 14.81% have arranged the students in circles; 48.15% have created a station layout in their classroom; and 11.11% have had other grouping and seating arrangements.

The teachers were asked whether they use technology, networking, and local and national/international partnerships as resources within their pedagogy: 100% of the teachers use technology; 68.52% use networking; 38.89% use local partnerships; 20.37% use national partnerships; and 3.70% use international partnerships.

Regarding a 21st century curriculum within the school, Administrator 4 said, “in a recent production, we allowed our students to act out a Shakespeare play in the classroom. To be able to read the material and act it out and have a text to self-connection, I thought it was really important. Thereafter, students were able to watch a Shakespeare production and be able to make not only connections, but be able to reflect on what they’ve read, how they have acted in filling those various roles, and then being able to see others.”
According to the survey, the use of technology is prevalent within the school. The survey revealed that 100% of the teachers have implemented the use of technology within their lessons.

**Research Question 3**

*To what extent are the skills taught aligned with the skills needs for employment in the 21st century?*

During non-participant observation, the following was observed regarding 21st century skills:

*Teacher A* – The skills observed being taught within the lesson were motivation, critical thinking, ability to collaborate, self-reflective, curiosity and imagination, transference of knowledge, effective oral and written communication, and agility and adaptability. The lesson objective of the teacher was stated as, “Analyze examples of classic American rhetoric by discussing the speaker’s overall purpose and explaining how he/she uses rhetorical strategies.” The students were asked to work in groups to analyze quotes by historical figures and to determine deeper meanings. The students presented their findings to the class and were asked to engage in a self-assessment activity. The students were highly respectful toward each other and stayed on task.

*Teacher B* – The skills observed being taught within the lesson were critical thinking, ability to collaborate, curiosity and imagination, transference of knowledge, and effective oral and written communication. The lesson objective was stated by the teacher as, “Students will be able to determine the main idea of a text by working in small groups
and using a thinking map.” The students were asked to work in groups to write three benefits of the use of social media and use evidence from the text.

*Teacher C* – The skills observed being taught within the lesson were critical thinking, ability to collaborate, curiosity and imagination, transference of knowledge, effective oral and written communication, and agility and adaptability. The students were asked to annotate a text and to create a system of equations from the text and then solve them using various strategies.

*Teacher D* – The skills observed being taught within the lesson were the ability to collaborate, effective oral and written communication, and curiosity and imagination. The students were asked to work in groups and to create a dialog in Spanish to present to the class.

The teachers were asked to respond freely to the question, “How do you (the teacher) promote engagement of students?” The responses were organized based on themes and patterns. The responses fell within the following themes:

- Rigorous and relevant assignments
- Project-based learning assignments
- 21st century pedagogical practices, such as turn and talk, think pair share, gallery walks
- Student-centered instruction
- Real-life connections to the content
- Kinesthetic activities
- Students collaborating in groups

During non-participant observations, the following was observed regarding 21st century teachers:

*Teacher A* – The teacher allowed the students to engage in organic discourse. The teacher facilitated natural discussion, curiosity and student-generated questions. The teacher promoted the four roles of engage, enable, expect and empower within the lesson. The teacher also promoted the 8Cs: curiosity, creativity, criticism, communication, collaboration, compassion, composure and citizenship. The activity was learning- and student-centered for engagement.

*Teacher B* – The teacher practiced 21st century pedagogical skills such as asking students to work in groups to complete the assignment. The teacher promoted the four roles of engage, enable, expect, empower. The teacher promoted components of the 8Cs, such as curiosity, creativity, criticism, communication and collaboration. The activity was learning- and student-centered for engagement.

*Teacher C* – The teacher used 21st century pedagogical strategies such as station activities, technology and co-teaching. The teacher created stations for the students to engage in the lesson. Some students were involved in direct instruction from the teacher; other students engaged in small-group instruction from the teacher’s assistant; and the
other students participated in a computer-based skill-building program called ALEKS. The teacher promoted the four roles of engage, enable, expect, empower. The teacher promoted components of the 8Cs, such as curiosity, creativity, criticism, communication and collaboration. The activity was learning- and student centered for engagement.

Teacher D – The teacher promoted the four roles of engage, enable, expect and empower. The teacher promoted the 8Cs: curiosity, creativity, criticism, communication, citizenship, composure, citizenship and collaboration. The activity was learning- and student-centered for engagement.

The teachers were asked how they promote enabling students, one response was: “The classroom room is designed like an art studio. In addition, each student has their mailbox and section in the classroom where they store all their work that they are responsible for.”

During non-participant observation, the following was observed regarding 21st century learning environment:

Teacher A – The teacher asked students to work in groups of four to five to create their presentations. Students used technology such as Google Slides to present their projects, and all the students were fully engaged during the lesson.
Teacher B – The teacher’s classroom was set up in a large U-Shape and an inner set of parallel desks facing each other. This setup allowed for students to collaborate with each other in discussion and group work.

Teacher C – The learning environment consisted of students sitting in three stations. One station was focused on direct instruction from the teacher, the second station was a small-group instruction, and the third was students using laptops utilizing a skill-building software called ALEKS.

Teacher D – The learning environment allowed students to engage in a group setting. Students sat together in groups of three to four.

Furthermore, according to the survey, 70% of the teachers regularly use technology within their lessons.

Within the survey, teachers commented that they made connections to real-world activities. Some of the responses were as follows: “I promote engagement by creating student-centered activities throughout the curriculum”; “I create hands-on activities within the curriculum”; and that the teacher has “student’s complete hands-on projects, inquiry-based labs and asking them to reflect on the curriculum and inform me of topics that they have interest/additional questions in.” Eighty-five percent of the teachers responded yes to using ongoing and continuous assessment within their curriculum; 50% responded yes to using project-based learning within their curriculum; 55.56% responded yes to having activities within their curriculum connected to the real world; 70.37%
responded yes to their curriculum preparing students to engage in a diverse world; 53.70% responded yes to their curriculum having real-life connections; and 62.96% responded yes to their curriculum being balanced.

During the non-participant observation, the following was observed regarding 21st century curriculum:

*Teacher A* – The curriculum used a variety of assessment strategies, such as questioning and self-assessment rubrics with a scale score of 1 to 4. The curriculum allowed students to practice real-life applications, to make connections to activities in the real world, to nurture the skills to engage in a diverse world and used project-based learning.

*Teacher B* – The curriculum allowed students to make connections to activities in the real world by analyzing the benefits of social media. The students in this class were a mix of all levels of English as Second Language learners. The curriculum and the lesson allowed students to practice the skills needed to engage in a diverse world. The students participated in discussions and group work together.

*Teacher C* – The curriculum allowed students to make connections to the real world by utilizing real-life problems to set up issues and to solve them.

*Teacher D* – The curriculum allowed students to make connections to activities in the real world, supported real-life applications and the skills to engage in a diverse world.
According to the survey, 52% of the teachers responded that they utilize national or international partnerships within their pedagogy, and 100% of the teachers have used technology in their lessons.

During the non-participant observation, the following was observed regarding resources:

Teacher A – The teacher and students utilized Google Sheets during the lesson. No other resources were used.

Teacher B – The teacher utilized technology within the class to present her lesson on Google Sheets. The students did not use technology within this lesson. No other resources were used.

Teacher C – The teacher utilized technology within his lesson, using laptops to access the skills-building program called ALEKS.

Teacher D – No 21st century resources were observed.

Research Question 4

What do administrators and teachers believe are the gaps and challenges to bridge the misalignment?
The teachers surveyed were asked what the top three skills are to become employable 21st century workers. The highest response was 64.81% for both critical thinking and effective oral and written communication, and the third highest was 55.56% with motivation (see Table 4.3).

Table 4.3

Most Important 21st Century Skills

<table>
<thead>
<tr>
<th>Skill</th>
<th>Percentage</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>55.56%</td>
<td>30</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>64.81%</td>
<td>35</td>
</tr>
<tr>
<td>Ability to Collaborate</td>
<td>53.70%</td>
<td>29</td>
</tr>
<tr>
<td>Self-Reflective</td>
<td>18.52%</td>
<td>10</td>
</tr>
<tr>
<td>Economically Responsible</td>
<td>1.85%</td>
<td>1</td>
</tr>
<tr>
<td>Curiosity and Imagination (Creativity)</td>
<td>12.96%</td>
<td>7</td>
</tr>
<tr>
<td>Transference of Knowledge</td>
<td>16.67%</td>
<td>9</td>
</tr>
<tr>
<td>Effective Oral and Written Communication</td>
<td>64.81%</td>
<td>35</td>
</tr>
</tbody>
</table>

During the focus-group interviews, the following excerpts were recorded concerning gaps within 21st century skills:

Chairperson 1: “The biggest things for making sure to keep 21st century students employable is to really focus on the skills of reading, writing, speaking, listening, math
skills, that are the foundational skills across the board, so that way they can become more critical thinkers. They can become more persuasive writers and speakers, because those types of skills will make somebody employable because it proves that a student is somebody who is able to do those things, is able to think, and is able to train, and be trained, on how to do specific job skills.”

Administrator 1: “The gap is the lack of skills. The people skills, the human touch.”

Chairperson 3: “Well one gap would be…I don't know if we really teach students skills that they need in technology, whether it’s creating a spreadsheet or creating a shared presentation. It used to be typing class, but now just being good at using a Word document, or a Google Doc now, and formatting a Google Doc. So, specifically teaching students the skills they need, and also, I’d say, just emphasizing as an English teacher, the writing. I think that employable students can write cleanly quite often, and really supporting them in editing and proofreading their writing to present well.”

The teachers were asked what three skills needed to be most developed and incorporated within their lessons. The highest response was 55.56% of teachers choosing critical thinking. The second highest response was 50% for effective oral and written communication. The third highest was self-reflection, with 37.04% (see Table 4.4).
Table 4.4

Top Skills Most Needed to Be Incorporated Within Teachers’ Lessons

<table>
<thead>
<tr>
<th>Skill</th>
<th>Percentage</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>29.63%</td>
<td>16</td>
</tr>
<tr>
<td>Critical Thinking</td>
<td>55.56%</td>
<td>30</td>
</tr>
<tr>
<td>Ability to Collaborate</td>
<td>22.22%</td>
<td>12</td>
</tr>
<tr>
<td>Self-Reflection (from the Student)</td>
<td>37.04%</td>
<td>20</td>
</tr>
<tr>
<td>Economically Responsible</td>
<td>20.37%</td>
<td>11</td>
</tr>
<tr>
<td>Curiosity and Imagination (Creativity)</td>
<td>29.63%</td>
<td>16</td>
</tr>
<tr>
<td>Transference of Knowledge</td>
<td>35.19%</td>
<td>19</td>
</tr>
<tr>
<td>Effective Oral and Written Communication</td>
<td>50.00%</td>
<td>27</td>
</tr>
<tr>
<td>Agility and Adaptability</td>
<td>14.81%</td>
<td>8</td>
</tr>
</tbody>
</table>

During the focus-group interviews, the following excerpts were recorded in response to the question of gaps within the 21st century learning environment:

*Administrator 4:* “Students need to be able to be given some level of freedom, some independence to explore their various areas of interest or to learn about fields that they’re just not aware of, by sometimes taking the learning outside of the classroom . . . A learning environment that empowers students to take risks. A learning environment that equips students not only to take risks, but to search and explore areas of interest, or to
explore areas that they may not have considered. That can be done through trips. That can be done through bringing guest speakers. That can be done through internships.”

Chairperson 1: “Our learning environments need to be adaptive and adapted to the whole idea of the 21st century. So, pretty much the idea that learning can happen and should happen everywhere, and having people using classrooms more as an area of coming in and checking in, and getting clarification, and utilizing them in a different way.”

Administrator 1: “I think a holistic learning environment supports the 21st century learning skills, where students can utilize all of their learning styles. Where, if they’re a kinesthetic learner, they can get up and be able to move. If they need a relaxing environment, they can have that synergy and be able to lay down and relax, and have music that will stimulate their brain. Have a holistic approach, whatever works for their learning style. Be able to work for them. I think of Google and how they work, and how it’s based on their need. They transform the learning environment of the workplace, based on what the employee needs and not cookie cutter for what the actual employer needs.”

Administrator 3: “The gap is that the work environment is totally different than a school environment.”

During the focus-group interviews, the following excerpts were recorded in response to the question of gaps within the 21st century curriculum:
Chairperson 4: “I think the gap that is created is just in the preparation, and students understanding where the preparation leads, which road they’ll be able to explore. And, certainly, literacy. Literacy is a big deal. Again, but that takes you back to the K through 12 alignment, just making sure that the playing field has been leveled for all students, despite any deficits in their education or gaps in their learning. . .Then there are some areas where students aren’t as prepared because of the coursework that they’ve taken thus far, to be employed in certain areas.”

Administrator 3: “The changes I feel need to be made to the curriculum to make it more 21st century friendly would be alignment with the real-world and/or college career readiness. Post-secondary skills being taught based on student interests. If the student is not interested in college, but they’re interested in a career, then really finding an internship that a student can go to and really learn what those skills are. Additionally, the curriculum needs to align to real-life situations for a lot of our students and simulate work-based situations. Providing more hands-on learning and problem-solving strategies for kids.”

During the focus-group interviews, the following excerpts were recorded in response to the issue of gaps within resources:

Chairperson 4: “We need, again, resources in terms of funding for projects and programs and building partnerships with local universities and colleges.”
Chairperson 1: “The biggest gap is just that, unfortunately, schools and their funding are not equitable, and therefore the gaps that exist a lot of times are financial gaps. As technology becomes more prevalent, as we become more interconnected with people from around the world, the students who don’t have that opportunity, or may not have the technology to be able to do that, are at a disadvantage. . . Time. Time is the biggest resource. Time is the biggest resource for implementing any skill, because every skill that gets added to a curriculum means that there’s another skill that is not being removed from the curriculum.”

Chairperson 3: “Yeah, definitely students having their own laptops or Chromebooks, one for every student perhaps, and really kind of do away with traditional textbooks.”

Unexpected Data

During the collection of data, there were unexpected data that did not fit the researcher’s conceptual framework in the areas of funding and socio-emotional needs. These data were gathered through the focus-group interviews with the administrators and chairpersons.

The following excerpts were recorded concerning gaps in funding:

Administrator 3: “The main thing I feel would be needed to implement 21st century learning skills would be the funding sources.”
Administrator 2: “I agree with funding.”

Administrator 4: “Funding becomes an issue in terms of the technology gap.”

Chairperson 1: “The biggest gap is just that, unfortunately, schools and their funding are not equitable, and therefore the gaps that exist a lot of times are financial gaps.”

Chairperson 2: “Schools should have funding.”

Chairperson 4: “Resources in terms of funding for projects and programs.”

The following excerpts were recorded concerning the need for socio-emotional support:

Administrator 1: “Think a holistic learning environment.”

Administrator 2: “The social and emotional needs of teachers and students, and community. . . Really being able to teach with empathy, but also with validity, as well being able to balance how much transparency should be offered.”

Administrator 3: “How to deal with your emotions at the job, how to speak to people in a professional manner. Looking at people in the eye, sitting around a table, working with a group of people, agreeing to disagree. . . Students that leave high school and want to go
immediately to work, we need to find the time to teach them those whole secondary skills that are needed, including the soft skills, including how to deal with time management, how to deal with stress at the job.”

_Administrator 4:_ “A learning environment that equips students not only to take risks, but to search and explore areas of interest, or to explore areas that they may not have considered. . . Recognize (curriculum) the need to build relationships.”

**Summary**

This chapter presented the data in a structured format and was organized based on the research questions and the conceptual framework designed by the researcher. Each research question was answered with data from the survey taken by 54 teachers, as well as four random non-participant observations in English Language Arts, English as a Second Language, Mathematics and Foreign Language (Spanish), and focus-group interviews with four administrators, including a principal and three assistant principals.

In Chapter 5, the data is analyzed and interpreted. The researcher draws conclusions based on the data and supports those conclusions using the literature review. Furthermore, the researcher makes recommendations for future research and practice based on the data and conclusions.
Chapter 5 – Analysis, Conclusions and Recommendations

Introduction
This chapter addresses the interpretations of the data through each research question. The data presented in Chapter 4 answered each research question. The data collection was done via a survey, two focus-group interviews and four non-participant observations. The different data collection methods allowed the researcher to triangulate and analyze the data to answer each research question. The data are supported (or not) by the literature review in Chapter 2 and the researcher’s conceptual framework. The researcher then draws conclusions and recommendations for practice and for future research. The chapter concludes with an epilogue, allowing the researcher to self-reflect on the process in its entirety.

Discussion
Research Question 1: What skills do administrators and teachers identify necessary for the 21st century workplace?
The researcher surveyed the teachers and asked them to rank the most important to least important skills. The following skills were ranked: motivation, critical thinking, ability to collaborate, self-reflective, economically responsible, entrepreneurship, curiosity and imagination (creativity), transference of knowledge, effective oral and written communication, and agility and adaptability. The researcher then asked the teachers to choose the most important three skills needed in the workplace.
The most important skills ranked by the teachers in the survey were motivation, then critical thinking, then ability to collaborate, and the least important was entrepreneurship. However, the top three most important skills needed in the workplace according to the teachers were effective oral and written communication, then critical thinking, then motivation, and the least important skill was being economically responsible. According to the focus group, critical thinking was the most important 21st century skill, then effective oral and writing skills, and then transference of knowledge. Both the focus groups and the survey identified critical thinking as the most important 21st century skill. The focus group identified effective oral and writing skills as the second most important skill.

These data support Pellegrino and Hilton’s (2012) research, which states that, “business and political leaders are increasingly asking schools to develop skills such as problem solving, critical thinking, communication, collaboration, and self-management, often referred to as 21st century skills.” The P21 Framework states that students should be able to, “elaborate, refine, analyze and evaluate their own work ideas in order to improve and maximize creative efforts” (Partnership-for-21st-Century-Skills, 2013). Furthermore, the framework states that 21st century students must be able to articulate their thoughts and ideas using, oral, written and non-verbal communications skills (Partnership-for-21st-Century-Skills, 2013).

The data coincide also with components from “Seven Survival Skills for the 21st Century” by Wagner (2008), which include critical thinking, problem-solving, and effective oral and written communication. Research by Davis (2016) suggests that the most important skill needed for employment is critical thinking. The research concludes
that communication, assessing and adaptability are the most important skills (Davis, 2016). McIntyre-Odoms (2015) concludes that critical thinking is the most important 21st century skill, followed by communication and collaboration.

The teachers were asked what two components of the curriculum they believed to be the most important to support 21st century learning: 20.37% responded that a balanced curriculum was essential; 46.30% responded that the curriculum must contain real-life applications; 46.30% responded that curriculum must teach the skills needed to engage in a diverse world; 55.56 responded the activities must connect to the real world; 25.93 responded that the curriculum must contain project-based learning; and 16.67% responded that the curriculum must contain continuing and ongoing assessment.

These data support Taylor’s (2012) theory, which states that, “it is a common feature of many innovative learning environments to make the learning experience authentic and meaningful by engaging students with real-life problems, offering hands-on experiences and incorporating students’ historical, natural, and cultural environment in learning activities.” Authentic learning, inquiry and collaborative work helps prepare students for future learning (Taylor, 2012). Although the data supports Taylor’s (2012) theory, the data do not support Sweet’s (2014) research, which claims that, “the most common method for implementing 21st century skills is project-based learning.”

Furthermore, Zhao (2012) states that, “project based learning has been said to have many benefits, compared with traditional instructional approaches.” Finally, according to Pearson (2014), project-based learning enhances learning and student creativity and innovation.
**Research Question 2:** What 21st century skills do administrators and teachers identify as part of the educational process in their school?

The survey revealed myriad responses identifying the different skills used within the school. The teachers’ responses were measured using a Likert scale. The survey revealed that 53.70% of teachers strongly agree, and 46.30% agree, that they provide students with learning experiences to promote critical thinking. Furthermore, 48.15% strongly agree and 40.74% agree that they involve students in learning experiences that promote collaboration. Finally, 46.30% strongly agree and 48.15% agree that they provide students with learning experiences that promote curiosity and imagination.

McIntyre-Odoms (2015) concludes that critical thinking is the most important 21st century skill, followed by communication and collaboration, which the data support. In Research Question 1, the teachers, chairpersons and administrators identified critical thinking and collaboration as the most important skills, in addition to effective oral and written communication. In the survey, the teachers identified those skills being used within their own pedagogy. Ellis (2012) and Wagner (2012) describe that 21st century jobs need employees who are critical thinkers and who have mastered strong communication skills, innovation skills and creativity (Ellis, 2012; Wagner, 2012).

All the teachers responded that they have utilized technology within their lessons, and 70% answered that they utilize technology regularly. The teachers were then asked the different types of grouping and seating arrangements they use within their classrooms: 72.22% responded they have grouped their students in pairs; 64.81% responded they have grouped their students in groups of three to four; 20.37% have grouped their students in groups of five or more; 24.07% have seated their students in
parallel rows; 25.93% have seated their students in a U-shaped formation; 14.81% have arranged the students in circles; 48.15% have created a station layout in their classroom; and 11.11% have had other grouping and seating arrangements.

These data indicate that the school was utilizing its resources and that teachers were creating a 21st century learning environment, according to the researcher’s conceptual framework. The grouping of the students and seating arrangements is an element of Taylor’s (2012) pedagogical core. The proper grouping of students allowed for collaboration. Pearson (2014) states, “Through collaboration with fellow students, students will have learned how to work in teams becoming more adaptable and agile under complex conditions.”

The school was implementing a 21st century curriculum that allowed students to make connections. For example, Administrator 4 stated that, “in a recent production, we allowed our students to act out a Shakespeare play in the classroom. To be able to read the material and act it out and have a text to self-connection, I thought it was really important. Thereafter, students were able to watch a Shakespeare production and be able to make not only connections, but be able to reflect on what they’ve read, how they have acted in filling those various roles, and then being able to see others.” This type of activity coincides with Taylor’s (2012) definition of “authentic learning,” which states: “make the learning experience authentic and meaningful by engage students with real-life problems, offering hands-on experiences and incorporating students’ historical, natural and cultural environment in learning activities.”
**Research Question 3:** To what extent are the skills taught aligned with the skills needed for employment in the 21st century?

The non-participant observations revealed that three of the four teachers were teaching skills and using practices that were aligned to the researcher’s conceptual framework. The fourth teacher’s practice was partially aligned to the researcher’s conceptual framework. Free responses within the survey allowed for the researcher to find themes within the teachers’ pedagogy.

All the teachers were teaching skills aligned with the 21st century skills within the researcher’s conceptual framework. These skills include motivation, critical thinking, ability to collaborate, self-reflective, curiosity and imagination, transference of knowledge, effective oral and written communication, and agility and adaptability. As mentioned in the discussion of Research Question 1, these data support Pellegrino and Hilton’s (2012) research, the P21 Framework and Wagner’s (2008) Survival Skills.

The teachers were asked to freely respond to the survey question, “How do you (the teacher) promote engagement of students?” The responses fell within the following themes:

- Rigorous and relevant assignments
- Project-based learning assignments
- 21st century pedagogical practices, such as turn and talk, think pair share, gallery walks
- Student-centered instruction
- Real-life connections to the content
- Kinesthetic activities
- Students collaborating in groups

These data support Robinson and Aronica (2015) also, describing the following four responsibilities of a teacher:

1) Education should enable students to become economically responsible and independent.

2) Education should enable students to understand and appreciate their own cultures and to respect the diversity of others.

3) Education should enable young people to become active and compassionate citizens.

4) Education should enable young people to engage with the world within them as well as the world around them

(Robinson & Aronica, 2015, pp. 45-51).

Furthermore, the data support the researcher’s conceptual framework in the components of 21st century skills, 21st century teacher and 21st century curriculum.

All the teachers during the non-participant observation displayed attributes within the 21st century teacher components. Teachers A, B, C, and D all promoted the four roles of a teacher: engage, enable, expect, empower; thus, supporting Robinson and Aronica’s (2015) research on these roles.

Not all the teachers during the non-participant observations were able to promote all the 8Cs, but they did promote a majority. According to Robinson and Aronica (2015), the 8Cs consist of curiosity, creativity, criticism, communication, collaboration, compassion, composure, citizenship.
Teacher C used a co-teaching model, an online mathematics program called ALEKS and a station activity during his lesson. Multiple components within the researcher’s conceptual framework were implemented, such as 21st century learning environment, 21st century teacher and the use of resources. The OECD (2013a) defines a learning environment as both a physical and digital setting in which students carry out their activities, including all the resources found in that setting. Teacher C’s lesson allowed students to rotate between different teachers for direct and small-group instruction, as well as developing fundamental skills through the ALEKS program.

During the non-participant observations, the learning environment was recorded. Teacher A asked students to work in groups of four to five to create presentations using technology. Teacher B arranged her students in a large U-Shape and an inner set of parallel desks facing each other. The students were then able to collaborate with each other. Teacher C asked the students to sit in three different stations, with one station focusing on direct instruction from the teacher, the second station involved small-group instruction, and the third station consisted of students using laptops on the ALEKS program.

These data support the 21st century learning environment from the researcher’s conceptual framework. The group work, collaboration and seating of the students demonstrated such an environment. This finding is supported by Pearson’s (2014) research, which states, “Through collaboration with fellow students, students will have learned how to work in teams becoming more adaptable and agile under complex conditions.”
The data revealed that 70% of the teachers regularly used technology within their lessons. These data are aligned to the researcher’s conceptual framework regarding the 21st century learning environment and the resources needed. The survey further revealed that teachers made connections to real-world activities within their lessons and curriculum. For example, various teachers stated the following: “I promote engagement by creating student-centered activities throughout the curriculum”; “I create hands-on activities within the curriculum”; and “[I have] student’s complete hands-on projects, inquiry-based labs and asking them to reflect on the curriculum and inform me of topics that they have interest/additional questions in.” This finding is directly aligned to the researcher’s conceptual framework regarding the 21st century learning environment and the 21st century curriculum. Furthermore, this finding coincides with the reforms South Korea has made. The Korean Commission of Educational Reform emphasized that students need the ability to recognize and solve problems in daily life, and to engage in logical, critical and creative thinking (Darling-Hammond, 2010).

The survey further revealed that 85% of teachers responded yes to using ongoing and continuous assessment within their curriculum; 50% responded yes to using project-based learning within their curriculum; 55.56% responded yes to having activities within their curriculum connected to the real world; 70.37% responded yes to their curriculum preparing students to engage in a diverse world; 53.70% responded yes to their curriculum having real-life connections; and 62.96% responded yes to their curriculum being balanced. This information indicates that the school has areas within the researcher’s conceptual framework that are highly linked to 21st century components; whereas, the other areas need improvement.
The non-participant observations revealed that all the teachers were implementing components of the 21st century curriculum in the areas of making connections to real-world activities, nurturing skills to engage in a diverse world, and project-based learning. However, only three teachers utilized technology as a resource to implement 21st century learning. Moreover, one teacher did not use resources to implement 21st century learning. The observations are aligned to components within the researcher’s conceptual framework.

**Research Question 4:** *What do administrators and teachers believe are the gaps and challenges to bridge the misalignment?*

The survey revealed that the teachers felt the most important skills needed for employability were critical thinking (64.81%), effective oral and written communication (55.56%) and motivation (55.56%). These data support Pellegrino and Hilton (2012), who state that, “business and political leaders are increasingly asking schools to develop skills such as problem solving, critical thinking, communication, collaboration, and self-management, often referred to as 21st century skills.” There was a gap evident regarding the rest of the skills from the conceptual framework, which include self-reflective, economically responsible, entrepreneurship, curiosity and imagination, transference of knowledge, ability to collaborate, and agility and adaptability. According to Ellis (2012), “Business leaders are consistently describing a need for employees to be able to ask questions, think critically and problem solve.” There is a widening skills gap between what schools are teaching and what the global economy actually needs (Robinson & Aronica, 2015, p. 16).
The focus-group interviews revealed myriad gaps in 21st century skills, 21st century teachers, 21st century curriculum, and 21st century learning environment and resources.

Regarding 21st century skills, Chairperson 1 said, “The biggest things for making sure to keep 21st century students employable is to really focus on the skills of reading, writing, speaking, listening, math skills, that are the foundational skills across the board, so that way they can become more critical thinkers.” Administrator 1 said, “The gap is the lack of skills, the people skills, the human touch.” Chairperson 3 identified a lack of knowledge regarding technology. The interviews revealed that not only do students need the skills outlined within the researcher’s conceptual framework, there is also a need for socio-emotional skills to be learned by the student. The Korean Commission of Educational Reform emphasized its goal to develop a balance of mind and body and a mature sense of self-identity for all of their students (Darling-Hammond, 2010). Robinson and Aronica (2015) believe that the core purpose of education is to prepare young children for life after school; helping them to build up the mental, emotional, social and strategic resources to challenge and cope with the uncertainty and complexity of life.

Regarding the 21st century learning environment, Administrator 4 said, “Student’s need to be able to be given some level of freedom, some independence to explore their various areas of interest or to learn about fields that they’re just not aware of, by sometimes taking the learning outside of the classroom. . .That can be done through internships.” Chairperson 1 said, “Our learning environments need to be adaptive and adapted to the whole idea of the 21st century.” Administrator 1 believed a holistic
learning environment needs to be implemented to support all learning styles. Finally, Administrator 3 said, “The gap is that the work environment is totally different than a school environment.”

This gap is supported by Derya Orhan and Kurt (2017); the ever-changing and evolving conditions in the world have caused transformations in teaching and learning environments. Furthermore, this gap indicates that there is a misalignment with the components from Dumont, Benavides and Istancé’s (2010) seven principles:

1) Recognize the learners as its core participants, encourage their active engagement, and develop in them an understanding of their own activity as learners (self-regulation)

2) Be founded on the social nature of learning, and actively encourage group work and well-organized cooperative learning

3) Have learning professionals who are highly attuned to the learners’ motivations and the key role of emotions in achievement

4) Be acutely sensitive to the individual differences among the learners in it, including their prior knowledge

5) Devise programs that demand hard work and challenge from all without excessive overload

6) Operate with clarity of expectations and deploy assessment strategies consistent with these expectations: there should be a strong emphasis on formative feedback to support learning

7) Strongly promote “horizontal connectedness” across areas of knowledge and subjects, as well as the community and the wider world
Regarding the 21st century curriculum, Chairperson 4 said, “I think the gap that is created just in preparation and students understanding where the preparation leads, which road they’ll be able to explore. And, certainly, literacy. Literacy is a big deal. Again, but this takes you back to K through 12 alignment.” Administrator 3 mentioned, “alignment with real-world or college career readiness. Post-secondary skills being taught based on student interests. If the student is not interested in college, but they’re interested in a career, then really finding an internship. . . Additionally, the curriculum needs to align to real-life.” These data indicate a slight misalignment from the researcher’s conceptual framework. There needs to be focus on 21st century curriculum to close the gap and make a student more “employable.”

Regarding gaps in resources, it was almost unanimously agreed that the largest gap was lack of funding and technology. Chairperson 1 said, “The biggest gap is just that, unfortunately, schools and their funding are not equitable. . . As technology becomes more prevalent . . . the students who don’t have the opportunity, or may not have the technology to be able to do that, are at a disadvantage.” Chairperson 3 said it would be beneficial if, “students hav[e] their own laptops or Chromebooks.” This gap in technology was expected by the researcher and fits the conceptual framework. Lack of funding, however, was unexpected and does not fit the researcher’s conceptual framework.
Conclusions

This study attempted to determine, through a case study, whether the school being studied was aligned with 21st century practices and to determine what gaps exist to make a student employable according to the current needs and possible future needs of the market. The researcher developed a conceptual framework by reviewing the research conducted by Tony Wagner, Linda Darling-Hammond, Thomas Friedman, Ken Robinson, Yong Zhao and other researchers. For a school or district to develop a student ready and able to be employable in the current and future market, the school or district should use the researcher’s conceptual framework as a template.

This study revealed that the school being researched implemented and practiced many components of the researcher’s conceptual framework. The school was implementing with fidelity the teaching of 21st century skills, utilizing some 21st century learning environments, developing a 21st century curriculum and had 21st century teachers implementing 21st century pedagogical practices. Although not all the components were being utilized or implemented all the time, the majority of the components were.

The study further revealed areas that were lacking in the use of the researcher’s conceptual framework. These two areas were the funding and socio-emotional components. Funding was mentioned repeatedly as a gap in terms of purchasing resources, such as technology. The school relies heavily on state funding and, regarding providing up-to-date technological resources, the school is limited. Furthermore, the need for more socio-emotional support for students and for teachers was discovered through the non-participant observations. This study found that the school has implemented
structures and is maintaining practices that support a student becoming employable in the 21st century.

Through this research, it is apparent that schools must adopt a policy and plan to move toward 21st century learning as outlined by the researcher’s conceptual framework. Many schools are moving away from the traditional classroom setting, with desks in rows and the teacher lecturing in the front of the classroom, and have already begun to adopt 21st century practices, while some are currently implementing them. The challenge is to revolutionize education with its current educational mandates and high-stakes testing. Although many schools are moving toward 21st century practices, it is impossible to prepare a student fully for employment with the current educational system.

The conceptual framework outlined the following five key components to make a 21st century employable student: 21st century skills, 21st century learning environment, 21st century teacher, 21st century curriculum and resources. Schools that are successfully implementing some 21st century practices remain restricted from implementing them all.

For the school in this case study to fully implement all 21st century practices, there needs to be a substantial increase in resources, such as funding and socio-emotional support, including adding more clinicians, the removal of state-mandated testing, and ongoing weekly professional development for teachers and administrators in 21st century practices. Furthermore, there is a need for upgraded classrooms with workstations, desks and computers/technology. The curriculum must be revamped, and testing should be limited and replaced with project-based learning, which would allow students to apply their knowledge and skills to solve real-world problems.
Recommendations for Practice

The research revealed the essential components to create a 21\textsuperscript{st} century student who is ready for the 21\textsuperscript{st} century workforce. The literature review revealed school reforms in Finland, Singapore and South Korea. Furthermore, the literature review identified different schools practicing 21\textsuperscript{st} century practices that are not bounded by the “traditional” school and classroom model.

For this entire process to begin to shift toward 21\textsuperscript{st} century practices, there needs to be reform in the United States and a plan to provide equitable funding for schools to be able to fund sufficiently the resources needed to create an employable 21\textsuperscript{st} century student. Increased funding would allow for more resources, such as technology, networking and partnerships, and for students to have real-world experiences. Funding would enable teacher preparation programs and professional development to train teachers in 21\textsuperscript{st} century pedagogical strategies. Furthermore, funding would allow classrooms to become 21\textsuperscript{st} century learning environments with the addition of workstations, technology and other 21\textsuperscript{st} century resources.

The reforms must also lessen and/or eliminate the reliance on standardized testing as a measure of success. The reforms must allow for schools to develop the whole child through a holistic approach in the areas of liberal arts and student interests. By developing the whole child and building a foundation of 21\textsuperscript{st} century skills, students can then find their areas of interest. Schools can then assist in developing that student in their field of interest through real-world scenarios, problem-solving, project-based learning and other real-life applications.
Schools are bound and restrained by the accountability mandates and test scores. There needs to be a national movement away from the accountability mandates and toward less emphasis on test scores. There must be reforms that will allow schools the freedom to develop and implement curricula that will build 21st century skills and offer students real-world experience that will teach them the skills that will allow them to become employable.

Professional develop must be ongoing and weekly to train current teachers about 21st century practices, and teacher preparation programs must be teaching future teachers these practices also. With teachers being trained in 21st century practices, they must then rewrite curricula to incorporate more project based learning and 21st century skills that can be applied to real-world scenarios. Students must be exposed to real-world problems and challenged to think critically to solve problems.

**Recommendations for Future Research**

This study was limited to one school with approximately 70 teachers, four administrators and seven department chairpersons. Future research should have fewer limitations regarding both the theorists and data source. The following recommendations for future research are made based on this study:

1. Data could be collected from employers from many different companies in different fields. The researcher could analyze the different skillsets the employers expect from potential candidates when they are interviewing them.
2. Data could be collected from students. Students could be asked what skills they are being taught from their perspective. Interviews with employers could reveal whether they feel students are being prepared properly for the workforce.

3. The study could be opened up to different schools in different regions and be conducted on a wider scope. A study of the New York State education system could determine whether the current policies and practices are preparing students to become employable 21st century students.

4. Research Question 4, “What do administrators and teachers believe are the gaps and challenges to bridge the misalignment?” could be its own entirely separate study. A comprehensive case study of schools that have successfully implemented 21st century practices could be analyzed to determine how they bridged the gap and met the challenges.

This study raised questions that do not have quick and easy answers. The main questions raised are as follows: “How do we fully implement 21st century practices to create an employable 21st century student with the current educational model?” Moreover, “how do we implement these practices and structures without fear of backlash if the system does not work?” It is difficult to make changes in education when reform has been taking place for decades without apparent success. To make the transition to fully implement 21st century practices, there must be a shift in mindset regarding the purpose of education and the end goal of education. Until the accountability mandates are removed, until high-stakes testing is ended and the mindset of the population changes, schools cannot fully implement all 21st century practices.
Epilogue

This process was an experience of learning, enlightenment, perseverance and discipline. Writing this dissertation allowed me to learn about the elements needed for 21st century learning. Reading the theories of Tony Wagner, Linda Darling-Hammond, Thomas Friedman, Ken Robinson, Yong Zhao and other researchers allowed me to expand my knowledge of 21st century learning. Such research broadened my view of the path education needs to take to best serve our students.

The data analysis process taught me how to consider data and make formal conclusions and create recommendations. Although some recommendations may be difficult to execute due to state mandates and laws, this process has allowed me to think of various ways to best implement reform within a school or district while adhering to such regulations. Until the restrictions are lifted and sufficient funding is available, there will always be difficulty in fully implementing 21st century practices to develop a student who is completely ready for the 21st century job market.
Bibliography


OECD. (2013a). Innovative Learning Environments. *OECD.*


Zhao, Y. (2012). World Class Learners - Educating Creative and Entrepreneurial Students. California: SAGE.
1) How many years have you been teaching?
   a. 1–3 years
   b. 4–7 years
   c. 8–11 years
   d. 15+ years

2) What subject do you teach?
   a. Math
   b. English
   c. Social Studies
   d. Science
   e. Art
   f. Business
   g. Physical Education
   h. Other

3) Please rate the following skills from most important to least important on a scale of 1-10 (1 most important – 10 least important).
   a. Motivation
   b. Critical Thinking
   c. Ability to collaborate
   d. Self-reflective
   e. Economically Responsible
   f. Entrepreneurship
   g. Curiosity and Imagination (Creativity)
   h. Transference of Knowledge
   i. Effective Oral and Written Communication
   j. Agility and Adaptability

4) I have an excellent understanding of 21st century learning skills.
   Strongly disagree 1 2 3 4 Strongly agree

5) I engage students in learning experiences that promote motivation.
Strongly disagree 1 2 3 4 Strongly agree

6) I provide students with learning experiences that promote critical thinking.
   Strongly disagree 1 2 3 4 Strongly agree

7) I involve students in learning experiences that promote collaboration.
   Strongly disagree 1 2 3 4 Strongly agree

8) I engage students in learning experiences that promote self-reflection.
   Strongly disagree 1 2 3 4 Strongly agree

9) I involve students in learning experiences that promote economic responsibility.
   Strongly disagree 1 2 3 4 Strongly agree

10) I engage students in learning experiences that promote entrepreneurship.
    Strongly disagree 1 2 3 4 Strongly agree

11) I provide students with learning experiences that promote curiosity and imagination (creativity).
    Strongly disagree 1 2 3 4 Strongly agree

12) I involve students in learning experiences that promote transference of knowledge.
    Strongly disagree 1 2 3 4 Strongly agree

13) I engage students in learning experiences that promote agility and adaptability.
    Strongly disagree 1 2 3 4 Strongly agree

14) I utilize the following resources within my pedagogy (check all that apply):
    a. Technology
    b. Networking
    c. National Partnerships
    d. Local Partnerships
    e. International Partnerships

15) Which aspects of the curriculum do you feel are most important (check two):
    a. Balanced
    b. Contains real-life applications
    c. Teaches the skills to engage in a diverse world
    d. Connected to activities in the real world
    e. Project-based learning
    f. Continuous and ongoing assessment

16) The curriculum I use is currently balanced. (Yes or No)

17) The curriculum I use contains real-life applications. (Yes or No)

18) The curriculum I use teaches the skills to engage in a diverse world. (Yes or No)

19) The curriculum I use is connected to activities in the real world. (Yes or No)

20) The curriculum I use contains project-based learning. (Yes or No)

21) The curriculum I use has continuous and ongoing assessments. (Yes or No)

22) How do you group your students? (check all that apply)
    a. Pairs
    b. Groups of 3–4
    c. Groups of 5+
    d. U-shaped
    e. Circles
f. Seated next to each other in parallel rows

g. Other

23) Within your own practice, how do you promote the engagement of students? (please fill in your answer)

24) Within your own practice, how do you promote the enabling the students? (please fill in your answer)

25) Within your own practice, how do you promote the expectations of the students? (please fill in your answer)

26) Within your own practice, how do you promote the empowerment of the students? (please fill in your answer)

27) Within your own practice, which of the following do you help your students develop? (check all that apply)
   a. Curiosity
   b. Creativity
   c. Criticism
   d. Communication
   e. Collaboration
   f. Compassion
   g. Composure
   h. Citizenship

28) What areas do you feel are most important for students to develop to become employable? (check three)
   a. Motivation
   b. Critical Thinking
   c. Ability to collaborate
   d. Self-reflective
   e. Economically Responsible
   f. Entrepreneurship
   g. Curiosity and Imagination (Creativity)
   h. Transference of Knowledge
   i. Effective Oral and Written Communication
   j. Agility and Adaptability

29) What areas do you feel you need to focus most on within your lessons? (check three)
   a. Motivation
   b. Critical Thinking
   c. Ability to Collaborate
   d. Self-reflective
   e. Economically Responsible
   f. Entrepreneurship
   g. Curiosity and Imagination (Creativity)
   h. Transference of Knowledge
   i. Effective Oral and Written Communication
j. Agility and Adaptability

30) What areas of the curriculum do you feel need the most attention to improve? (check two)
   a. Balanced
   b. Contains real-life applications
   c. Teaches the skills to engage in a diverse world
   d. Connected to activities in the real world
   e. Project-based learning
   f. Continuous and ongoing assessment

Focus Group Questions

1) What skills should 21\textsuperscript{st} century students possess?

2) How should teachers be implementing and teaching such 21\textsuperscript{st} century skills?

3) What change needs to be made to make the curriculum support 21\textsuperscript{st} century learning skills?

4) What resources are needed to implement 21\textsuperscript{st} century learning skills?

5) What type of learning environment supports 21\textsuperscript{st} century learning skills?

6) Where do you feel there are the gaps regarding creating an employable 21\textsuperscript{st} century student?
Appendix B – Consent Forms

Informed Consent Form to Participate in Focus Group Study

St. John’s University IRB number: 2670640

Principal Contact: William Toro  Telephone Number: (631) 275-1108

William.toro17@stjohns.edu

Introduction

You are invited to participate in a dissertation research study under the direction of Dr. Annunziato, Professor of Educational Leadership at St. John’s University. Taking part in this research is voluntary. The principal investigator in this study is William Toro, who is a doctoral student at St. John’s University School of Education.

Rationale for the research study

The purpose of this study is to determine what 21st century learning skills are taught and practiced within a diverse high-needs suburban school district. In addition, the purpose is to identify the gaps in skills that need to be taught to be successful in today’s global market with current pedagogical practices. The study will utilize the Partnership for 21st Century Learning as its theoretical framework, as well as a conceptual framework designed by the researcher, combining the theories of Tony Wagner, Linda Darling-Hammond, Thomas Friedman, Ken Robinson, Yong Zhao and other researchers. These theorists have in common their visions of what changes need to occur in education to develop 21st century citizens who can compete in the global market of the present and
future. This study will conclude with an analysis of whether there is alignment between what 21st century skills are being taught and what gaps need to be filled to be competitive in the global market

**What is involved in this study?**

If you choose to participate in this study, you will be asked to:

- Participate in a 45-minute interview
- Have those interviews recorded
- Review transcriptions to ensure accuracy and to approve the commentary

**What are the risks of participating in this study?**

There are no physical risks associated with this study. Every effort will be made to keep your information confidential, there will be no names recorded during the interview. You may refuse to answer any of the questions that you believe will divulge this information and/or that make you feel uncomfortable. Additionally, you may take a break at any time and halt your participation.

**Are there any benefits to participating in this study?**

You may benefit from participating in this study by gaining a better understanding of what 21st century practices are being utilized within your school environment and whether gaps exist.

**Will I receive payment for being in this study?**

You will not be paid for taking part in the study.

**How will my privacy be protected?**

Confidentiality will be protected in a variety of ways. There will be no names recorded or used within the study. You will be given an opportunity to review the researcher’s notes
and transcripts of the interview for accuracy, as well as have information deleted if you choose. The recordings will be safeguarded using a password-protected iPhone 7, the transcriptions will be secured on a password-protected computer, and hard copies will be secured in a locked safe and made available only to the interviewees, the researcher and the dissertation committee. Upon completion and final approval of the research project by the dissertation committee, the transcripts will be destroyed, and the electronic versions and recordings will be deleted.

If the results of this research study are reported in journals or scientific texts or meetings, the people who participated in this study will not be named or identified.

*Please keep a copy of this document for future review.

If there is anything about the study or your participation that is unclear or that you do not understand, or if you have questions or wish to report a research-related problem, you may contact William Toro at 631-275-1108, or the faculty sponsor, Dr. Annunziato, at 631-218-7775.

For questions about your rights as a research participant, you may contact the University’s Institutional Review Board, St. John’s University, Dr. Raymond DiGiuseppe, Chair digiuser@stjohns.edu 718-990-1955 or Marie Nitopi, IRB Coordinator, nitopim@stjohns.edu 718-990-1440.

*If you agree to participate in this study, please sign below:*

**Documentation of informed consent**

I understand the information printed on this form. I have discussed this study, its risks and potential benefits. My questions so far have been answered. My signature, below,
indicates my willingness to participate in this study and my understanding that I can withdraw at any time.

________________________________________   ________
Subject’s Name (printed) and Signature     Date

_________________________________________   _______ _________
Name (printed) and Signature of Person Obtaining Consent   Date
Introduction

You are invited to participate in a dissertation research study under the direction of Dr. Annunziato, Professor of Educational Leadership at St. John’s University. Taking part in this research is voluntary. The principal investigator in this study is William Toro, who is a doctoral student at St. John’s University School of Education.

Rationale for the research study

The purpose of this study is to determine what 21st century learning skills are taught and practiced within a diverse high-needs suburban school district. In addition, the purpose is to identify the gaps in skills needed to be taught to be successful in today’s global market with current pedagogical practices. The study will utilize the Partnership for 21st Century Learning as its theoretical framework, as well as a conceptual framework designed by the researcher, combining the theories of Tony Wagner, Linda Darling-Hammond, Thomas Friedman, Ken Robinson, Yong Zhao and other researchers. The theorists have in common their visions of what changes need to occur in education to develop 21st century citizens who can compete in the global market of the present and future. This study will
conclude with an analysis of whether there is alignment between what 21st century skills are being taught and what gaps need to be filled to be competitive in the global market.

**What is involved in this study?**

If you choose to participate in this study, you will be asked to:

- Conduct your class as you ordinarily do
- The observer will take running notes
- The observer will not interact with the class nor with the students
- All observations will remain anonymous

**What are the risks of participating in this study?**

There are no physical risks associated with this study. Every effort will be made to keep your information confidential, and there will be no names recorded in this observation. You may refuse to answer any of the questions that you believe will divulge this information and/or that make you feel uncomfortable. Additionally, you may take a break at any time and stop your participation.

**Are there any benefits to participating in this study?**

You may benefit from participating in this study by gaining a better understanding of what 21st century practices are being utilized within your school environment and whether gaps exist.

**Will I receive payment for being in this study?**

You will not be paid for taking part in the study.

**How will my privacy be protected?**

Confidentiality will be protected in a variety of ways. There will be no names recorded or used within the study. You will be given an opportunity to review the researcher’s notes.
for accuracy, as well as have information deleted if you choose. It will not be recorded in any way.

If the results of this research study are reported in journals or scientific texts or meetings, the people who participated in this study will not be named or identified.

*Please keep a copy of this document for future review.

If there is anything about the study or your participation that is unclear or that you do not understand, or if you have questions or wish to report a research-related problem, you may contact William Toro at 631-275-1108, or the faculty sponsor, Dr. Annunziato, at 631-218-7775.

For questions about your rights as a research participant, you may contact the University’s Institutional Review Board, St. John’s University, Dr. Raymond DiGiuseppe, Chair digiuser@stjohns.edu 718-990-1955 or Marie Nitopi, IRB Coordinator, nitopim@stjohns.edu 718-990-1440.

**If you agree to participate in this study, please sign below:**

**Documentation of informed consent**

I understand the information printed on this form. I have discussed this study, its risks and potential benefits. My questions so far have been answered. My signature, below, indicates my willingness to participate in this study and my understanding that I can withdraw at any time.

_____________________________________   ___________ _____  
Subject’s Name (printed) and Signature     Date

______________________________________   __________ ______  
Name (printed) and Signature of Person Obtaining Consent   Date
Appendix C – IRB Approval

MEMO

Institutional Review Board  
Federal Wide Assurance: FWA00009066

Date: January 29, 2019

To: William Toro

CC: Dr. Anthony Annunziato  
    Dr. Rene Parman  
    Dr. Mary Beth Schaefer

Dr. Sandra Reznik  
Acting Chair, Institutional Review Board  
Tel 718-990-2634  
rezniks@stjohns.edu

Dr. Marie Nitopi  
IRB Coordinator  
Tel 718-990-1440  
nitopin@stjohns.edu

Protocol #: 1118-175  
Protocol Title: 21st Century Learning Skills in Education and Employability

Please be advised that your human subject protocol has been reviewed by the IRB and is  
considered approved/exempt. You are free to begin your project.

Since the proposal is exempt, no further follow-up by the IRB is required. Please notify  
the IRB of any deviation from your proposal since any change may require IRB review and  
approval.

Best wishes for successful pursuit of this research.

**It is imperative that you keep this on file where it can easily be accessed. You will  
need to provide copies of this document when involved in further correspondence with the  
IRB. The IRB will provide you with an additional copy of this document only in the case of an  
emergency.**
Appendix D – Letter of Consent from the District to Conduct Research

Peekskill City School District
A System Focused on Every Student, Every Day

January 7, 2019
Mr. William Toro:

I am approving your dissertation study to take place in our district pending the approval from the IRB process at your institution of higher education. Please submit it to my office when it is approved.

Good luck in the process of obtaining your doctorate degree. This achievement will surely enhance your leadership. Thank you for all that you do for our students.

Sincerely,

[Signature]

David Mauricio, Ed.D.
Superintendent

The Mission of the Peekskill City School District is to educate and empower all students to strive for excellence as lifelong learners who embrace diversity and are contributing members of a global society.
1031 Elm Street, Peekskill, NY 10566-3499
(914) 737-3300, ext. 325 FAX: (914) 788-7584
www.peekskillcsd.org
Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that William Toro successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 03/04/2018.

Certification Number: 2670640.
Vita

Name: William Xavier Toro

Baccalaureate Degree: Bachelors of Arts, St. Joseph’s College
  Major: Mathematics

Date Graduated: January 2007

Other Degrees or Certificates: Masters of Arts and Liberal Studies, SUNY Stony Brook
  Major: Liberal Studies

Date Graduated: June 2010

Other Degrees or Certificates: Advanced Graduate Certificate, SUNY Stony Brook
  Major: Educational Leadership

Date Graduated: August 2015