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An International Quantitative Comparative Content Analysis of Reading Curriculum Using a 21st Century Framework

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by

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Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work here at Lindenwood University and that I have not submitted it for any other college or university course or degree here or elsewhere.

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Abstract

Research in the area of 21st century learning suggested the American public education system lacked educational preparation for students to compete in a global/connection economy. The United States performed lower than other nations on the Programme for International Student Assessment (PISA) 2012 reading performance. However, the United States had a higher number of 21st century skills and knowledge embedded in the curriculum. The 21st century skills, referred to as the 4Cs (collaboration, communication, creativity, and critical thinking) served as the foundation of this research. Moreover, while the United Sates performance on the PISA was no match to other developed nations; the country ranked above competitors in other international indexes such as the Global Competitiveness Index and the Global Entrepreneurship Monitor.

The researcher analyzed data using an Analysis of Variance (ANOVA), Pearson Product Moment Correlation Coefficient (PPMCC), and Chi-Square tests for independence and goodness of fit, to seek a possible relationship between the number of 21st century skills included within the 2012 reading curriculums in the countries of Finland, Singapore, and the United States and compared to reading scores measured by the 2012 PISA. For the null hypotheses numbers one through five the researcher applied a PPMCC to the data by comparing a single 4C to the score of each researched country for reading PISA results. With exception to null hypothesis three, a significant inverse relationship existed between the number of 21st century skills included within the 2012 reading curriculums and the 2012 PISA reading scores of the researched countries. Although null hypothesis three was not significant, an observable inverse relationship did

exist. This study revealed when a country scored higher on the PISA 2012, the total number of 21st century skills included in the reading curriculums were lower. Additionally, students within the American educational system may benefit from increased focus on academic performance and instructional design to harness creativity and develop an entrepreneurial spirit.

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Chapter One: Introduction

Introduction

Many educational leaders throughout the United States reached consensus that America's educational system must implement curricular changes to equip students with 21st century skills necessary to compete in a global economy. Jerald (2009) noted, "globalization affects the types of knowledge and skills students will need to thrive" (p. 11). Comparatively, on the most recent international assessment at the time of this study, the Programme for International Student Assessment (PISA), American students scored lower than other industrialized nations, particularly Finland and Singapore, both countries revered for their education systems. According to research conducted by the National Center for Education Statistics (NCES), based on results from the 2009 PISA, Finland students scored 536, Singapore students scored 526, and the United States students scored 500 (NCES, 2010, p. 15). In a more recent report, *PISA 2012 Results: What Students Know and Can Do – Student Performance in Mathematics, Reading, and Science*, the United States again ranked behind Finland students who scored 524, Singapore students scored 542, and the United States students scored 498 in the content area of reading proficiency (Organisation for Economic Co-operation and Development [OECD], 2013b, p. 194). The literature revealed researchers believed nations should increase performance on the PISA to be globally competitive. A notable economist Hanushek asserted, if the American students' scores increased on the international assessments, the government would see an increase in its gross domestic product (as cited in Hanushek & Woessmann, 2008). Additionally, international expert, Tucker and columnist, Friedman argued the importance of America's educational system and the need to increase student scores on

the PISA to better prepare American students to compete in a global economy (Friedman & Tucker, 2011). On the other hand, some researchers believed curriculum changes to increase performance on the assessments would do more harm than good (Loveless, 2012; Zhao, 2012). Meanwhile, the researcher perceived a lack in clarity if the incorporation of 21st century skills within education curriculums and the quest to increase scores on international assessments would help students succeed in a connected economy.

Economies were faced with competition on a global scale due to the interconnectedness (Zhao, 2009) of "products, people, companies, countries, everything" (Davis & Meyer, 1998, p. 5) or as Godin (2012) described, the "connection economy" (p. 25). As a result, job demands changed and the imperative to equip students with 21st century skills remained essential for their success (Kay & Greenhill, 2013). Levy and Murnane (2004) examined the role of job distribution in the United States and found students who graduated from high school were prepared for the lower paying jobs, while companies sought individuals for higher paying jobs due to the increase of computerization. Some researchers argued the importance of the United States to increase achievement on international assessments to accommodate these demands (Friedman & Tucker, 2011). Conversely, researchers reported that international assessments would not lead to later success in the global economy (Loveless, 2012).

One method to increase American student success was the implementation of the Common Core State Standards (CCSS), commonly referred to as The Common Core. According to the Common Core State Standard's mission statement (CCSS Initiative, 2012), "standards [were] designed to be robust and relevant to the real world and prepare

[American students] to compete successfully in the global economy" (para. 1). A shared set of standards were created to directly compete with other leading countries' educational systems (CCSS Initiative, 2012). Coupled with education leaders use of 21st century skills frameworks as described in works such as *enGauge 21st Century Skills for 21st Century Learners: Literacy in the Digital Age for 21st Century Skills* (2003) and the *Partnership for 21st Century Skills'* (P21, n.d.), students should be fully prepared to compete globally. While an abundance of research existed regarding 21st century skills and knowledge (Jerald, 2009; Kay & Greenhill, 2013; Partnership for 21st Century Skills [P21], n.d.; Tucker, 2011; Zhao, 2009), there seemed to be little information related to the actual success of students based on the incorporation of these skills within the United States or national curriculums of Finland and Singapore, as compared to PISA rankings.

To gauge the success of global student achievement, the Programme for International Student Assessment (PISA) was launched. PISA's original purpose was to assess how students "apply their knowledge to real-life situations and [are] equipped for full participation in society" (OECD, n.d.a., para. 4). One might postulate that if a country had a high rating of 21st century skills and knowledge included in their country's curriculums and a high score on the PISA, students possessed the necessary skills to compete in a connection economy. While the Common Core's purpose was to prepare American students to "compete sucessfully in the global economy" (CCSS Initiative, 2012, para. 1), a report conducted by Loveless (2012) revealed "[the Common Core] will have little effect on American students' achievement" (p. 14). Although the researcher analyzed a wealth of information, regarding the inclusion of 21st century skills and knowledge within curriculums (Cassner-Lotto & Benner, 2006; Council on Foreign

Relations, 2012; Schleicher, 2012) no studies were located that examined the comparison of these skills within the 2012 curriculums of nations that ranked highest in international student performance.

Research indicated the United States' educational system was in a crisis (Duncan, 2013) and performance on the PISA had to be increased to allow the country to remain economically competitive (Tucker, 2011), however, other studies disputed this belief (Zhao, 2012). For example, one study found that when a country had lower performance on PISA, that country ranked higher on the entrepreneurship capability index (Bosma, Wennekers, & Amoros, 2012) which held true for the United States. Another study conducted in 2007 and 2008 revealed the United States continued to drive innovations and led the world in science and technology (World Economic Forum, 2007). Although the taskforce on United States education and reform viewed the state of the educational system as a national security risk (Council on Foreign Relations, 2012), the literaure reviews and the findings of the researcher's study did not support this idea of an educational crisis.

Previous research on connections between PISA performance, 21st century skills, national curriculums, and a nations economic competiveness left gaps in the literature. The intent of the researcher's study was to identify the industrialized nations with high performance on the PISA and compare those scores to the United States using a quantiative methodology. Additionally, the researcher sought to statistically determine the nations with the higher number of 21st century skills embedded in the curriculums. The researchers' findings could provide statistical insight on the notion of the American

educational system's educational and eocnomic standings, as compared to nations with higher performance on PISA.

Purpose of the Study

A consensus among educational leaders revealed America's need to implement changes that equipped students with 21st century skills (Council on Foreign Relations, 2012; Godin, 2012; Tucker, 2011; Zhao, 2012) to be successful in a connected economy. Friedman and Tucker (2011) argued in their video, *Tom Friedman and Marc Tucker Discussion with Luke Russert: Surpassing Shanghai,* the importance for the U.S. educational system to increase American students' average scores on PISA to remain globally competitive. Therefore, the researcher investigated a possible relationship between the PISA 2012 reading scores and the measurement of 21st century skills and knowledge found within the 2012 reading curriculums of those nations which ranked highest in international student performance (Finland and Singapore), in comparison to the U.S. (Tucker, 2011). The researcher defined 21st century skills and knowledge based on Kay and Greenhill (2013), in their text, *The Leaders' Guide to 21st Century Education: 7 Steps for Schools and Districts.* The researcher selected this text due to the authors' previous experiences within schools and their work with educational leaders and businesses to address the skills necessary for students to "succeed in the new global economy" (p. xiii). The researcher statistically analyzed the data using an ANOVA, PPMCC, and Chi-Square test for independence.

The purpose of this research was twofold: a gap in literature existed related to students' success in the connected economy, based on the presence of 21st century skills in curriculums. Secondly, literature reviews of U.S. PISA performance in comparison to

Finland and Singapore showed a gap in potential aspects of results. Therefore, the researcher intended to determine how the number of 21st century skills embedded in the research countries' curriculums compared to the research countries' findings of PISA performance. Based on the frequency of 21st century skills, an assumption existed; the nation that possessed the higher number of 21st century skills would presumably have higher performance on the PISA 2012 and be better prepared to compete in a connected economy.

The significance of this study was to provide an in-depth understanding of the research countries' curriculums and connections between performances on international assessments. Researchers were doubtful of the American educational system because of low performance on PISA (Council on Foreign Relations, 2012; Friedman, 2005) and (Duncan, 2013) believed there was an educational crisis. This study aimed to help fill gaps in the priorities of American curriculum reforms to increase performance on PISA. Moreover, this study hoped to provide a deeper understanding of the impact of curriculum reform on national economic competitiveness. Ultimately, educational leaders and policy makers made decisions with a focus on the heart of the issue: to prepare students to compete successfully in a connected economy and ensure the U.S. maintained a competitive edge in international markets.

Rationale

For the U.S. to prepare students to compete in a connection economy, research revealed a fixation on the imperative for educational leaders to reform curriculums by including 21st century skills and the need to increase academic performance on the PISA. At the time of this study, the researcher found a gap in literature with the various

influences associated with the notion that the American educational system was in crisis (Duncan, 2013) and at risk of losing the economic competitive edge (Hanushek & Woessmann, 2008).

Kay and Greenhill (2013) argued the importance of embedding 21st century skills and knowledge were essential for students to compete in the job market. An examination of job distribution in the U.S. uncovered students graduating high school were not equipped to compete for higher paying jobs (Levy & Murnane, 2004). Meanwhile, American students consistently scored lowered on the PISA and researchers argued to remain globally competitive, scores must be increased (Council on Foreign Relations, 2012; Friedman, 2005; Friedman & Tucker, 2011). Then again, if the U.S. focused on educational reforms to increase performance on PISA, there was a possibility that it would "reduce entrepreneurial capability [and have] significant implications for the direction of education" (Zhao, 2012, p. 15). The review of literature revealed across multiple studies, the U.S.' reputation of entrepreneurial capabilities (Bosma et al., 2012; World Economic Forum, 2007; Zhao, 2012) and the educational system was not in the crisis (Baker, 2007), as believed by other researchers (Duncan, 2013; Hanushek & Woessmann, 2008; Zhao, 2012).

Studies related to 21st century skills and national performance on PISA existed throughout the literature. However, the researcher found no studies showing a correlation between the 4Cs embedded in curriculums of the research countries and performance on the PISA. This lack of research merited an investigation of this subject. Findings allowed educational leaders and policy makers to make informed decisions on the importance of embedding 21st century skills in curriculums and determine the

importance of increasing performance on PISA. Moreover, with the end goal in mind, to better prepare students to compete in a connected economy.

The researcher reviewed several reports to lay the foundation of the study: the PISA 2012, curriculums of the research countries, the Global Entrepreneurship Monitor (GEM), and other international indices; all discussed in Chapter Two and Chapter Five. This study provided data about a possible relationship between the number of 21st century skills included within the 2012 reading curriculums used by teachers of 15-year-old students, within the countries of Finland, Singapore, and the U.S. and the reading scores measured by the 2012 PISA. Essentially, one could postulate that if a country had a high number of 21st century skills and knowledge included in the curriculum and a high score on the 2012 PISA that the students possessed the necessary skills to compete in a "connection economy" (Godin, 2012, p. 25). Additionally, this research may provide information for educational leaders and policy makers to make informed decisions on the necessity to reform education to remain competitive on international assessments, or if it may be more important to harness creativity in curriculum than to remain globally competitive.

Hypotheses

The imperative to equip students with the necessary skills to compete successfully in a connection economy was essential for America to maintain its competitive economic edge. Previous research provided evidence that the U.S. scored lower than other industrialized nations on PISA (OECD, 2011). Furthermore, literature current at the time of this writing showed the researched countries revised their curriculum to include 21st century skills for the purpose of increasing performance scores on PISA and preparing

students to compete globally. To that end, this study added to the body of knowledge that existed on this topic. To find clarity, the following hypotheses were tested:

Hypothesis 1: There is a relationship between the rating of 21st century skills and knowledge included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 Reading scores measured by PISA.

Hypothesis 2: There is a relationship between the rating of collaboration skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

Hypothesis 3: There is a relationship between the rating of communication skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

Hypothesis 4: There is a relationship between the rating of creativity skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

Hypothesis 5: There is a relationship between the number of critical thinking skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

Hypothesis 6: The score earned is dependent on the respondents who critiqued: Finland, Singapore, and the United States Common Core reading curriculum.

Limitations

As with most academic research, limitations may exist. The limitations included variables out of the control of the researcher with possible ramifications on the outcome of this study. Many 21st century skills and knowledge resources existed at the time of this study; however, the researcher chose to focus solely on the skills and knowledge based on the work of Kay and Greenhill (2013): creativity, communication, collaboration, and critical thinking, noted as the 4Cs. Although, the research was based solely on Kay and Greenhill (2013), the literature reviewed supported the 21st century skills and knowledge noted in their text (North Central Regional Educational Laboratory, & Metiri Group [NCREL & Metiri], 2003; p. 21, n.d.). Additionally, the researcher took the position that if educators included 21st century skills and knowledge in their curriculums, they implemented them with fidelity. Moreover, the researcher analyzed the foreign countries of Finland and Singapore reading curriculum for comparison to the U.S. Common Core. Since the researcher is American and had no foreign language background, the potential for bias when determining language interpretation in the foreign curriculum existed. To overcome this, the researcher forwarded surveys of the foreign curriculums to teachers with reading specialist certifications.

Definition of Terms

21st Century Skills and Knowledge*:* A set of skills and knowledge that students must possess to compete in a global economy (Kay & Greenhill, 2013). For the purpose

of this study, the researcher measured the following 21st Century Skills and Knowledge: creativity, communication, collaboration, and critical thinking (Kay & Greenhill, 2013).

Common Core State Standards*:* According to the Common Core State Standard's mission statement (2012) "standards are designed to be robust and relevant to the real world and prepare [American students] to compete successfully in the global economy" (para.1). For the purpose of this study, the researcher referenced the U.S. Common Core Standards as CCSS.

Collaboration*:* Kay and Greenhill (2013) described this term as the "ability to work effectively and respectfully with diverse teams" (p. 143). For additional descriptors of collaboration, the researcher selected key words and phrases that possessed the following identifiers, "work effectively and respectfully with diverse teams, assume shared responsibility for collaborative work, and value the individual contributions by each team member [and demonstrate a] willingness to be helpful" (Kay & Greenhill, 2013, p. 122).

Communication*:* "Articulate thoughts and ideas effectively using oral, written, and nonverbal communication skills in a variety of forms and contexts" (Kay & Greenhill, 2013, p. 136). For additional descriptors of communication, the researcher selected key words and phrases that utilized the following identifiers, "articulate thoughts and ideas effectively, listen effectively to decipher meaning [and] communicate effectively in diverse environments (including multilingual)" (Kay & Greenhill, 2013, p. 136).

Creativity*:* Kay and Greenhill (2013) described this term as the ability to "think creatively, work creatively with others, and implement innovations" (p. 148). For

additional descriptors of creativity, the researcher selected key words and phrases that utilized the following identifiers, "formulate ideas, brainstorm, elaborate, refine, analyze, and evaluate their own ideas" (Kay & Greenhill, 2013, p. 148). For the purpose of this study, the researcher used the terms creativity and innovation interchangeably to describe this 21st century skill, as did Kay and Greenhill (2013), in their text, *The Leaders' Guide to 21st Century Education: 7 Steps for Schools and Districts*.

Critical Thinking*:* Defined by Kay and Greenhill (2013) as the skills of reasoning effectively, analyzing and using the tools of systems thinking, making judgments and decisions, "identify, define and solve authentic problems and essential questions, collect, assess, and analyze relevant information and reflect critically on learning experiences, processes and solutions" (pp. 130-131). For additional descriptors of critical thinking, the researcher selected key words and phrases that utilized the following identifiers, "higher-order thinking and sound reasoning, prioritizing, planning, and managing for results" (NCREL & Metiri, 2003, p. 5).

Global Competitive Index*:* The GCI is an index that "assesses the competitiveness landscape of 140 economies, providing insight into the drivers of their productivity and prosperity. The Report series remains the most comprehensive assessment of national competitiveness worldwide" (World Economic Forum, n.d., para. 1).

Global Entrepreneurship Monitor*:* "[T]he Global Entrepreneurship Monitor (GEM) is an annual assessment of the entrepreneurial activity, aspirations and attitudes of individuals across a wide range of countries" (GEM, n.d., para. 1).

Human Development Index: The Human Development Index (HDI) is a "summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living" (United Nations Development Programme [UNDP], n.d., para. 2).

Organisation [sic] for Economic Co-operation and Development*:* The organization is comprised of thirty-four nations that "uses its wealth of information on a broad range of topics to help governments' foster prosperity and fight poverty through economic growth and financial stability" (Organization for Economic Co-operation and Development [OECD], n.d.a., para. 1).

Programme for International Student Assessment (PISA): "an international study which aims to evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students" (OECD, n.d.b., para. 1). The assessment compared and ranked the literacy scores of participating nations in the subject areas of mathematics, science, and reading (Dall, 2011).

Summary

It was apparent that 21st century skills and knowledge were essential to prepare students to compete in a connection economy, evidenced by American students' lack of preparedness in job markets (American Management Association [AMA], 2010; Levy & Murnane, 2004; p. P21, 2008) and increased technological changes (Godin, 2012; NEA, 2010). At the time of this study, the U.S.' educational system was under fire due to low scores on PISA, contrasted by other industrialized nations, such as Finland and Singapore. In fact, American students fell behind on the PISA 2012, specifically in the area of reading proficiency (OECD, 2013b). According to the OECD's website, PISA

assessed the skills and knowledge of 15-year-old students and reported the performance of national educational systems (OECD, n.d.a.) with the assertion that if a country scored high on the PISA, students were better prepared to compete in a global society (OECD, n.d.b.).

The United States Secretary of Education, Duncan (2013) stated the educational system was in a crisis and at risk of losing international competitive advantage if PISA performance did not increase (Council on Foreign Relations, 2012). Zhao (2012) challenged this assertion of an educational crisis and argued the U.S.' education system simply needed a paradigm shift. It was evident that reforms to the U.S.' educational system were necessary (Friedman & Tucker, 2011; Kay & Greenhill, 2013; Levy & Murnane, 2004) to ensure success in the global economy. However, it was unclear if increased PISA performance influenced students' success in the connected economy (Baker, 2007) and despite assumptions that this would not be conducive to preparing students (Loveless, 2012; Shiel & Eivers, 2009; Zhao, 2009).

The intent of this research was to measure the frequency of 21st century skills and knowledge embedded within the curriculums of industrialized nations known for educational excellence, based on 2012 PISA reading performance. The researcher examined the research countries' curriculums for presence of 21st century skills: communication, collaboration, critical thinking, and creativity skills and knowledge, and examined where PISA 2012 rankings and existing literature about correlations with educational standings, rankings on international indexes, and economic impacts. Designed to evaluate whether a correlation existed between the inclusion of 4Cs in curriculums and performance on the PISA – this study aimed to provide additional

information for educational leaders and policy makers to ensure students were prepared to compete in a connected economy.

Chapter Two describes educational systems in the U.S. and their desire to incorporate the necessary skills and knowledge for students to be prepared in a global and connected economy. The chapter also includes the literature available at the time on the incorporation of 21st century skills and knowledge in curriculums with comparisons to rankings on international assessment, PISA. Also included are literature reviews on a nation's curriculum initiatives, the importance of the 4Cs, an overview of PISA, and varying perspectives from top educational researchers. Chapter Three discusses the methodology; Chapter Four notes the results, and Chapter Five discusses the results and recommendations for future studies.

Chapter Two: The Literature Review

Introduction

Chapter 2 provided a detailed review of existing literature about educational uncertainties that existed regarding the preparation of students to compete in a connected economy. This chapter referenced varying perspectives of notable educational leaders on the current state of the educational performance of nations with a primary focus on the U.S. This chapter also explored 21st century frameworks used to define 21st century skills. Further, an in-depth review of the text written by Kay and Greenhill (2013) focused on the 4Cs as important skills to embed in curriculums and reinforce student success in a connected economy. In this chapter, the researcher presents information about PISA's development and the connection to gauge success of a student's ability to compete in a connected economy. Finally, the researcher examines the researched countries' curriculums and initiatives along with curriculum background information.

Background of the Problem

Economic competitiveness increased because of a seamless flow of information, goods, and services, which eliminated international distance barriers (Davis & Meyer, 1998; Friedman, 2005; Godin, 2012; Zhao, 2009). Consequently, educational leaders and policy makers implemented initiatives to meet the demands of the connected economy (CCSS Initiative, 2012). Kay and Greenhill (2013) stated, "Our [America's] education system was built for an economy that no longer exists" (p. 3). According to Hanushek, Peterson, and Woessmann (2013) the U.S. "is in trouble" based on reading levels of students in comparison to other countries (p. 2). Further, a report conducted by the *21st Century Workforce Commission* (2000) posited, "[T]he current and future health of

America's 21st Century Economy depends directly on how broadly and deeply Americans reach a new level of literacy" (p. 5). Not only did American educational leaders recognize the new challenges, other industrialized nations implemented initiatives to meet the new demands (Friedman, 2005; Zhao, 2009). Specifically, the Finnish government implemented a plan for the ongoing development of education in their country (Finnish National Board of Education [FNBE], 2013). Similarly, the Singaporean government launched a program in 1999 for continuous improvements to upgrade schools' to the current standards (Ministry of Education, Singapore, 2015). Furthermore, the U.S. Common Core developed in 2009, aimed to prepare students to compete in a global economy (CCSS Initiative, 2012).

In short, although, the aforementioned nations were different in their approach to education, they shared a common goal – to equip students with the necessary skills to be successful in a global and connected economy (CCSS Initiative, 2012; Finnish National Board of Education, 2013; MOES, 2015). Although the researched countries' implemented changes in their curriculums, Zhao (2012) believed, this move hindered the success of students competing in the 21st century economy. Specifically, researchers argued the U.S. would be losing their competitive edge (Baker, 2007; Zhao, 2009) by focusing on increased performance on the PISA. In further support of this, Carmichael, Wilson, Finn, Winkler, and Palmieri (2009) concluded in their report, the U.S. should not rely on data provided by PISA when making decisions about curriculum reform.

The definition of 21st century skills and knowledge was ambiguous and differed between researchers, Jerald (2009) stated, defining 21st century skills is a daunting task for educators. According to the 2003 report, *enGauge 21st Century Skills: Literacy in the*

Digital Age, "the 21st century skills required for such success are not well defined" (NCREL & Metiri, p. 2). Researchers provided varying opinions on what skills and knowledge were necessary to be successful in a 21st century economy. When defining what students needed to be successful, researchers agreed, we must think globally (Davis & Meyer, 1998; Kay & Greenhill, 2013; Zhao, 2009). "[T]here is no more important endeavor today than ensuring all students are successful in life, work, and citizenship in the 21st century and transforming our schools and districts to support such a vision" (Kay & Greenhill, 2013, p. xix). Moreover, the National Education Association (NEA, 2010) defined 21st century skills and knowledge with the inclusion of creativity, communication, collaboration, and critical thinking referred to as the 4Cs. Upon completion of their research, Kay and Greenhill (2013) defined the 4Cs as the skills and knowledge the education communities agreed were most important for students to be successful in a global economy (p. xiv). The American Management Association (AMA, 2012), a global organization that assessed talent development to help businesses succeed, surveyed 768 managers and other executives asking about the importance of the 4Cs in their organizations (pp. 1-2.). Like Kay and Greenhill (2013), AMA (2012) reported the majority of executives believed 4Cs were necessary for employees to be successful in their job. As an illustration, "executives said these skills and competencies [4Cs] have been articulated within their organizations as priorities for employee development" (AMA, 2012, p. 2). The NEA (2010) agreed, the 4Cs were necessary skills and knowledge to help students' succeed in the 21st century.

Kay and Greenhill (2013) concluded, "Our [America's] education system was built for an economy that no longer exists" and "[o]ur education model has not kept pace

with these changes" (p. 3). Zhao (2012) and Duncan (2013) agreed that America's education system must shift to a new paradigm to address challenges in a 21st century economy. Describing the new flat world (Friedman, 2005) predicted, "Developed Western countries will need to adapt" (p. 273) to economic changes to maintain their "comparative advantage" (p. 273). In their text, *The Leader's Guide to 21st Century Education: 7 Steps for Schools and Districts*, Kay and Greenhill (2013) outlined eight perspectives on 21st century life they believed were important to equip students with the necessary skills: the workforce, the flat world, the service economy, citizenship, pace of change, design and innovation, information, and technology (pp. 2-11).

Perspective 1: The workforce

Workforce demands changed because of economic shifts in the 21st century. Kay and Greenhill (2013) asserted the economy had changed and America's education system initially focused to prepare students to work in factories since manufacturing jobs were in excess. Likewise, the New Commission on the Skills of the American Workforce (2007) reported, "the core problem is that our education and training systems were built for another era, an era in which most workers needed only a rudimentary education" (p. xix). As the 21st century neared and technology evolved, computers replaced those jobs (Levy & Murnane, 2004); resulting in a workforce that no longer required employees to perform routine work. To accommodate a 21st century workforce, educational leaders needed to work collaboratively with the private sector "to combine efforts in building a skilled, knowledge-based labor force" (Bevins, Carter, Jones, Moye, & Ritz, 2012, p. 9). The *2010 Critical Skills Survey* conducted by American Management Association (2012) reinforced the seven perspectives outlined in the text (Kay & Greenhill, 2013, pp. 2-11):

the workforce, the flat world, the service economy, citizenship, pace of change, design and innovation, information, and technology. As presented in the AMA (2012) researchers found 80% of executives believed employees would need to be able to "think critically, solve problems, collaborate, [and] communicate effectively" (p. 7). With this in mind, Zhao (2009) believed in the new era, the workforce needed creative employees rather than those who performed routine tasks. As shown in previous research, the public education system did not change to meet the demands of the new economy (Friedman, 2005; Levy & Murnane, 2004). Kay and Greenhill (2013), supported this notion and asserted, although the workforce had changed the educational model had not and a paradigm shift was necessary to prepare students to compete competitively (Zhao, 2012). Friedman (2005) believed because of the flat world, developed countries stood to lose their competitive advantage over other industrialized nations.

In short, the workforce perspective had the most influence for the U.S. to sustain economic competitiveness (Levy & Murnane, 2004). Research showed business leaders were concerned about new entrants to the workforce. As a result, of technological changes and a shift in job demands students were not prepared to compete for higher wages (Cassner-Lotto & Benner, 2006).

Perspective 2: The flat world

Kay and Greenhill (2013) examined the work of Friedman, a three-time winner of the Pulitzer Prize, who conducted extensive research on globalization. In Friedman's (2005) text, *The World is Flat,* the author examined the technological influences on the global market and believed economic competitiveness leveled or "flattened" because of the exchange of goods and services across national borders. "[T]he U.S. today is in a

truly global environment, and those competitor countries are not only wide awake, they are running a marathon while we are running sprints" (Friedman, 2005, p. 340). Friedman (2011) later believed as long as educational systems prepared students to master new skills that developed and developing countries could "all do well at the same time" (p. 274). The Council on Foreign Relations (2012) agreed, in that a quiet crisis existed and if not addressed the U.S. stood to lose its competitive advantage.

Similarly, in the report, *To Dream the Impossible Dream: Four Approaches to National Standards and Tests for America's Schools*, the authors emphasized that educational leaders must take heed to the change in economic conditions because of this "flattening effect" (Finn, Julian, & Petrilli, 2006). The report concluded, "The United States faces unprecedented competition from nations around the planet. If all of our young people are to succeed in the 'flat' global economy of the 21st century, they will need to achieve to world-class standards" (Finn et al., 2006, p. 10). To support this claim, Kay and Greenhill (2013) examined Friedman and Mandelbaum's (2011) text, *That Used to Be Us: How America Fell Behind in the World It Invented and How We Can Come Back*, and found the authors agreed with (Finn et al., 2006), in that, the U.S. experienced a steady decline influenced by changes in the economy. To that end, many researchers emphatically suggested if the U.S. was unable to change and address a new era, the economic system would be perilous (Council on Foreign Relations, 2012; Duncan, 2013; Friedman, 2005; Education of the States [ECS], 2008).

In essence, with the ease of information exchange, a new challenge existed for economies to find a foot hold in global markets. Economies faced global competition due to the interconnectedness (Godin, 2012) of people and products and the flattening of

economic competitiveness (Friedman, 2005). The outcome of this resulted in educational reforms to prepare students to compete globally.

Perspective 3: The service economy

Described by Bitner and Brown (2007) as "the form of customer service that supports an organization's offerings and often is the "face" of an organization to its customers" (p. 2), the service economy increased in industrialized nations. Research suggested educators had a preconceived notion about this sector of the economy. Some educators believed the service economy consisted of low paying jobs, however higher skilled workers fell under this criteria as well (Kay & Greenhill, 2013). The Council on Competitiveness (2008) confirmed, "[P]eople sometimes have a misconception that most service jobs are low-skilled, low-wage, no-benefits jobs in fast food joints and beauty parlors" (p. 18). On the contrary, "[M]ore than three-quarters of all jobs in the United States are in the service economy" (Council on Competitiveness, 2008, p. 5). Furthermore, Kay and Greenhill (2013) wrote,

> We often ask educators, when they are gathered in large groups, "What percentage of you consider yourselves to be in the service economy?" Often only half of the educators raise their hands. We argue that all educators are in the service economy. For some reason, people tend to equate service economy jobs with low-end, fast-food jobs. But service economy jobs run the full gamut of our economy. Educators, doctors, lawyers, accountants, and bankers are all in the service economy. Pretty much everyone in healthcare and education is in the service economy. Anyone who engages with customers, clients, or patients is in the service economy. PhDs in electrical engineering who sell high-end computers

> are in the service economy. One hundred years ago, we were largely an agrarian economy. Fifty years ago, we were largely a manufacturing economy. Today we are largely becoming a service economy. Our education model has not shifted to accommodate this profound change. (pp. 6-7)

Co-directors of the Center for Service Leadership with the W. P. Carey School of Business, maintained that educational leaders should focus on equipping students with skills to compete in the service economy because "new services are becoming the dominant driver of economic growth" (Bitner & Brown, 2007, p. 20). In fact, research at the UCLA Anderson School of Management found services grew from 36% to 56% over a 30-year span (Karmarkar & Apte, 2007, p. 2). Important to note, Kay and Greenhill (2013) referenced the article, *21st Century Skills, Education & Competitiveness* (P21, 2008) when they explained the service economy.

For the most part, research suggested a direct correlation with the service economy and the flat world, being that, the service sector increased because of constant technological advances. The U.S. shifted from a manufacturing to an information economy, which was comprised mostly of the service sector (Karmarkar & Apte, 2007). The world's "developed nations are all service economies already and the growth of services in these economies will continue unabated" (Bitner & Brown, 2007, p. 3). To that end, Bitner and Brown (2007) argued the need for economies to "invest in service innovation" (p. 3) to compete globally.

Perspective 4: Citizenship

Described as the students' ability to hone in on aspects such as "… [more] empathy, [more] civility, and [more] sophisticated forms of interactivity" (Kay &

Greenhill, 2013, p. 7), citizenship, was a competency necessary for success in a global economy (Zhao, 2009). Additionally, students required skills that engaged people from diverse backgrounds and "a high degree of media literacy" (Kay & Greenhill, 2013, p. 7). In the same way, researchers explained how the job market required workers to have cultural competencies (Council on Foreign Relations, 2012; Friedman, 2005; NEA, 2010; Zhao, 2009) and "communicate clearly and effectively in a variety of languages" (NEA, 2010, p. 13). Nonetheless, a report from the Committee for Economic Development (2006) criticized American students for not possessing the skills and knowledge of world regions and languages, thus making it difficult to "compete and lead in a global work environment" (p. 14). Zhao (2009) agreed educational leaders must address this issue or the economy will face new challenges such as cultural clashes, new forms of poverty, and terrorism (p. 113). Other researchers believed that citizenship and cultural awareness were essential for students to interact and compete in a connected economy.

Perspective 5: Pace of change

Pace of change was a perspective that Kay and Greenhill (2013) pointed out as one of the influences that affected the global society, "[I]n the 1950's, "change" was not an identifying feature of our culture. In just two generations, it has become the hallmark of our culture" (p. 7). Over the years, researchers agreed, economies were rapidly changing and the impetus to equip students with skills to succeed was vital to their success in life (Council on Foreign Relations, 2012; Davis & Meyer, 1998; Friedman, 2005; Zhao, 2009). Moreover, Jerald (2009) asserted students who "adapt to change-will be at an even greater advantage in work and life" (p. 23). Both Kay and Greenhill (2013) and Friedman (2005) asserted a modification to the education system was required to

keep up with the pace of change. Without a doubt, Zhao (2012) believed there were jobs not yet defined and necessary for the future. Pace of change was an important perspective for educational leaders and policy makers to consider; according the United States Census Bureau (2007), the fastest growing industries were internet service providers which grew 17% and web search portals which grew 41% (para. 4).

Perspective 6: Design and innovation

Research has shown creativity as a necessary 21st century skill to ensure the success of students to compete in a connected economy. It was so important that Zhao, a notable figure in the international education arena devoted an entire book with a focus on creativity and entrepreneurship. In the text, *World Class Learners Educating Creative and Entrepreneurial Students*, Zhao (2012), set out to determine why "college graduates in developed countries who supposedly have better education and more resources" (p. 1) do not participate more in entrepreneurial activities to create jobs for themselves. Studies concluded business leaders preferred individuals with creativity and innovative skills that generate new ideas within organizations (AMA, 2012). Likewise, Kay and Greenhill (2013) suggested educational leaders considered design and innovation as one of the influences of societal changes. The NEA (2010) referred to design and innovation, as "key drivers in the global economy" (p. 24) and these skills were necessary for the success of an economy (AMA, 2012; Bosma et al., 2012; Friedman & Mandelbaum, 2011; P21, 2008; Zhao, 2009).

Zhao (2012) examined the entrepreneurship gap of the U.S. and other developed nations such as China and Singapore, concluding that although the countries scored higher on international assessments, those same countries sought to duplicate the U.S.

ability to produce creative and entrepreneurial-minded citizens. Namely, an article written in the local newspaper in Ningbo, China, discussed China's plan to spend millions of *yuan* to produce citizens like Steve Jobs, the American technology entrepreneur who created Apple (Luo, Wu, & Yan, 2011, para. 5). According to the article, the Chinese government planned to develop 1400 innovative leaders in five years (Luo et al., 2011, para. 6).

The *Global Entrepreneurship Monitor: 2011 Extended Report*, "measure[s] differences in entrepreneurial attitudes, activity and aspirations among economies" (Bosma et al., 2012, p. 8). Developed in 1997 and comprised of 52 countries, the GEM set out to determine "national entrepreneurial activity" and "identify policy implications for enhancing entrepreneurship in an economy" (Bosma et al., 2012, p. 8). The GEM's premise was to determine an economy's dependency level on the entrepreneurship sector. The report showed Finland and Singapore's entrepreneurial activity was "continuously lower than in the reference countries' group" (Bosma et al., 2012, p. 120). On the other hand, the U.S. expected to "create more jobs than did entrepreneurs in any innovation-driven economy" (Bosma et al., 2012, p. 196). In further support of this report, the World Economic Forum (2007) found the U.S. ranked highest as the most competitive economy and "is home to highly sophisticated and innovative companies operating in very efficient factor markets" (p. 8). The GEM report offered suggestions to policy makers and educational leaders to gauge the level of innovativeness within their country to form initiatives that motivated entrepreneurs.

Something else to consider, Kay and Greenhill (2013) stated, "[F]or decades, we have been worried that jobs were being lost to China and India because of the lower cost

of labor. But cost is not the only factor" (p. 8). In other words, American consumers did not automatically default to the purchase of a lower cost item; consumers sought uniqueness of items directly related to design and innovation (Godin, 2012). The connection economy created endless choices of products and services (Godin, 2012) and forced businesses to hone in on creativity (NEA, 2010). Zhao (2012) maintained as educators we needed to consider and respect children as human beings and support their passions without suppressing them. Godin (2012) agreed if educators did this, "our children will become global, creative, and entrepreneurial" (p. 256).

Perspective 7: Information

Previous research supported this notion of accessibility to information in the new economy (Friedman, 2005; Godin, 2012; Zhao, 2009). Referring to economic changes and the need to adjust to 21st century education, Kay and Greenhill (2013) explained that information was easily accessible to everyone and "[T]he sheer volume of available information was incredibly different than it was just 10 years ago" (p. 9). Students required knowledge to adequately navigate through systems and make informed decisions. With the ease of access to information, problems frequently occurred with fidelity of topics searched. In turn, this left students with a need to understand "internet documents to ensure appropriate, effective searching and accurate evaluation of sources" (NCREL & Metiri, 2003, p. 26) and the importance of honoring the intellectual property of others" (p. 26). The American Library Association (1989) predicted, "[H]ow our country deals with the realities of the Information Age will have enormous impact on our democratic way of life and on our nation's ability to compete internationally" (para. 3). Consequently, Kay and Greenhill (2013) asserted that students were learning in an

educational system structured on remembering details and content although information was available at their fingertips. The NCREL and Metiri (2003) report concluded that access to information was essential for the success of students in a 21st century economy.

Perspective 8: Technology

Similar to the Information Age, technology was the driving force behind how economies and educational leaders made decisions. Technology has the ability to "provide support for learners in ways that were unrealistic 10 years ago" (NCREL & Metiri, 2003, p. 36). For instance, according to the U.S. Department of Labor (1999) report, *Futurework: Trends and Challenges for Work in the 21st Century*, "in 1995, there were only 22 million Internet users in the U.S. By 1998, the figure had quadrupled to 88 million" (p. 62). To illustrate the rapid change in the use of technology, Kay and Greenhill (2013) stated:

> When we began our work in 21st century education more than a decade ago, both of us believed wholeheartedly in education technology as a revolutionary shift in the educational process. At the time (in the late '90s), the Internet explosion appeared to be the single most important foundation for change we could imagine. (p. 10)

Zhao (2009) acknowledged technology made it easy for people to seek opportunities in other countries (Zhao, 2009) and it "erases geographical distances and brings millions of people together" (Zhao, 2009, p. 138). To that end, technology was an important skill for educators to teach (Kay & Greenhill, 2013).

PISA

The OECD launched the PISA in 1997 in response to "member countries' who demanded regular and reliable data on the knowledge and skills of their students and the performance of their educational systems" (OECD, n.d.b., para. 2). The assessment provided countries with a foundation to determine academic strengths and weaknesses in comparison to international educational systems. According to OECD's website, "[PISA] is an international study which aims to evaluate education systems worldwide by testing the skills and knowledge of 15-year-old students" (OECD, n.d.b., para. 1). Likewise, as stated by the NCES (2010), "[the] objective of PISA is to measure…what skills and competencies students have acquired and can apply in these subjects to real-world contexts" (p. 2).

Comprised of 37 member countries and over 70 participating countries "[PISA] provides governments with a powerful tool to shape their policy making" (OECD, n.d.b., para. 5). The development of PISA began in the 1990s, launched in 1997 with the first survey administered in 2000. For the purpose of demonstrating each countries' potential to improve education, the OECD issued a triennial report that occurs every three years to assess "the knowledge and skills of 15-year-old students" (OECD, 2011, p. 19) around the world. Every three years, the PISA focused on a primary subject either math, reading, or science, while the other subjects were the minor focus (OECD, n.d.b., p. 26). For example, reading was the primary focus for PISA in years 2000 and 2009, although data was reported on the other subjects. The first assessment was administered in 2000 with a focus on reading literacy, 2003 focused on mathematics literacy, 2006 focused on science literacy, 2009 focused on reading literacy, and 2012 focused on mathematics

literacy. In this dissertation, the researcher focused on reading results from PISA 2012 and reported comparisons as discussed in Chapters Three and Four.

The researcher chose reading as a focus and examined PISA 2012 because "success in Reading provides the foundation for achievement in other subject areas and for full participation in adult life" (OECD, 2010, p. 18). Further illustrating the importance of reading, Zhao (2009) stated when students performed poorly on "reading test [they] are considered at risk, no matter how well they do in other areas" (p. 3). The OECD (2014) defined reading literacy as "understanding, using, reflecting on and engaging with written texts, in order to achieve one's goals" (p. 37) and "to participate in society" (p. 37). Additionally, Levitov (2010) believed the "[A]bility to communicate in an online world, to be successful in the current and future work environment, requires strong reading and writing skills" (p. 4).

The OECD established a mean score to set a benchmark for country comparisons. The PISA 2012 OECD mean score was 496 with a standard deviation of 94 (OECD, 2013b, p. 176), only the countries with a significant difference in mean were reported. According to OECD's 2013 study, *PISA 2012 Assessment and Analytical Framework: Mathematics, Reading, Science, Problem Solving and Financial Literacy*, reading literacy was defined as "an expanding set of knowledge, skills, and strategies that individuals build on throughout life in various contexts, through interaction with their peers and the wider community" (p. 60). Similarly, Levitov (2010) believed students needed to effectively communicate in the changing workplace and information era; this "requires strong reading and writing skills" (p. 4). Further, "reading literacy is intended to express the active, purposeful and functional application of reading in a range of situations and

for various purposes" (OECD, 2013a, p. 61). Levitov (2010), a member of the American Association of School Libraries stated, "As every educator knows, the impetus to read is highly linked to the personal connections that the reader makes to the text" (p. 4). Reading is important for students to be successful in life and a skill that should not be taken lightly (Levitov, 2010).

The OECD (2013a) posited that countries who showed increased performance scores on the PISA was evidence that the country prepared students to be successful in a 21st century society. However, some researchers doubted the vailidity of international assessments (Bulle, 2011; Loveless, 2012; Shiel & Eivers, 2009). A lecturer in sociology of education, in the journal article *Comparing OECD Educational Models Through the Prism of PISA*, Bulle (2011) conducted a study by use of five main educational models within the OECD countries: Northern, Anglo-Saxon, Latin, Germanic, and East-Asian. The study revealed that Finnish students were weak in mathematics; however, the PISA scores did not reflect the entire story. In the 1960's the Finnish educational system received harsh criticism over poor mathematics scores, the government addressed the issue by, "simply instilling in students practical rules by training them to use them and give the correct answers" (Bulle, 2011, p. 515). Baker (2007) also acknowledged that PISA performance did not show the full picture and believed the assessment was worthless. Bulle (2011) stated

> As we have argued, PISA evaluates a certain academic potential of the student body. This potential hardly depends, if at all, on specific academic competencies effectively developed by the educational systems, or does only very early in the school curriculum. (p. 515)

Similarly, Dall (2011) questioned the validity of PISA and stated, “A country's long-term economic growth and prosperity are perceived to depend on how well the education system is aligned with market demands” (p. 11). A nation’s economic success was based on how well education was aligned with the “market demands [and] how well it is preparing citizens for future study and work in a globalis[z]ed economy" (Dall, 2011, p. 10). “The overall results presented here, which are very synthetic but also strongly significant, show how careless readings of PISA contribute to the international construction of an educational doxa which in reality weakens the national educational systems” (Bulle, 2011, p. 516).

In a journal article by Shiel and Eivers (2009) agreed with Bulle (2011) in that, there were challenges and many factors that influenced the achievement, specifically the socioeconomic status that varied between the participating countries and made it difficult to interpret achievement from PISA results. According to the OECD report *Programme for International Student Assessment Results from PISA 2012: United States Country Note the United Sates* spent more on education per student in comparison to other participating countries with similar performance levels. To illustrate, the Slovak Republic spent roughly USD $53,000 per student and the U.S. spent over $115, 000 per student although both countries performed at the same level on PISA 2012 (OECD, n.d.c., p. 1). Furthermore, both Shiel and Eivers (2009) had a history of working on and developing international assessments; benefits and criticisms of PISA. The authors concluded and offered suggestions for future PISA development specifically “issues around the vailidity of the tests and the sampling of schools and students” (Shiel & Eivers, 2009, p. 358). Similarly, Dall (2011) reviewed literature to determine the

effectiveness of the PISA gauging the success of student's in a global economy and concluded based on existing research it was difficult to draw conclusions on the effectiveness of PISA (Zhao, 2009). While curriculums were streamlined to increase performance on international assessments, educational leaders took a gamble on its importance (Dall, 2011). Likewise, in a report *Stars by Which to Navigate? Scanning National and International Education Standards in 2009. An Interim Report on Common Core, NAEP, TIMSS, and PISA* published by the Thomas B. Fordham Institute a non-profit organization that researches education reform at the national level, concluded that the U.S. should use caution when revising curriculum standards based on PISA data (Carmichael et al., 2009). Zhao (2009) agreed, "There are two paths in front of us [America]: one in which we destroy our strengths in order to 'catch up' with others in test scores and one in which we build on our strengths so we can keep the lead in innovation and creativity" (p. xii).

Other research showed no correlation between high performance on PISA and the economic competitiveness of a country. A United States Department of Education retiree, Keith Baker believed instead of using academic performance on international assessments to gauge the success of a an economy, the U.S. should consider economic success in terms of creativity. Baker (2007) stated, "the higher a nation's test score 40 years ago, the worse its economic performance" (p. 102). Researchers believed the U.S. education system was in a crisis, the "U.S. comes out on top in national success in 74% of the comparisons with higher-scoring nations statistically significant" (Baker, 2007, p. 103). In agreement, Zhao (2009) questioned if there actually was an educational crisis in the U.S. based on performance on international assessments and believed that while the

U.S. education system was indeed not preparing students to be successful in a global economy, the U.S. needed a "paradigm shift in thinking about education" (Zhao, 2009, p. 18); specifically what should be taught and how it should be taught.

Conversely, many researchers supported PISA's findings and the need for educational systems to increase scores (Duncan, 2013; Friedman & Tucker, 2011; Hanushek & Woessmann, 2008). The OECD (2013a) asserted countries who showed an increased performance were preparing students to compete in a 21st century economy. Duncan (2013), the U.S. Secretary of Education, agreed that the 2012 PISA results should be taken seriously by educational leaders. Since PISA assessed 15-year old students nationally, the results showed the U.S. had "educational stagnation" (Duncan, 2013, p. 2) and there was a need to increase performance for the success of the economy. Hanusheck et al. (2013) went a step further and noted higher PISA scores meant an increase in GDP. Based on PISA performance, the U.S.' future was in jeaporday "as indicated by the math, science, and reading skill levels" (Hanuschek et al., 2013, p. 2.) compared to the performance of other top nations. When students performed higher on international assessments the performance represented more skilled citizens which in turn leds to new ideas for an ever changing economy (Hanushek et al., 2013).

Other researchers argued based on the many variables involved in international comparisons, the U.S., while not the highest performer on the PISA, had no worries about its economic competitive edge (Baker, 2007; Bosma et al., 2012; Zhao, 2009). An obsession existed amongst educational leaders to determine why American schools did not perform as well when compared to their international counterparts. "The fixation on test scores has so dominated policy that little attention has been paid to finding out what

makes America's schools the best in the world with regard to international economic competition" (Baker, 2007, p. 104). Similarly, a 2011 report conducted by Bosma et al. (2012) concluded there existed a statistically significant negative relationship between PISA scores and entrepreneurship capabilities of a country. Baker (2007) pointed out, "[I]nternational comparisons on many factors show that Norway is the best place in the world to live, and, like the U.S., Norway scored right at the PISA average" (p. 104). Bosma et al. (2012) believed countries with mediocore international assessment scores "correlate with better, more sucessful countries than do top scores" (as cited in Baker, 2007, p. 104). In other words, countries that typically ranked high on the PISA showed lower levels of entrepreneuriship on the GEM (Zhao, 2012). This information was correborated in the findings from GEM in that, the U.S. ranked highest in overall entrepreneurial activity in contrast to Finland and Singapore who ranked lower in entreprenurial activity (Bosma et al., 2012).

21st Century Skills and Knowledge

Many educational leaders provided research rationalizing the need to reform educational systems by including 21st century skills and knowledge in curriculums to prepare students to be competitive in connected economy (Friedman, 2005; Jerald, 2009; Kay & Greenhill, 2013; P21, 2008; Zhao, 2009). To succeed in the 21st century, Jerald (2009) noted students must "apply what they have learned in school to deal with real world challenges" (p. 34). "The intellectual demands of 21st century work, today's leaders say, require assessments that measure more advanced skills, 21st century skills" (Silva, 2009, p. 630). The research showed varying opinions on the skills and knowledge most necessary for students to be successful in a connection economy. Two of the major

players responsible for the development of 21st century skills frameworks included P21 (n.d.) and enGauge 21st Century Skills (NCEL & Metiri, 2003). While the frameworks differed, the commonality that existed was the need to equip students with the necessary skills and knowledge to compete in a global economy.

The Council on Foreign Relations (CFR, 2012), an independent organization dedicated to work with educators, business executives, and governmental officials to research international policies and the influences on the U.S. concluded in their 2012 report *U.S. Education Reform and National Security* there were inadequate levels of education in the U.S. (2012). Similarly, Zhao (2009) posited, for a nation to be economically competitive, the focus needed to be on how students were educated. Moreover, *The Teaching Commission's* (2006) report while referencing the new global economy, noted, "Powered as never before by innovation and intellect, demands that America's young people be well educated. It is not only their individual potential that hangs in the balance; it is the nation's economic future" (p. 12). The Council on Competitiveness (2009) assessed the urgent need for the U.S. to "provide a 21st century education to match the 21st century job opportunities, requirements, and needs" (p. 1). In a fluid economy, students must be equipped with the necessary skills and knowledge to remain competitive.

The review of prior and current literature revealed varying opinions of the 21st century skills most needed for students to be prepared for the 21st century; however, common themes existed. The Partnership for 21st Century Skills (P21) collaborated with business and education leaders to provide frameworks and resources to assist in the development of 21st century skills in curriculums. According to their guide, *21st*

Century Skills Education and Competitiveness: A Resource and Policy Guide, "[C]reating an aligned, 21st century public education system that prepares Americans to thrive is the central competitiveness challenge of the next decade" (P21, 2008, p. 16). The guide provided three reasons why the U.S. should act immediately to remain globally competitive: the economic changes in jobs and business, changing skill demands, and existing achievement gaps (P21, 2008). After an exhaustive review of literature, the researcher selected the 4Cs (collaboration, communication, critical thinking, and creativity) based on the text of Kay and Greenhill (2013) because their research included a myriad of literature which supported their claims (AMA, 2012; Friedman, 2005; Friedman & Mandelbaum, 2011; P21, 2008). Additionally, the NEA (2010), an organization with collaborative partnerships with educational leaders, businesses, and policy makers developed the guide, *Preparing 21st Century Students for a Global Society: An Educator's Guide to the "Four Cs,"* to "encourage more members and leaders to incorporate this policy into their own instruction" (p. 3). This guide outlined the importance of society being proficient in the 4Cs to be successful in the 21st economy (NEA, 2010). Additionally, the guide explained the importance, definition, and how each of the 4Cs skills related to other skills (NEA, 2010). Important to note, the NEA believed in addition to mastering the 4Cs, additional skills must be mastered including "foreign languages, the arts, geography, science, and social studies" (2010, p. 5).

Collaboration

Collaboration skills and knowledge was a widely used term in the educational field: from students working together to complete a task, to business executives working with educational leaders to determine the skills necessary for students to compete in a

21st century workforce. Defined by Kay and Greenhill (2013) as the "ability to work effectively and respectfully with diverse teams" (as cited in P21, n.d.), collaboration was referenced countless times throughout the literature (Karmarkar & Apte, 2007; Levy & Murnane, 2004; Zhao, 2009; NCREL & Metiri, 2003). Schleicher agreed, "In the 21st century, the only way for us to "grow our way out" is through education, giving more people the tools to invent, compete, collaborate and connect in a way that drives our economies forward" (Avila, Lam, & Tan, 2012, p. 23). As stated at the *22nd Annual Conference on Distance Teaching and Learning*, classrooms focused on students performing tasks independently although students interacted with peers via various forms of technology (Rodgers, Runyon, Starrett, & Von Holzan, 2006). In the text, *Catching Up or Leading the Way: American Education in the Age of Globalization*, Zhao (2009) voiced concerns about whether the U.S. educational system even prepared students to live in a virtual world because of the dramatic increase of internet users on social networks (Zhao, 2009). Since the internet was a means of linking people across the world, collaboration was a required skill.

The NEA (2010) believed collaboration was an essential skill to be successful in all aspects of life and "necessary for students and employees, due to globalization and the rise of technology" (p. 19). Described as the ability to work in diverse teams to produce results (NEA, 2010), collaboration was also the ability to "exercise flexibility and willingness to be helpful" (p. 20) while making compromises to "accomplish a common goal" (p. 20). The OECD (2010) identified collaboration as a necessary 21st century skill for individuals to be competitive in a 21st century economy.

Given these points, research revealed collaboration as one of the skills necessary for students to succeed in a connected economy. Underscored by Friedman's (2005) examination of the flat world where boundaries no longer existed and goods and services easily crossed national borders. Students needed to be able to interact and collaborate to continue to compete in the connected economy (Zhao, 2009). Moreover, as addressed earlier in this chapter, citizenship requires collaboration skills because the student must be able to engage people from diverse backgrounds.

Communication

Communication skills were defined by Kay and Greenhill (2013) and based on the 21st century framework as "[T]he ability to articulate thoughts and ideas effectively using oral, written, and nonverbal communication skills in a variety of forms and contexts" (P21, 2008, p. 136). Similarly, the NEA (2010) described communication as the ability to effectively communicate in diverse groups, use various types of technology for communication purposes, listen, and understand meaning. Likewise, according to the report *Are They Really Ready to Work?,* employers explained that written and oral communication as imperative for the workforce, however, they asserted graduates lacked basic communication skills (Cassner-Lotto & Benner, 2006). In further support of this finding, economists Levy and Murnane (2004) emphasized that computers now have an upper hand in the job market. Additionally, computer systems were capable of handling routine tasks, but for expert thinking and complex communication, only humans were capable of handling such tasks (Levy & Murnane, 2004). The NEA (2010) also pointed out that communication was a skill "especially critical in the expanding service economy (p. 13) since "new services are becoming the dominant driver of economic growth"

(Bitner & Brown, 2007, p. 20). The NEA (2010) maintained communication and collaboration as interconnected and "it can be difficult to separate [communication and collaboration] from the other Cs - especially collaboration" (p. 14).

In short, research has shown communication is a paramount skill for the success of students. Evidenced by technological advancements that require levels of communication in different ways, technology was the driving force behind how economies and educational leaders made decisions about what and how students needed to learn how to adapt to the changes. Moreover, research illustrated the importance of including communication in curriculums so students were prepared to compete in a global economy.

Creativity and Innovation

Defined by Kay and Greenhill (2013) as the ability to “think creatively, work creatively with others, and implement innovations” (p. 148), creativity and innovation was a skill most discussed in the literature. Other nations wished to duplicate these skills and learn from the U.S. Zhao (2009) believed the U.S. “is still viewed as the hotbed for innovation and entrepreneurship” (p. 134). According to Wadhwa (2011), American students had an advantage in the workforce, in that they were risk takers and challenged the norm, making them the leader in innovation. Zhao (2012) stated, "We need to provide high-quality education to all children so they can be prepared for the future - the globalized world that is constantly and rapidly transformed by technology" (p. 15). Like many researchers (Bevins et al., 2012; Kay & Greenhill, 2013; Zhao, 2012), Schleicher, believed "[I]n the 21st century, the only way for us to "grow our way out" is through education, giving more people the tools to invent, compete, collaborate and connect in a

way that drives our economies forward" (as cited in Avila et al., 2012, p. 23). Further, Bosma et al. (2012) viewed entrepreneurial capability as an individual's ability to generate ideas to start businesses.

Although research showed, the U.S. was revered for its creativity, research also revealed how American students scored lower than developed countries such as Finland and Singapore. Zhao (2012) attested, "[T]he possibility that measures to raise test scores or to improve academic achievement reduce entrepreneurial capability has significant implications for the directions of education" (p. 15). The underlying issue that plagued educational leaders was if the urgency to include 21st century skills in curriculums to increase performance on international assessments hindered creativity.

In the final analysis, creativity and innovation was the most sought after skill in the world. Many countries sought this skill because studies had shown a correlation with creativity skills and increased economic performance within a nation (Bosma et al., 2012). Namely, GEM 2011 reported which the U.S. ranked high in overall entrepreneurial activity in all areas of their study (Bosma et al., 2012). Upon a review of the *2007-2008 Global Competitive Index*, Baker (2007) sought a relationship between academic performance on international assessments and competitiveness of a country. The study suggested a possibility of nations with higher performance on PISA lead to decreased levels of entrepreneurial capabilities (Baker, 2007). The U.S. consistently scored lower on academic assessments, but ranked highest on global competitiveness (Baker, 2007). Zhao (2012) also believed that the U.S. low performance on international assessments could be the very reason for their economic success. Ultimately, creativity and the ability to innovate was a top priority for the global market (Godin, 2012).

Critical Thinking

Critical thinking skills was defined as the ability to reason effectively, analyze, use the tools of systems thinking, and make judgments and decisions. Researchers agreed this skill was essential to incorporate in curriculums (Kay & Greenhill, 2013). In the text, *Academically Adrift: Limited Learning on College Campuses*, two professors who conducted a research project to offer research based policies in the field of education, explained "the future of a democratic society depend upon educating a generation of young adults who can think critically" (Arum & Roksa, 2011, p. 31). Students must be able to adapt to workforce, technological, and economical changes to be successful in a connection economy (Godin, 2012; Jerald, 2009). According to a workforce survey conducted by The Conference Board, 69.6% of employer respondents reported that high school entrants to the workplace were deficient in critical thinking skills and knowledge (Cassner-Lotto & Benner, 2006, p. 13). Moreover, 57.5% of the employer respondents indicated critical thinking/problem solving skills and knowledge were important for new hires to be successful in their working roles (Cassner-Lotto & Benner, 2006, p. 20). Ultimately, critical thinking skills and knowledge were essential to the success of the student to compete in a connected economy because of constant technological changes. Additionally, as based on research from work skills reported, an individual's ability to think critically facilitated the success of the company (AMA, 2010). Lastly, when an individual with critical thinking skills generated new ideas, this created innovative opportunities, which in turn positively affected the economy.

In the connected economy or most known as the 21st century or global economy, educational leaders and policymakers shifted focus on 21st century skills and knowledge

most important for students to compete in society. The integration of technological advances, international trade, and a shift in the job markets had educational researchers offering the most important skills (Friedman, 2005). For example, Kay and Greenhill (2013) used the P21 framework to address global education concerns, specifically the 4Cs, collaboration, communication, creativity, and critical thinking skills, all discussed earlier in this chapter. Another framework, *enGauge 21st Century Skills*, offered four broad skills: digital-age literacy, inventive thinking, effective communication, and high productivity (NCREL & Metiri, 2003, p. 5). While the skills these researchers discussed were different, there were similarities and broad explanations for each skill. Overall, the researcher believed the various 21st century frameworks aimed to accomplish a common goal, to enlighten educational leaders and policy makers with the skills and knowledge necessary for students to compete in a connected economy.

Finland Educational System

According to the Finnish National Board of Education's (FNBE, n.d.a.) website, "[T]he main objective of Finnish education policy is to offer all citizens equal opportunities to receive education, regardless of age, domicile, financial situation, sex or mother tongue" (para. 1). Like most industrialized nations, Finland built the education system based on the needs of the society (Hautamaki, Karjalainen, & Kupiainen, 2009). Initially, Swedish was the official language in Finland, however, nationalist movements worked to establish Finnish as the official language and to establish a public education system taught in Finnish (FNBE, 2013a). Over a course of development and reform, the FNBE came to fruition with the purpose of overseeing general and vocational education and training for the public. In the 19th century, the government issued a decree that

"contained an obligation for the local authorities to provide all school-aged children with an opportunity for schooling" (FNBE, n.d., para. 17).

Over the years, the Finnish education system developed into a system that provided free basic education not only to Finnish citizens but also to everyone (FNBE, 2013). "A major objective of Finnish education policy is to achieve as high level of education and competence as possible for the whole population" (FNBE, 2013a). Although some citizens spoke languages other than Finnish, such as Swedish - those citizens could receive education in their native tongue; hence the reason to have over five curriculums in different languages (FNBE, 2004). Similar to American schools, the Finnish school system began with early childhood education for age's birth to five (Kyro, n.d.). Six-year-old students enrolled in preprimary education and ages 7 to 17 in basic education (comprehensive schools) (FNBE, 2013). In terms of the formulation of the curriculum, the FNBE (2004) stated

> The national core curriculum is the national framework, on the basis of which the local curriculum is formulated. The education provider takes responsibility for the preparation and development of the local curriculum. In the local curriculum, decisions are made regarding the educational and teaching task of basic education, and the objectives and contents specified in the national core curriculum, as well as other factors bearing on provision of the education, are specified. In formulating a curriculum for basic education, attention is to be given to the pre-primary educational curriculum, the coherence of basic education, and other decisions made by the local authority in respect of children, young people, and schooling. (p. 8)

In other words, teachers in Finland had the autonomy to create their own curriculums as long as it was within the framework of the national core curriculum. An experienced teacher in Finland and America, Janet English, a blogger, wrote about her experiences while observing and teaching in both countries. English (2013) stated most Finnish lessons deliberately "leave something out" of lessons so students had to figure out what was missing (para. 3). The Finnish classroom was usually silent as students worked together and teachers honed in on individual progress of the students. On the other hand, American schools bustled with creative energy and an excitement for learning (Zhao, 2012).

In the publication, *The Finnish Education System and PISA*, authors Hautamaki et al. (2009) offered a comparison of the Finnish system with the "General Western Model" (p. 12). The authors asserted Western countries displayed "strict standards for schools, teachers and students to guarantee the quality of outcomes" in contrast to the Finnish system which offered "school-based curriculum development, steering by information and support" (Hautamaki et al., 2009, p. 12). Teachers in Finland had the autonomy to cater lesson plans to the individual student (Zhao, 2012).

The most essential part of the Finnish education system was the basic education or also referred to as compulsory education (FNBE, 2013b). As illustrated in Figure 1, this system is comprised of nine years starting with students' age 7 to 15 attending grades 1 through 9.

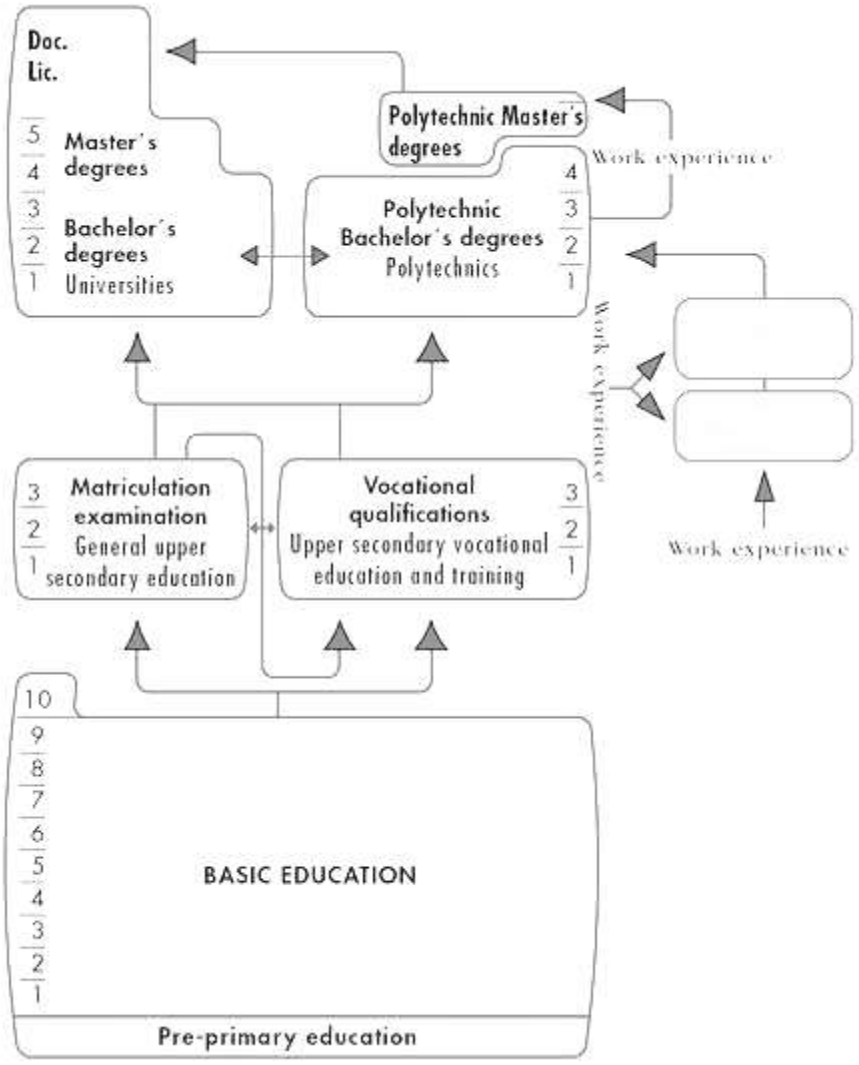

Figure 1. Finland educational system. Reprinted with permission from Finnish National Board of Education (n.d.). See Appendix D.

Rarely did students repeat a grade in Finland since the system focused on remedial and special education in the early years. Finland's educational system provided instruction to students based on their comprehension level of the subject matter. In fact, "teachers are required to treat the children and young people as individuals and help them to proceed according to their own capabilities" (FNBE, 2013a, p. 7). The pre-school, basic education, and upper secondary education was free to all students inclusive of textbooks and other materials required for completion. Schools provided free lunch for

basic education and upper secondary schools since the Finnish people viewed these as supports to learning (FNBE, 2013a). The Finnish system paid close attention to special needs students and provided individualized instruction as early as possible (Kyro, n.d.). If students required more support to learn, they attended a specialized school otherwise, remedial assistance occurred in the regular classrooms.

According to the report *International Comparisons of Some Features of Finnish Education and Training* one of the major characteristics of Finland's education system was the quality of education that provided to all citizens regardless of socioeconomic background (Kyro, n.d.). With the efforts of the principal, teachers, and school support, staff within individual schools wrote curriculums. The curriculums provided guidelines and goals specific to each school. During basic education no students participated in rigorous national exams; however, the teachers tested students based on the content of the subject matter learned by the students FNBE, 2013a). In other words, "control of learning is left to schools and individual teachers" (Hautamaki et al., 2009, p. 21). Additionally, the Finnish Board of Education created exams based on the individual success of each student. Therefore, if a student did not comprehend well, there was an exam specifically created to test on information learned up to that point (Hautamaki et al., 2009).

In short, known as the world's education giants because of high performance on PISA, educational leaders revered the Finnish educational system (Tucker, 2011). The most notable aspects of Finland's system was the focus on a quality education and to "achieve as high level of education and competence as possible for the whole population" (FNBE, n.d., para. 4). Additionally, with the Finland teacher's autonomy to create

curriculums based on the need of the individual student (Kyro, n.d.), this could influence the results of PISA performance (Baker, 2007).

The literature also showed shortcomings of the Finland education system, specifically, the differences in classroom styles when compared to the U.S. English (2013) pointed out the Finnish classroom consisted of silence as teachers honed in on individual progress of students. On the other hand, the U.S. classroom bustled with creativity and an excitement to learn (Zhao, 2012). Further, although Finnish teachers had flexibility on how to teach, strict standards were adhered to (Hautamaki et al., 2009). Due to the rigorous nature of their standards, researchers believed this hindered creativity (Wozniak, 2011; Zhao, 2012) a skill most sought by educational leaders and policy makers.

Singapore Educational System

Operating as a central government educational system, the Singaporean government controlled and enforced what students learned (Zhao, 2012) through the national curriculum. According to the Ministry of Education, Singapore's (n.d.) vision statement, as noted on their website, "describes a nation of thinking and committed citizens capable of meeting the challenges of the future, and an education system geared to the needs of the 21st century" (para. 6). Like the other research countries, Singapore sought to prepare students to compete globally. Similar to Finland, Singapore operated under a national curriculum with education decisions controlled by the government (MOES, 2015c).

The Ministry of Education in Singapore made efforts to improve the educational system, specifically, the reform initiative *Thinking Schools, Learning Nation* (2005),

aimed to create critical thinkers and creative citizens by use of instructional technology and a collaborative project based work environment (as cited in Saravanan, 2005, p. 97). Singapore created a curriculum review committee in 1997 that found, in some schools classrooms consisted of rote learning routines and ways of "developing mastery of the syntactic forms of the language" (Saravanan, 2005, p. 98). The report concluded there was "little room for creativity or flexibility in such approaches, and the constraints of time and the haste to cover a large amount of curriculum, from language skills to content areas" (Saravanan, 2005, p. 98), led to a rigid and structured way of teaching (Wee, 2011). Because of these findings, the Singaporean government developed the English Language syllabus with a goal to create an academic culture of critical thinking and creativity (Zhao, 2009).

In their electronic brochure, *Bringing out the Best in Every Child Education in Singapore* (2015b), Singapore's education system emphasized key strengths; "bilingual policy, emphasis on broad based and holistic learning, focus on teacher quality and integration of information and communication technologies (ICT) into learning" (p. 5). Bilingualism was an important concept in Singapore's educational system, because it prepared students to develop global outlooks in Asian and American cultures (MOE Press Release, 2013). In broad-based and holistic learning, the educational system provided a variety of activities for students to explore and identify strengths within themselves. For example, while the system built "a strong foundation of literacy and numeracy" (p. 5) in the schools, they also offered co-curricular programs such as music, sports, and arts (MOES, 2015b).

As illustrated in Figure 2, Singapore's education system comprised of a complex system with multiple pathways that prepared students for work and life. The pathways included Pre-school that consisted of 4-6 year old students; Primary schools consisted of 7 to 12 year old students and Secondary schools (included in this study) consisted of 13 to16 year old students (MOES, 2015b). Throughout the pathway of Primary to Post Secondary and similar to the other researched countries, special schools were available for students with special needs such as physical or behavioral disabilities (MOES, 2015b).

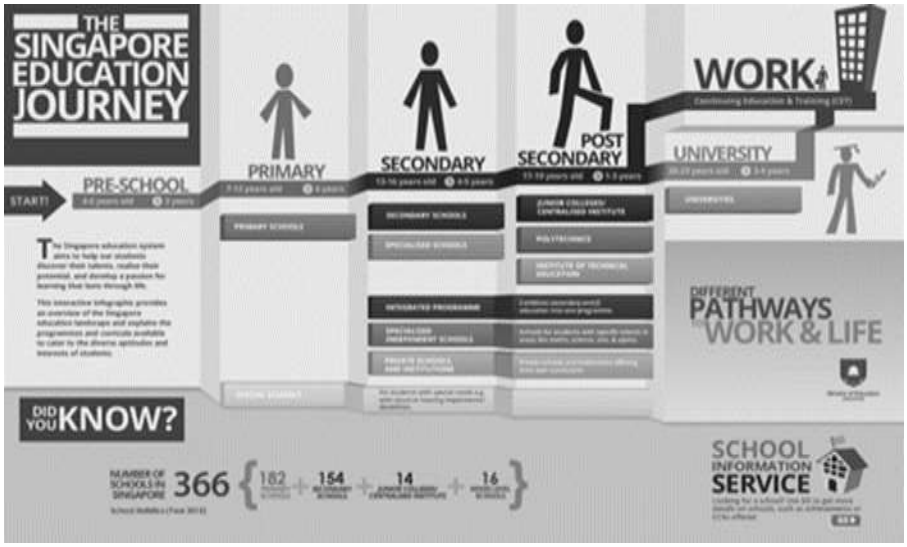

Figure 2. Singapore educational system. Reprinted with permission from (Ministry of Education Singapore, 2015b). See Appendix E.

Singapore was listed by the OECD (2013b) as one of the top five "highest-performing countries and economies in reading" (p. 181); the country showed annual improvement in reading throughout their participation in PISA. According to the Ministry of Education Press Release, *International OECD Study Affirms the High Quality of Singapore's Education System* (2010), "Singapore's good performance at PISA 2009 shows that beyond a strong grasp of knowledge, our students have the ability to think

critically and solve real-life problems…" (p. 1). Authors of this press release also noted that Singapore's "curriculum is well-developed with rigorous standards aligned to instruction and assessment" (MOE, 2010, p. 1). Likewise, a report of a public lecture, symposium, and seminar titled, *PISA: Lessons for and From Singapore*, Schleicher (2012), a Special Advisor on Education Policy to the OECD lauded the Singaporean government on educational decision making, specifically the collaborative efforts of governmental and education leaders. After a visit to Singapore to understand their continued success on PISA, Schleicher reported, "If I had to summarise [sic] what I learned in one sentence, this is a story about political coherence and leadership as well as alignment between policy and practice" (Avila et al., 2012, p. 24). Schleicher also stated there were important lessons that countries could learn from Singapore, "countries need a policy infrastructure that drives performance and builds the capacity for educators to deliver it in schools. Singapore has developed both" (Avila et al., 2012, p. 26). On the other hand, Wozniak (2011) argued the rigor of Singapore's educational policies had a negative influence on the quest to promote creativity (Mahtani & Holmes, 2011). A native of Singapore and entrepreneur, Willis Wee agreed with Wozniak's assertion, in that he believed Singaporean citizens were ambitious and had big dreams; however they did not have the braveries to follow through with creative ideas (Wee, 2011).

Overall, Singapore's educational system witnessed continual success on the PISA. With a focus to improve instruction, the Singaporean government implemented initiatives to hone in on the skills of the 21st century, specifically, critical thinking and creativity skills (Zhao, 2009). Although, some researchers laud how Singapore's educational system aligned policies with practices and the ability to deliver in the schools (Avila et

al., 2012; Schleicher, 2012), others believed the rigidity of policies, did nothing more than hinder critical thinking and creativity (Wee, 2011; Wozniak, 2011; Zhao, 2012).

United States Common Core

The CCSS is a set of academic standards developed by the National Governors Association (NGA) and the Council of Chief State School Officers (CCSSO). Also referred to as learning goals, the goal of these standards were "to ensure that all students graduate from high school with the skills and knowledge necessary to succeed in college, career, and life, regardless of where they live" (CCSS Initiative, 2012, para. 2). The CCSS reportedly were created to directly compete with other leading countries' educational systems (OECD, 2011). At the behest of the CCSSO, the lead writer of the Common Core developed an English Language Proficiency Development Framework to aid in the creation of the English Language Proficiency (ELP) standards (CCSS Initiative, 2012, p. i). The framework "offers a descriptively rich structure for unpacking the language demands of the CCSS" (CCSSO, 2012, p. 2). The states were encouraged to follow a guide, "to adopt a simultaneous theory of action" (p. 89) so "students are learning the language knowledge and skills the need" (CCSS Initiative, 2012, p. 89). According to the Framework for ELP Development Standards, they should "reference different types of communicative activities embedded in subject matter pursuits" (as cited in CCSSO, 2012, p. 31).

The Education Commission of the States (ECS) was an organization created to monitor educational performance and address issues that influenced all states in America (ECS, 2008). The ECS developed a blueprint to "assist states, districts, and schools to benchmark to international standards" (ECS, 2008, p. 5). International benchmarking

was the "alignment of standards, instruction, professional development, and assessment to those of the highest-performing countries" (ECS, 2008, p. 5). The purpose of the blueprint was to provide a guide for states to move from comparing themselves to other states and assist them to "benchmark to international standards" (ECS, 2008, p. 5). The literature revealed a concern about the U.S.' low performance on international assessments (Friedman, 2005; Tucker, 2011); therefore, the ECS (2008) could provide suggestions for educational leaders and policy makers.

Based on two principles, the *International Benchmarking Blueprint* noted, "U.S. students can and must succeed and achieve in a knowledge-based global society and economy" and "can and must lead again" (ECS, 2008, p. 5). While ECS acknowledged challenges existed, they suggested, "standards should [also] align with that of a knowledge-based economy and society" (ECS, 2008, p. 8). Tucker (2011) agreed, in that international benchmarking and the alignment of standards allow improvement in educational systems. ECS (2008) argued, "Educational leaders have a moral and economic imperative to prepare students and schools for a global society and economy" (p. 6), therefore, educational leaders and policy makers must make decisions to meet this imperative. The idea of curriculum standard alignment received some opposition, Zhao (2012) believed when countries moved to a common curriculum for the sake of increasing performance on international assessments this hindered the chances of students' success in the global economy. On the other hand, Tucker (2011) believed that one thing countries had in common when they performed higher on PISA was a common curriculum. While Loveless (2012) believed the alignment of standards "will have little effect on American students' achievement" (p. 14).

In sum, the development of the U.S. CCSS aimed to increase the quality of education and directly compete on international benchmarking assessments. Although *The 2012 Brown Center Report on American Education* study found some value in the CCSS reducing the variation of scores from state to state, no statistical data existed to show improvement on international benchmarking (Loveless, 2012). The ECS' (2008) goal was to focus on all states and provide solutions for the U.S. to increase international academic performance.

Summary

Chapter Two provided varying perspectives concerning literature related to this study. Research revealed educational leaders and policy makers believed the U.S. educational system was in a crisis, and low performance on the PISA in comparison to other industrialized nations, the U.S. implemented the CCCS with an end goal in mind, to prepare students to compete in a 21st century economy and compete on international assessments (CCSSO, 2012). Kay and Greenhill (2013) along with Zhao (2012) believed [America's] educational system needed a paradigm shift. The 21st Century Workforce Commission (2000) argued Americans needed to "reach a new level of literacy" (p. 5) to compete in a connected economy. Not only did the U.S. believe their educational systems were in trouble, Finland and Singapore' governments shared the same sentiment. Evidenced by reform initiatives, Finland and Singapore focused on ways to include 21st century skills and knowledge in the curriculums (FNB, 2013b; MOES, 2015a).

With the educational reform initiatives, critics believed the move to common curriculums and reforms hindered creativity and the success of students in the 21st century (Baker, 2007; Zhao, 2012). Carmichael et al. (2009) described PISA data as

unreliable and should not be used when making decisions on curriculum reform. In fact, the U.S. would lose its competitive advantage by focusing on reforms to increase performance on PISA (Baker, 2007; Zhao, 2009).

The literature showed a shared aspiration among the researched countries to prepare students to compete in a connected economy. Likewise, the importance of including 21st century skills and knowledge in curriculums was a widely discussed topic throughout the literature (NCREL & Metiri, 2003; P21, 2008). With this in mind, the need to investigate the frequency of 21st century skills and knowledge within reading curriculums became a topic of study. Although ambiguity existed with which 21st century skills most necessary to prepare students (Jerald, 2009), Kay and Greenhill's (2013) work became the foundation for this study's focus on the 4Cs.

As earlier discussed, previous researchers offered eight perspectives necessary to equip students to compete in a connection economy: the workforce, the flat world, the service economy, citizenship, pace of change, design and innovation, information, and technology (Kay & Greenhill, 2013, pp. 2-11). Each perspective was associated with one of the 4Cs, which supported existing literature.

Each researched country participated in the PISA with the U.S. score noted as the lowest among the researched countries. This low score prompted American educational leaders and policy makers to initiate curriculum reforms to increase performance on the assessment. In spite of backlash from some researchers (Bulle, 2011; Loveless, 2012), who believed the U.S. should not make educational decisions based on performance on the PISA. The premise of this study was to address the postulate that if a country had a high number of 21st century skills and knowledge embedded in their reading curriculums

and a high score on the PISA that the students possessed the necessary skills to compete in a connection economy.

Chapter Three: Methodology

Research Overview

The methodology used for this study was a quantitative content analysis to identify a possible relationship between the PISA 2012 reading scores and the number of 21st century skills and knowledge found within the reading curriculums of Finland, Singapore, and the U.S., Fraenkel, Wallen, and Hyun (2015) described content analysis as a "technique that enables researchers to study human behavior in an indirect way, through an analysis of their communications" (p. 476). Similarly, Rourke and Anderson (2004) described content analysis as "a process that includes segmenting communication content into units, assigning each unit to a category, and providing tallies for each category" (p. 5). Furthermore, this quantitative content analysis assessed the reliability of the scoring guide used by the survey respondents who examined the research countries' curriculum strands for the presence of 21st century skills. The researcher chose this type of methodology because it provided an understandable representation of the data. This type of methodology may allow other researchers to duplicate a study or conduct a repeated analysis (Fraenkel, Wallen, & Hyun, 2015).

The researcher examined literature that supported the importance of preparing students to compete in a global and interconnected economy (Davis & Meyer, 1998; Friedman & Tucker, 2011; Godin, 2012). Thus, using Kay and Greenhill's (2013) 21st century framework the researcher developed a document titled, 4Cs Related Terms and Synonyms, for educational leaders to reference for the analysis of each research country's curriculum standards. The document included definitions and identifiers of the 21st century skills: collaboration, communication, critical thinking skills, and creativity from

three different sources (see Appendix G). As a means of collecting data from the educational leaders, the researcher coded the research countries' curriculum strands by use of responses to a survey administered through *SurveyMonkey* (1999-2004), an online survey tool.

To gather feedback for the reading curriculums used in Finland and Singapore, the researcher emailed the online survey (see Appendix F) and the 4Cs Related Terms and Synonyms document (see Appendix G), to four different American educational leaders with a reading specialist background. It was important for the educational leaders to possess this level of expertise due to the anticipated language barriers during the data-gathering phase of the study, since there were three different researched countries. The researcher preferred to send the survey to educational leaders native to the research countries; however, no reliable international connections were available at the time of the study. To gather feedback for the reading curriculums used in the U.S., the researcher emailed the online survey (see Appendix H) and the 4Cs Related Terms and Synonyms document (see Appendix G) to four different educational leaders with experience using the Common Core. Based on the feedback of the educational leaders, the researcher recorded the data using a Microsoft Excel spreadsheet and determined the number of 21st century skills and knowledge present in each curriculum strand. To check the consistency of the educational leaders' responses to the survey, the researcher applied a Chi-square test for independence to the data for Finland ($X= 7.348393$; critical value= 16.909), Singapore ($X=5.259283$; critical value= 16.909), and the U.S. ($X=13.25483$; critical value 16.909). This test indicated consistency in scoring among the survey respondents.

Next, the researcher applied a Chi-Square test for independence to determine a possible relationship between the PISA 2012 reading scores and the number of 21st century skills and knowledge found within the reading curriculums of the research countries. The researcher included PISA 2009, scores for the purpose of data comparisons.

Null Hypotheses

Null Hypothesis 1: There is no relationship between the rating of 21st century skills and knowledge included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 Reading scores measured by PISA.

Null Hypothesis 2: There is no relationship between the rating of collaboration skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

Null Hypothesis 3: There is no relationship between the rating of communication skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

Null Hypothesis 4: There is no relationship between the rating of creativity skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

Null Hypothesis 5: There is no relationship between the rating of critical thinking skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

Null Hypothesis 6: The score earned is not dependent on the respondents who critiqued Finland, Singapore, and the U.S. Common Core reading curriculum.

The PISA 2012 results listed those published by the OECD (2013b) nations with the highest reading performance scores. Based on the top performing countries' overall PISA scores, the researcher selected the countries of Finland (524) and Singapore (542), along with the U.S. (498), for the sample used for of this study. Statistical comparisons included PISA 2009 reading performance scores for Finland (536), Singapore (526), and the U.S. (500). Since the crux of the research was to determine the extent to which the 21st century skills were embedded in the reading curriculums, the researcher engaged four educational leaders with a reading specialist background to examine and provide feedback for Finland and Singapore's reading curriculums. The researcher selected four additional educational experts with experience teaching the Common Core to analyze the U.S. Common Core.

The Instruments

The researcher developed a document with a list of definitions and identifiers for each of the 21st century skills, collaboration, communication, critical thinking, and creativity, based on the works of Kay and Greenhill (2013). The purpose of the document was for educational leaders to cross-reference during analysis of the research countries' curriculum strands. To increase validity and reliability of the document, the

researcher included three different sources to define and identify the 4Cs of the 21st century skills. The document included three tables. The first source contained synonyms and related words from a commonly used online source, titled *Merriam-Webster Thesaurus* (n.d.). The researcher searched this online source for synonyms and related words for collaboration, communication, creativity, and critical thinking. No synonyms were found for critical thinking, therefore the researcher used related words. The synonyms and related terms are shown in Table 1.

Table 1

Source 1: 21st Century Skills and Knowledge Synonyms and Related Terms

Collaborate[ion] Synonyms	Communication[ion] Synonyms	Creative[ity] Synonyms	Critical Thinking Synonyms
band(together)	conduct	clever	
concert	convey	imaginative	*see related words*
concur	brainstorm	ingenious	
conjoin	intercommunicate	innovational	
conspire	demonstrate	innovative	
join	manifest	inventive	
league		original	
team(up)			
unite			
Collaboration Related Words	**Communication Related Words**	**Creativity Related Words**	**Critical Thinking Related Words**
affiliate	correspond	gifted	reason effectively
ally	converse	inspired	make judgments
associate	talk	talented	make decisions
	message	resourceful	identify problems
hang together	bond	fecund	define problems
interface	commune	productive	solve problems
	relate	artful	collect relevant information
	contact	visionary	reflect critically
	acquaint	cleverish	
	fill in	handy	
	inform		
	instruct		
	tell		

Note. The synonyms and related words are cited from *Merriam-Webster Inc.* (n.d.).

Table 2, includes a 21st century skills and knowledge framework, from the Partnership for 21st Century Skills, commonly used by educational leaders to define collaboration, communication, creativity, and critical thinking. This list included identifiers. For example, collaboration was listed as "ability to work effectively and respectfully with diverse teams, assume responsibility for collaborative work, etc." (Partnership for 21st Century Skills, n.d., para. 8) (see Table 2).

Table 2

Source 2: 21st Century Skills and Knowledge Identifiers

21st Century Skills	Identifiers
Collaborate[ion]	ability to work effectively and respectfully with diverse teams, assume responsibility for collaborative work, and value the individual contributions by each team member and demonstrate a willingness to be helpful
Communicate[ion]	articulate thoughts and ideas effectively using oral, written, and nonverbal communication skills in a variety of forms and contexts, listen effectively to decipher meaning and communicate effectively in diverse environments (including multilingual)
Creative[ity]	ability to think creatively, work creatively with others, and implement innovations, formulate ideas, brainstorm, elaborate, refine, analyze, and evaluate own ideas
Critical Thinking	ability to reason effectively, analyzing and using the tools of systems thinking, making judgments and decisions, identifying, defining and solving authentic problems and essential questions, collecting, assessing, and analyzing relevant information and reflecting critically on learning experiences, processes and solutions

Note. The identifiers are cited from *Partnership for 21st Century Skills* (n.d.).

Table 3 includes identifiers from another commonly used 21st century skills framework, *enGauge 21st Century Skills for 21st Century Learners: Literacy in the Digital Age* (NCREL & Metiri, 2003).

Table 3

Source 3: 21st Century Skills and Knowledge Identifiers

21st Century Skills	Identifiers
Collaborate[ion]	teaming, collaboration, interpersonal skills, personal, social, and civic responsibility
Communicate[ion]	interactive communication, adaptability
Creative[ity]	self-direction, curiosity, creativity, and risk taking, ability to produce relevant, high-quality products, adaptability and managing complexity
Critical Thinking	higher-order thinking and sound reasoning, prioritizing, planning, and managing for results

Note. The identifiers are cited from *enGauge 21st Century Skills for 21st Century Learners: Literacy in the Digital Age* (2003)

For data collection purposes, the researcher developed three scoring devices to record and tally the survey responses received from the educational leaders. For Finland's reading curriculum, the curriculum strands were referred to as *Objectives* (see Table 4). To maintain the integrity of each curriculum examination, the researcher did not alter the way the curriculum strands were titled. The same process was applied to the other scoring devices. For Singapore's reading curriculum, the curriculum strands were referred to as *Pupils will* (see Table 5). For U.S. Common Core reading curriculum, the curriculum strands were referred to as *RL.9-10* (see Table 6).

Data Collection and Analysis Procedures

The data source for this research included a publicly available report maintained by the OECD on findings from the PISA 2012 reading scores. At the time of this study, the OECD (2013a) was a primary data source nations relied on to gauge how well educational systems compared between nations. After a review of the literature, the researcher selected two industrialized nations with high performance on the PISA 2012 and compared those results to that of the U.S. Then, the researcher set out to determine the reading curriculums used by teachers of fifteen-year-old students, as utilized by the researched countries, to determine the number of 21st century skills embedded in each. In conjunction with PISA 2012 reading data and curriculums of the researched countries, the intent of this study was to seek a relationship between the researched countries' PISA 2012 reading scores and the number of 21st century skills included in the curriculum.

Originally, the researcher wanted to count the number of times the specific word, collaboration, communication, creativity, or critical thinking was present in the reading curriculums. However, the researcher rejected this idea because of the various interpretations of word usage. Fraenkel et al. (2015) explained, "Coding the latent content of a document has the advantage of getting at the underlying meaning of what is written or shown" (p. 482). Therefore, due to the various interpretations of words and the context in which they were used, it was decided to present the reading curriculums in survey format, so educational leaders could make inferences based on their experiences and interactions with students. After the selection of educational leaders, analysis began on the inclusion of the 4Cs in the reading curriculums. The researcher applied a Chi-

Square test for independence to check the quality of consistency between the respondents.

Data collection began April 30, 2013, with an email to the Ministry of Education Finland to determine the reading curriculum used to teach fifteen-year-old students. An emailed response from E. Vitikka with the Finnish National Board of Education (FNBE), in which she stated, "Reading and comprehension for 15-year-old students includes in chapter 7.3 Mother tongue and literature. 15-year-old students are on [sic] ninth grade, so the aims and core contents for grades 6-9 and criteria for final assessment relates to them" (personal communication, January 2, 2014). The researcher analyzed the Finnish curriculum and focused on the objectives for the reading curriculum listed in Part II, chapter 7.3 *Mother tongue and literature for grades six through nine* (Finnish National Board of Education [FNBE], 2004, p. 51). The researcher coded each curriculum objective of the Finland national reading curriculum in survey format to provide an effective way to collect responses from the respondents. Important to note, the research did not alter the information in the reading curriculum in any way while coding the curriculum objectives to the survey format. For example, the curriculum objectives with the subheading, the *pupil's interaction skills will increase,* were divided into 10 questions and labeled *Finland National Curriculum Part I* of the survey. The researcher coded the first curriculum objective as question 1 of the survey; the second was coded as question 2, and so on. The researcher applied the same method of coding to the second part of the reading curriculum objectives with the subheading, *text comprehension*, and labeled *Finland National Curriculum Part II* of the survey.

The researcher then emailed the Ministry of Education of Singapore to determine the reading curriculum used to teach fifteen-year-old students; however, the researcher received no response. The researcher sent a follow up email on June 6, 2013, and again received no response. Consequently, the researcher's dissertation chair provided a Singaporean contact to overcome this hurdle. The researcher sent an email to Lim, the Associate Dean of Teacher Education at the National Institute of Education in Nanyan Walk, Singapore, and requested a source to access the reading curriculum. An emailed response from Lim stated in summary, Singapore's curriculum shows fifteen-year-old students were at Secondary 4 level (personal communication, June 12, 2013). The email included an attachment of the reading curriculum used to teach fifteen-year-old students.

Based on the response from Lim, the section of the curriculum used to teach 15-year-old students was titled, *Learning Outcomes by the End of Secondary Four S/E or Secondary Five N(A)* with subheading *Learning Outcomes: Skills/Strategies and Attitudes* (English Language Syllabus 2001 for Primary and Secondary Schools, 2001, pp. 72-77). This section of the curriculum consisted of numerical and alphabetical progressions referred to as learning outcomes that explained what *pupils will* do upon completion of secondary four school. The learning outcomes were listed 1 through 7 with each coded in survey format with the label *Singapore Curriculum Part I*. The learning outcomes for the second part of the curriculum were listed 8.1 through 9.3, coded in survey format, and labeled *Singapore Curriculum Part II*.

Next, the researcher accessed the website for the U.S. Common Core, a set of curriculum standards used to teach fifteen-year-old students in the U.S. (Common Core State Standards Initiative, 2012). Comprised of two parts, English Language Arts

Standards and Mathematics Standards, the researcher determined the reading standards listed under English Language Arts. Further, the subheadings of English Language Arts, *Reading Literature* and *Reading Informational Text*, contained curriculum standards 9-10.1 through 9-10.10. The researcher coded these standards in survey format and labeled *United States Common Core Curriculum Part I* and United States *Common Core Curriculum Part II*.

Due to potential language interpretations, the researcher chose educational experts with a reading specialist background and five years classroom teaching experience. Since reading specialists were trained to teach "decoding and comprehension" (Juel, 1988, p. 437) of written words, the researcher believed these experts were the most qualified to examine the foreign curriculums of Finland and Singapore.

In summary, the researcher emailed 85 instructors asking for their participation in the study. In total, four faculty members agreed to participate and each met the criteria for participation. The researcher selected the instructors to provide feedback on the reading curriculums of Finland and Singapore. When the researcher received the response agreeing to participate in the study, the researcher sent an email to four of the educational leaders, which included attachments of the Guidelines for Participation, the 4Cs Related Terms and Synonyms instrument, and links to access the reading curriculum surveys. The purpose was for the respondents to assess the degree to which the 4Cs existed in Finland and Singapore's national curriculums. In other words, since each curriculum strand was in the form of a question in the survey, the respondent checked a box in the survey if they believed collaboration, communication, creativity, or critical thinking was present in a particular curriculum strand. Each educational expert had the

option to make multiple choices, if they perceived more than one of the 4Cs existed in the curriculum strands.

For the Common Core, the researcher selected respondents who possessed at least two-to-five years of experience with teaching or researching the Common Core. The researcher emailed four American teachers meeting this criterion and requested their participation in the study; each agreed. The researcher emailed these respondents the link to the survey that included the Guidelines for Participation, the 4Cs Related Terms and Synonyms document, and links to access the reading curriculum surveys. Again, the purpose was for the experts to assess the degree to which they believed the 4Cs existed in the Common Core curriculum strands. The educational leader was required to check a box in the survey if collaboration, communication, creativity, or critical thinking existed in a particular curriculum strand. Just like the first group, respondents had the option to make multiple choices if they perceived more than one of the 4Cs were present.

Based on survey results received from the respondents, the researcher calculated the responses after the development of three devices presented in Table 4, Table 5, and Table 6. The computer program, Microsoft Excel served as the platform to collect responses. The researcher applied a numeric reference in the columns where respondents marked the presence of collaboration, communication, creativity, and/or critical thinking. If the respondent selected collaboration as being present in a particular curriculum strand, the researcher marked the scoring guide with the numeric value of 1 under the column heading collaboration. The researcher did the same process for all researched countries. Then, the researcher totaled all numeric values representing each time one of the 4Cs were present in the curriculum strands. After the collection of all data, the researcher

applied a Chi-Square test for independence that compared the results provided by the four respondents through each of the categories. Next, the researcher conducted a PPMCC analysis to determine a difference in comparison of the 4Cs data from category-to-category. Since those results indicated a difference in values, the researcher applied the ANOVA to find the source of variation.

The PISA provided a specific set of criterion and procedures to measure the skills and knowledge of 15-year-old students who apply those skills in the real world (NCES, 2010). In broad terms, PISA's targeted population was 15-year-old students; however, to address the issue of differences with educational structures, specific age parameters were set to include students aged 15 years 3 months and 16 years 2 months (OECD, 2013b, p. 265). For the PISA 2012, the average age range of participating countries was 15 years and 9 months (OECD, 2013b, p. 265). The PISA 2012 framework included seven *proficiency levels* in terms of reading assessments: Level 1a, 1b, Level 2, Level 3, up to Level 6 (OECD, 2013b, p. 191). Some of the characteristics on this scale included: use of public knowledge to make inferences on texts, critically evaluate complex text, and the ability to retrieve information and locate pieces of embedded information. To address issues of validity and reliability, there is a peer review process, along with a multilateral surveillance of individual countries by their peers (OECD, 2015, para. 3). Additionally, chaired by representatives of the various country members, the PISA Governing Board is responsible for the development of the PISA along with individual experts and consultants.

Summary

This study consisted of a quantitative comparative content analysis to identify the extent to which 21st century skills were embedded in the reading curricula of three different high performing countries in the area of reading on the PISA. An examination such as this could provide information to educational leaders who desire to increase PISA performance. Since one might postulate that if a country had a high rating on the PISA, that same country would possess a higher number of 21st century skills in the curriculums compared to other industrialized nations. By use of Kay and Greenhill's (2013) text, the researcher selected the 4Cs as the framework to determine the necessary 21st century skills and knowledge to prepare students to compete in a connected economy. The hypotheses of this study aimed to determine the extent to which the 4Cs existed in the curriculums of the researched countries and most importantly, to determine what type of a statistical relationship existed between the performance on the PISA and the number of 21st century skills embedded in the research countries' curriculums. A detailed discussion is provided in Chapter Four about the results of this study. Chapter Five includes a review of methodology and implications of this research.

Chapter Four: Results

Introduction

The purpose of this study was to seek a possible relationship between the PISA 2012 reading scores and the measurement of 21st century skills and knowledge embedded in the reading curriculums of those nations known for educational excellence. The results may provide American educational leaders and policy makers with statistical data to assist in educational decisions on the use of PISA performance as a gauge for the success of a student's ability to compete in a 21st century connected economy.

Null Hypotheses

The Null Hypotheses used for this study were:

Null Hypothesis 1: There is no relationship between the rating of 21st century skills and knowledge included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 Reading scores measured by PISA.

Null Hypothesis 2: There is no relationship between the rating of collaboration skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

Null Hypothesis 3: There is no relationship between the rating of communication skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

Null Hypothesis 4: There is no relationship between the rating of creativity skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

Null Hypothesis 5: There is no relationship between the rating of critical thinking skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

Null Hypothesis 6: The score earned is not dependent on the respondents who critiqued Finland, Singapore, and the U.S. Common Core reading curriculum.

Description of Data Collection

This chapter presents the researcher's systemized approach to data collection and findings to test the hypotheses. The respondents in the study included teachers with CCSS experience and teachers with a reading specialist background. The researcher tallied responses from the respondents after their review of the curriculum strands of the researched nations. The researcher performed a statistical analysis to test validity of data. Finally, the researcher quantitatively summarized the data to address each of the hypotheses.

Analysis and Treatment of Data

The researcher developed a scoring guide to record tallies from respondents upon their review of the extent to which 21st century skills existed in the curriculums of the researched countries. The researcher tallied the number of times a respondent checked

the survey box that indicated the presence of 4Cs in each curriculum strand (see Table 4; Table 5; Table 6).

Table 4 displays results of the identification of collaboration, communication, creativity, and critical thinking in the reading objectives linked to the reading curriculum of Finland. The researcher-recorded tallies based on feedback from the respondents for the survey used to critique the curriculum of Finland (see Table 4).

Table 4

Scoring Device Finland Curriculum Strands

Part I	Collaboration	Communication	Creativity	Critical Thinking
Objective 1	0	4	0	2
Objective 2	3	4	1	2
Objective 3	4	3	0	0
Objective 4	0	3	1	4
Objective 5	0	1	0	4
Objective 6	0	2	1	2
Objective 7	1	4	1	1
Objective 8	2	4	2	4
Objective 9	0	4	1	3
Objective 10	1	4	1	3
Part II	**Collaboration**	**Communication**	**Creativity**	**Critical Thinking**
Objective 1	1	4	0	4
Objective 2	0	3	1	3
Objective 3	3	4	3	3
Objective 4	0	4	1	4
Objective 5	0	3	1	4
Objective 6	0	1	0	4
Objective 7	1	3	1	3
Objective 8	0	3	2	4
Objective 9	1	3	2	4

Note. Finland's curriculum was broken into two parts for better tracking of the respondents' analysis as explained in Chapter 3. To remain consistent, Finland's curriculum strands were referenced as objectives (FNBE, 2004).

[a]Part I of this curriculum represented 10 objectives, taken directly from the curriculum. [b]Part II only represented 9 objectives, taken directly from the curriculum.

Table 5 displays results of the identification of collaboration, communication, creativity, and critical thinking in the reading objectives linked to the reading curriculum of Singapore. The researcher recorded tallies based on feedback from the respondents for the survey used to critique the curriculum of Singapore (see Table 5).

Table 5

Scoring Device Singapore Curriculum Strands

Part I	Collaboration	Communication	Creativity	Critical Thinking
Pupils will: 1	0	4	1	0
Pupils will: 2	0	3	0	2
Pupils will: 3	0	4	0	1
Pupils will: 4	2	4	1	2
Pupils will: 5	1	4	1	1
Pupils will: 6	0	3	0	3
Pupils will: 7	0	1	0	3
Part II	**Collaboration**	**Communication**	**Creativity**	**Critical Thinking**
Pupils will: 8.1	0	1	0	4
Pupils will: 8.2	0	1	0	4
Pupils will: 8.3	0	2	0	4
Pupils will: 9.1	0	1	1	4
Pupils will: 9.2	0	3	1	4
Pupils will: 9.3	0	4	0	3
Pupils will: 10	3	4	1	2

Note. Singapore's curriculum was broken into two parts for better tracking of the respondents' analysis as explained in Chapter 3. This curriculum referred to curriculum strands as "pupils will" to remain consistent with the reference from the curriculum *English Language Syllabus 2001 for Primary and Secondary Schools* (2001, pp. 72-77).

[a]Part I of this curriculum represented 7 curriculum strands, taken directly from the curriculum.

[b]Part II represented a continuation of Part I, taken directly from the curriculum.

Table 6 displays results of the identification of collaboration, communication, creativity, and critical thinking in the reading objectives linked to the reading curriculum of Singapore.

Table 6

Scoring Device U.S. CCSS Curriculum Strands

Part I	Collaboration	Communication	Creativity	Critical Thinking
RL.9-10.1	0	4	0	3
RL.9-10.2	0	3	0	2
RL.9-10.3	2	1	1	4
RL.9-10.4	0	2	1	4
RL.9-10.5	0	3	1	4
RL.9-10.6	2	3	1	4
RL.9-10.7	2	4	1	4
RL.9-10.8	0	0	0	0
RL.9-10.9	0	2	2	4
RL.9-10.10	3	3	3	3
Part II	**Collaboration**	**Communication**	**Creativity**	**Critical Thinking**
RI.9-10.1	0	3	1	4
RI.9-10.2	1	4	0	4
RI.9-10.3	2	3	2	4
RI.9-10.4	1	3	0	4
RI.9-10.5	2	2	1	4
RI.9-10.6	0	3	1	4
RI.9-10.7	2	2	1	4
RI.9-10.8	2	3	0	4
RI.9-10.9	1	3	3	4
RI.9-10.10	2	3	3	3

Note. There were two parts to the U.S. CCSS, this is explained in Chapter 3. The curriculum strands were referenced as RL and RI respectively to remain consistent with the wording from the curriculum.

Next, the researcher tabulated and calculated the tallies to determine the total number of 21st century skills embedded in the curriculum as shown in Table 7. Important to note, the U.S. Common Core possessed the highest total number of 21st century skills in comparison to the researched countries. Additionally, with exception to Communication, the U.S. possessed the highest number of any specific 21st century skill in comparison to the research countries.

Table 7

21st Century Skills Embedded in Curriculum

	Collaboration	Communication	Creativity	Critical Thinking	Total
Finland	17	59	19	56	151
Singapore	6	35	6	36	83
U.S. CCSS	21	53	23	71	168

Note. This researcher developed this table based on the feedback from the respondents

The researcher applied a Chi-Square test for goodness of fit to the data shown in both Table 7 and Table 8 to determine if a difference in comparison from category-to-category existed. For the null hypothesis, there will be no difference in comparison of category-to-category, the analysis revealed the test value of 64.090 was greater than the critical value of 24.996 and the researcher rejected the null hypothesis, and the researcher determined a difference in values did exist category-to-category. The result was significant, therefore the researcher checked for comparison by separating the scores for comparison from the categories.

The researcher then applied a Chi-Square test for goodness of fit to data only in Table 7. The test value of 6.318 was not greater than the critical value of 12.592; therefore, the null hypothesis was not rejected, and a difference did not exist in values from category-to-category. The researcher applied a Chi-Square test for independence to data only in Table 8. The test value of 0.378 was less than the critical value of 3.841; therefore, the null hypothesis was not rejected, and no difference existed in values from category-to-category.

Table 8

PISA Reading Scores

	2012	2009
Finland	524	536
Singapore	542	526
U.S. CCSS	498	500

Note. The PISA scores represented the mean scores for each country during that particular cycle of the assessment.
[a]The OECD average mean score on the overall reading scale in 2009 was 494. [b]The OECD average mean score on the overall reading scale in 2012 was 496.

To determine if a difference existed in comparing the 4Cs, the researcher applied an ANOVA (see Table 9). For the null hypothesis, there will be no difference in comparison of categories, the ANOVA produced a test statistic of $F = 8.847414$, compared to a critical value of 4.066181, with a *p*-value of 0.006389 calculated at the 0.05 level of significance. The null hypothesis was rejected, and the analysis revealed a difference existed among the categories; Communication and Critical Thinking scored high, while Collaboration and Creativity scored low.

Table 9

ANOVA: Difference in Comparing 4Cs

SUMMARY

Group	Count	Sum	Average	Variance
Collaboration	3	44	14.66667	60.33333
Communication	3	147	49	156
Creativity	3	48	16	79
Critical Thinking	3	163	54.33333	308.3333

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	4005.667	3	1335.222	8.847414	0.006389	4.066181
Within Groups	1207.333	8	150.9167			
Total	5213	11				

Note: SS=Sum of Squares, DF=Degrees of Freedom, MS=Mean Square, F=F Value, P-value=probability of obtaining a test, F crit=Critical Value of F.

To determine if a difference existed among the researched countries' 2009 and 2012 reading PISA scores, the researcher applied an ANOVA (see Table 10). For the null hypothesis, there will be no difference in comparison of 2009 and 2012 reading PISA scores, the ANOVA produced a test statistic of $F = 0.001597$, compared to a critical value of 7.708647, with a p-value of 0.970034 calculated at a 0.05 level of significance. The null hypothesis was not rejected, and no difference existed in comparing the countries' scores to each other. The results also verified no difference in PISA scores year-to-year.

Table 10

ANOVA: Difference in Comparing Countries PISA Scores to Each Other

SUMMARY

Groups	Count	Sum	Average	Variance
PISA 2012	3	1564	521.3333	489.3333
PISA 2009	3	1562	520.6667	345.3333

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.666667	1	0.666667	0.001597	0.970034	7.708647
Within Groups	1669.333	4	417.3333			
Total	1670	5				

Note: SS=Sum of Squares, DF=Degrees of Freedom, MS=Mean Square, F=F Value, P-value=probability of obtaining a test, F crit=Critical Value of F.

The researcher applied an ANOVA to determine if a difference existed among comparable categories with regard to the country considered. For the null hypothesis, there will be no difference in PISA scores in comparison of country-to-country, the ANOVA produced a test statistic of $F = 1.083363$, compared to a critical value of 4.256495, with a p-value of 0.378813 calculated at a 0.05 level of significance. The null

hypothesis was not rejected, and no difference existed in comparing the four categories to each other with regard to the country considered (see Table 11).

Table 11

ANOVA: Difference in Comparing Categories with Regard to Country Considered

SUMMARY						
Groups	Count		Sum		Average	Variance
Finland	4		151		37.75	522.25
Singapore	4		83		20.75	290.25
United States	4		168		42	588
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1011.5	2	505.75	1.083363	0.378813	4.256495
Within Groups	4201.5	9	466.8333			
Total	5213	11				

Note: SS=Sum of Squares, DF=Degrees of Freedom, MS=Mean Square, F=F Value, P-value=probability of obtaining a test, F crit=Critical Value of F.

Finally, the researcher applied an ANOVA to determine if a difference existed among comparable countries' reading scores. For the null hypothesis, there will be no difference in reading scores, when comparing country-to=-country, the ANOVA produced a test statistic of $F = 10.90099$, compared to a critical value of 9.552094, with a p-value of 0.042068 calculated at a 0.05 level of significance. The null hypothesis was rejected, and a difference existed in comparing the countries' scores to each other (see Table 12). As predicted, based on PISA 2009 and PISA 2012 reports, the U.S. data were significantly lower than data representing both Finland and Singapore.

Table 12

ANOVA: Difference in Comparing Countries' 4Cs Scores to Each Other

SUMMARY				
Groups	Count	Sum	Average	Variance
Finland	2	1060	530	72
Singapore	2	1068	534	128
United States	2	998	499	2

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1468	2	734	10.90099	0.042068	9.552094
Within Groups	202	3	67.33333			
Total	1670	5				

Note: SS=Sum of Squares, DF=Degrees of Freedom, MS=Mean Square, F=F Value, P-value=probability of obtaining a test, F crit=Critical Value of F.

In summary, the researcher calculated tallies to determine the total number of 21st century skills embedded in the research countries reading curriculum based on feedback from respondents as shown in Table 7. A Chi-square test for goodness of fit (see Table 7 and Table 8) revealed a difference from category-to-category. The researcher applied an ANOVA to the data only in Table 7 and results revealed a difference existed in the values from category-to-category. Next, the researcher applied a Chi-square test for goodness of fit to data only in Table 8 and results revealed no difference in values from category-to-category.

To seek a difference when comparing the 4Cs, as shown in Table 9, results revealed that both Communication and Critical Thinking were higher in contrast to Collaboration and Creativity. Next, the researcher applied an ANOVA to seek a difference among comparable countries as shown in Table 10; results revealed no difference in PISA scores from year-to-year. As summarized in Table 11, there was no difference in comparing the four categories with regard to countries considered. As

shown in Table 12 a difference existed in comparing the countries, which revealed the U.S. scored significantly lower. Finally, based on these statistical analyses, the researcher was confident of accuracy and presented data to test the hypotheses.

Findings of Research

The researcher conducted statistical analysis to present the data and validate findings. Specifically, inter-rater reliability analyzed for accuracy during the application of respondents and the uniformity of scoring between respondents. The following hypotheses explained the findings in detail.

Null Hypothesis 1: There is no relationship between the rating of 21st century skills and knowledge included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 Reading scores measured by PISA.

As represented in Table 13, the researcher applied a PPMCC to the data by comparing the total number of 21st century skills to the PISA 2012 score of the researched countries. The shaded cells represent significance; therefore, the findings revealed a significant inverse relationship existed between PISA 2012 results and measures of 21st century skills in Total 4Cs, creativity, and critical thinking.

Table 13

PPMCC Comparison by Row

	PISA 2012	PISA 2009	Total 4Cs	Collab	Comm	Creat	Critical
PISA 2012	1						
PISA 2009	0.77033	1					
Total 4Cs	-0.90558	-0.42712	1				
Collab	-0.93313	-0.48957	0.9975	1			
Comm	-0.64425	-0.00862	0.9078	0.8761	1		
Creat	-0.92058	-0.46013	0.9993	0.9994	0.89178	1	
Critical	-0.98259	-0.63845	0.9686	0.9836	0.77513	0.977115	1
	c = 0.707						

Note. The 21st century skills, Collaboration, Communication, Creativity, and Critical Thinking were abbreviated for better representation in this table.

Null Hypothesis 2: There is no relationship between the rating of collaboration skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

As represented in Table 14, the researcher applied a PPMCC to the data comparing the 21st century skill collaboration to the PISA 2012 and PISA 2009 score of the researched countries. The findings revealed a significant inverse relationship existed between collaboration and results of both the PISA 2009 (-0.48597) and PISA 2012 (-0.93313).

Table 14

PPMCC Collaboration

	PISA 2012	PISA 2009	Total 4Cs	Collab	Comm	Creat	Critical
PISA 2012	1						
Collab	-0.93313	-0.48957	0.99753	1			

Note. The 21st century skills, Collaboration, Communication, Creativity, and Critical Thinking were abbreviated for better representation in this table.

Null Hypothesis 3: There is no relationship between the rating of communication skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

As represented in Table 15, the researcher applied a PPMCC to the data comparing the 21st century skill communication to the PISA 2012 and PISA 2009 score of the researched countries. The findings revealed an observed inverse relationship existed between communication and results of both the PISA 2009 (-0.00862) and PISA 2012 (-0.64425), however the findings were not significant.

Table 15

PPMCC Communication

	PISA 2012	PISA 2009	Total 4Cs	Collab	Comm	Creat	Critical
PISA 2012	1						
Comm	-0.64425	-0.00862	0.90784	0.87614	1		

Note. The 21st century skills, Collaboration, Communication, Creativity, and Critical Thinking were abbreviated for better representation in this table.

Null Hypothesis 4: There is no relationship between the rating of creativity skills and knowledge level included within the 2012 reading curriculum used by teachers of

fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

As represented in Table 16, the researcher applied a PPMCC to the data comparing the 21st century skill creativity to the PISA 2012 score of the researched countries. The findings revealed a significant inverse relationship existed between creativity and results of the PISA 2012 (-0.92058).

Table 16

PPMCC Creativity Skills

	PISA 2012	PISA 2009	Total 4Cs	Collab	Comm	Creat	Critical
PISA 2012	1						
Creat	-0.92058	-0.46013	0.99932	0.99944	0.89178	1	

Note. The 21st century skills, Collaboration, Communication, Creativity, and Critical Thinking were abbreviated for better representation in this table.

Null Hypothesis 5: There is no relationship between the rating of critical thinking skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

As represented in Table 17, the researcher applied a PPMCC to the data comparing the 21st century skill critical thinking to the PISA 2012 score of the researched countries. The findings revealed a significant inverse relationship existed between critical thinking and results of both the PISA 2009 (-0.63845) and PISA 2012 (-0.98259).

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Table 17

Descriptive Statistics: PPMCC Critical Thinking Skills

	PISA 2012	PISA 2009	Total 4Cs	Collab	Comm	Creat	Critical
PISA 2012	1						
Critical	-0.98259	-0.63845	0.96862	0.9836	0.77513	0.97711	1

Note. The 21st century skills, Collaboration, Communication, Creativity, and Critical Thinking were abbreviated for better representation in this table.

Null hypothesis 6: The score earned is not dependent on the respondents who critiqued Finland, Singapore, and the United States Common Core reading curriculum.

Finland: As represented in Table 18, the researcher applied a Chi-Square test for independence to the data to determine validity between how respondents critiqued the curriculum of Finland. The Chi-Square test value of 7.348393 was less than the Critical Value of 16.909; therefore, the researcher did not reject the null hypothesis and results were not dependent upon which per critiqued the reading curriculum.

Table 18

Chi-Square test for Independence of the Respondents who Critiqued Finland's Reading Curriculum

	R1	R2	R3	R4	Test Value
Collaboration	0.636176	0.872797	1.698905	0.031963	
Creativity	3.900662	1.21313	0.965176	2.859839	
Communication	0.688307	1.039006	0.379392	1.008706	
Critical Thinking	0.545076	0.012108	0.433186	0.002772	7.348393

Note. The R represents the respondent who critiqued the curriculum.

Singapore: As represented in Table 19, the researcher applied a Chi-Square test for Independence to the data to determine validity between how respondents critiqued curriculum of Singapore. The Chi-Square test value of 5.259283, was less than the

Critical Value of 16.909, therefore the researcher did not reject the null hypothesis and results were not dependent upon which per critiqued the reading curriculum.

Table 19

Chi-Square test for Independence of the Respondents who Critiqued Singapore's Reading Curriculum

	R1	R2	R3	R4	Test Value
Collaboration	0.13745	0.86747	0.21245	0.257093	
Creativity	1.445783	0.86747	1.445783	6.30548	
Communication	1.508021	0.000717	0.038021	1.268603	
Critical Thinking	0.32331	0.619171	0.012199	0.01478	
					5.259283

Note. The R represents the respondent who critiqued the curriculum.

United States: As represented in Table 20, the researcher applied a Chi-Square test for independence to the data to determine validity between how respondents critiqued the curriculum of the U.S. The Chi-Square test value of 13.25483 was less than the Critical Value of 16.909; therefore, the researcher did not reject the null hypothesis and results were not dependent upon which per critiqued the reading curriculum.

Table 20

Chi-Square test for Independence of the Respondents who Critiqued U.S. CCSS Reading Curriculum

	R1	R2	R3	R4	Test Value
Collaboration	1.420454	0.881097	3.375	1.002777	
Creativity	2.653872	1.216488	3.696428	0.549120	
Communication	0.318600	1.277827	0.257899	0.719699	
Critical Thinking	1.183100	0.026109	2.737787	0.054476	
					13.2548

Note. The R represents the respondent who critiqued the curriculum.

The researcher did not reject the null hypotheses concerning how the respondents critiqued the curriculum of Finland, Singapore, and the U.S. Common Core. The data supported the null hypotheses; there was no difference in scoring among respondents and the use of the rubric provided consistency in scoring. After all data was analyzed findings showed a significant inverse relationship when comparing the number of 21st century skills embedded in reading curriculums to the reading performance scores on the PISA 2012.

Summary of Findings

After the development of a scoring device to record tallies from respondents, results showed the U.S. possessed the highest total number of 21st century skills in comparison to the researched countries. With exception to Communication, the scoring device showed that the U.S. possessed the higher number of any 21st century skill in comparison to the researched countries. The researcher statistically analyzed data by using an ANOVA test, PPMCC and Chi-Square test for independence, and Chi-Square test for goodness of fit by checking for comparisons and separating the scores for comparison from the categories and checking differences from category-to-category. The results revealed a significant inverse relationship between the total number of 21st century skills and the scores on the PISA 2012. In other words, when a country possessed a high number of 21st century skills in the curriculums, the performance was lower on the PISA 2012.

With exception to null hypothesis three, a significant inverse relationship existed in hypotheses one, two, four, and five. Although, hypothesis three was not significant, an observed inverse relationship did exist. Hypothesis six validated the accuracy in scoring

of the respondents who analyzed the researched countries' curriculums. The analysis of this data revealed fidelity in the scoring device used by the respondents. The literature related to the researched countries' inclusion of 21st century skills in their curriculums and their performances on the PISA, at the time of this study, was a debated topic among educational leaders and policy makers. The researcher concluded this analysis refuted researchers' claims that the U.S. was in an educational crisis and at risk of losing its economic standing, based on performance on the PISA. In Chapter Five, the researcher presented a discussion of the results, implications, and recommendations for future research.

Chapter Five: Discussion, Implications and Recommendations

The purpose of this study was to identify a possible relationship between the PISA reading scores and the number of 21st century skills and knowledge found within the reading curriculums of three nations ranked highest in international student performance. Data sources for measurement included PISA 2012 reading scores and the number of 4Cs embedded in the research countries' curriculums, based on feedback from experts in the field.

The literature review revealed disagreements about the importance of international performance on PISA with regard to a student's level of preparation in a 21st century connected economy and the success of a nation with higher ratings on the PISA (Friedman, 2005; Tucker, 2011). Research also showed ambiguities when educational leaders defined which 21st century skills and knowledge were most relevant to include in curriculums to prepare students to be successful (NCREL & Metiri, 2003; P21, 2008). Further, the literature was deficient in studies that sought to determine the number of 21st century skills and knowledge embedded in the research countries' curriculums.

Hypotheses

For the following hypotheses, numbers one, two, and four yielded significant findings.

Hypothesis 1: There is a relationship between the rating of 21st century skills and knowledge included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 Reading scores measured by PISA.

Hypothesis 2: There is a relationship between the rating of collaboration skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

Hypothesis 3: There is a relationship between the rating of communication skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

Hypothesis 4: There is a relationship between the rating of creativity skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

Hypothesis 5: There is a relationship between the rating of critical thinking skills and knowledge level included within the 2012 reading curriculum used by teachers of fifteen-year-old students, as utilized by the countries of Finland, Singapore, and the United States and the 2012 reading scores measured by PISA.

Hypothesis 6: The score earned is dependent on the respondents who critiqued Finland, Singapore, and the U.S. Common Core reading curriculum.

Review of Methodology

To provide greater insight on the relevance of increasing performance on the PISA reading assessment and the skills necessary to prepare a student to compete in a connection economy, the researcher first conducted a review of literature on 21st century skills and knowledge. After a review of literature, the researcher selected the text of Kay

and Greenhill (2013) as a foundation for this study, since their research involved other supporting literature of the 4Cs: collaboration, communication, critical thinking, and creativity (AMA, 2010; NCREL & Metiri, 2003; Friedman, 2005; P21, n.d.). The researcher then selected nations, which performed highest on the reading section of the PISA 2012 to compare to the U.S. performance on the same assessment. Important to note, during the initial phases of this study, the researcher selected China for country comparison, due to its high PISA reading scores (OECD, 2013b); however, after failed attempts to gather curriculum documentation, the researcher selected Finland and Singapore. Based on extensive review of the reading curriculum used to teach 15-year-old students in the countries of Finland, Singapore, and U.S., the researcher developed a survey based on the curriculum standards of the researched countries, to allow educational leaders to provide feedback. The survey consisted of curriculum strands of the researched countries in the form of a survey question. The curriculums were transcribed and each curriculum strand broken into a survey question, to extrapolate information in numerical form for quantitative exploration. Educational experts provided feedback on the curriculums of the research countries.

The researcher applied a PPMCC to the data by comparing a single 4C to the score of each researched country PISA 2012 reading score. A significant inverse relationship existed for hypotheses one, two, and four; an observed inverse relationship existed for hypothesis three, however it was not significant. For hypothesis six, a Chi-Square test for independence was applied, and this validated consistency in scoring between respondents who critiqued the curriculums. During the initial development of data collection, the researcher considered counting each time one of the 4Cs was present,

to determine the inclusion of these skills embedded in the curriculum. For example, if a respondent selected collaboration in the curriculum, the researcher would have counted the number of occurrences using a tally mark. However, because of the limitation of interpretation of foreign writings of Finland and Singapore, the researcher decided to have educational experts analyze the curriculum and make assumptions based on their expertise, their own classroom interpretation, and their expert interpretation of potential language differences. The findings in this study supported the literature, which concluded that the U.S. should not rely solely on PISA performance to determine educational reforms.

21st Century Skills and Knowledge Data Analysis

A PPMCC was applied to the data after respondents critiqued the research countries' curriculums to determine the number of 4Cs embedded in each. The survey responses showed that the U.S. indicated a higher number of Collaboration skills embedded in the curriculum. Finland showed a higher number of Communication skills embedded in the curriculum, which could explain why hypothesis three did not show a significant inverse relationship, as shown in the hypotheses focused on the other 4Cs. The U.S. showed a higher number of creativity skills, which substantiates the researchers' claims about the innovativeness and entrepreneurial capabilities of the citizens (Wadhwa, 2011; Wee, 2011; World Economic Forum, 2007; Zhao, 2012). Again, the U.S. topped Finland and Singapore with the highest number of critical thinking skills embedded in the curriculum. Overall, the data analysis supported that the U.S. possessed the total highest number of 21st century skills in its curriculum, among the three countries compared.

Implications Regarding 21st Century Skills and Knowledge Improvement

Implications of this study specifically for educational leaders and policy makers would be to examine the inclusion of 21st century skills within the curriculum. Research showed curriculum was the driver in a student's learning and success in an economy. The researched countries were all seeking educational reforms to increase performance on the PISA or to increase a 21st century skill. Although previous research described how the U.S. performed lower on international assessments by comparison to other industrialized nations, other nations sought to adopt curriculum strategies used by American educational leaders. Further, researchers believed, if the U.S. increased international performance on assessments, the economy would see an increase in GDP (Friedman, 2005; Hanushek & Woessmann, 2008).

A common theme that emerged after reviewing the literature on 21st century skills and knowledge was that most researchers agreed upon the importance of the inclusion of creativity and innovation in the curriculums (Zhao, 2012). Additionally, creativity was the skill that most researchers believed would result in the economic success of a country. Zhao (2012) said the U.S. was a "hotbed of innovation and entrepreneurship" (p. 134). Results from the 2011 GEM supported Zhao's statement, in that the U.S. ranked highest on entrepreneurial capability, compared to top performing countries on the PISA. In other words, the report showed a "statistically significant negative relationship between test scores in math, reading, and sciences and aspects of entrepreneurship" (Zhao, 2012, p. 12). This research indicated statistically significant inverse relationship between the total number of 21st century skills embedded in the reading curriculum of Finland, Singapore, and the U.S. CCSS and the PISA 2012 reading

scores. In other words, when a country possessed a higher frequency of 21st century skills in the curriculums, the country ranked lower on the PISA 2012.

PISA Performance Analysis

A review of international assessments from PISA 2012 reading scores showed the U.S. reading performance was lower than that of Finland and Singapore, two countries revered for their educational systems. Sixty-five countries participated in PISA 2012, and over 6,000 students were randomly selected from 161 schools in the U.S. (OECD, n.d.c., p. 8). The researcher chose PISA, because it was a nationally accepted assessment at the time of this research. The researcher statistically analyzed data by using PISA 2012 reading scores. The U.S. scored lower than the researched countries during each cycle of the PISA 2009, scoring 500, and the PISA 2012, scoring 498. Finland scored higher than the researched countries in 2009 with a score of 536, and in 2012 scored 524. Singapore scored 536 in 2009, and scored higher than the researched countries in 2012, with a score of 542. The researcher applied a Chi-square test for goodness of fit to the PISA 2012 data, which supported a difference between the researched countries and the U.S. The findings showed the U.S. scored significantly lower than the researched countries. Important to note, the researcher did not examine PISA 2009 reading scores in detail; however, the scores for the researched countries were included only for statistical comparisons.

Implications Regarding the Hindrance of Creativity Skills and Knowledge

Data from this dissertation revealed countries with higher performance on the PISA did not have a higher number of 21st century skills embedded in the curriculums. Evidenced by the hypotheses in this study, findings revealed a significant inverse

relationship occurred when the researcher compared the total number of 21st century skills in curriculums to the reading scores of the PISA 2012. Since the OECD touted the PISA as a tool for a nation to gauge the success of students' preparation in the 21st century (OECD, 2013b), this research illustrated that PISA may not be the tool for which results should be solely focused on. Further, with the researched countries' recent curriculum changes to better prepare students for higher performance on the PISA, this research illustrated a flaw in educational leaders and policy makers' assumptions. Specifically, the U.S. sought to increase performance on international assessments by modeling educational strategies of the top performers, such as China, Finland, and Singapore. Although, research reported other countries were looking to incorporate American strategies in their own education systems (Tucker, 2011). With countries, such as China, Finland, and Singapore as regular top performers on international assessments, America's educational leaders were doing what was necessary to increase their own performance and remain competitive on the assessments. Zhao (2012) agreed, "[L]ike China, Singapore has been a country of envy and admiration by outsiders for its consistent high performance in international tests" (p. 104). However, countries with high performance on PISA did not possess high levels of innovativeness in comparison to the U.S., evidenced by the GEM findings (Bosma et al., 2012).

An example of the differences in innovativeness included China's quest to invest in the cultivation of entrepreneurs. The inventor of Apple products, Jobs, was an American entrepreneurial icon (Zhao, 2012) to most nations. According to a local newspaper in China, authors Luo et al. (2011) wrote about China's plan to increase entrepreneurial citizens, such as Jobs. Tucker (2011) posited that China was an education

giant because of its high performance on international assessments. Similarly, Singapore looked to the U.S. to harness creativity and entrepreneurship skills in its students; however, there was doubt among educational leaders and researchers that Singapore would be able to accomplish this task. According to Wozniak (2011), the co-founder of Apple, creativity would not flourish in countries, such as Singapore, due to its rigid culture. Wozniak further questioned Asia's ability to develop individuals with 21st century skills by reminding us of the country that produced the great creators, musicians, singers, and writers; America (Wozniak, 2011). The researcher concluded, based on the results of this study, if the U.S. shifted focus to increasing performance on the PISA, this move could compromise creativity.

Based on conflicting views about U.S. performance on the PISA, the researcher noted concerns about the hindrance of creativity skills and knowledge in students (Wozniak, 2011; Zhao, 2012). Therefore, the importance of creativity skills and economic outcomes merited further investigation as related to this study. Concerns about the state of America's educational system, due to the 21st century connection economy, was apparent to this researcher throughout the literature. Some researchers insisted, if student achievement on the PISA increased, the U.S. could see a boost in the economy (CFR, 2012; Hanushek & Woessmann, 2008; Levy & Murnane, 2004). On the other hand, some researchers argued the obsession to increase PISA scores could hinder creativity (Baker, 2007; Dall, 2011; Zhao, 2009). Although most researchers reached the same conclusion, that the American educational system did in fact require some reform to meet demands, there seemed to be a disconnect in the literature. This disconnect was a result of insufficient capacity building; what Maiese (2005) described as a "matter of

development at all levels of society and includes institutional development, community development, and economic development" (p. 1). In other words, all sectors of the government, to include, education, private business, and community, must collaborate during the decision making process to ensure all areas lead to a strong economy. The researcher concluded educational leaders and policy makers should not place too much weight on educational assessments when determining economic success; other economic indicators should receive equal consideration.

If this study applied the capacity-building concept, the researcher could also argue that American educational leaders did not broaden focus to other indices when determining indicators to gauge student success, with regard to a connection economy. For instance, PISA was an assessment that measured academic strengths and weaknesses in international educational systems. Further, PISA was touted as a tool for a nation to use to gauge the success of students' preparation in the 21st century (OECD, 2013b); however, other indices, such as the Human Development Index (HDI) should be considered when determining the success of America's educational system. Since the HDI, assessed various levels of human development, to include "life expectancy, educational attainment and command over the resources needed for a decent living" (UNDP, 2013, p. 1), the researcher believed this was a sound index for educational leaders to consider when determining the success of a student's success in the connection economy. To illustrate this point, the researcher developed a chart for educational leaders to use to make comparisons across different indicators to assist in decision-making, as related to this study (see Table 21).

Table 21

Visual for Comparisons Across Different Indicators

	PISA 2012 Reading	Creativity Skills	HDI 2013 Ranking
Finland	524	19	21
Singapore	542	6	18
U.S.	498	23	3

Note. This researcher developed this table to serve as a visual tool for comparisons.
[a]PISA 2012 Reading data reflect the score for each country - the OECD average mean score on the overall reading scale in 2012 was 496.
[b]Creativity Skills data is reflective of the respondents feedback which included a tally of each occurrence of the skill embedded in the curriculums.
[c]HDI 2013 data reflect a rank for 187 countries (Malik, 2013).

Recommendations for Further Study

The researcher reviewed a wealth of information on the topic of 21st century skills, how to prepare students to compete in a global economy, and the importance of receiving high scores on the PISA. As a result, the researcher asserted students must be equipped with the 4Cs to possess the necessary skills to compete in a connected economy. Based on the findings in this study, the researcher believed educators should focus on the incorporation of the 4Cs throughout all curriculum. Although, Finland and Singapore PISA reading performance scores were higher, the U.S. had a higher number of 21st century skills embedded in the curriculum. The researcher concluded policy makers and educational leaders should view PISA as a competitive assessment and also consider other economic indicators, such as the HDI when making decisions. The research supported the development of the Common Core, since it increased the inclusion of 21st century skills as reflected in this study. The U.S. continued to be an economic super power, but with the focus to increase scores on the PISA, focus may be lost and entrepreneurial economic status may decline.

Discussion

Based on the findings, one can logically argue that if a country has a high number of 21st century skills and knowledge embedded within its curriculum that it would have performed higher on the PISA 2012. On the contrary, the U.S. scored lower on the PISA 2012, while Finland and Singapore scored marginally higher. In other words, the data showed the U.S. had a higher number of 21st century skills and ranked higher on the GEM (Bosma et al., 2012). The GEM reinforced the findings of this study, in that Finland, Singapore, and the U.S. were innovation-driven economies (Bosma et al., 2012). Findings illustrated the U.S. ranked high in overall entrepreneurial activity in all areas of the study, while Finland and Singapore's entrepreneurial activity was lower than the U.S. (Bosma et al., 2012). The GEM researchers asserted that all policy makers and educational leaders gauged the level of innovativeness within their respective economies and used data to form initiatives to motivate entrepreneurship. Countries that ranked lower in entrepreneurial activity were the countries that scored higher on international assessments, such as the PISA (Zhao, 2012). These findings aligned with the results in this research, because while the U.S. scored lower on PISA, it also ranked higher on other economic indicators.

With curriculum reforms underway, researchers showed concern about focusing on curriculum changes without looking at the overall picture. Zhao (2012) referred to this as curriculum narrowing. In short, when countries focused to increase performance on international assessments, attention to those subjects tested received higher priority, while other subjects took a backseat. This strengthened the researcher's assessment that

diminished capacity building existed, because of the conflicting views on the state of America's educational system.

Educational leaders could use the results of this study to make decisions on 21st century skills to include in reading curriculums taught to 15-year-old students. The data could also lead to changes on the implementation of curriculums. Teachers could use the results for pedagogical purposes by focusing on the skills best suited to prepare students to compete in a connection economy. Educational leaders could use the data to determine if international assessments, specifically the PISA, were a true indicator of a student's ability to apply knowledge to real life situations. Current and prior research showed a consensus among educational leaders that change must occur to equip American students with 21st century skills (Friedman, 2005; P21, n.d.; Tucker, 2011). However, there was an ongoing debate about the importance of nations increasing scores on the PISA (Bulle, 2011; CCSSO, 2012).

Conclusion

Policy makers and educational leaders agreed that the U.S. must implement changes in curriculum to better prepare students to compete in a connected economy. American students scored lower on international assessments in comparison to other industrialized nations; while some researchers contended the U.S. needed to increase PISA scores to better prepare students to compete in a connected economy (Council on Foreign Relations, 2012; Duncan, 2013; Tucker, 2011). Other researchers believed that higher PISA scores would produce positive outcomes for the economy by increasing GDP (Friedman & Mandelbaum, 2011). Conversely, the findings in this research illustrated a significant inverse relationship between the number of 21st century skills

embedded in curriculums and success on the PISA 2012. The U.S. had a higher number of 21st century skills embedded in its curriculum, although it scored lower on the PISA. Based on the GEM 2011 report and the findings in this research, the U.S. ranked lower than the researched countries on the PISA 2012; however, it scored higher on the GEM 2011. Based on the literature and this statistical data, the researcher recommended the U.S. shift focus from trying to remain competitive on the PISA and focus on indices that gauge innovativeness and entrepreneurship in an economy. The statistical analysis in this research was similar to that of the GEM 2011, in that, when a country scored lower on the PISA, it had a higher number of 21st century skills. In addition, when a country scored lower on the PISA, it had a higher ranking on the GEM 2011.

It is the researcher's belief that American educational leaders and policy makers should continue to review curriculums to include 21st century skills relevant for student success in a dynamic economy. Additionally, if the U.S. fixation to increase performance on international assessments, such as the PISA, may negatively influence the economy. Conversely, the U.S. should focus on harnessing the 21st century skill most sought by other industrialized nations, creativity. Although researchers believed increasing performance on the PISA would yield positive economic outcomes (Friedman, 2005; Hanushek & Woessmann, 2008), some researchers believed it would do more harm than good (Baker, 2007; Dall, 2011; Zhao, 2012). Results of this study supported the notion that the U.S. should not focus on increasing performance on PISA; instead, look into ways to harness creativity skills.

Findings revealed entrepreneurship capability from individuals was the driver of success in an economy and the U.S. led the way in creativity and innovativeness. The

researcher took the position that if educational leaders and policy makers continued the quest to increase student achievement on academic assessments without considering other economic indicators; this could potentially harm the economy. Overall, this research opened the door to many unanswered questions that merit further research. For one, why are American educational leaders fixated on increasing PISA performance when evidence clearly revealed economic success in the economy? Secondly, why do high performers on PISA seek to model America's educational system? Lastly, why are other economic indices not strongly considered when educational leaders make decisions on curriculum reforms? This study is relevant because the results validated findings from similar research while adding to the existing body of literature. Furthermore, this study generated relevant concerns about how the U.S. educational system was viewed by other industrialized nations with high performance on the PISA. Lastly, the introduction of the idea that educational leaders must consider various sources outside of the academia when deciding on curriculum reform was discussed.

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Appendix A

Introductory Letter to Educational Leaders – Common Core Review

Thank you for your time and participation with my research study. Enclosed are the following:

- Team of Experts Form - to be completed by you (you can email or return in the envelope – no postage is required)
- Form titled 'Synonyms and Related Terms' – this document includes identifiers from three different sources that define the linguistic meaning of the 21st century skills of Collaboration, Communication, Creativity, and Critical Thinking.
- Business Card – My contact information to email or call me at any time with questions or concerns.

The survey includes copied text from the Common Core State Standards website; each question in the survey represents a standard. As the expert, you are to analyze and provide your feedback regarding the occurrences of Collaboration, Communication, Creativity, and Critical Thinking skills embedded within the United States Common Core State Standards. This is done by referencing the last sheet in this packet titled "Synonyms and Related Terms". In other words, you will reference the Synonyms and Related Terms document while completing the survey.

Once you receive this packet, please email tmoore@lindenwood.edu so I can send you the survey via surveymonkey.com. Two surveys that will be sent to you once you email me saying you received the packet. The surveys will include 10 questions each and should take 10 minutes to complete. The surveys are titled:

Part I – Reading Literature AND **Part II – Reading Informational Text**

Introductory Letter to Educational Leaders – Common Core Review (continued)

Once you complete the surveys, a $25 Visa gift card will be sent to you for your participation.

I appreciate the time you have taken to review the materials and complete the surveys. You can retract your participation at any time by emailing me.

If you have any questions, concerns, or suggestions regarding this study feel free to contact me at 636-949-4379 or tmoore@lindenwood.edu

Warmest Regards,

Tammy T. Moore

Appendix B

Information Sheet for Respondents to Complete

Researcher: Tammy T. Moore School: Lindenwood University

Dissertation Title: Quantitative Content Analysis of Reading Standards Found within the Countries of Finland, Singapore, and the United States using a 21st Century Framework

---

Name: _____ Email: _____

Job Title: _____

(list current status/prior job title – if Full time student)

Education Level (degree type): _____

Teaching Experience (overall years): _____

Grade Level Teaching/Taught:_____

Subject Area Teaching/Taught: _____

Certification Area: _____

Urban or Rural School: _____

Recognition/Awards: _____

Experience with Common Core State Standards: *(brief description*):

Appendix C

Permission to Use Tables and Figures from OECD

Moore, Tammy

From: [redacted]
Sent: Monday, January 05, 2015 4:37 AM
To: Moore, Tammy
Cc: EDU.Pisa@oecd.org
Subject: RE: ***Permission to use PISA Figures in my Dissertation***

Categories: Dissertation

Thank you for your message. It's fine with the OECD for you to use the figures from the study as long as you cite the OECD as the source.
Best regards,
Juliet Evans

-----Original Message-----
From: Moore, Tammy [mailto:TMoore@lindenwood.edu]
Sent: 27 December, 2014 10:15 PM
To: EDU Pisa, EDU/IA
Subject: ***Permission to use PISA Figures in my Dissertation***

I am an American student writing a dissertation on PISA 2009 and 2012 results. Who do I speak with for permission to use figures from the study?

Tammy T. Moore, MBA
Certification Officer | Data Manager
Lindenwood University
Email: tmoore@Lindenwood.edu

Appendix D

Permission to Use Tables and Figures from Ministry of Education, Finland

Moore, Tammy

From: [redacted]
Sent: Wednesday, January 07, 2015 12:33 AM
To: Moore, Tammy
Subject: VS: American Student Studying Finland's Curriculum

Categories: Dissertation

Hello,

you may use the Finnish national core curriculum (including graphs etc.) as a reference on your study.

Erja Vitikka

Erja Vitikka
Counsellor of Education, Ph.D.
Finnish National Board of Education
PO Box 380
FI-00531 Helsinki
Finland
+35829 533 1225
erja.vitikka@oph.fi
www.oph.fi

Appendix E

Permission to Use Tables and Figures from Ministry of Education, Singapore

Moore, Tammy

From: Moore, Tammy
Sent: Wednesday, October 14, 2015 4:37 PM
To: Moore, Tammy
Subject: SINGAPORE APPROVAL

Categories: Dissertation

From: Diana KOH (MOE) [mailto:Diana_KOH@moe.gov.sg]
Sent: Wednesday, July 15, 2015 2:48 AM
To: Moore, Tammy
Subject: RE: Reference: 2015/02/006470 - Singapore Request for Approval to Use Tables and Figures

Message Classification: Restricted

Dear Tameka,

I refer to your request on 5 July 2015.

Information about our syllabuses may be of relevance to you. We are unable to share further information that is not available in the public domain.

Thank you.

Best Regards,
Diana Koh

Appendix F

Email to Respondents with website Links to Survey Monkey to Critique Curriculums of Finland and Singapore

Thank you for your time and participation with my research study. Attached is a form titled 'Synonyms and Related Terms' – this document includes identifiers from three different sources that define the linguistic meaning of the 21st century skills of Collaboration, Communication, Creativity, and Critical Thinking.

The survey links below include copied curriculum standards from Finland and Singapore's national curriculums; each question in the survey represents a standard. As the expert, you are to analyze and provide your feedback regarding the occurrences of *Collaboration, Communication, Creativity, and Critical Thinking* skills embedded within the curriculum standards. This is done by referencing the attached spreadsheet titled "Synonyms and Related Terms". In other words, you will reference the Synonyms and Related Terms document while completing the survey.

There are four surveys included in this email. The surveys will include 10 curriculum strands and should take approximately 15 minutes to complete. I appreciate the time you have taken to review the materials and complete the surveys. You can retract your participation at any time by emailing me. If you have any questions, concerns, or suggestions regarding this study feel free to contact me at 618-616-7027 or tmoore@lindenwood.edu

Singapore National Curriculum Part I: https://www.surveymonkey.com/s/8YN2GM8 (DUE DATE: 4/15/15) if possible

Singapore National Curriculum Part II: https://www.surveymonkey.com/s/H25CJM3 (DUE DATE: 4/15/15) if possible

Finland National Core Curriculum - Part I (Objectives): https://www.surveymonkey.com/s/Q3WGFJX (DUE DATE: 4/30/15) if possible

Finland National Core Curriculum - Part II (Text Comprehension): https://www.surveymonkey.com/s/CFM6C5M (DUE DATE: 4/30/15) if possible

Tammy T. Moore, MBA
Certification Officer | Data Manager
Chair, Council of Teacher Education (CTE)

Lindenwood University | Education Office | Roemer 106
Office: 636-949-4379 Fax: 636-627-4197 Email: TMoore@lindenwood.edu

Appendix G

4Cs Related Terms and Synonyms

Table 1 - Synonyms to measure 21st century skills in curricula

Source: Merriam-Webster, Incorporated (2013). Merriam-Webster's online thesaurus. Retrieved May 7, 2013 from http://www.merriam-webster.com/thesaurus/

Collaborate[ion]	Communicate[ion]	Creative[itv]	Critical Thinking
Synonyms	**Synonyms**	**Synonyms**	**Synonyms**
band (together)	conduct	clever	
concert	convey	imaginative	see related words
concur	brainstorm	ingenious	
conjoin	intercommunicate	innovational	
conspire	demonstrate	innovative	
join	manifest	inventive	
league		original	
team(up)			
unite			
Related Words	**Related Words**	**Related Words**	**Related Words**
affiliate	correspond	gifted	reason effectively
ally	converse	inspired	make judgements
associate	talk	talented	make decisions
	message	resourceful	identify problems
hang together	bond	fecund	define problems
interface	commune	productive	solve problems
	relate	artful	collect relevant information
	contact	visionary	reflect critically
	acquaint	clevertish	
	fill in	handy	
	inform		
	instruct		
	tell		

Terms not reviewed in Kay and Greenhill (2013) (pp. 130-131).

Table 2 - Identifiers to measure 21st century knowledge

Source: Partnership for 21st Century Skills. (2009, December). P21Framework definitions. Retrieved May 7, 2013 from http://www.p21.org/storage/documents/P21_Framework_Definitions.pdf

21st Century Skill	Identifier
Collaborate[ion]	ability to work effectively and respectfully with diverse teams, assume responsibility for collaborative work, and value the individual contributions by each team member and demonstrate a willingness to be helpful
Communicate[ion]	articulate thoughts and ideas effectively using oral, written, and nonverbal communication skills in a variety of forms and contexts, listen effectively to decipher meaning and communicate effectively in diverse environments (including multilingual)
Creative[itv]	ability to think creatively, work creatively with others, and implement innovations, formulate ideas, brainstorm, elaborate, refine, analyze, and evaluate own ideas
Critical Thinking	ability to reason effectively, analyzing and using the tools of systems thinking, making judgements and decisions, identifying, defining and solving authentic problems and essential questions, collecting, assessing, and analyzing relevant information and reflecting critically on learning experiences, processes and solutions

Table 3

Source: enGauge 21st century skills for 21st century learners: Literacy in the digital age (2003). Retrieved from http://pict.sdsu.edu/engauge21st.pdf

21st Century Skill	Identifier
Collaborate[ion]	teaming, collaboration, interpersonal skills, personal, social, and civic responsibility
Communicate[ion]	interactive communication, adaptability
Creative[itv]	self-direction, curiosity, creativity, and risk taking, ability to produce relevant, high-quality products, adaptability and managing complexity
Critical Thinking	higher-order thinking and sound reasoning, prioritizing, planning, and managing for results

Appendix H

Email to Respondents with website Links to Survey Monkey to Critique Curriculum of United States

Thank you for your time and participation with my research study. Attached is a form titled 'Synonyms and Related Terms' – this document includes identifiers from three different sources that define the linguistic meaning of the 21st century skills of Collaboration, Communication, Creativity, and Critical Thinking.

The survey links below include copied curriculum standards from Finland and Singapore's national curriculums; each question in the survey represents a standard. As the expert, you are to analyze and provide your feedback regarding the occurrences of *Collaboration*, *Communication*, *Creativity*, *and Critical Thinking* skills embedded within the curriculum standards. This is done by referencing the attached spreadsheet titled "Synonyms and Related Terms". In other words, you will reference the Synonyms and Related Terms document while completing the survey.

There are four surveys included in this email. The surveys will include 10 curriculum strands and should take approximately 15 minutes to complete. I appreciate the time you have taken to review the materials and complete the surveys. You can retract your participation at any time by emailing me. If you have any questions, concerns, or suggestions regarding this study feel free to contact me at 618-616-7027 or tmoore@lindenwood.edu

United States Common Core – Part I
https://www.surveymonkey.com/r/Q9KTYQG

United States Common Core – Part II
https://www.surveymonkey.com/r/Q92JQXK

Tammy T. Moore, MBA
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Vitae

Tameka “Tammy” Moore was born and raised in East Saint Louis, Illinois. She graduated from East Saint Louis Senior High School in 1995. As a single mother, Mrs. Moore was unsure as to which professional path in life to take; therefore, she attended Coiffure School of Cosmetology in Belleville, Illinois, and became a licensed Cosmetologist in 1996. Mrs. Moore enjoyed several years in the Cosmetology profession and later decided to return to school to pursue a business degree. Tammy completed a Bachelor of Arts degree in Business Administration and received the high honor of magna cum laude in 2009 from Lindenwood University. Mrs. Moore continued her educational quest and completed her Master of Business Administration degree in 2010 from Lindenwood University. She currently resides in Fairview Heights, Illinois, with her husband, Carlos, and her children, Ariah and Christopher. Mrs. Moore plans to graduate from Lindenwood University with a doctorate in Educational Leadership in May 2016.