Spring 4-6-2018

Best Practices in 21st Century Learning Environments: A Study of Two P21 Exemplar Schools

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A Dissertation by

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Submitted in partial fulfillment of the requirements for the degree of

Doctor of Education in Organizational Leadership

April, 2018

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ACKNOWLEDGEMENTS

This journey and dissertation would not have been possible without the love and support from my friends, colleagues, and especially my family. To my husband, Dan and daughters, Kimber and Kylie, whether from across the room, or across the country you have been my cheerleaders; supporting and encouraging me with just the right words, just when I needed them most. Dan, thank you for your patience, putting up with late nights, early mornings, quick meals, and even occasional late night tech support when things went awry. Your love and support mean more than I can say.

I am eternally grateful to my chair, Dr. Jeff Lee, for motivating me to dig deep to truly make a difference with this work. Thank you for setting high expectations while providing continued guidance, feedback, and research insights. The entirety of this dissertation would not be the caliber it is without the background and expertise of my entire committee bringing perspective and meaning. Thank you, Drs. Lee, Capellino, and Greenberg.

This journey was made all the more enjoyable by my partners in crime, Britta and Michele, as we went through this venture together led by our amazing mentor, Dr. CMO, who guided us, kept us all grounded, and occasionally led therapy sessions.

Finally, I would like to thank all the staff and study participants in the schools at the center of this study. This study truly would not exist if it weren't for your hospitality and willingness to share your stories. Words cannot express my gratitude to Dr. Helen Soulé whose support for this study helped me connect with these amazing P21 exemplar schools. My sincere hope is that the findings and implications in this study bring

additional meaning to the essential work of organizations like P21, in creating 21st century learning environments for all students.

ABSTRACT

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by Susan Brown

Purpose: The purpose of this phenomenological study is to identify and describe best practices related to 21st century skill development in two elementary schools outside of California that have been recognized as exemplary by the Partnership for 21st Century Learning (P21).

Methodology: This qualitative phenomenological study sought to investigate and understand the experiences of those associated with the phenomenon of exemplar schools, namely teachers, staff and parents in these elite elementary schools, as the elementary level sets the foundation for 21st century learning. Two schools were selected for the study based on the criteria that they had been identified as exemplary by P21, were public elementary schools, and were located outside of California. Teachers, staff, and parents at these two schools, were randomly selected for focus group interviews. Data were collected, analyzed and triangulated between interview data, observations, and review of artifacts.

Findings: Following data analysis, and a review of the prominent themes, five findings emerged as significant. First, learning experiences are intentionally designed to be integrated throughout. Second, a focus on developing agency is intentional for both students and teachers. Third, relationships exist across the school community. Fourth, learning experiences extend to the world beyond the walls of the classroom. Finally, leadership promotes a culture of inquiry and innovation.

Conclusions: Based on the findings of the study, four conclusions were drawn regarding best practices in exemplar schools. First, learning experiences in these schools intentionally integrated lesson design, content, application of 21st century skills, agency and evaluation, rather than teaching and testing skills in isolation. Second, relationships are fostered and perpetuated through meaningful partnerships where a clear vision for the school is mutually shared. Third, authentically engaging students in community and global opportunities beyond the classroom promotes global learners. Finally, school and district leaders who promoted innovation and experimentation, created a culture of growth mindset and adaptability to change.

Recommendations: This study emphasized best practices in public elementary schools recognized as exemplary by P21. Further research is recommended to identify best practices in other P21 school models, such as multi-level, early learning, charter schools, and those with diverse populations.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I: INTRODUCTION

Change is inevitable. Centuries ago, Columbus disrupted a commonly held belief that the world was flat when he set out to explore shorter trade routes to Asia. Inadvertently, he proved that the world was round with continents separated by vast oceans, and forever changing the previous belief of the world being a contiguous flat surface. Recently, however, authors such as Friedman and Mandelbaum (2011) highlight a phenomenon resulting from modern technology and globalization; the world is once again contiguously connected, or flat (Burrus, 2014). Advancements in technology have also made possible the creation of new careers, requiring prospective employees to possess competencies beyond compulsory reading, writing and arithmetic. Schools, then, are now tasked to prepare students for these new competencies, prompting various educational organizations to help cultivate the development of these 21st century skills in the educational system and showcase examples of model programs (Aragon, 2015; Brown, 2014).

Advances in technology, specifically computers and digital networks, enable people in almost any part of the world access to information across the globe almost instantly contributing to a global society, also referred to as globalization (D. Miller & Slocombe, 2012; A. Ross, 2016). This shift to globalization and digital technology have significantly changed the way industries do business, for example businesses with global presence may have internationally based teams collaborating in virtual environments. Consequently, the skills, or competencies, that businesses demand from prospective employees have changed from the traditional factory based skills of the past, to non-cognitive competencies that include innovation, collaboration and perseverance (Kivunja,

2015). Notwithstanding this demand, employers report that students leaving the school system and entering the workforce are ill equipped with the skills, including technology, innovation, and other "soft-skills", that employers are seeking (D. Gordon, 2011; Zhao, 2015a). Further, due in part to the exponential rate at which technology is advancing, many low-skill jobs are being replaced or automated by technology. It is estimated by 2020, there will be a disproportionate distribution of jobs to workforce with an expected 122 million high skills jobs available, however, only 55 million workers qualified to fill them (Achieve Inc., 2012; Casner-Lotto & Barrington, 2006).

The education system is being tasked to fully prepare students not only with academic knowledge, but also with 21st century skills required by potential employers. Organizations such as Partnership for 21st Century Learning (P21) have developed frameworks to define and illustrate the key subjects and competencies needed by students to be ready for the 21st century workforce (Trilling & Fadel, 2009). Competencies detailed in the P21 Framework include academic knowledge framed within the context of the rigorous state academic standards, and interdisciplinary themes such as financial, global and environmental awareness that employers have indicated are important (Partnership for 21st Century Learning, 2015). Moreover, the P21 framework identifies the 21st century competencies, some of them soft skills, employers identified as essential in the future workforce such as learning and innovation skills, technology skills, and life and career skills (Partnership for 21st Century Learning, 2015).

Advancements in technology that have contributed to a "flat" globalized economy, are resulting in business models that incorporate diverse teams working from various parts of the world on a common project, connected through virtual technology. This

evolving convention creates the urgency for schools to develop 21st century skills such as global awareness, communication, and technology skills in order to perspicaciously work in international teams, connected from all parts of the globe, through technology (A. Ross, 2016). Finally, P21 created the Exemplar Program with the intention of providing a model to schools, communities, and policymakers, to showcase schools that have been successful implementing the 21st century skills framework serving as a model to other schools intending to transform their school (Brown, 2014).

Background

Changes in the 21st Century Workplace

Change is inevitable. Significant change in an organization occurs in response to some catalyst in the environment or marketplace (Anderson & Ackerman Anderson, 2010). Technology has created a catalyst for change affecting the workplace. Recent technological advances have created three conditions: first, technology is evolving at an exponential rate perpetuating new technologies and new jobs; second, advances in technology are enabling globalization; third, globalization and new jobs are creating the need for a new skill set in the future workforce.

Advances in Technology Perpetuates Changes in Jobs

When the first computers were created in the mid-1900's, they were bulky, relatively slow and only capable of simple calculations. Since then, Moore's Law has held true with the actualization that computers have gotten significantly smaller, faster and smarter (Ceze, Hill, & Wenisch, 2016). Within the last decade alone, computer processing power had increased exponentially, bandwidth for internet access has increased to speeds previously thought unobtainable, and storage capacity is now

utilizing nanotechnology and cloud networks making memory almost limitless (Burrus, 2014). Each new innovation in technology, has further perpetuated the creation of additional developments and applications such as carbon nanotubes that improve performance in 3D applications, and quantum computing that speeds up traditional computer algorithms exponentially (Ceze et al., 2016). Utilizing advanced components, IBM created "Watson", an advanced supercomputer equipped with artificial intelligence, capable of learning, and interacting with people (Nelson & Simek, 2016).

This advanced digital capacity has allowed the world's innovators to create innovative applications using these sophisticated technologies that enhance productivity in the workplace and life. For example, computers with word processing capabilities and speech recognition have replaced the traditional typewriter, introduction of computerized medication dispensaries have reduced the incidents of patients receiving incorrect medications or dosages. Similarly, robots that complete repetitive tasks have replaced the number of workers needed on assembly lines, and 3D printers are capable of manufacturing customized parts and even clothing at reduced costs (Viltard, 2016). The result has led to an elimination of some jobs that have been replaced by technology, such as automobile assembly line workers. In addition, some restaurants are now implementing kiosks for ordering in lieu of a human order taker (Burrus, 2014). Furthermore, a growing concern exists in the legal world that Watson's younger generation, ROSS, programed and launched in the legal realm, will eventually replace paralegals and threaten the livelihood of practicing attorneys (Nelson & Simek, 2016). Despite the jobs replaced, new jobs have also been created as a direct result of these technologies, such as alternative energies engineer, cloud architect, commercial drone

operator, cyber-security management, and information forensics (Burrus, 2014). Engineers and web app developers will continue to increase in demand as applications such as Google, Skype and Siri continue enhancements and gain popularity (Friedman & Mandelbaum, 2011).

Technology Enables Globalization

Advances in technology have paved the way for a globalized society. Friedman and Mandelbaum (2011) assert that the information technology (IT) revolution and globalization are directly connected and are impelling each other forward. The invention of the computer and the connection of the internet allowed people to communicate within major hubs of the world. Eventually, technology improved becoming less expensive and easily obtainable. Equally important, improvements in connectivity have allowed internet connections in remote, previously disconnected locations. Given this new level of access, people from almost any part of the world have the ability to instantly connect with almost anyone else in the world, at any given time (Schwab, 2016).

In the traditional business model, commerce was limited to local regional areas based on pragmatics. Due to the global interconnectedness, the world is flat, once again (Burrus, 2014; Friedman & Mandelbaum, 2011). Not only are people of the world communicating with each other, entrepreneurs have seized on this new opportunity to expand capitalism, with endless borders and boundaries, changing the traditional business model forever (Chareonwongsak, 2002; Viltard, 2016). New technologically based businesses such as Amazon, eBay and Uber are becoming the norm for consumers (Sheninger & Murray, 2017). Additionally, technology is allowing companies real-time responses connecting brands with consumers, such as coupons that appear on a users'

smartphone as they pass their favorite store (Viltard, 2016). Finally, due to the interconnectedness of technology, business models defy borders. EndoStim is one such model of a global company wherein immigrants from Cuba and India, created a company in Missouri, U.S., that develops medical equipment manufactured in Uruguay, with the help of engineers in Israel and doctors in the United States, India, Europe and Chile (Friedman & Mandelbaum, 2011). This changing business model creates implications in the education system requiring a redesign of what is being taught, and how, in order to equip students with the skills necessary to survive in the future global economy (Fadel, 2015).

Technology Changes Skills Required by the Future Workforce

Much has been published pertaining to the changing skills that will be needed by the future workforce linked to advancements in technology and globalization, referred to as 21st century skills (Achieve Inc., 2012; Burrus, 2014; Casner-Lotto & Barrington, 2006; Schwab, 2016; Zhao, 2015b). Globalization and technology have forced a shift away from simple manufacturing industries, to more technology based and international enterprises (Friedman & Mandelbaum, 2011). As such, employers are looking for employees with commensurate skills, such as collaboration, critical thinking, and innovation (Kivunja, 2014). Current business models, convene teams of people collectively innovating and solving problems. Consequently, the top competencies employers considered valuable included: work ethics, teamwork and collaboration, communication, critical thinking and reading comprehension (Casner-Lotto & Barrington, 2006). Equally important, to perpetuate the continued development of future science and technology, corporations are demanding employees who are highly

creative, and innovative, with the ability to work in collaborative environments engaging in problem solving ventures (Schwab, 2016). Finally, in order to function effectively in an internationally globalized work environment, corporations desire a workforce to be knowledgeable about the world with cultural and social awareness and sensitivity to diversity (Hallissy, Butler, Hurley, & Marshall, 2013; Trilling & Fadel, 2009).

By the year 2025, forecasters estimate there will be as many as 20 million jobs without qualified people to fill them (Achieve Inc., 2012; Casner-Lotto & Barrington, 2006; E. Gordon, 2013). Two primary factors are attributed to this phenomenon. First, technology is developing at an exponential pace, commensurately transforming jobs and creating new jobs, pertaining to these new technologies and their applications. This development has necessitated a need for a significant transformation in the education system to prepare students with technological and applied skills beyond basic reading and math, such as flexibility and perseverance, to be equipped for future jobs yet to be created using technology that has not been invented (Bevins, Carter, Jones, Moye, & Ritz, 2012; Burrus, 2014; D. Gordon, 2011). Information has become a commodity, Google knows all (Robinson & Aronica, 2015; TED, 2016). What matters in education is that students know how to discern information readily available, and how to apply it (Kay, 2010). Second, students have not been achieving to the degree of their international counterparts as evidenced by the latest results of the Programme for International Students Assessment (Organisation for Economic Co-operation and Development) which measures student's ability to approach and solve complex, project based problems. The most recent 2015 PISA results indicates students in US schools ranked 19th in science, 20th in reading and 31st in mathematics, demonstrating that US students are not prepared for complex, real-

world problem solving (Organisation for Economic Co-operation and Development, 2016). Much criticism has come from the corporate world that the education system has been slow to implement the required reforms, to prepare students for these 21st century competencies (Achieve Inc., 2012; Bevins et al., 2012; E. Gordon, 2013). Instead, traditional educational systems are continuing to prepare students for jobs that will no longer exist in their future (Burrus, 2014).

21st Century Education

Transition from Industrial Models to Informational Age

The original purpose of formal, public education was to impart knowledge on youth to learn basic, agricultural, and workplace knowledge eventually producing functional adults in society (Kelting-Gibson, 2013; Kivunja, 2014; Norman & Moorhouse, 2012). To meet the agricultural needs of the time, the school calendar in American schools was based on the Agrarian calendar with time off during the day and year to allow children to help with harvest, and farm chores (Scott-Webber, 2012). As the country neared the "industrialized" economy, a more standardized education was thought necessary, leading to a prescribed curriculum focused on basic core concepts in reading, writing and mathematical calculations to create a standardized workforce with basic knowledge (Kivunja, 2014; Norman & Moorhouse, 2012). The industrialization of education mimicked a factory assembly line, with students packed in classrooms, teachers reciting the same "one-size-fits-all" curriculum, then moving students down the assembly line to the next content expert, and through the compulsory grades as efficiently as possible (Scott-Webber, 2012). Today, most schools still implement this standardized structure with curriculum focused on the 3Rs (D. Gordon, 2011), using techniques of

mass production like those in the Industrialized era, and still based on an Agrarian calendar; echoing schools much like those of a hundred years ago (Norman & Moorhouse, 2012; Scott-Webber, 2012).

Business leaders and educational researchers are calling for a transformation in education from the standardized Industrial model of education where all learners are exposed to uniformed experiences, to an "inquiry" system that develops critical thinking and challenges the learner to take a more active role in their learning experiences (Hallissy et al., 2013; Kivunja, 2014; Robinson & Aronica, 2015). It is no longer sufficient for schools to teach in the traditional model about the current world, since the world is changing at such a rapid pace (Sheninger & Murray, 2017). The 21st century demands that learners be more creative, collaborative and flexible. The rapid advancement of technology requires new skills such as adaptability and innovation for businesses to keep up and compete in the global economy (Schwab, 2016). Schools need to foster the ability to collaborate, adapt, and innovate to equip students with some of the 21st century skills they will need to survive in the future era (Trilling & Fadel, 2009), or as some refer to the 21st century as, the Knowledge Age (Friedman & Mandelbaum, 2011; Kivunja, 2014).

21st Century Skills

In the Knowledge Age, the imperative for schools is to prepare students with the 21st century skills that will equip them to be competitive for jobs in the future (Kivunja, 2014). This requires schools to shift from simply teaching the standard 3Rs: reading, writing and arithmetic; to the integration of the 3Rs with the 4Cs of 21st century skills: creativity, critical thinking, collaboration, and communication (D. Gordon, 2011). The

establishment of Common Core State Standards (CCSS) in 2010, provided the foundation for internationally benchmarked, rigorous content standards that would facilitate the integration of the 4Cs during instruction. (Brusic & Shearer, 2014; Demski, 2013; Harris & Rodriguez, 2012; Partnership for 21st Century Learning, 2011; Soulé & Warrick, 2015). Literature pertaining to 21st century skills does not emphasize any particular skill over another. Nevertheless, Soulé and Warrick (2015) suggest that the most important of the 21st century skills is creativity as it cultivates brainstorming and innovation. Conversely, November (2010) posits that collaboration is the most critical as it prepares students to work in a global team setting. Additional 21st century skills recognized by many, such as P21, include competencies as technology skills, information literacy, initiative, and adaptability which have been emphasized by business leaders as essential (Partnership for 21st Century Learning, 2015; Trilling & Fadel, 2009).

To adequately prepare students for 21st century skills in school and beyond, requires a transformation in how instruction is delivered (A. Ross, 2016; Sheninger & Murray, 2017). Because of the ubiquitous nature of technology, 21st century tools, such as information and communication technology (Mosley, 2012), must also be integrated as a natural part of instruction (Hallissy et al., 2013; Partnership for 21st Century Learning, 2015; Voogt, Erstad, Dede, & Mishra, 2013). In 2016, ISTE revised technology standards, with the intention of fostering student's technical advantage to remain competitive in the workforce due to the influence of technology in the workforce (International Society for Technology in Education, 2016). Integrating technology in the classroom is essential as it allows students new and innovative opportunities to express their learning that did not previously exist, such as presenting digital content to a global

audience (Brown, 2014; Enyedy, 2014; Hallissy et al., 2013; Soulé & Warrick, 2015). Technology can help fill achievement gaps, and encourages student agency over their own learning; a concept that could be intimidating to some educators (International Society for Technology in Education, 2016). However, the concern is that the access to technology is disproportionate to what it should be (Sheninger & Murray, 2017).

Students today have grown up in an environment immersed in technology, where access to technology in life is the norm (Dunkle, 2012). Technology has changed how we communicate, and how we interact with information. Yet, a disconnect exists in how technology is leveraged for instruction in schools to engage students and support 21st century learning (Sheninger & Murray, 2017). Schools must leverage technology in instruction to equip students with the digital skills necessary to be competitive in the 21st century workforce (D. Gordon, 2011). Further, Gordon (2011) quips about asking a person who says they love technology but rarely use it, stating that person must be a student or a teacher.

Frameworks

Partnership for 21st Century Learning. When discussing 21st century skills, many of the references ascribe to the work of the Partnership for 21st Century Learning (P21) (Brusic & Shearer, 2014; Hallissy et al., 2013; Kivunja, 2014). P21 was created as an advocacy coalition comprised of educators, business leaders, and policy makers to identify and promote 21st century skills. The P21 Framework was developed around student outcomes and support systems. At the core are academic subjects and 21st century themes, such as globalization. Equally important, are life and career skills, information, media and technology skills, and learning and innovation skills which

include the 4Cs. Much of the existing literature references the 4Cs; communication, collaboration, creativity, and critical thinking, as the core of the 21st century skills (Brusic & Shearer, 2014; Kereluik, Mishra, Fahnoe, & Terry, 2013; Soulé & Warrick, 2015).

Deeper Learning Framework. Additional literature from organizations such as Alliance for Excellent Education and Students at the Center, offer a commensurate version of 21st century skills in what they term "deeper learning" (Alliance for Excellent Education, 2011; Heller & Wolfe, 2015). Deeper learning references 21st century skills such as collaboration and problem solving, however, the literature typically references deeper learning in the context of active learning such as inquiry, and project based learning (DeNisco, 2015; Heller & Wolfe, 2015).

Future Ready Schools Framework. Future Ready Schools has been recognized by the United States Department of Education, Office of Technology as the model for incorporating technology into 21st century education. Personalized learning for students and teachers that capitalizes on technology is at the center of the Future Ready Framework. The framework is designed around gears: logos that represent essential characteristics of future ready learning including curriculum, professional development, infrastructure, use of time and space, budget, and community partnerships ("Future ready frameworks," n.d.).

P21 Exemplar Schools Program

Much is known about 21st century skills (Trilling & Fadel, 2009), and much is known about leveraging technology in the classroom to prepare students for the digital skills of the future (A. Ross, 2016). In contrast, a disconnect exists in classrooms today actually integrating 21st century skills, technology, and engaging the real world in

instruction (Bellanca, 2016). A majority of classrooms are still cemented in the traditional Industrial pedagogy based on traditional textbooks, and worksheets (Bellanca, 2016; Kivunja, 2014). What is needed are models of schools successfully implementing 21st century instruction as it would appear in the real world, that can serve as exemplars for other schools desiring to make this transformation (Brown, 2014).

In response to calls from the education community, the Partnership for 21st Century Learning (P21) created the Exemplar Schools program for the purpose of providing a model and disseminating information about schools effectively implementing components of the P21 framework and preparing students with 21st century skills (Brown, 2014; Hallissy et al., 2013; Partnership for 21st Century Learning, 2015). Currently, 79 schools (early learning center, preschool, elementary, middle and high), 14 school districts, and 4 beyond school programs have been identified as exemplar by P21. Schools can self-select specific 21st century topics of focus to showcase themselves, such as Critical Thinking, Creativity, Leadership, Technology, and Global Awareness (Partnership for 21st Century Learning, n.d.). Once identified and validated, successful schools and districts are highlighted, and their successes detailed to provide insights and models of 21st century learning (Brown, 2014).

Any school or district in the United States can self-nominate, or nominate other PK-12 schools or districts through a rigorous application accompanied by supporting documentation or media, which is scored against a detailed rubric in the initial evaluation process. Schools and districts with successful applications, progress to the next phase and have their programs reviewed and validated by an on-site evaluation team before they can finally be called “exemplar” (Partnership for 21st Century Learning, n.d.).

Finally, these schools, representing all levels and various demographic configurations, can then serve as models for other schools in their transformational journey to create 21st century learning environments (Brown, 2014).

Summary

There is a well-documented urgency to prepare students with the knowledge and skills to enter the 21st century workforce ready to fill the anticipated job vacancies (Finneran, 2015; Rugaber, 2017; Schwab, 2016). A plethora of literature exists detailing 21st century skills relevant to education, there is much known about 21st century skills, and an urgency to transform educational practices to meet the demands of 21st century learning. Organizations such as P21 have sought to highlight and publicize schools and districts successfully implementing the 21st century learning framework as a model through the Exemplar Schools Program. However, as the Exemplar Schools Program is relatively new, not much is known about the causal relationship of the best practices employed by exemplar schools. Understanding the best practices these exemplar schools contribute to their success in becoming exemplary schools will provide insights and implications for transformation to 21st century learning environments.

Statement of the Research Problem

Change is inevitable. Approximately six billion smartphones not only make phone calls, but also connect their users instantly to a plethora of information via the internet, then become a device for networking and sharing information across the globe (Friedman & Mandelbaum, 2011; Trilling & Fadel, 2009). Traditional business models have changed giving rise to globally based, cloud connected companies such as Amazon, Uber, and Airbnb. Advancements in technology have enabled and encouraged the

existence of an interconnected global society and changing workplace, requiring that today's students, tomorrow's workforce, be equipped with a skillset that had been unprecedented previously. Some of these skills include the ability to collaborate with individuals through physical and virtual modalities while taking into account cultural diversities, the ability to communicate effectively in variety of formats and purposes, as well as the skills to adapt to new technologies that may capitalize on the ability to innovate and create the future (Gratton, 2011). Consequently, employers are now seeking prospective employees who are equipped with 21st century skills; who possess the flexibility and adaptability to work with rapidly changing technology, globally collaborative teams, to create new and innovative solutions to a variety of problems (Schwab, 2016). In contrast, however, business leaders are having difficulty finding adequately prepared employees, concerned that students coming out of the K-12 educational system are "woefully unprepared" to succeed in the workplace (D. Gordon, 2011; Rugaber, 2017).

The urgency to prepare students with the skills they need for the future is forefront to insure the US economy will stay competitive in the global market (Bellanca, 2015). The imperative is then placed on schools to fully equip students with the 21st century skills, including and beyond basic academic knowledge needed for the future (Casner-Lotto & Barrington, 2006; Friedman & Mandelbaum, 2011). Nevertheless, with all that is known about 21st century learning, the education system as a whole has made little growth (E. Gordon, 2013).

Many studies have been conducted relative to 21st century skills, and their impact towards the larger global picture of preparing students for the future (Fisher & Frey,

2010; Trilling & Fadel, 2009). Some studies have examined schools implementing 21st century skills, specifically high schools, charter schools, and teacher perceptions of teaching 21st century skills (Cho, 2012; Hillman, 2012; S. Miller, 2016). In 2013-14, P21 developed the Exemplar School Program for the purpose of showcasing schools that have gone through a rigorous review and been validated by P21 as effectively implementing components of the P21 framework (Brown, 2014). However, no quantitative studies could be found that address the causal relationship of P21 exemplar elementary schools. Only one qualitative study could be found that explores the specific best practices used by P21 exemplar schools of two elementary schools in California that contributed to their success with 21st century skills (Wilbert, 2016). No studies could be found that explore best practices of P21 schools outside of California. Considering that the P21 Exemplar Schools program is relatively new, a gap exists in the literature of studies that focus on the specific best practices of exemplar schools outside of California that contributed to their success in addressing 21st century skills.

Purpose Statement

The purpose of this qualitative phenomenological study is to identify and describe best practices related to 21st century skill development in two elementary schools outside California that have been recognized as exemplary by the Partnership for 21st Century Learning (P21).

Research Question

One central research question guided this study: What are the best practices used in elementary schools identified as exemplary by P21?

Significance of the Problem

Change is inevitable. The phenomenon of advancements in technology contributing to changes in the workplace and globalization has been the impetus for business leaders to demand that schools focus on a different set of competencies for the workforce of the future; 21st century skills (Fadel, 2015). Additionally, the workplace is changing as technology becomes embedded in routine tasks (A. Ross, 2016). Subsequently, there are significant implications for the education community. The traditional education system is based on the mass production of students all with a similar skill set required during the Industrial Revolution (Zhao, 2015a). A predominance of schools are still utilizing this pedagogy educating today's students (Kivunja, 2014). This study will add to the literature pertaining to 21st century skills in education. Specifically, this study fills the gaps in the literature describing the best practices used by P21 exemplar elementary schools that contributed to their success in developing 21st century skills in students.

This study is significant in the following four ways. First, this study augments the body of knowledge pertaining to practical teaching practices that facilitate 21st century skills employed by current classroom teachers and schools. 21st century skills have been ruminated since the turn of the current century with educational experts asserting the significance of transforming educational pedagogy to build these competencies in students (Bellanca, 2015). It is time to move from vision to action integrating and teaching 21st century skills (Kay, 2010). This study is significant by highlighting best practices of schools successfully integrating 21st century skills, contributing to the literature regarding teaching 21st century skills.

Technology has become ubiquitous in society and is a prevalent topic in education. The second significance of this study identified best practices that pertain to the integration of technology in education as a significant 21st century skill. Frameworks and standards for technology, such as ISTE standards, have been updated to enhance the facilitation of 21st century skills in concert with technology (International Society for Technology in Education, 2016). Leveraging the use of technology in instruction can foster an environment of personalized learning and student agency, which can be significant in closing achievement gaps and engaging students (Sheninger & Murray, 2017). This study can inform literature with models of these frameworks and standards in action in exemplar schools.

Third, this study provides information to contribute to the knowledgebase for policy makers as policies and regulations are considered pertaining to 21st century learning. Policymakers have advocated the reform of educational systems which will foster improved achievement of students in U.S. schools, however, some of those policies have reduced resources and implemented sanctions that promote practices maintaining the status quo such as No Child Left Behind, and Race to the Top (Darling-Hammond, 2011). In contrast, it comes to question if reforms in education are enough, in lieu of significant paradigm shift in policy and practice to transform education (Zhao, 2015b). With the dismal results of the most recent PISA assessment, congressional discussions are being convened regarding the importance of 21st century skills in education (D. Ross, 2017). This study could have significance in that conversation by contributing to the literature of relevant studies pertaining to best practices of 21st century skills, such as literature shared in congressional presentations by the 21st Century Skills Caucus.

Finally, this study is a significant contribution early research done by P21 on exemplar schools. An early pilot study, conducted by P21, of the original 25 exemplar schools looked for similarities of practices used by exemplar schools revealed five themes in exemplar schools: student agency, distributed leadership, a climate of achievement, engaged community, and research and evidence. However, recognizing the exemplar program is new and evolving, a larger sample was recommended as more information is learned from a larger sample of exemplar schools (Brown, 2014). This study focused on best practices of exemplar elementary schools and is significant as the data adds to existing published works on exemplar schools; conclusions drawn from this study are significant in advancing the work of Brown and others.

In summary, P21 designed a framework and identified exemplar schools for the purpose of identifying key 21st century competencies and learning environments students need to be successful in school and beyond (Partnership for 21st Century Learning, 2015). This study will contribute to the scant body of knowledge by identifying best practices used by exemplar elementary schools and thereby, providing a model for other elementary schools desiring to transform to 21st century learning environments.

Definitions

21st Century Skills: The blend of content knowledge, specific skills and literacies students need to be successful in work and life (Partnership for 21st Century Learning, 2015).

Agency: A learner's capacity to empower, or exert one's own choice and influence, in the learning process (Sheninger & Murray, 2017)

Coding: The process of problem solving that combines logic with the way computers think (International Society for Technology in Education, 2016).

Collaboration: A activity that involves individuals working in a coordinated, synchronous effort towards a common goal or to solve a problem (Plucker, Kennedy, & Dilley, n.d.).

Communication: The effective use of oral, written and nonverbal cues to convey thoughts and ideas in a variety of formats, for a range of purposes (Trilling & Fadel, 2009).

Creativity: The ability of a group or individual to process and techniques to produce something that is both novel and useful in a given context (Plucker, Kaufman, & Beghetto, n.d.).

Critical Thinking: The cognitive ability to effectively analyze, interpret, evaluate, and synthesize information to draw conclusions or produce outcomes (Trilling & Fadel, 2009).

Exemplar School: A school that has successfully completed the application process, and has been validated as demonstrating a transition to 21st century learning environment based on the P21 Exemplar Evaluation Tool (Partnership for 21st Century Learning, n.d.).

Globalization: The interconnectedness and free movement of information, goods, services, capital and people across national borders (Friedman & Mandelbaum, 2011).

Learning and Innovation Skills: Competency with higher order cognitive functions required for students to become effective lifelong learners (Partnership for 21st Century Skills, 2007).

Life and Career Skills: Akin to "soft skills", these are the personal and interpersonal skills that encompass emotional intelligence, enabling more harmonious and productive interactions in society (Partnership for 21st Century Skills, 2007).

Partnership for 21st Century Learning: A coalition of business, education and policy-makers whose mission is to guide policy that supports the development of 21st century skills and learning environments in the education system (Soulé & Warrick, 2015).

Delimitations

Delimitations are those decisions made and controlled by the researcher that provide the boundaries of the study (Patton, 2015). This study is a replica study of P21 exemplar elementary schools, and as such has similar delimitations to the original study (Wilbert, 2016). Considerations of delimitations in this study were confined to (a) school characteristics, elementary schools having been recognized as exemplar, and (b) geographical location, those that reside outside the state of California.

The original study included two P21 exemplar elementary schools, as this study intends to replicate. Creswell (2007), affirms the purpose of qualitative research is collect rich, meaningful data, not to generalize information. Consequently, sample sizes can be much lower in qualitative research than in quantitative. Currently, there are 79 schools in the P21 Exemplar program, 17 of which are elementary schools. Of those elementary schools, two exemplar elementary schools in California were included in the

original study. The focus of this study is schools outside California, therefore, the remaining 13 schools became the target population, from which the final two were randomly selected.

Organization of the Study

This study is organized into five chapters. Chapter I provided a background to delineate the problem, and describe the purpose of the study and research question. Chapter II examined the literature pertaining to advances in technology, changes in the workplace, 21st century skills, 21st century learning environments, and exemplar schools. Chapter III detailed the methodology to be employed in this replica study, including population and sample selection. Chapter IV described findings of the study. Chapter V provided an interpretation, conclusions, and recommendations from the study.

CHAPTER II: REVIEW OF THE LITERATURE

Change is inevitable. The Digital Revolution, the Information Age, or the Fourth Industrial Revolution; despite the term used, the incontrovertible fact is that technology is changing the way people live, interact, and work (A. Ross, 2016; Schwab, 2016). Chapter I provided a cursory review of background information to frame the problem, significance of the study and research question. This chapter begins by exploring the impact of technology in shaping and transforming the workplace, which leads into a discussion of the changing skillset employers seek as a catalyst prompting a transformation in how schools are currently preparing students for the future workforce. Specific 21st century skills and frameworks designed to respond to the competencies employers demand for a changing workforce will be discussed. Finally, the P21 exemplar program is highlighted demonstrating model schools deemed successful in transforming their practices, and effectively preparing students for the future with the 21st century skills needed for life and work.

Purpose Statement

The purpose of this phenomenological study is to identify and describe best practices related to 21st century skill development in two elementary schools outside California that have been recognized as exemplary by the Partnership for 21st Century Learning (P21).

Research Question

One central research question guided this study: What are the best practices used in elementary schools identified as exemplary by P21?

Review of the Literature

From the Stone Age, to the Industrial Revolution, to the Digital Revolution, change is inevitable (Schwab, 2016). Capitalizing on profound advancements in technology such as cloud computing, nanotechnology, and artificial intelligence (AI), industries are compelled to adapt evolving technology to improve their product or services to humankind, ultimately resulting in substantial changes to how, where, and when work is performed (Burrus, 2014; Schwab, 2016). Additionally attributed to the ubiquitous nature of technology, is the connectedness of society resulting in the phenomenon of globalization, wherein countries across the globe are instantly connected in life and work further perpetuating the need for a workforce that is multiculturally astute (A. Ross, 2016). Considering the role of the education system is to prepare students for the future workforce, the need for schools to transform their practices is imperative for the country to maintain a competitive edge globally (Trilling & Fadel, 2009). However, a review of the current literature results in a resounding consensus that the education system is falling perilously behind other countries in the changes needed to stay globally competitive (Fadel, 2015; Friedman & Mandelbaum, 2011; Norman & Moorhouse, 2012; Zhao, 2015b).

Changes in the 21st Century Workplace

What once seemed predictable, the path of the future has been blurred. Anderson and Ackerman Anderson (2010) describe change drivers as catalyst forces that first bring awareness of a situation or event, then force a change to occur. As far back as the Industrial Revolution at the turn of the 19th century, the creation of coal and steam power became the change drivers attributing to the creation of various coal and steam engines,

changing the landscape of work and transportation (Gratton, 2011). While these change drivers were easy to identify, the catalyst forces driving current changes in the 21st century cannot be attributed to just one factor. Instead, a combination of factors are enabling a unprecedented phenomenon of change drivers, and the impact is almost impossible to predict (Schwab, 2016). Five prominent change drivers have been identified that will influence transformation in the workplace of the future, most of which are attributed to advancements in technology to some degree; globalization, connectivity, digital technologies, convergence of technology, and social networks (Viltard, 2016). As a result, fears of mass unemployment and underemployment are being attributed to impending changes in the workplace, much as they were during the days of the Industrial Revolution (Schwab, 2016).

Advances in Technology Perpetuates Changes in the Workplace

As technology evolves, so too, will the workplace. Early technology of the Industrial Revolution transformed the way workers completed common tasks of the time such as harvesting crops and making clothing (Brynjolfsson, McAfee, & Manyika, 2014). The Digital Revolution, on the other hand, is unlike preceding eras precipitated by the rapid pace of which change is occurring, the magnitude of simultaneous changes, and the invention of completely new technologies with undefined applications (Schwab, 2016). While the exact impact of these changes on the workplace are obscure, one certainty exists; changes to the workplace are inevitable, and will be profound (A. Ross, 2016; Schwab, 2016).

Rate of change. The precise effects technology will have on the workplace are capricious. In contrast, the rate of change is predictable and suggest the trend will

continue (Kelly, 2016). Intel co-founder, Gordon Moore summarized an observation that has become known as Moore's Law in 1965 (Track, Forbes, & Strawn, 2017). Moore's Law is the observation that the density and capacity of computer circuits doubles every two years, while simultaneously reducing in size. Moore's observation translates to predictably smaller and faster computers, capable of exponentially more processing power and speed. While serving the industry as a guide rather than a natural law, Moore's Law has held true from 1965 until just recent years when standard silicon computer chips have become about as small as feasibly possible (Poeter, 2015; Track et al., 2017). Nevertheless, the industry of semiconductors has shifted its attention to exploring new materials for advanced circuits including biotechnology, forecasting the future of digital technology to be capable of processes previously unimaginable and ensuring enduring change (Track et al., 2017). Analogous to the rate of hardware, the rate of new information being generated each year is commensurate to rate of Moore's Law and is anticipated to continue for decades to come, in sizes unimaginable, producing currently unimaginable disruptive technologies (Kelly, 2016).

Disruptive technology. From personal computers to cell phones, and even the internet, technological innovations such as these were once considered disruptive technologies, yet have become ubiquitous in life and work, ultimately affecting the manner in which work is completed (Colbert, Yee, & George, 2016). Disruptive technology refers to any new technology that has become responsible for displacing existing technology, or creating a new industry altogether (Kassel, 2017). Generally, disruptive technology enhances jobs, or creates new ones altogether, for instance the creation of email has expedited interoffice communication, advancements in smartphones

have empowered mobile computing, and eventually giving birth to the industry of "app" development (Kassel, 2017). Conversely, disruptive technology can also eliminate jobs or industries altogether (Autor, 2015). Many predictions suggest a substitution from an older technology to a more sophisticated option enabled by technology (Schwab, 2016). As Stevens (2016) so eloquently states, "When society lost its horse, it gained the car. When society lost its telephone operators, it gained digital graphic designers. When it lost the VCR industry, it gained the on-demand internet and streamlining-media industry" (Stevens, 2016, p. 378). Forecasters predict future jobs and industries will continue to be profoundly affected by disruptive technologies such as robotics, artificial intelligence (AI), cloud computing and three-dimensional printing (Brynjolfsson et al., 2014; Fitzpatrick, 2016; Nelson & Simek, 2016).

Robots in the workplace. The age of robots and AI is not only eminent, it has already arrived and changing the way we live and work (Kelly, 2016; A. Ross, 2016). Prominent evidence of this can be seen on automobile assembly lines in auto factories across the country. Where human workers once dominated, automated machines and robotic arms now dominate, with relatively little human interaction (Byrnes, 2016). There is ostensible consensus in the literature evaluating the future impact of robotics on the labor market acknowledging that robots are well suited for automation of repetitive tasks, such as assembly lines, however, admonishing they are not well suited in non-routine tasks requiring a human touch such as food preparation and skilled nursing (Autor, 2015; Brynjolfsson et al., 2014; Finneran, 2015; Kelly, 2016) To challenge this notion, however, Alec Ross (2016) chronicles successes coming out of Japan in the development of home assistant and care taking robots designed for the purpose of aiding

the escalating numbers of the aging population in Japan. Population policies in Japan have led to low birth rates, translating into a shortage of human care takers as society ages. Therefore, these eldercare robots are filling this shortage, in a collaborative capacity with human care takers assisting in such things as brushing teeth, bathing, and emotional connections (A. Ross, 2016).

The concept of "collaborative robotics" is a more recent evolution having a disparate effect on jobs in which robots work side by side with humans in an assistive capacity to boost productivity (Fitzpatrick, 2016). A unique shift in workforce duties and collaboration is demonstrated in the BMW factory in South Carolina (Byrnes, 2016). In one division, the frame and metal shell of the cars are built almost entirely by robots, while the scarce remaining human workers in that section have been retrained to monitor the robot's computer banks and bring them supplies. Conversely, in the next division, humans work side by side with robots in assembly of components such as the interior and engine, also resulting in a profound change in the workplace (Byrnes, 2016). Even highly skilled workplaces, such as surgical operating rooms are not immune from being enigmatically changed by collaborative robots, as surgeons perform intricate surgical procedures with the assistance of robots such as the daVinci robot (A. Ross, 2016). Further, some researchers predict that as technology continues to advance, the robotic workforce will too, as robots attain the ability to learn on the job (Chui, Manyika, & Mehdli, 2016; Gold, 2016).

Artificial intelligence in the workplace. As artificial intelligence (AI) becomes more advanced, the implications for the workplace are significant; driving changes in the workplace, and commensurately, preparation for employees (Chui et al., 2016; Finneran,

2015). Until recently, the predominant opinion put limitations on how much of the job market, and which industry sectors, could be influenced by technology citing a computer's lack of cognitive ability as the impediment (Manyika et al., 2017b). Recent developments in AI, however, have made cognitive learning and the ability to make decisions possible for computers and robots. In 2011, the world was introduced to Watson, IBM's pivotal AI achievement, through a test of trivial intellect against notable humans on the television gameshow, Jeopardy (Nelson & Simek, 2016). Although Watson won handily, he was fallible. More importantly, however, on that day in 2011, the world experienced science history as AI lifted off the screen of science fiction, and became a reality functioning in society (Nelson & Simek, 2016).

Since Watson's debut, several progeny have been created for various industries, having an inconceivable effect on the workplace (Nelson & Simek, 2016). Watson, himself has gone to medical school and has become adept at diagnosing complex medical issues, while his son, Ross, has gone to law school becoming a foreboding paralegal. In every subsequent rendition, the more opportunities for interactions that are provided, the more each device learns and applies the learning, thereby becoming capable of making better judgements and predictions (Nelson & Simek, 2016). Consequently, vast new applications for AI are being pioneered in industries thought inconceivable for automation such as autonomous "driverless" vehicles, pharmacy dispensary, and medical diagnosis (A. Ross, 2016).

Considering the rate of technological advancements, it is difficult to predict the magnitude of impact that automation has on the workplace (Manyika et al., 2017a). One estimate predicated by the McKinsey Global Institute (MGI) is that only five percent of

jobs are subject to full automation (Manyika et al., 2017a). However, the MGI estimates approximately 60 percent of jobs could have a portion of the related tasks automated (Manyika et al., 2017a). An example of partial automation can be seen in a retail sales clerk whose tasks involving stocking merchandise could become automated, however, direct customer service interactions would not. Alternatively, a different example could be the anesthesiologist who works side by side with the robotic assistance of SEDASYS, enabling him to monitor more patients at one time (A. Ross, 2016). Ultimately, while it is difficult to anticipate specific changes to the workplace, one thing is exceedingly clear, change in the workplace is inevitable, and no industry appears immune (Autor, 2015; Brynjolfsson et al., 2014; A. Ross, 2016; Schwab, 2016). A repercussion of this inevitability, it is imperative that education commensurately change how it is preparing the workforce of the future (Burrus, 2014; Fadel, 2015; Manyika et al., 2017a).

Technology Enables Globalization

The world is once again flat. Where vast oceans once delineated separate economies around the world, technology has expedited the instantaneous connection of all parts of the world, thereby creating global businesses and a global economy (Friedman & Mandelbaum, 2011; Zhao, 2015b). Today's borders of national delineation are blurred by the imperceptible web of digital, fiber optic, and satellite networks enabling global connectivity (Viltard, 2016). For the first time in human history, people possess the capacity to instantly connect and collaborate with other people around the world (Friedman & Mandelbaum, 2011). That connectivity is perpetuating globalization through the use of connected computers, smartphones, and digital devices that have become virtually ubiquitous even in parts of the world unconnected until just recently

(Friedman & Mandelbaum, 2011). Friedman and Mandelbaum (2011) credit the merger of the IT Revolution with globalization for impacting every job and industry in some manner.

In the confluence between technology and globalization, industries are no longer bound by venerable business practices (Viltard, 2016). The traditional parameters that defined the goods, services, distribution, or location of a company have been blurred, resulting in changes to the workplace (Viltard, 2016). For example, Apple, originally a computer company, is now equally renowned for digital music players, smart phones, and app creation. Google, originally known as a search engine, has entered the autonomous car market. Connectivity is the new global imperative for businesses, allowing a flexible business model to innovate and change at a rapid pace to keep up with the changing demands of a connected, global economy as Google and Apple have done (Kolb, Collins, & Lind, 2008).

In a global economy, speed has become a requisite asset to business and industries in order to stay connected with their customers, build branding, and maintain analytics (Viltard, 2016). Commensurately, the speed of innovation is swift. Businesses that innovate, or nimbly adapt to advancing innovations and trends, are more apt to survive in a global economy (Kolb et al., 2008; Schwab, 2016). For example, precipitated on a socially connected global network, Uber became the largest taxi service in the country, but owns no taxis; Airbnb became the largest hotel chain in the world, but owns no hotels; and Netflix became the most popular movie house, but own no cinemas (A. Ross, 2016; Sheninger & Murray, 2017).

The by-product of adaptation in the global economy is an ever changing, unpredictable landscape in the workplace, requiring the workforce to be equally adaptable and flexible to change (Friedman & Mandelbaum, 2011). In fact, numerous studies of the impact of global economy on the changing workplace have come to a similar conclusion; individuals entering the workforce must have the flexibility to adapt to changing workplace environments and technologies, and additionally be equipped with perseverance, critical thinking and problem solving skills (Bevins et al., 2012; Burrus, 2014; Hallissy et al., 2013; Hilton, 2015; Zhao, 2015b).

Finally, internationally connected businesses, have given rise to internationally connected work environments and project teams (DeRosa & Lepsinger, 2010). Technology has enabled organizations to seek the best talent, or the most conducive locations, where ever it happens to be geographically, without the geographic location as a barrier (DeRosa & Lepsinger, 2010). Technology has enabled virtual teams to become more prevalent for geographically distant teams in the global economy, introducing cultural awareness as another facet of change to the workplace (Colbert et al., 2016). Cultural awareness and tolerance of diversity have historically been a secondary dynamic in the traditional workplace, nevertheless they have become imperative competencies for successful teamwork in today's internationally connected business environment (Fadel, 2015; A. Ross, 2016).

Changes Needed for the 21st Century Workforce

The world has changed, the workplace has changed, so too, have the skills needed to be successful in the future (Kay, 2010). The significance of requisit reforms are evidenced in the plethora of literature discussing the skills needed by the future

workforce in response to the changing workplace precipitated by advancements in technology and globalization (Achieve Inc., 2012; Burrus, 2014; Casner-Lotto & Barrington, 2006; Zhao, 2015b). Studies such as "Are they Really Ready to Work?" (2006), Achieve (2012) and the AMA Critical Skills Survey (2012) have compiled input from employers spanning diverse industries to gain insights on the specific skills deemed critical for the future of the workforce. The information resulting from these studies has been used to guide policy and best practices for transforming education to include instruction of 21st century skills, alongside academics, in schools (Darling-Hammond, 2010; Partnership for 21st Century Learning, n.d.).

Skills Employers and CEOs Identify as Necessary for the Future Workforce

A formidable mismatch exists between the skills employers seek versus the skills possessed by students coming their way (Myers, 2016; Wagner, 2015). A multitude of studies have been conducted surveying CEOs, managers, and human resource directors pertaining to the skills deemed pertinent for employees to possess for the future success of their organization (American Management Association, 2012; Casner-Lotto & Barrington, 2006; D. Gordon, 2011; Hallissy et al., 2013; Myers, 2016). Proficiency in core academic subjects remains high, however, "applied skills" such as adaptability, critical thinking and communication, are gaining in importance (D. Gordon, 2011). While results from individual studies may differ slightly, the resounding body of evidence suggests the skills employers deem most valuable to the future of their organization include:

- Creativity and innovation
- Critical thinking and problem solving

- Collaboration and teamwork
- Communication
- Flexibility and adaptability
- Perseverance, grit and failure
- Professionalism and work ethic

Creativity and innovation. Across the literature, creativity and innovation is ranked amongst the highest of the important skills of the future workforce, at all levels of an organization (American Management Association, 2012; Casner-Lotto & Barrington, 2006; Zhao, 2015b). The AMA Critical Skills Survey defined creativity and innovation as "the ability to see what's NOT there and make something happen" (American Management Association, 2012, p. 2). To survive in the future, businesses, industries, and even governments must continually innovate and transform their business model to stay relevant (Schwab, 2016). This exacerbates the imperative for a workforce with a creative and innovative mindset, capable of seeing possibilities to innovate products, services, or business models capitalizing on emerging technologies enabling new possibilities (Friedman & Mandelbaum, 2011; Hallissy et al., 2013).

Critical thinking and problem solving. Critical thinking and problem solving is the ability to evaluate information, apply knowledge to a given situation, and take appropriate or reasonable action (American Management Association, 2012). To think critically does not simply rely on the amount of knowledge one innately possesses, it relies on the ability to ascertain relevant information, and then know what to do with it (Wagner, 2015). Via the internet, society has access to a plethora of knowledge, creating a greater urgency to know how to discern validity of information, and how to apply it

(Robinson & Aronica, 2015). Organizations rely of the success of their employees to evaluate information and problem solve in teams, subsequently also relying on teamwork and collaboration (Casner-Lotto & Barrington, 2006). Nevertheless, organizational leaders report critical thinking and problem solving as a deficient skill amongst high school graduates (Casner-Lotto & Barrington, 2006).

Collaboration and teamwork. As stated in the aforementioned section, collaboration and teamwork is reported as a critical skill, and in many organization is symbiotically connected to creativity and problem solving at every level (Casner-Lotto & Barrington, 2006). As globalization continues to propel, a culture of collaboration will become increasingly important in creating innovative solutions to complex problems (Sheninger & Murray, 2017). Further, as automation enters the workplace, employees will begin collaborating to some extent with robots or technology (Fitzpatrick, 2016).

Communication. In the present workplace, communication in not reserved for face to face interactions, or basic essay writing. Communication is a crucial element in collaboration and teamwork (Casner-Lotto & Barrington, 2006). Further, globalization is changing the manner in which we communicate (Hallissy et al., 2013). Communication in the workplace occurs in various contexts; in writing, in email, in person, and even virtually (Robinson & Aronica, 2015). Employees need to be adept in the etiquette and nuances of various forms of communication, from written to spoken, to virtual, as well as audience and purpose (D. Gordon, 2011). Friedman and Mandelbaum (2011) encapsulate the importance of communication in affecting the efficacy of both collaboration and creativity where communication skills may be lacking.

Flexibility and adaptability. Due to continually changing environment of the workplace brought on by technology and globalization, there is increasing demand on the future workforce to be flexible and adaptable to a changing workplace (Schwab, 2016). As jobs are becoming automated, or partially automated, employees need to be adaptable to the changing environment (Manyika, 2017). It is estimated that a majority of jobs are capable of a portion of regularly assigned tasks to be automated, therefore, the potential exists for employees to spend some of their time working alongside robots or technology of some manner (Manyika et al., 2017a). Further, as the speed of innovation is rapid, jobs will require frequent retooling which will require employees to demonstrate flexibility and adaptability (Viltard, 2016).

Perseverance, grit and failure. Perseverance and grit refer to the ability to stick with a problem or project until it is completed (Costa & Kallick, 2015). In the workplace, perseverance is most important in strategizing alternative solutions when confronted with adversity or failure. Roger Schank (1997), educational and corporate reformer, advocates celebrating failure in the corporate world as initiative to learn. He asserts a guiding principle stating, "Real thinking never starts until the learner fails" (Schank, 1997, p. 31). By engaging in reflective thinking based on failure, learning is solidified on a much deeper level, promoting the engagement of perseverance and grit. In order to solve global problems of the future, the future workforce will need the ability to learn from failure, and possess the skills of perseverance to continue the strategies of problem solving in spite of failure (Sheninger & Murray, 2017).

Professionalism and work ethic. Professionalism and work ethic includes competencies such as proper dress, boundaries of formal and informal communication,

and personal responsibility (Casner-Lotto & Barrington, 2006; D. Gordon, 2011). Leaders in organizations surveyed report professionalism and work ethic to be an important competency to be successful in the workplace, however, it is also reported to be a deficient skill especially among high school graduates (Casner-Lotto & Barrington, 2006). In organizations, this often leads to high turnover rates, negatively impacting the flow of the organization.

Skills expected to increase in importance in the future. Additional competencies anticipated to increase in coming years were acknowledged in some of the literature (Hallissy et al., 2013; Zhao, 2015b). To address the topic of globalization, competencies and skill cited include cultural awareness, diversity, and foreign languages (A. Ross, 2016; Zhao, 2015b). Technology skills, including coding as an alternative second language, are increasing in importance as technology becomes ubiquitous (Bevins et al., 2012; A. Ross, 2016; Viltard, 2016). Finally, competencies in STEM subjects have been identified as important to combat industry concerns of the United States losing its ground academically (D. Gordon, 2011; E. Gordon, 2013).

Businesses and CEOs report concerns for the future workforce. By the year 2025, forecasters estimate there will be as many as 20 million jobs without qualified people to fill them (Achieve Inc., 2012; Casner-Lotto & Barrington, 2006; E. Gordon, 2013). The most notable factors weighing into this phenomenon include transformation of jobs due to technology, a lack of prepared students entering the work force, and the exodus of Baby Boomers from the workforce (Hallissy et al., 2013; Zhao, 2015b).

Advancements in technology are having a profound effect on the future workplace through automation, collaborative robotics, and AI (Autor, 2015; Fitzpatrick,

2016). A report compiled by the McKinsey Global Institute estimates that 60 percent of all jobs have the potential for approximately 30 percent of the applicable tasks to be automated (Manyika, 2017). Middle-skilled jobs, such as radiology and machinist, are particularly susceptible (Autor, 2015). Due to advances in technology, some jobs are being eliminated, others jobs are being transformed, and entirely new careers are being created, collectively leading to a lack of qualified workforce to fill vacant positions (Burrus, 2014).

Employers cite that another contributing factor leading to vacant positions is the lack of prepared students coming out of high schools and colleges (Rugaber, 2017). The traditional models of standardized mass education produce a large number of workers with similar skills, but at rudimentary levels (Zhao, 2015a). Information has become a commodity easily located through Google and Wikipedia (TED, 2016). What matters most to employers is that people know how to locate and discern relevant information, and possess the ability to apply it to an unknown problem; a skill that US students appear to be lacking (Kay, 2010). To fill their vacant positions, business leaders rank skills such as critical thinking, problem solving and communication higher than rudimentary academics (Achieve Inc., 2012).

Finally, it is anticipated that the majority of Baby Boomers are on the cusp of retirement, vacating positions and taking their knowledge base with them (Casner-Lotto & Barrington, 2006; A. Ross, 2016). Not only does that translate into fewer skilled workers in the workplace, but a converging factor leaves fewer healthcare professionals to care for the aging population (A. Ross, 2016). Friedman and Mandelbaum (2011) predict that skilled heath care will not be subject to automation. However, Japan has

responded successfully with robots capable of home assistance to combat the shortage of human help required to do the job (A. Ross, 2016). The result of these three factors, technology changing workplace, lack of qualified workforce, and exodus of Baby Boomers, are causing business leaders concern for the future of their industries.

The Purpose and History of American Education

The origin of formal, public education was to impart knowledge on youth to learn basic, agricultural, and workplace knowledge with the end goal of producing functional adults in society (Kelting-Gibson, 2013; Kivunja, 2014; Norman & Moorhouse, 2012). Originally, the school calendar in American schools was based on the Agrarian calendar with time off during the day and year to allow children to help with farm chores (Scott-Webber, 2012). Through the mid nineteenth century, the prescribed curriculum was focused on basic core concepts in reading, writing and mathematical calculations (Kivunja, 2014; Norman & Moorhouse, 2012). Current literature concludes that many schools today still echo those of a hundred years ago (Norman & Moorhouse, 2012; Scott-Webber, 2012)

The focus of the Industrial Model of education in the late 19th and 20th centuries was a uniformed approach centered on fundamental academic skills of reading, writing and mathematics in a one-size-fits-all structure (Hallissy et al., 2013). Review of the evolution of curriculum planning suggest that the first formal curriculum, published in 1918, is not dissimilar from curriculum today essentially stating that objectives are to be chosen for all students and performance criteria should be established for specific standards (Kelting-Gibson, 2013). The notion of evaluating the outcomes of instruction was added in 1935 by Caswell and Campbell (Kelting-Gibson, 2013). The concept of

prescriptive teaching strategies, where teachers learned to follow a scripted lesson plan model and check for understanding, came about with Madeline Hunter in the late 1970's, which was applied uniformly by teachers in their classrooms (Kelting-Gibson, 2013).

Business leaders report not much has changed. There has been much criticism from the corporate world that the education system has been slow to implement the required reforms, to prepare students for these 21st century competencies (Achieve Inc., 2012; Bevins et al., 2012; E. Gordon, 2013). Instead, the education community has been slow to respond, and is continuing to prepare students for jobs that will no longer exist in their future (Burrus, 2014). As recently as 2017, CEOs reported to the President during a workforce summit, that vacant jobs still exist because they are unable to find candidates with the necessary skills to fill them (Rugaber, 2017). Namely, candidates lack 21st century skills.

21st Century Learning

The world is changing, nevertheless, the U.S. education system has largely not kept pace with the requisite changes to adequately prepare the workforce of the future (Kay, 2010). The nation's competitiveness, economy, and position as a world leader is in jeopardy without significant transformation of the current education system (Casner-Lotto & Barrington, 2006; Sheninger & Murray, 2017; Trilling & Fadel, 2009). Based on what is known about the changing demands in the workplace, a moral imperative is placed on the nation's education system to transform traditional educational practices, focusing instead on 21st century skills and learning environments essential to prepare students for their future in work, and life (Casner-Lotto & Barrington, 2006; Fadel, 2015; Kay, 2010; Soulé & Warrick, 2015).

21st Century Skills

Reviews of the literature agree that the institution of the Common Core State Standards (CCSS) in 2010, provided the foundation for rigorous content standards that would drive the focus on the 4Cs; creativity, critical thinking, communication and collaboration (Brusic & Shearer, 2014; Demski, 2013; Harris & Rodriguez, 2012; Partnership for 21st Century Learning, 2011; Soulé & Warrick, 2015). While most reviews do not emphasize one skill over another, one review does suggest that the most important of the 21st century skills is creativity (Soulé & Warrick, 2015). Creativity is woven throughout the P21 framework and is requisite in brainstorming and innovation, as well as creatively communicating ideas and concepts (Soulé & Warrick, 2015). However, the gamut of 21st century skills extends beyond the 4Cs to include a focus on core subjects and themes, life and career skills, and technology and digital literacy skills (Partnership for 21st Century Learning, 2015; Soulé & Warrick, 2015).

Core Subjects and Themes. Many references are cited in the literature describing 21st century skills as the amalgamation of the 3Rs and the 4Cs (D. Gordon, 2011; Partnership for 21st Century Learning, 2011; Trilling & Fadel, 2009). This reference is to asseverate the critical importance on core academic subjects such as: English-language arts, mathematics, science, history, economics, and foreign language. Additionally, P21 has extended core academics to include content themes relevant to the 21st century to be integrated into core subjects; these include global awareness, financial literacy, and environmental literacy (Partnership for 21st Century Learning, 2015). Moreover, the focus on rigor and integrated studies in the CCSS perpetuates the blending of the 4Cs within the core academic subjects for a 21st century learning experience

(Partnership for 21st Century Learning, 2011). Evidence in the literature asserts that while core academic skills are important, to meet the demands required for the future workforce, students need both core academic knowledge alongside applied 21st century competencies (Alliance for Excellent Education, 2011; Kay, 2010)

Learning and innovation skills. Also known as the keys to innovation, P21 categorizes the 4Cs under Learning and Innovation Skills: critical thinking, collaboration, communication, and creativity (Trilling & Fadel, 2009). Collectively, these competencies frame the ability for students to apply content knowledge to unknown problems (Kay, 2010). The literature portrays these competencies in a variety of terms, nevertheless, there is general consensus in the literature of the four primary competencies included in P21 (Alliance for Excellent Education, 2011; Fullan & Langworthy, 2013; D. Gordon, 2011; Trilling & Fadel, 2009). For example, Robinson (2015) advocates for eight competencies, all beginning with "c", inclusive of the 4Cs. A further example comes from the enGauge (2002) framework which names them differently, but includes these basic 4Cs skills.

Critical thinking. Critical thinking pertains to the ability to apply cognitive thought to new or known information. Going beyond simple logic, critical thinking involves the ability to evaluate, analyze, interpret, synthesize, and reason for the purpose of solving problems, make decisions, make judgements, or understand complex issues (Dilley, Kaufman, Kennedy, & Plucker, n.d.; Robinson & Aronica, 2015; Trilling & Fadel, 2009). Robinson (2015) emphasizes the significance of critical thinking regarding to the ability to critically discern the ubiquitous information curated on the internet, and the ostensible risks precipitated by misinformation. According to a study by P21 (n.d.),

rather than teaching critical thinking in isolation, P21 promulgates explicitly teaching critical thinking in the context of a learning experience, such as PBL type activities.

Collaboration. Advances in technology have facilitated globalization, and by association, promoted collaboration. Collaboration refers to the ability to work with others, engage in discourse, and problem solve to accomplish a common goal (Sheninger & Murray, 2017; Trilling & Fadel, 2009). Globalization and the impending changing workplace requires employees to collaborate across continents and cultures, in vastly different business models to produce products or services to maintain relevance in the global economy (A. Ross, 2016; Schwab, 2016). Robinson (2015) posits that schools provide opportunities for students to work *in* groups, however, fall significantly short of teaching students the skills to perpetuate working *as* a group. Collaboration as a group can be effectively facilitated through authentic engagements or challenges such as PBL (Sheninger & Murray, 2017). The skills developed through this type of purposive collaboration include soft skills such as active listening, appreciating different points of view, conflict resolution in addition to promoting communication (Bellanca, 2015).

Communication. The literature reveals significant differences surrounding the descriptors of communication. Robinson (2015) discusses communication pertaining to attributes of spoken language, or oracy. Whereas, Trilling and Fadel (2009), and Bellanca (2015) are inclusive of written communication in addition to spoken, emphasizing range of purpose, and diverse environments as indicators of competency. P21's research report on communication, expands the notion of oral and written communication to include synchronous and asynchronous forms of computer mediated communication (Dilley, Fishlock, & Plucker, n.d.). Finally, Ross (2016) posits that

globalization and the ubiquity of technology globally, has cultivated an environment wherein communication skills must also include fluency in foreign languages, and technical languages (i.e., coding).

Creativity. Creativity is paramount in fostering the atmosphere for innovation to thrive (Couros, 2015). Innovation is critical in solving problems of the future such as climate change, green energy technologies, or create entirely new industries (Friedman & Mandelbaum, 2011; Trilling & Fadel, 2009), and is crucial in maintaining our global competitiveness (Wagner, 2012). Creativity refers to the ability to generate a novel or useful product or idea, individually or as part of a group (Plucker, Kaufman, et al., n.d.). There is general agreement in the literature of an existing fallacy in education wherein prevailing opinion states creativity cannot be taught; students innately possess creativity, or they don't (Plucker, Kaufman, et al., n.d.; Soulé & Warrick, 2015; Trilling & Fadel, 2009). On the contrary, studies have concluded creativity can be nurtured or enhanced (Plucker, Kaufman, et al., n.d.; Trilling & Fadel, 2009). Robinson (2015) argues that traditional schools often teach creativity out of students. Subsequently, it is imperative for schools to help students develop creativity and innovation to prepare for the future workforce (Robinson & Aronica, 2015; Soulé & Warrick, 2015; Wagner, 2012).

Life and Career Skills. The changing workplace precipitated by globalization and technology, is requiring that students possess a different career skillset beyond basic academic skills; these are referred to as life and career skills (Partnership for 21st Century Learning, 2015). Among the different frameworks or researchers, there is general consensus in the literature pertaining to these "soft skills", coincide with the skills employers are demanding of the future workforce (Kay, 2010). While not exclusive, the

prominent life and career skills that span across the literature include flexibility and adaptability, perseverance or "grit", cross-cultural skills, and leadership and responsibility (Heller & Wolfe, 2015). Employers identify these soft skill competencies as necessary in response to changing work environments (Trilling & Fadel, 2009). A flexible learner has the ability to consider multiple points of view, postulate options and alternatives, change opinions based on discovery of new information, and adapt to changing environments (Costa & Kallick, 2015; Trilling & Fadel, 2009). Akin to flexibility, a learner with grit has the ability to stick with a problem or task, even through adversity, plan alternate solutions, know how to ascertain information needed and persevere to conclusion (Costa & Kallick, 2015). To fully embrace these skills, students must be given the freedom to fail in order to learn from failure (Couros, 2015). While these skills are not novel in their own right, the magnitude of their impact on the future workforce is significant considering how rapidly the workplace is changing (Kivunja, 2015; Trilling & Fadel, 2009).

Information and media literacy, and technology skills. Technology is ubiquitous, enabling immediate access to an inordinate amount of information which continues to grow exponentially (Dede, 2010; A. Ross, 2016). Ross (2016) likens data to being the new "raw material" of the current information age. Competency in information and media literacy pertains to the ability to access and manage relevant information, then subsequently discern the quality and validity of the information obtained (Dede, 2010).

There is general agreement in the literature that integrating technology in education can enhance learning as it allows students innovative opportunities to access content and express their learning that did not previously exist (Hallissy et al., 2013;

Office of Educational Technology, 2017; Soulé & Warrick, 2015). There is general agreement that technology alone, does not improve learning (Sheninger & Murray, 2017). Instead, teachers need to be skillful in leveraging technology to enhance and transform the learning process, engage the learner, and personalize the learning (Office of Educational Technology, 2017).

Since 2003, a variety of implementation frameworks have been offered to describe the competencies of ICT and digital literacy (Dede, 2010). Most notably The International Society for Technology in Education, or ISTE, (Kereluik et al.) produced a set of technology standards designed to drive pedagogy that enhances effective teaching and learning across the subjects while promoting digital literacy and technology skills (International Society for Technology in Education, 2016). The ISTE standards were updated in 2016 in response to the changing role of technology in the workplace. The revised standards leverage the use of technology to promote student agency, curation and innovation. Additionally, the standards promote digital citizenship, using technology as a mechanism to enhance collaborative experiences with others locally and globally. The ISTE standards are learning standards designed to be germane with other content standards while accentuating the potential of technology to enhance the learning (International Society for Technology in Education, 2016). Additional tools and frameworks available to teachers in support of the implementation of technology include TPACK, SAMR, and Web 2.0 tools.

TPACK. Technological, Pedagogical and Content Knowledge (TPACK) is an instructional pedagogical approach first offered by Mishra and Koehler (2013). The TPACK framework guides teachers to consider three aspects of a lesson in determining

how, or if, technology would be most effectively utilized: the content of the subject matter to be learned; the pedagogy of the lesson, or how students will interact in the lesson; and what technology will be the most efficacious in allowing the learner to demonstrate their learning or interact with the content (Koehler et al., 2013). This framework promulgates the focus on the lesson content and objectives, circumventing the use of technology for the sake of using technology or as a digital worksheet (Kereluik et al., 2013).

SAMR. Current research seeks to investigate if technology is being used effectively, or simply as the latest new fad (Boyle, 2015). Methodologies such as SAMR (Substitution, Augmentation, Modification, Redefinition) support apprehensive teachers who may not be comfortable with technology, phase into meaningful applications of technology as their skill and competency improves (Boyle, 2015). While the SAMR approach is becoming more widely utilized in education, it is not well represented in seminal research (Hamilton, Rosenberg, & Akcaoglu, 2016). Hamilton, et. al. (2016) suggest this could lead to confusion or lack appropriate implementation among practitioners. They liken SAMR to a hierarchy without content, and promulgate it fails to produce an effect on instructional quality or educational gains. Conversely, in a mobile learning environment, support of the learning benefits of the modification and redefinition levels of SAMR were noted as a predominant factor in transforming learning experience (Romrell, Kidder, & Wood, 2014). By design, a mobile learning environment propagates the use of technology to redefine the learning experience. The implementation of the SAMR model encourages teachers to expand their repertoire of

technology applications that enable students to demonstrate learning previously inconceivable without technology (Lindenmuth, 2015).

Table 1

Hierarchical Levels of SAMR

Term	Definition
Substitution	Technology is used as a direct substitute for a non-tech function
Augmentation	Technology is used as a substitute for a non-tech function, includes minor enhancements afforded by the use of technology
Modification	The task is redesigned to utilize functions of technology
Redefinition	The use of technology enables an innovative, novel approach to a task

Note. Adapted from Hamilton et al. The Substitution Augmentation Modification Redefinition (SAMR) Model: a Critical Review and Suggestions for its Use.

Web 2.0 tools. While Web 2.0 is not a framework on its own merit, the tools and applications themselves are becoming as ubiquitous as the technology used to access them. Web 2.0 is known as the social web, in that it enables anyone with a connection to the internet to access and contribute to information via online communities (Dede, 2010). Tools including Wikipedia, Pinterest, Nearpod, and blogs are examples of Web 2.0 tools wherein online communities curate, collaborate, and share information relevant to the education community (Dede, 2010). Framing Web 2.0 tools in the SAMR framework, a plethora of Web 2.0 resources emerge that support a digital learning environment maintaining a purposive focus on instruction rather than using technology for random purposes (Crane, 2012; Kharbach, 2015). Through the use of Web 2.0 tools, students learn to become curators of knowledge and co-creators of content as they build digital literacy and 21st century skills (Crane, 2012; Dede, 2010).

Frameworks for Teaching 21st Century Skills

The world is changing, so too, must schools. To be adequately prepared for their future in the workplace and life, schools must equip students with 21st century skills (Sheninger & Murray, 2017). Attempting to elucidate a common understanding of 21st century skills, several organizations have produced conceptual frameworks to delineate 21st century skills (Dede, 2010). These different frameworks are fairly consistent in concept and vocabulary, and ultimately are complimentary to each other in curricular recommendations to transform 21st century learning (Dede, 2010). Three of the more prominent frameworks in the literature are highlighted, including Partnership for 21st Century Learning (P21) Framework, Deeper Learning Framework, and Future Ready Schools Framework.

P21 Framework. Believing in the mission that the job of schools is to educate students for the future, the P21 Framework was developed with input from business leaders and educators, to bring context and clarity to the knowledge and skills of 21st century learning (Partnership for 21st Century Learning, n.d.). Known as "the rainbow", P21 uses the rainbow arch to represent the 21st century skills and knowledge students need to master, in the context of four components detailed previously: core academics, learning and innovation skills, life and career skills, and information and technology skills (Trilling & Fadel, 2009). The pools below the rainbow, represent the supporting structures that support the development of the skills represented in the rainbow. The P21 Framework has become one of the prominent frameworks referenced amongst academic communities (Dede, 2010).

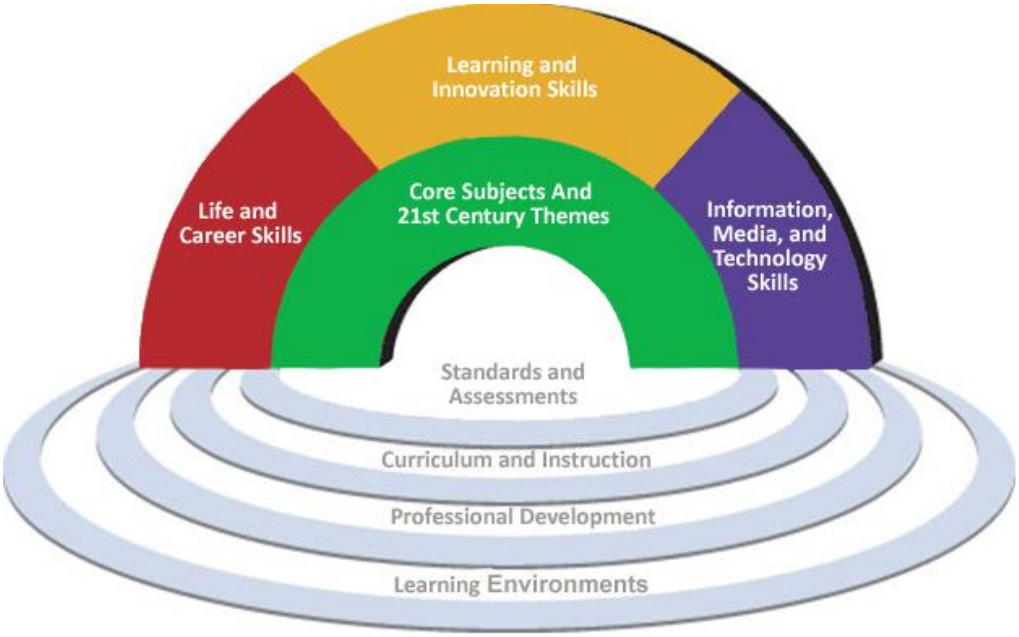

Figure 1. Graphic representation of the four contextual components of the P21 Framework adapted from www.p21.org. P21 framework definitions in: The Partnership for 21st Century Learning (2015).

Deeper Learning Framework. The William and Flora Hewlett Foundation, along with supporting organizations such as Alliance for Excellent Education, Students at the Center, and Digital Promise offer a commensurate version of 21st century skills in what they term "Deeper Learning" (Alliance for Excellent Education, 2011; Heller & Wolfe, 2015). Deeper learning references 21st century skills such as collaboration and problem solving, however, the literature typically references deeper learning in the context of active learning such as project based learning (DeNisco, 2015; Heller & Wolfe, 2015; William and Flora Hewlett Foundation, 2010). A key element of deeper learning is framed in the context of transfer, suggesting the ability of the learner to apply the learning to a new situation (Bellanca, 2015; Pellegrino, 2015). The framework itself is detailed in Table 2. It is comprised of six competencies, consistent with the 4Cs,

conceptualized within three domains as follows: Cognitive, Interpersonal, and Intrapersonal.

Table 2

Elements of the Deeper Learning Framework

Domain	Competency
Cognitive	Deep content knowledge
	Critical thinking and complex problem solving
Interpersonal	Collaboration
	Communication
Intrapersonal	Understanding how to learn
	Academic mindset

Note. Adapted from Heller & Wolfe (2015). Effective Schools for Deeper Learning: An Exploratory Study.

Future Ready Schools Framework. The Future Ready Schools (FRS) framework is yet another title lobbied at the national level, and supported by the Alliance for Excellent Education (Sheninger & Murray, 2017). The primary mission of Future Ready Schools is leveraging technology to provide students with a personalized learning experience based on high-quality, rigorous content that promotes 21st century learning regardless of where the student is from (Sheninger & Murray, 2017). The components of the FRS framework are designed to support the implementation of technology in the learning environment, thereby supporting 21st century learning. The components in the FRS Framework are referred to as “gears” ("Future ready frameworks," n.d.). FRS implementation strategies include, research-based curriculum that supports 21st century learning, personalized professional development for teachers, a robust infrastructure capable of sustaining the technology demands, flexibility in learning time and space, a

budget planning that allows for the support of maintaining, and replacing aging technology ("Future ready frameworks," n.d.).

The literature does not portray these three frameworks in competition with each other. The literature, collectively, demonstrates a focus on the need to radically transform our education system through the implementation of 21st century skills in creating 21st century learning environments, to prepare students for their future in life and in work (Bellanca, 2015; Kay, 2010; Sheninger & Murray, 2017; Trilling & Fadel, 2009; Wagner, 2015).

21st Century Learning Exemplar Program

The world is changing, so too, is the workplace. Consequently, schools must change to prepare students for the changing workplace, but what does that look like (Kay, 2010)? The P21 created the 21st Century Learning Exemplar Program as a mechanism to showcase schools successfully preparing students with 21st century skills (Partnership for 21st Century Learning, n.d.).

About P21

Educating students with 21st century skills is not simply a vision, it is a moral imperative. Founded in 2002, the Partnership for 21st Century Learning (P21) was developed with the primary purpose to create a partnership between business, education, and government to keep the focus of 21st century learning at the center of the national conversation. The core mission of this coalition is to leverage the strengths of its members from all factions to guide policy and set in motion changes that support the development of 21st century skills to prepare students for their future and future workforce (Partnership for 21st Century Learning, n.d.). P21 partner members contribute

to the mission by leveraging the strengths of their organization, for example the US Department of Education, National Education Association, and National School Boards Association contribute a voice in policymaking, whereas Pearson, Intel, Crayola, and the Walt Disney Company contribute concepts of educational creativity and innovation (Partnership for 21st Century Learning, n.d.).

Today, P21 focuses on three main functions (Partnership for 21st Century Learning, n.d.). First, P21 is leading the national conversation around the development of 21st century skills. Congressman Loebsack and Congressman Costello are co-chairs of the Congressional 21st Century Skills Caucus whose purpose is to provide a platform to inform and advocate for changes in education that prepare students for the 21st century skills they will need in the workplace. The second function of P21 is to support the alignment of curriculum and resources to support the development of 21st century skills in schools. Most notably, P21 has developed a framework as a representation of 21st century learning that has been widely adopted throughout the education community (Partnership for 21st Century Learning, 2015; Trilling & Fadel, 2009). There are also numerous resources for educators, policymakers, parents, and even news outlets linked from the P21 website. The third function of P21 is showcasing exemplar schools and policies that support the development of 21st century skills. While many schools around the country face the daily struggle of integrating 21st century skills like creativity, critical thinking, collaboration, and communication, few have fully succeeded (D. Gordon, 2011; Kay, 2010). The P21 intentionally created a framework to identify and define 21st century skills, then subsequently, defined criteria to identify model schools by P21 standards, in an attempt to document and promote successful practices (Partnership for

21st Century Learning, n.d.) To date, almost 100 schools, districts, and educational programs have been highlighted for their successes in providing a learning environment that prepares students with 21st century skills, and the 21st Century Learning Exemplar Program continues to expand.

About the Exemplar Program

The 21st Century Learning Exemplar Program (n.d.) was created to bridge a divide between an understanding of 21st century skills, and educational practices that implement them successfully (Kay, 2010; Partnership for 21st Century Learning, n.d.). Despite that education is nearly two decades into the 21st century, educational institutions are still struggling to intentionally integrate 21st century skills into the educational environment (Soulé & Warrick, 2015). Therefore, the Exemplar Program was created to provide a forum to showcase schools and districts successful in creating a 21st century learning environment as a model for other schools (Brown, 2014).

The Exemplar Program continues to expand. In its inaugural year, 2013-14, 22 schools and districts set the standard and were identified as exemplar. Currently, 79 schools (early learning center, preschool, elementary, middle and high), 14 school districts, and 4 beyond school programs have been identified as exemplar by P21. Table 3 demonstrates the progression and total of exemplar schools, districts and programs identified by P21.

Table 3

Overview of Progression of P21 Exemplar Program

Year	2013-14	2014-15	2015-16	2016-17	2017-18	Current Total
Preschool	1	1	3	4	5	14
Elementary	6	4	2	4	1	17
Middle	2	1	2	1	0	6
High	8	6	8	5	3	30
Multi-level	0	5	3	2	2	12
District	5	1	2	4	2	14
Beyond School	-	-	-	-	4	4
Total	22	18	20	20	17	97

Note. Data extracted from P21 at www.p21.org.

The Exemplar Program highlights schools by topic associated with the 21st century skills framework. Examples of topics highlighted include global awareness, environmental literacy, civic literacy, leadership, technology, and the 4Cs (collaboration, communication, critical thinking, and creativity). Schools self-select relevant 21st century topics of focus applicable to showcase themselves. For example, Ocean Lakes High School in Virginia focuses on life and career skills, instruction, leadership, and community partnerships. Benjamin Franklin Elementary in Illinois focuses on critical thinking, creativity, collaboration, technology, and using the PLC model for professional development. Through the exemplar program, the successes of schools and districts implementing 21st century learning environments are detailed providing insights and models of 21st century learning (Brown, 2014; Partnership for 21st Century Learning, n.d.).

Exemplar Program Application Process and Evaluation

The application and evaluation process for the Exemplar Program is a rigorous two-step process. First, schools must complete and submit a thorough self-study application addressing six criteria areas:

1. Commitment to college, career, and life readiness
2. Education support systems and intentional design
3. Engaging learning approaches
4. Equitable student access to 21st century learning
5. Student acquisition of 21st century knowledge and skills
6. Partnerships for sustainable success

Schools, or school districts, who consider themselves to be effectively implementing 21st century learning environments, are eligible to apply or be nominated to apply. Schools complete the application appropriate for their organization: early learning center, PK-12 school, school district, or beyond school program. Once submitted, applications are evaluated against a rubric for evidence of embedding practices of exemplary 21st century learning. Schools demonstrating exceptional evidence of embedding 21st century learning in their application and supporting documentation, are selected for a site evaluation visit (Partnership for 21st Century Learning, n.d.). Those who are not successful receive feedback on their application and are encouraged to make adjustments to their program and re-apply, in support of a continuous improvement cycle.

The second step in the process, for those schools selected, is the site evaluation visit. During the evaluation visit, a team of two to four members of the Exemplar Program conducts a thorough visit of the school. Visits include classroom observations and interviews with school stakeholders including the superintendent, principal, teachers, students and community members. An evaluation rubric, utilizing the six criteria areas from the application, is used to determine if the school meets exemplar status (see Appendix A for evaluation rubric). Once validated, the school maintains its exemplar

status for the year in which it was granted. Finally, case studies of the school and the exemplary practices of 21st century learning employed, are highlighted and published on the P21 website as a model for other schools.

Examples of Exemplar Schools

Transforming the learning experience to prepare students for the 21st century workplace, is the imperative of schools today (Kay, 2010; Sheninger & Murray, 2017). The P21 Exemplar Program provides a forum to highlight schools who have successfully transformed their practices to create a 21st century learning environment and encompasses schools not only at the high school level, but also the middle and elementary schools that build the foundation. Three examples of successful P21 Exemplar Schools include:

- Clean Technologies Early College High School: Ballston Spa, New York
- Saluda Trail STEAM Middle School: Rock Hill, South Carolina
- Roosevelt Elementary School: Burlingame, California

Clean Technologies Early College High School. Forecasting that technology will create changes in the future of jobs, Clean Technologies Early College High School is innovating education and business partnerships to ensure students are prepared with knowledge and skills necessary for the workplace of the future (Partnership for 21st Century Learning, n.d.). Students choose between four STEM based career pathways which currently include:

- Clean Energy
- Computer Science and Information Systems
- Nanotechnology and Mechatronics

- Leadership, Innovation & Entrepreneurship

Each pathway includes established partnerships with local business. Students earn both high school credit and college credit simultaneously for some courses. Further, in each career pathway, a forecast predicts future careers or directions the job market may take based on anticipated advances in technology. The learning environment models the workplace by allowing students ownership of their learning, while students work collaboratively on project based issues such as writing grant proposals, creating engineering designs, and participating in various academic competitions. Clean Tech ECHS became an exemplar school in 2015-16, and is part of the Ballston Spa Central School District in New York.

Saluda Trail STEAM Middle School. Saluda Trail utilized a STEAM (Science, Technology, Engineering, Arts, and Math) focus and project based learning (PBL) to transform its traditional educational program to prepare students to meet the changing skills required in the work place (Partnership for 21st Century Learning, n.d.). Utilizing the learning communities model, Saluda Trail sets the foundational skills for the next level of education, by creating an interconnected learning network where teachers work in interdisciplinary team to better support students' needs across the curriculum, perpetuating an environment where students are comfortable approaching any teacher in their network for support. Emulating the workplace, students are encouraged to take risks, learn from failure, and share with colleagues as they work collaboratively on project based learning experiences. Technology is leveraged as a tool for learning and working, and accesses daily through a 1:1 iPad initiative. Partnerships with resources from the local area bring meaning to PBL enhanced by direct access to resources such as

the state art museum, engineering associations, and aerospace with Boeing. Saluda Trail STEAM Middle School is located in Rock Hill, South Carolina, and became an exemplar school in 2014-15 (Partnership for 21st Century Learning, n.d.).

Roosevelt Elementary School. Elementary schools are essential in setting the foundation for how students will engage in learning throughout their school career. Emphasizing inquiry, creativity and problem solving in a project based learning model helps students learn skills to solve problems of the future, those that have not existed before (Trilling & Fadel, 2009). Roosevelt Elementary School utilizes this approach in their IDEA program and lab. Students are taught the IDEA cycle comprised of: Imagine or Inquire about a problem; Design a plan for problem solving; Engineer a solution; and either Act on that solution, or present it to an audience that elicits an action (Partnership for 21st Century Learning, n.d.). Students use the IDEA lab, much like a maker space, to apply the IDEA cycle. A further component to complete the IDEA cycle, and prepare students with the 21st century skill of communication, students learn how to create and present using skills typically taught to CEOs in a TED talk manner. Employing this model, students showcase their solutions to the community in a forum called TEDDY talks. The application of these 21st century skills prepare the youngest of students for the challenges that await before them in their educational journey to tackle the unknown problems that may not even exist today. Becoming an exemplar school in 2016-17, Roosevelt Elementary School serves a low-income population as a Title I school in Burlingame, California (Partnership for 21st Century Learning, n.d.).

Studies of Exemplar Schools

Much has been written and studied about 21st century skills and innovative schools implementing 21st century learning (Hillman, 2012; Soulé & Warrick, 2015; Trilling, 2015; Trilling & Fadel, 2009). Seminal studies from Trilling and Fadel have sparked further exploration of 21st century skills, and calling on schools to transform traditional education to address the demands of a changing world (Trilling & Fadel, 2009). Similarly, disparate studies highlight individual schools showing promise in implementing 21st century learning environment such as High Tech High in California, and Manor New Tech High in Texas (Duvall, 2016; Lynch et al., 2017; Zipkes, 2015).

Upon completion of the inaugural round of exemplar schools in 2013-14, P21 partnered with the Pearson Foundation to study and observe learning practices in the initial 22 schools in an attempt to identify best practices. The results of this study were published in *Patterns of Innovation: Showcasing the Nation's Best in 21st Century Learning* (Brown, 2014), and revealed five predominant elements ardently integrated throughout the culture of these initial exemplar schools. These five elements include: Student Agency, Distributed Leadership, Climate of Achievement, Engaged Community, and the application of Research and Evidence. Figure 2 demonstrates these five interconnecting elements deemed essential in 21st century learning environments.

Student agency. Student Agency is the understanding that students are provided a degree of autonomy, and take ownership and responsibility for their own learning. Exemplar schools provide an environment that values a student's aspirations, needs, and capacity to learn. Opportunities for autonomy are built into the learning environment.

The concept of agency may be considered the most influential aspect of 21st century schools (Brown, 2014).

Distributed leadership. Clear vision is central to Distributed Leadership. Vision is owned and clearly articulated by site leaders and supported by all. Teachers use data to evaluate progress in achieving the vision. Furthermore, teachers and students are empowered to act as leaders (Brown, 2014).

A climate of achievement. In exemplar schools, a climate of student achievement is pervasive. Beyond merely a positive school climate, achievement is expected. Equally important to this, however, achievement is fostered by a strong sense of physical and emotional safety, celebration and respect (Brown, 2014).

Engaged community. As Figure 2 demonstrates, an engaged community overlaps all aspects of exemplar schools in the form of partnerships with community organizations or businesses, internships, and project based learning. Exemplar schools serve their community's unique needs. A culture of trust and support is cultivated between the school and community (Brown, 2014).

Application of evidence and research. Exemplar schools take time to evaluate the merits of educational research, and implement those that are applicable to their needs. While the approaches vary, there is exceptional coherence in the application of the applied research articulated to all aspects of the school. Notably, the most common transformational approach implemented in exemplar schools is Project Based Learning (PBL) (Brown, 2014).

Figure 2. Visual representation of the interconnectedness of the five essential elements of 21st century learning environments resulting from an early study of exemplar schools. Adapted from Brown (2014). *Patterns of Innovation: Showcasing the Nation's Best in 21st Century Learning*.

Summary

How this study can inform best practices: Next Steps

Change is inevitable. As technology and globalization continue to evolve, dramatic change has become a byproduct in the workplace (Achieve Inc., 2012; Fadel, 2015). Employers have expressed concerns that traditional schools are not keeping pace with changes, resulting in students ill prepared for the changing workplace (Rugaber, 2017; Trilling & Fadel, 2009). Considering the need for credible models of successful schools, P21 created the Exemplar Program to showcase examples of schools

successfully preparing students for the changing workplace with 21st century skills (Partnership for 21st Century Learning, n.d.).

Researchers such as Trilling and Fadel (2009), Robinson (2015), and Wagner (2015) have posited the imperative to transform educational environments and teach 21st century skills to prepare students for life and the future workplace. Transformational practices such as PBL, design thinking, STEM and the concept of invisible technology, have emerged from subsequent studies of best practices (Zipkes, 2015). The five elements detailed by P21 and Pearson in their study of best practices in the 22 inaugural exemplar schools (Brown, 2014). However, a gap exists in the literature regarding current studies of elementary schools identified as exemplary, moreover, practices that led to their success. Only one other study could be located specifically focusing on best practices in exemplar elementary schools (Wilbert, 2016). In this study, the researcher conducted interviews and observations at elementary schools inside California identified by P21 as exemplary for the purpose of identifying best practices these schools employ attributing to their success in providing 21st century learning environments.

Considering the urgency to transform education to prepare students for the changing workplace of the future, it is imperative to exploit best practices in schools that have already been validated as exemplar schools. This study seeks to fill that gap, by determining best practices of elementary schools identified as exemplary outside California.

CHAPTER III: METHODOLOGY

Overview

Change is inevitable. Advances in technology enable people in almost any part of the world access to information across the globe almost instantly, contributing to a global society. This globalization and ubiquitous use of technology has fundamentally changed the workplace (Friedman & Mandelbaum, 2011). Yet, employers report that students leaving the school system are ill equipped with the technology skills and "soft-skills" that employers are seeking for the 21st century workplace (Rugaber, 2017; Schwab, 2016).

The education system is therefore being tasked to prepare students with 21st century skills required for the workplace. P21 has developed a framework to define and illustrate the key subjects and competencies needed by students to be ready for the 21st century workforce (Trilling & Fadel, 2009). Further, P21 created the Exemplar Program providing a model to schools, communities, and policymakers, showcasing schools that have been successful implementing the 21st century skills framework (Brown, 2014).

In the organization of this study, Chapter I provided an overview of the study, introducing the reader to the topic of 21st century learning and relevance to education today. Chapter II provided an in-depth review of research and seminal works relevant to 21st century skills and related change drivers. Chapter III, describes the methodology used to conduct this study, including details about the purpose statement, research questions, and how the research design supports the study. Additionally included, is information about the population, sample, instrumentation, and the process used for data collection and analysis. This detailed account of methodology serves as a roadmap for future researchers who wish to replicate this study.

Purpose Statement

The purpose of this phenomenological study is to identify and describe best practices related to 21st century skill development in two elementary schools outside California that have been recognized as exemplary by the Partnership for 21st Century Learning (P21).

Central Question

There is one overarching central question that guided this examination of best practices at P21 exemplar elementary schools.

Research Question

The research question that guided this study is: What are the best practices used in elementary schools identified as exemplary by P21?

Research Design

The focus of this study was to explore and describe the best practices used in elementary schools identified as exemplary by P21. When considering methodology related to this study, factors pertaining to the focus of the study were taken into consideration. Qualitative research seeks to make sense of an experience or phenomenon as an observer in the environment from which the phenomenon is occurring rather than in a lab or contrived setting (Creswell, 2007). This study sought to understand an experience within an educational environment, making the natural setting of the specific school site to be studied more conducive to gathering rich, relevant data, further allowing the researcher to observe how the subjects involved interact within the context of their environment. Conducting research in the natural environment allowed the researcher access to interviews, observations and artifacts, contributing to an understanding of how a

phenomenon could be intertwined in a complex, multifaceted perspective. Given these considerations, qualitative research methods were deemed most appropriate as this study aimed to describe and understand the best practices experienced in exemplar schools from the perspective of the people who experienced it, in the natural setting where it was experienced. Further, since the focus of this study was to investigate and describe the phenomenon of elite schools that have been identified as exemplar, and the experiences of best practices of teachers, staff and parents in these exemplary schools, a phenomenological approach was the most appropriate. Phenomenological research specifically seeks to investigate and describe experiences of a person, or group, to some phenomenon, program, or experience (Patton, 2015). The design of this phenomenological narrative was to objectively describe the common experience of a group of teachers, staff and parents at an exemplar school, experiencing 21st century instructional practices, without the presupposition of an interpretation from the researcher (Creswell, 2007).

Qualitative research investigations customarily collect multiple sources of data to bring meaning to the study, including interviews, observations, artifacts, and archival records. Use of a form with predetermined questions or topics, promotes structure during an interview or observation (Creswell, 2007). An inherent concern in qualitative investigation is the researcher as the primary instrument for gathering data. A human instrument, or researcher, can be fallible and prone to bias (Merriam, 1998). Use of convergent evidence from multiple sources strengthens data triangulation, mitigating the potential for bias and strengthening validity.

The growing imperative to reform education for 21st century learning is spurring an interest in studying best practices in exemplar schools. As the former Executive Director of P21, Dr. Helen Soulé now serves as a senior advisor working directly with the P21 Exemplar Schools Program. Soulé (2015) advocates that school communities use models from P21 to inform a transformation to 21st century learning environments. This phenomenological qualitative study was designed to call attention to best practices stemming from the models used in the exemplar program, as Soulé posits. This study replicated an existing study of best practices of two P21 exemplar elementary schools in California. As in the original study, this study intended to develop a deeper understanding of best practices of 21st century learning in two exemplar elementary schools outside California, including the perceptions of teachers, support staff and parents in experiencing 21st century instruction at these schools. Multiple sources of data collected in this study included open-ended interviews, observations and reviews of relevant artifacts. Protocols were employed for interviews ensuring the same questions and similar experience for all participants.

As the scope of the workplace changes, so must schools in preparing students for the future workforce. The exemplar schools program has provided an avenue for promoting schools successful in preparing students for the demands of the 21st century workforce. Two elementary schools identified as exemplar became the focus of this phenomenological, comparative study. As interest in best practices of 21st century learning increases, to date, there has only been one study highlighting best practices in exemplar elementary schools, using schools within California. Presently in California, only four elementary schools have been identified as exemplar, two of which were

included in the original study. As the focus of this study is schools outside California, the remaining schools outside California became the target population for this comparative study.

Consistent with the original study, the researcher visited each of the schools selected to conduct interviews with individuals, focus groups, and conduct observations and artifact reviews. Separate focus groups were configured for each stakeholder group, teachers, administrators, parents and support staff members, for the purpose of determining the best practices used by these exemplary elementary schools. Interviews consisted of four to six open ended questions focusing on central variables of 21st century learning, and were recorded and transcribed upon acquiring applicable consent. In accordance with phenomenological research, the commonalities of the experiences from all participants were sought.

To obtain convergent data, the researcher conducted classroom observations and reviewed relevant artifacts pertaining to 21st century learning including school website, letters, emails, and meeting minutes. Observations and relevant artifacts were recorded as field notes, making data triangulation possible and thereby strengthening the validity of the study (Creswell, 2007).

Population

For the purpose of a phenomenological study, it is necessary that all participants have experienced the same phenomenon being studied (Creswell, 2007). The focus of this study was schools that have been identified as exemplar by P21. The P21 Exemplar Schools program currently has 97 schools, districts, and programs that successfully concluded the application and validation process, having been identified as exemplar.

These exemplar schools and programs range from early childhood programs, elementary, middle and high schools, school districts, and recently added beyond school programs. Table 4 demonstrates the development of the exemplar program since its inception.

Table 4

Overview of Progression of P21 Exemplar Program

Year	2013-14	2014-15	2015-16	2016-17	2017-18	Current Total
Preschool	1	1	3	4	5	14
Elementary	6	4	2	4	1	17
Middle	2	1	2	1	0	6
High	8	6	8	5	3	30
Multi Level	0	5	3	2	2	12
District	5	1	2	4	2	14
Beyond School	-	-	-	-	4	4
Total	22	18	20	20	17	97

Note. Data extracted from P21 at www.p21.org.

The specific focus of this study was schools, not districts or beyond school programs, therefore, the twelve school districts and four beyond school programs were not included in the population. The remaining 79 schools became the population for the study.

Sample

The quality of the information obtained from a sample is reliant on the quality of the information the sample possesses (McMillan & Schumacher, 2010). To facilitate a phenomenological study, it is necessary to identify information-rich samples who have all experienced the same phenomenon (Creswell, 2007). In this case, the phenomenon is the elite schools that have been identified as exemplar, and the study focused on the experiences of those participants associated with exemplar schools. This study aims to replicate Dr. Kelly Wilbert's study, *Transforming to 21st Century Learning Environments: Best Practices Revealed Through a Study of Exemplar Schools* (2016)

which identified two elementary schools in California that had been identified as exemplar by P21.

It was of interest to the researcher in this replica study, to identify elementary schools in a different part of the county, with the intention of discovering similarities or differences in participants experiences of best practices. Since qualitative studies are not meant to be generalized, the sample sizes can be smaller in qualitative research than in quantitative (Creswell, 2007). To date, there are 79 schools in the P21 Exemplar program, 17 of which are elementary schools. Two of the four schools in California were included in the original study. The focus for this study was schools outside California, subsequently, the remaining 13 schools became the target population, from which the final two were randomly selected.

Data from the respective state departments of education provided an overview of demographic information for each of the exemplar elementary schools as detailed in Table 5.

Table 5

Overview of P21 Elementary Schools in Study

School	A	B
P21 Focus	Global Awareness	Creativity
Location	North Carolina	Missouri
Grades Served	PK-5	K-5
Setting	Suburban	Suburban
Enrollment	400	300
Ethnicity:		
Asian	0.7%	2%
Black	59%	2%
Hispanic	17%	4%
Multiple	7%	3%
White	14%	89%
English Learner	3%	+
Special Education	9%	4.5%
Free/Reduced Lunch	100%	5.4%
Title I School	Yes	No
Principal Tenure	2 years	4 years
School Opened	1990	2013
School Calendar	Traditional	Traditional
Community Information:		
Population	204,700	30,300
Median age	31	38
Per capita income	$22,749	$32,158
Mean home price	$175,200	$198,000

Note. School and enrollment information adapted from Public Schools of North Carolina website at www.ncpublicschools.org and Missouri Department of Elementary and Secondary Education website at https://dese.co.gov. Community data adapted from www.city-data.com. P21 focus extracted from P21 website at www.p21.org.
+ Specific data for this population was below an identifiable threshold

The sample for this study included two of the thirteen elementary schools outside the state of California that had been identified as exemplar by P21. Study data was gathered in the form of interviews, observations, and examination of artifacts.

Sampling Procedures

Patton (2015) describes sampling for qualitative inquiries as information-rich cases that will provide depth and substance to a study. Further, Creswell (2007) asseverates the importance of participants in a phenomenological study having all lived the same experience. Narrowing the criteria of the sample population to only those schools identified as exemplar by P21 ensured all potential participants at the identified school had the same lived experience pertaining to 21st century skill development in an exemplar school. Data utilized to inform the experiences of best practices of 21st century skill development was generated by interviews, observations, and examination of artifacts.

Random sampling is defined as the equal chance of any member of a group to be selected for a study (McMillan & Schumacher, 2010). Random sampling was employed to select the participants for this study from the sample schools, with potential participants selected using the following procedures:

- First, prior to the visit, all teachers viewed an introductory video created to introduce the researcher, and the purpose and scope of the study.
- Second, teachers participated in an in person informational meeting explaining the purpose and scope of the study, voluntary participation, assurance of confidentiality and informed consent. Teachers were given the opportunity to ask questions.

- Next, teachers were recruited to sign informed consent, thereby becoming potential participants.
- Finally, volunteers from each site, five at School A and seven at School B, were randomly selected as study participants in the focus group interviews and observations.

These sampling procedures were the most efficacious for this study because they ensured that all participants had experienced the same phenomenon of exemplar elementary schools, as Creswell (2007) emphasizes. These procedures also employed random sampling to ensure all members of the selected school had equal opportunity to participate, increasing the credibility of the results as Patton (2015) affirms.

Instrumentation

Instrumentation consisted of open-ended interviews, observations, and review of relevant artifacts. The focus of a phenomenological study is to understand a phenomenon from the people who experienced it (Creswell, 2007). The phenomenon being studied was elite schools that had been identified as exemplar, and the study focused on the experiences of those associated with exemplar schools. Performing interviews in focus groups was desirable to stimulate conversation of the experience which may not occur in isolation, thereby yielding rich data.

The instruments used for interviews were based on components of the P21 Framework (Partnership for 21st Century Learning, 2015), as well as the specific focus area from the school's P21 exemplar application. Similar to a standardized open-ended interview (Patton, 2015), the primary interview questions used in this replica study were the same as those used in the original study with each focus group; teachers,

administrators, support staff and parents (see Appendix B for Interview Questions). Using the same interview questions provided consistency with the original study, and further assured the instrument had been field tested, reducing variation between studies and among groups based on questioning strategy. In contrast to standardized open-ended interviews, probing questions were used to clarify or pursue depth from topics that arose in focus groups and varied by group. A schedule was used to keep interviews focused, and to ensure a similar experience and amount of time to all groups. Interviews were scheduled approximately 30-40 minutes based on the actual time allowed, with a minimum interval of 10-15 minutes between to allow the researcher to perform a quality review check.

Observations were performed using an observation log to bring greater understanding to the setting, activities and personal contact that occurred. Artifacts that pertain to 21st century learning such as information on school websites and social media, parent newsletter and information sent to parents were utilized.

Validity and Reliability

Validity

Validity refers to the confirmation of accuracy of the measurements in a study that will yield accurate results between the researcher and subject (Creswell, 2007). Also referred to as truthfulness, or credibility, validity is concerned with how accurately the researcher has understood and interpreted the experiences of the participant (Johnson, 1997). For this study, three strategies were utilized to mitigate validity. First, an external audit procedure was employed to verify the process and methods used in the study were supported by the research and data. This study utilized the same primary interview

questions developed in the original study within each focus group; teachers, administrators, support staff and parents (see Appendix B for Interview Questions). This provided consistency with the original study, and assured the instrument had been appropriately field tested, reducing variation between studies and among groups based on questioning strategy. An external expert also reviewed the procedures to be followed to ensure they conformed with best practices in the field. Second, the researcher utilized member checking, a process wherein interview participants were invited to review notes and transcripts of the interview to evaluate the accuracy of the interpretations and observation. Third, data triangulation of multiple sources of data was used allowing the researcher to corroborate information from different sources including interviews, observations, and artifacts to bring validity to interpretations (Creswell, 2007).

Reliability

In qualitative research, reliability refers to the level of consistency in interpreting or coding responses from data sets (Creswell, 2007). For the scope of this study, interrater reliability was utilized to confirm consistency. Interrater reliability is appropriate when participants are asked the same questions in semi-structured interviews (Patton, 2015). The second coder was an experienced qualitative researcher, who was familiar with the topic of 21st century schools. Each coder began the coding process independently, before coming together to compare and confirm the consistency of patterns and trends that emerged in the coding process.

Some forms of qualitative research seek to make generalizations from the data that emerges. Generalization is not a concern in phenomenological research, as the

purpose is to convey each participant's personal experience, the "essence" of a shared experience (Patton, 2015).

Data Collection

Phenomenological research primarily involves in-depth interviews with participants in order to make meaning from their experience. The use of focus groups offers advantages to phenomenological research. First, the natural interaction in a focus group can stimulate deeper dialog yielding higher quality data (McMillan & Schumacher, 2010). Second, it can expedite the time needed to collect information from more subjects. Additional data collected included observation and examination of artifacts.

Site visits to two P21 exemplar elementary schools outside the state of California were the setting for the data collection. Upon approval of this study from the Brandman University Institutional Review Board (BUIRB), phone calls and emails were leveraged to make initial contact between the researcher, and district superintendents and site principals to explain the purpose and scope of the study, description of consent procedures, and assurance of confidentiality. Additionally, the study was approved by each district's respective approval process. Follow up phone calls and emails, were utilized to provide any additional clarification of the research procedures, and to secure dates for on-site visits.

Each on-site visit was anticipated to last three to four days. The first visit to School A occurred over four days in November, 2017. The second visit to School B occurred over three days in January, 2018. Other forms of communication utilized prior to the on-site visit, included the creation of an introductory video, personalized to each school, which helped the researcher begin building a rapport prior to arrival.

Communication prior to arriving on site allowed the researcher and site principal to introduce the recruitment process for potential members of focus groups, interviews and observations allowing for efficacious use of time during the on-site visit to conduct interviews and observations. Follow up questions and requests for artifacts after the conclusion of the on-site visit were addressed via email.

The daily schedule for each individual on-site visit was confirmed collaboratively between the site principal and researcher to insure regular school activities were not impacted, while still allowing sufficient time to conduct the research activities. Specific activities included a general orientation to the site, focus group interviews comprised of a group for teachers, a group for support staff, and a group for parents. Individual interviews were held with the site principal and district superintendent for the purpose of gaining their interpretations of best practices from an administrative position. Finally, classroom observations were conducted in multiple classrooms, at multiple grade levels to gain an understanding of how best practices were used during instruction. Observations of campus life including assemblies, staff meetings, playground, cafeteria and hallways were further employed to gain an understanding of best practices in action. Artifacts pertaining to 21st century learning were collected throughout the visit to strengthen triangulation, and included communications to parents, newsletters, and information on the school website and social media.

At the start of each interview, participants were reminded of the purpose of the study, voluntary participation, assurance of confidentiality and informed consent, and were given the opportunity to ask questions before signing informed consent. Additionally, participants were asked for consent to be audiotaped during the interviews

to provide an accurate account of the ensuing interview questions and discussion. An interview protocol, consistent with the original study, was used to ensure a uniform interview experience (see Appendix C for Interview Protocol).

Classroom observations were scheduled with the site principal and directly with teachers to maximize opportunities to observe best practices of 21st century learning at multiple grade levels. Prior to the observation, teachers who agreed to participate in the study received information explaining the purpose of the study, assurance of confidentiality and informed consent, and were given the opportunity to call or email the researcher prior to the visit to ask questions. Signed consent was collected on-site prior to initiating observations. Scheduling of observations took into account the daily school and classroom schedule and activities. Observations lasted between 30-45 minutes, with the researcher silently observing and taking notes so as not to interfere with the natural learning environment. An observation log was used for consistency and efficacy.

Data Collection Procedures

Patton (2015) posits the importance of going into the field to collect data first hand, while also attending to specific details during the fieldwork process. In preparation for this study, data collection procedures were outlined to ensure specific details had been attended to.

Preparation for site visit. The following steps were taken to prepare for the initial site visits.

1. Contact the superintendent of each school district as an introduction. Through phone calls and/or email, provide an overview and purpose for the study, and convey an interest for including the district and school site in the study. This

contact initiated a rapport between the researcher and the district, aimed to secure support from the district for inclusion in the sample, and provided an avenue to introduce the researcher to the principal of the school site.

2. Contact the site principal for each site selected to provide an overview, purpose of the study, and inquiry into the potential for inclusion of the site in the study. This helped establish a rapport with the school site and secure a commitment from the school site for participation. Specific information regarding the details of the visit were discussed including interviews, location of interviews, observations, and collection of artifacts. The risks of participation were discussed, which were minimal but could have included discomfort with being interviewed. Additionally, procedures for informed consent and assurance of confidentiality were reviewed. Informed consent documents were sent to the principal for review at that time.
3. Upon commitment of participation, the specific details of the visit were planned with the site principal. In order to maximize efficacy during the visit, a schedule of events was tentatively planned, including recruitment of potential participants for focus group interviews, observations, and identification of artifacts to collect for review. Additionally, a location at the school site was identified to serve as a safe, comfortable location for holding focus group interviews. It is important for interviewees to be in a neutral, non-threatening environment for the comfort of the participants. The researcher communicated via phone and email with the principal and any

potential participants to answer any questions, or provide any additional information requested in advance of arrival.

Interviews. Interviews help inform things that cannot directly be observed such as thoughts, feelings and intentions (Patton, 2015). The following steps were taken during the interview process.

1. Upon arrival at the site, the researcher oriented to the school site, and met the principal and all staff, in person, to establish a comfortable rapport between the researcher and the staff. Additionally, the schedule and location for the interviews was finalized with the principal, and communicated to those involved.
2. At the start of each focus group interview, the researcher reminded participants of the purpose of the study, reviewed the informed consent, voluntary participation, assurance of confidentiality, and interviewee right not to participate. To ensure complete transparency and comfort of the participants, they were informed of potential risks, which included potential discomfort of being interviewed. Participants were informed that the interview would be recorded, and finally they were given the opportunity to ask any questions.
3. Interviews lasted between 30-45 minutes, after the informed consent and procedural reviews have been completed. Interviews were recorded using two digital recorders. One was used as the primary device, and one as a secondary recording device to be used as a back-up in the event of a failure of the primary device.

4. Upon conclusion of the interviews, participants were thanked for their participation, and received a $10 gift card as a token of appreciation for their time. Participants were also informed of their opportunity to review the transcripts that were generated from the audio recording to ensure accuracy of the transcription, as well as the intended message. Allowing participants to review the transcripts increased the accuracy and quality of the analysis of the data generated.

Observations. Firsthand experience in a setting allows the researcher to better understand and describe in detail the experience observed (Patton, 2015). The following steps were taken during observations.

1. Teachers in all grade levels were given a letter inviting them to participate in the observations. The invitation letter was consistent with information presented at a staff meeting, and explained the purpose of the study, participant's right to participate, anonymity of teacher and student information, and informed consent. Additionally, potential risks were included in the letter. Risks were anticipated to be minimal, but could have included discomfort of the teacher or students being observed.
2. Signed informed consent forms were collected from teachers willing to participate. In conjunction with the site principal, a schedule was created and distributed to all involved to ensure all parties, including office staff, were aware of the schedule and the researcher's whereabouts. The daily school schedule, as well as the individual teacher's schedule were taken into consideration when scheduling observations so as not to disrupt the daily

classroom schedule, while maximizing the quality of time for meaningful observations.

3. Observations were conducted lasting between 30-45 minutes each, and occasionally split into two sessions to accommodate classroom schedules. The researcher was a silent observer in an unobtrusive area of the classroom. For the purpose of collecting best practices of 21st century learning, specific data was collected that reflected teacher and student dialogue, interactions, instructions, and work students were engaged in, while being conscientious to keep all data anonymous. Observation notes also included information about the general room environment.
4. Upon conclusion of the observation, teachers were thanked for participating in the observation process.

Artifacts. Artifacts are tangible items that bring meaning to people's experiences (McMillan & Schumacher, 2010). The following steps were taken during observations.

1. During pre-visit communications, the researcher shared a list of the types of artifacts to be reviewed that would support a review of best practices of 21st century learning. Principals and teachers also shared artifacts they perceived as relevant to support best practices. Examples of artifacts included school and classroom newsletters, school and classroom websites and social media postings, school calendar with relevant activities, and hallway and classroom bulletin boards. Artifacts were photocopied, digitally scanned, or photographed as appropriate for future review and analysis.

2. Upon conclusion of the site visit, the researcher verbally thanked the site principal, teachers and office staff. A follow up email was sent to the principal and superintendent thanking them for their participation.

Data Analysis

Once data are collected, the challenge for a qualitative researcher is to make sense of it and transform it into findings (Patton, 2015). In phenomenological research, the researcher must make meaning from the raw data to discover significant patterns and themes. While still in the field, rudimentary hunches were documented, and data was categorized by site, form of data, and the group from whom the data originated. A service was used to assist the researcher in generating a complete transcription from the audio recording of each interview, using the group name as the title. These transcriptions became the basis for identifying codes, or significant statements that would become meaningful themes. Careful attention was paid to maintaining anonymity of the participants, and storing electronic data via cloud-based storage, and portable back up device.

Consistent with analysis of phenomenological data, the researcher took the perspective of epoche, meaning perceptions, judgements and preconceived knowledge of the researcher were intentionally suspended to prevent bias. This was followed by bracketing which allows the data to be analyzed without presupposition. Once this was established, data was reviewed multiple times to confirm themes, to identify emerging themes previously overlooked, and to identify themes that may have been less significant than initially thought (Patton, 2015). To increase the validity of coding, a strategy known as triangulating analysts was employed, wherein another independent researcher

reviewed the data, identified codes and compared findings thereby establishing consistency of themes identified.

Once themes were identified and labeled, the coding process continued with the assistance of an online tool called NVivo. The researcher still performed the coding process, but NVivo assisted analysis with features to store, manage, categorize, and recall qualitative data from interview, observations and artifacts. This tool assisted the researcher in comparing between data sources making the process of triangulation more efficient.

Limitations

Limitations are features of a study, typically outside of the researcher's control which may negatively impact the results of the study (Roberts, 2010). Limitations included in this study were consistent with the original study and should be taken into consideration when generalizing to a larger scope.

Researcher Bias

Qualitative educational research is prone to researcher bias as the researcher is the instrument, and is knowledgeable with educational practices. The questions used for this study were the same as the original study to increase validity. While epoche and bracketing were employed, the interpretations are those of the researcher, therefore the potential for bias exists.

Geography

The original study included the only two elementary schools in California identified as exemplar at the time the study was conducted. This study intended to expand upon the work of the original researcher to include a different geographical area.

Of the remaining 13 elementary schools presently identified as exemplar, only two were included in this study. This expanded the geographical study from schools in the southern west coast region, to include a school in the mid-west and east coast regions. However, as in the original study, the demographics and culture are unique to those regions and cannot be generalized to exemplar elementary schools in all states.

Time Frame

Based on availability of the schools to the researcher, the time period for the study was November, 2017 for School A, and January, 2018 for School B. In School A, this corresponded with the start of the seasonal holiday period, as well as county wide benchmark testing, and may not have been representative of the academic activities that may have occurred at other times in the year.

Culture

Culture is a pattern of behaviors and beliefs (Patton, 2015). This study took place in North Carolina and Missouri, both of which were unfamiliar to the researcher. The behaviors, beliefs, and expressions were unfamiliar to the researcher. To help mitigate these factors, the researcher spent time acculturating to the school, staff and community environment prior to beginning the data collection in an effort to gain an understanding of the culture.

Curriculum and Standards

North Carolina adopted a version of Common Core State Standards in June, 2010, and the Next Generation Science Standards in February, 2010. Missouri developed the Missouri Learning Standards in ELA, Math and Science, which were revised in 2016. The adopted curriculum used for standards instruction varied commensurately by state.

A potential limitation could include the differences in standards, curriculum used and assessment references, as well as potential terms that could be germane to each state, but not familiar to the researcher.

Self-Reported Data

All participants included in the study were volunteers. Considering the multitude of recent educational reforms, (e.g., Common Core Standards, NGSS, ESSA) the state of mind of participants was assumed as honest and sincere. Additionally, personal or professional obligations may have posed a potential distraction affecting focus during interviews. While efforts were made to build a rapport, participants may not have been willing to share perceptions of their experiences, or open up to someone who is physically and culturally, a stranger to them.

Reducing Limitations

Efforts were made to reduce the potential for limitations. Not being from the area, the researcher attempted to complete introductions and build a rapport prior to the site visit by sending an introductory video personalized to each school. This provided an opportunity to introduce the school staff to the researcher, and become familiar with the scope of the study. To reduce the potential for limitations of data, use of convergent evidence for triangulation of data was utilized. Further, an independent researcher was used to help increase validity and reduce the potential for bias by reviewing interview transcripts to independently identify codes and themes. Triangulation strategy was employed through the use of multiple sources data including interviews, observations and artifacts. Finally, epoche and bracketing strategies were employed during data review to

remove potential bias of researcher familiarity with educational terms, concepts and programs.

Summary

Chapter three described the methodology used to conduct this study. It reiterated the purpose statement and research question to set the foundation, then detailed how the research design supported the study and chosen methodology. Also included was detailed information about the population, sample and instrumentation, as well as details about the data collection and analysis process.

CHAPTER IV: RESEARCH, DATA COLLECTION, AND FINDINGS

Overview

Chapter I provided an introduction to the study and background to the research. Chapter II reviewed the literature surrounding the influences of technology in changing the landscape of the workplace, the skills employers will be seeking in the future workforce as a result, and the need for schools to transform in response. Chapter III described the detailed methodology used to conduct this phenomenological study of two P21 exemplar elementary schools. This chapter begins with a description of the purpose, research methods, and participants. The better part of the chapter involves a detailed analysis of the findings from the data collected.

Purpose Statement

The purpose of this phenomenological study is to identify and describe best practices related to 21st century skill development in two elementary schools outside California that have been recognized as exemplary by the Partnership for 21st Century Learning (P21).

Research Question

One central research question guided this study: What are the best practices used in elementary schools identified as exemplary by P21?

Research Methods and Data Collection Procedures

A qualitative phenomenological approach was deemed the most appropriate for this study as it sought to investigate and understand the experiences of those associated with the phenomenon of exemplar schools, namely teachers, staff and parents in these elite schools. Consistent with Creswell's (2007) assertion, conducting research in the

natural environment of the school allowed the researcher access to interviews, observations and artifacts, while allowing for the complexities and natural interactions with the school environment to occur.

Site visits of the selected exemplar elementary schools occurred over four days at School A, and three days at School B. Data collected were in the form of interviews, observations, and a review of artifacts.

Population

For the purpose of a phenomenological study, all participants should have experienced the phenomenon under review (Patton, 2015). The P21 Exemplar Schools program is open to early learning, PK-12 schools, school districts, and beyond learning programs, identifying them as exemplar upon successful completion of a rigorous application and validation process. The population used for this study was schools that have successfully met the criteria for P21 exemplar status. To date, there are 79 PK-12 schools identified as exemplary by P21 which comprised the population for the study.

Sample

A sample is comprised of those individuals who can inform an understanding of the problem or phenomenon (Creswell, 2007). Currently, in 2018, there are 79 schools in the P21 Exemplar program, 17 of which are elementary schools. Two of the four elementary schools in California were included in the original study. The focus for this replica study was schools outside California, therefore, the sample consisted of the remaining 13 exemplar elementary schools. Two of these 13 schools were randomly selected, and the schools agreed to participate. Participants from the identified schools, were randomly selected from each stakeholder group to participate in focus group

interviews and observations. Table 6 displays the number of participants in each stakeholder group, for each school site.

Table 6

Number of participants in each stakeholder group

	Administrators	Teachers	Support Staff	Parents
School A	1	5	3	1
School B	2	7	4	2

Demographic Data

Specific demographic data were not collected directly from participants. Using staff demographic information from the respective state accountability report card for each school, School A reports 43% of the teachers with three years or less of teaching experience, 27% with four to ten years of teaching experience and 30% with more than ten years. The state accountability report for School B presents data differently, showing the average number of years of teaching experience is 14.9 years of experience. Table 7 displays the teaching experience as it was represented for each school.

Table 7

Delineation of teaching experience

School A		School B
0-3 years	43%	14.9 years avg. experience
4-10 years	27%	
10+ years	30%	

Note. Teaching experience information adapted from Public Schools of North Carolina website at www.ncpublicschools.org and Missouri Department of Elementary and Secondary Education website at https://dese.co.gov.

It should be noted that School A is an active participant in an international visiting teacher program, whereby teachers from other countries spend approximately two years at the school before returning to their home country.

Presentation and Analysis of Data

The findings presented in this chapter are the consummation of data collected through focus group interviews, individual interviews, observations and review of artifacts. This study looked at the data through a phenomenological approach, denoting an attempt to describe the lived experience of the participants associated with exemplar schools. In reviewing the phenomenological data, Creswell (2007) recommends analyzing significant phrases, and clustering them into themes. By triangulating interview data with observations and a review of artifacts, the validity of statements could be corroborated, and a more thorough description could unfold. Implementing this approach, the data revealed nine themes that emerged from a review of significant phrases, which are described in table 8.

Table 8

Frequency of Themes and Sources

Theme	Total Frequency	Interviews	Observations	Artifacts	Total Sources
1. Intentionally designing learning experiences that promote 21st century skills	160	140	20	0	22
2. Fostering an environment of learner agency	138	105	31	2	27
3. Belief that relationships amongst stakeholders fosters learning as a partnership	134	126	8	0	16
4. Classroom extends to the world beyond the school building	82	80	1	1	10

5. Implement a system of varied measures that inform decision making	67	62	5	0	12
6. Intentionally practicing inquiry and reflection as part of the learning process	58	39	14	5	21
7. Publish for authentic purposes	27	23	2	2	9
8. Leadership promotes innovation and relevance for changing future	22	22	0	0	7
9. Stakeholders share common vision of the school	21	21	0	0	7

These nine themes have been identified and will be further explained, including significant statements, in the following narrative.

Theme 1: Intentionally Designing Learning Experiences that Promote 21st Century Skills

This study focuses on best practices of P21 exemplar elementary schools. Data revealed nine themes, the first of which is intentionally designing learning experiences that promote 21st century skills.

Table 9

Frequency and Source Totals for Theme 1

Theme	Frequency	Sources
1. Intentionally designing learning experiences that promote 21st century skills	160	22

This theme was observed from 22 sources and recorded 160 frequency counts and was the highest recorded theme. The data for this theme was sorted into four categories: integration of the 4Cs, integration of soft skills, integration of technology and STEAM integration.

Integration of 4Cs. The 4Cs are competencies included the P21 Framework as part of Learning and Innovation Skills, and include collaboration, communication, creativity, and critical thinking (Trilling & Fadel, 2009). Throughout interviews across all stakeholder groups, the 4Cs, either collectively or naming a specific 'C' competency, recurred repeatedly causing the researcher to focus on the 4Cs as significant. It was also noted that the occurrences of 4Cs was not used in isolation, rather while referring to integration with standards and in support of the overall learning experience.

A best practice that emerged involved starting the lesson design process with a focus on the core content standards to be taught in the unit. Participants directly involved with creating lessons, discussed using the state content standards as a starting point in their lesson design, before determining how 21st century skills will be incorporated. A focus on standards was referenced across all stakeholder groups, with teaching staff being particularly attuned to the standards. Participant 18 exemplified this mindset and the focus on standards with the comment, "We start with the standards, so we know the ins and outs of what the students are expected to do."

After standards have been identified, a best practice that emerged during the planning phase, was an intentional focus on the manner in which students engage with 21st century skills during the learning experience. Participant 11 shared a glimpse into the thought process used while designing learning experiences.

> "Another lens we look for when we develop a unit, how are kids collaborating through the unit? What are they doing to be critical thinkers? What are they doing to problem solve? And what are they doing to communicate?"

Further, while discussing the design process, participants reflected on the practice of going beyond simply providing casual opportunities to participate in a given competency. Rather, they conduct a meaningful evaluation of how inclusion of the action will enrich the learning experience. Participants acknowledge not every lesson lends itself to a 4C, so one is not forced in, if it is determined not to have meaningful contribution to the overall learning experience.

It is important to note that while each of the 4Cs is considered in the learning experience, participants frequently discussed the 4Cs being intentionally interwoven throughout the learning experiences, not isolated. Learning in these classrooms is an integration of many skills, nothing is done in isolation. Several participants made similar comments to this statement from Participant 11, "everything is kind of integrated here together, it's hard to isolate things apart."

Not only was integration of 4Cs reflected in interviews, this practice was further exemplified during observations. During observation 12, for example, fourth grade students were collaborating in teams of four, while engaged in an authentic critical thinking inquiry that was unique to each team, and using effective communication techniques to express ideas in problem solving around the science content they were addressing. Additionally, a similar engagement was shared by participant 6 in a recent project that had students collaborating in groups of four, while working through options to effectively communicate their understanding of the content in a creative way. "I didn't tell them how. They had to figure out how they were going to do it."

In addition to 4C integration, teachers expressed the importance of designing learning experiences that support authentic purposes beginning at the youngest grades.

An example of integrating the 4Cs for authentic purpose is demonstrated in a vignette shared by participants 24 and 25. They depicted how first grade students engage in collaboration, communication and creativity as they prepare a weekly news broadcast for the school that includes a weather forecast for recess, and news updates. The students collaborate to write the script, read the teleprompter, and record the video with a green screen background that they overlay with weather graphics. Participant 24 shared amazement at the complexities involved in this experience, "They have to work together to collaborate on what's going to be on the news. Who's going to say what. For a first grader to read a teleprompter!"

These experiences demonstrate the best practice of integrating the 4Cs with intentionality to engage students in collaboration, communication, critical thinking and creativity, simultaneously, and within the context of the learning experience.

Integration of soft skills. Soft skills, also referred to as "non-cognitive" skills, are alluded to in the P21 framework, incorporated in Life and Career Skills. Soft skills encompass such competencies as teamwork, adaptability, accountability, perseverance and grit (International Society for Technology in Education, 2016; Kivunja, 2015). Participants at both schools discussed intentionally designing the development of soft skills into learning experiences beginning with the youngest learners to build capacity in these essential life skills. Participants at both schools shared similar stories of students struggling with particular soft skills, such as perseverance, or adaptability. Therefore, they intentionally build opportunities for students to practice these skills. At one school, the development perseverance and grit, begins in kindergarten and is integrated in a unit on Engineers. Through this engineering unit, kindergarten students learn the design

cycle, coming to the realization that "Try. Fail. Try, try again," as Participant 11 relayed, is a natural part of the design process, and demonstrates perseverance. These young students learn that through the design cycle, and perseverance, buildings are built and discoveries are made.

Several participants indicated soft skills are difficult for students, especially older students, albeit essential for future life skills. Their concern for students, as Participant 5 verbalized, "Students get frustrated, and just give up." By intentionally building opportunities for students to practice and understand perseverance, teachers report seeing less frustration, especially from older students. The researcher observed an example of this in an upper grade class doing PBL discovery challenges. One group was perplexed by their challenge. The teacher offered no advice, but simply asked them what they had tried, what failed, and what came close. She followed up with a single word, "Perseverance!" and walked away. With that one word, the students quickly regrouped, and enthusiastically made a plan for another attempt.

Focus, self-control, and managing distractions are other soft skills that were discussed at both schools. Participants discussed the importance of students being aware of when they are being distracted or losing focus, and equally important of possessing the skill to effectively self-monitor and control their focus. Both schools build opportunities to help students identify when they are being distracted and teach strategies to regain focus beginning as early as kindergarten. Participant 4 reported using a refocusing prompt with students as a reminder when they are distracted, as well as helping student to identify what is distracting them. One school employs a "Focus Challenge" as a practice exercise to help younger students recognize and gain control with this skill. The

researcher also observed the Focus Challenge used in a second-grade class. All students stood in a large circle while another student in the middle of the circle, walked up to each student and started talking, staring, or employed some behavior in an attempt to make the other student break focus. Participant 19 reported using the prompt, "Find your focal point," to remind students of the Focus Challenge, which helps students monitor themselves. The researcher observed this prompt being used during Observation 10.

The best practice of intentionally designing opportunities for students to build capacity with soft skills, was demonstrated across grades. Validating the need and urgency to build capacity in students with 4Cs and life skills, Participant 11 confirmed, "That's what our businesses tell us they need."

Integration of technology. Technology as a tool for learning, is included in the P21 framework as part of the Information, Media and Technology component of the framework. Technology is a powerful learning device allowing learning to be both amplified and personalized when intentionally integrated (Sheninger & Murray, 2017). Both schools in this study had different scenarios when addressing technology. Being a 1:1 iPad school, School B had technology available to the students daily. Further, students in School B were allowed to take their iPads home each day. School A, on the other hand, was limited in the amount of technology available for students. School A had carts with 30 chromebooks shared within each grade levels. Every grade had at least one cart to share, with fifth grade having two carts. The school made a conscientious choice rather than moving the cart around room to room on a rotation, teachers took between 3 to 10 devices into each classroom daily, returning them at the end of the day to charge. The exact number varied by grade level. While not a 1:1 environment, considering class

sizes between 12 – 22 students, this solution allowed students almost continual access to a device to work in pairs or 1:1 in small groups blended learning experiences. Explaining this innovative solution, Participant 9 shared, "We don't have all the resources that we would want to have, but we try to make it work."

Stakeholders across both schools recognized the important role of technology in both in education and life. Numerous participants discussed how critical technology has become in education for accessing content, curating content, creating innovative ways to share information, and personalizing the educational experience. Participant 20 summed up the perception of the role of technology in the educational experience, saying, "Technology truly is used as a tool to enhance the curriculum."

Both School A and School B integrate technology in the learning experiences. However, the manner in which each school integrates technology is different. Both schools use some of the same, or similar, digital and adaptive programs that allow for personalized instruction based on individual student performance and need. Adaptive digital content has evolved in recent years, tailoring to student need, while presenting information in a variety of visual and auditory formats, including additional tutorial scaffolds built in, thus allowing students to comprehend content they may have otherwise struggled with through traditional instructional delivery models. Students can benefit from personalized instruction, when adaptive content is intentionally integrated in support of direct instruction by the teacher. This practice of supporting direct instruction with online learning is often referred to as blended learning. Participants at both schools report a best practice of utilizing digital and adaptive programs to individualize instruction for students. Participant 21 indicated the rotation model of blended learning is

used daily in the primary grades, stating, "We use of a lot of blended learning with the rotation model." Participant 12 reiterated the significance of using digital tools to, "ensure that we're able to personalize for each student through 21st century learning." The practice of blended learning rotation model was observed in 6 of 13 total observations, representing four different grade levels, and also included classes in the Spanish immersion program at School A.

In School B, students have 1:1 access to technology in the form of iPads. Participants across all stakeholder groups report technology is a part of the total educational experience. Students in all grades use iPads for tasks such as accessing digital content, looking up information or resources, publishing, creating presentations, monitoring their own progress towards their goals, and coding. Participant 20 added to the discussion that hands on technology integration begins at the earliest grades stating, "Even starting in kindergarten, we're not scared to implement this technology from day one." Participants report that planning for technology in learning experiences is not a separate experience, rather it has become interwoven in instructional practices. In fact, the totality of their integration transition became apparent to them when an outside educational expert pointed out that all of their discussions focused on the learning, not on the devices. This, too, is notable as a best practice. With this in mind, Participant 18 confirmed, "It's not a thing we have to think about incorporating anymore, it's just how we teach." Participant 13 added, "Technology is not really integrated, it's just a piece of the learning puzzle. It's really not an 'add on'." Finally, Participant 21 suggested that technology is essentially invisible, "It's like a piece of paper and a pencil. It's really not something different than that."

School B also incorporates coding in the learning experiences. Coding is defined as the process of problem solving that combines logic with the way computers think (International Society for Technology in Education, 2016). Participants stress they employ coding as the application of critical thinking, problem solving and communication. Coding has become an essential part of the curriculum, and a best practice, beginning in kindergarten and developing through grade 5. Participants report they originally only participated in the "Hour of Code" annual event. However, they soon realized the value of coding in developing 21st century skills; critical thinking, problem solving, and communication. A scope and sequence was developed outlining coding skills students would learn from kindergarten through 5th grade. However, as students have become more versed in coding, this scope and sequence had to be revised. Participant 11 summed up the value teachers place on coding, saying, "We are teaching kids how to be problem solvers and critical thinkers through coding." Teachers report they no longer participate in "Hour of Code", as they now code "an hour a week". Participants shared an experience during a recent visit by some Apple executives. Upon learning some 5th grade students hacked into an Apple coding game to fix a bug, teachers worried the executives would be upset. Instead one exclaimed, "Way to go! These are the kind of people we want to work for us!" Participants shared how surprising that comment was, although they saw it as validating what they were doing to prepare students for the future.

In many circumstances, students have surpassed teachers in their ability to code. Participants candidly shared the humor, camaraderie, and vulnerability in these scenarios. Participant 21 shared a vignette from when first grade students taught kindergarten

students a new coding element. Later, when a kindergarten student needed help and asked the teacher, the teacher remarked, "I don't know. But, if you need a first grader, let me know!" Participants shared that teachers are often learning technology and coding elements alongside students. To this regard, Participant 20 shared, "Often, they [the students] have to problem solve with us to figure it out." While Participant 18 further asserted, "That vulnerability piece is really important for them to see." It was evident to the researcher this sincere sentiment also reinforced the existence of a culture of continuous learning.

STEAM integration. "We don't call ourselves a STEAM school," declared Participant 13, "but we do STEAM all the time." Integration of STEM, or STEAM (Science, Technology, Engineering, Arts, and Math) as a best practice, was evident throughout these schools, on the walls, through interviews, and through observations. Participants did not discuss STEAM as a separate focus, rather elements of STEAM are integrated into learning experiences as they most appropriately enhance the learning experience beyond the traditional curriculum. Participants discussed evaluating the components of STEAM to determine how the elements could be incorporated to enrich the learning experience. At times there doesn't appear to be a clear connection on the surface. During one focus group interview, participants encouraged a team mate to share unique applications of STEAM integration, stating "second grade knocks it out of the ballpark with integration," offered Participant 21. Participant 19 went on to describe how the arts are integrated into their units. Tableau, a type of miming, is incorporated to describe landscapes in a social studies unit on landforms; rhythm and dance is

incorporated in a science unit on sound, which is anticipated to culminate with a performance akin to “STOMP”.

STEAM integration in content instruction can be seen in an example shared by Participant 24. A grade level ELA creative writing theme was ‘Keys’. When students had competed their writing, both technology and math were then incorporated by using the 3D printer to design, program and print a 3D key that represented their creative writing piece. On other occasions, students use voice and choice to determine how they will incorporate a STEAM component as a product. Participant 7 shared options students have taken incorporating components of STEAM, to present their learning, such as “rap music, they can do a song, they can do a poem, they can do a video.” Many learning experiences are designed to integrate multiple components of STEAM at the same time. An example of this can be seen in the growing popularity of creating movies as a demonstration of learning, as mentioned by many participants. Students incorporate technology, art, and sometimes engineering in the process of learning a new app or program, together in concert with the goal of designing a creative, engaging movie clip that demonstrates content learning. This type of learning experience exemplifies the earlier comment made that these schools do not consider themselves STEAM schools, but also substantiates the previous comment made by Participant 11 about learning experiences being integrated together.

Theme 2: Fostering an Environment of Learner Agency

Agency is defined as a learner’s capacity to empower, or exert one’s own choice and influence, in the learning process (Sheninger & Murray, 2017). When considering learner agency in school, the learner would be empowered to make meaning choices

regarding their learning, furthermore the learning opportunities are flexible to the needs of the individual learner.

Table 10

Frequency and Source Totals for Theme 2

Theme	Frequency	Sources
Fostering an environment of learner agency	138	27

This theme was the second highest theme, and was recorded in 27 sources with a frequency count of 138. The data for this theme was sorted into two categories: student agency, and teacher agency.

Student agency. Student directed inquiry is a best practice reflected at both schools. Participants discussed the importance of giving students agency, or empowerment, over their learning. Students are given opportunities to explore interest projects, or as Participant 12 calls, "passion projects". Teachers found this practice made a significant difference in the level of student engagement and performance, commenting that the students had a sense of pride in their products that teachers normally would not typically see on basic assignments. Participants found through the course of these inquiry projects, students were managing themselves and, "going deeper with their thinking" according to Participant 21.

Akin to student directed inquiry, "voice and choice" was frequently discussed as a best practice and a standard element in planning learning experiences for students. Voice and choice allowed student agency when projects could not be completely autonomous. Participant 6 summed this concept up in an example from a fifth-grade class preparing to

start a research project on different countries. Choice was given to students to research any country of their choosing, rather than having one assigned to them. Another example of voice and choice was observed by the researcher during Observation 7. Students were recording short videos on an iPad as a proposal of a project they wanted to submit for the upcoming science fair. Participation was completely optional for the students, and students were allowed any project of their choosing. The only parameter, was students had to address specific elements in their video proposal. The researcher noticed a continuous flow of students recording their proposals in the duration of the observation. Voice and choice can also be seen in how student choose to present information. Participants shared that students are often given choices on creation tools to complete a given task. For example, in a kindergarten class, students were tasked with creating a stop motion movie to demonstrate movement in space; however, students had choice over which creation app they chose. This option for student choice was also observed by the researcher in Observation 13. The students had to demonstrate understanding between earth's rotation versus revolution, but were given the autonomy to demonstrate that understanding in whatever manner made the most sense to the student.

Personalized learning is an aspect of learner agency as it meets the needs of the individual learner. Personalized learning is another best practice utilized extensively in these two schools. It was observed that technology was frequently utilized to assist in personalizing learning; however, not exclusively. The adaptive learning programs discussed in the previous section, were used throughout these schools at all grade levels to support student agency in meeting student needs. Participants from all stakeholder groups, including teachers, parents, administrators, and support staff, discussed the

benefits of personalized learning in meeting students where they are, and helping them grow. Additionally, noted as a best practice, teachers frequently access reports available in these programs to further meet the needs of students in small group instruction to "do RtI the next day", as Participant 18 reports. The practice of developing student agency though adaptive learning, supported with small group instruction, was observed by the researcher in four of five observations conducted in primary grade classrooms.

Participants frequently made reference to the practice of using different resources for different types of learners to support personalized learning; finding the best resource, digital or not, that works for each child. "Because," as stated by Participant 10, "everyone learns differently." The practice of using different resources to fit the needs of the learner, was even noted in parent groups. Parents recognized and made reference to instruction being individualized to the needs of their individual child. One parent, with three children in the same grade level, commented the instruction and the work she saw coming home was different, yet specific to the needs of each of her three children. Further, she recognized, "They're constantly moving up. The teachers take a lot of time with them." Reinforcing the best practice of building agency by meeting the needs of each learner, Participant 21 summarized, "It may take different resources for [this kid], than it takes for [that kid]. And we're okay with that. I think that's the beauty of what we do."

A best practice in building student agency was demonstrated through the use of student voice and choice in determine how and when students approach independent practice. Participants shared giving students either menu-type options, or a goal chart, that signifies the assignments that must be completed by a specific time, typically by

Friday, as Participant 13 confirmed. Teachers report this practice helps build student's agency by allowing them to make choices about their learning. In some cases, students have choice in deciding some of their goals, for example, how many minutes they will read for the week. In a follow up, Participant 11 shared that, "much like in the adult world," some students will complete their least favorite tasks first to get to the ones they do like, and other students will do just the opposite. The sense of choice and ownership students perceive was observed by the researcher throughout formal and informal observations. A comment made by a first-grade student to the researcher in passing exemplifies this sense of ownership, "I think I want to work on my i-Ready right now, because I like it best." Similarly, a third-grade student reinforced the flexibility students have in decision making. This student reported to the researcher, on a Tuesday morning, "I'm already done with all of my spelling tasks for the week, because I am a good speller."

This best practice of building agency was further emphasized by parents of upper grade students in acknowledging the contribution of this practice in helping their children become responsible, independent and accountable learners. Parents report that since their children have a voice in their weekly goals, or targets, the children know what is expected of them, and by when. Participant 14 affirmed the sense of responsibility and accountability her child has developed by recalling a recent incident in which her child had not completed a particular target. "She was up at 6:30 in the morning because…she wasn't going to step foot in the building without having it done. This is very meaningful to them." Notwithstanding the accountability in meeting goals, parents asserted the flexibility built into these goals, or targets, which give students a voice in their choice.

Participant 14, again, shared a recent opportunity given to students to partake in an optional educational activity during the school day. Students were given the choice to participate, knowing the trade off, would mean completing some of their classwork at home rather than school. Participant 14 stated, "She was happy to do that."

The use of flexible learning environments is yet another best practice in developing student agency employed in these schools. Based on formal and informal observations, the researcher observed students frequently opted to sit in various places around the classroom, on the floor, or out in the hall. School B also had open learning spaces that students could choose to work in. Most students could be seen utilizing a variety of seating options that were available to them, from traditional chairs, to large and small yoga balls, or wobble stools. Additionally, if partner work was involved, students were frequently given the choice to select their partner. However, teachers could be heard reminding students, "Choose someone who won't be a distraction. Make brave choices", such as was said during Observation 10.

The use of flexible learning environments as a best practice was observed by the researcher during 10 of 13 formal observations. During an inquiry session, part of Observation 12, students worked in groups of four. One group opted to move outside of the glass wall, also referred to as the garage door, to move into the open space on the other side. Allowing students to move into flexible areas, and move frequently, was mentioned by many participants as an example of student agency, or empowering them to have control of their learning environment. There is an intentional focus on getting kids to move frequently, especially "the little ones" shared Participant 10. During observations, the researcher noted students intentionally move, or make a transition of

some sort approximately every 15 minutes for younger students, every 20 minutes for older students, unless they were engaged in a hands on inquiry project. Participants discussed how difficult it is for adults to sit for extended periods of time, and even more so for children. They emphasized the success students experience when allowed to move frequently, and exercise agency in their learning environment. Participant 14 supported this concept stating, "Kids don't sit in a desk all day long. They are allowed to learn in the way that they learn best…which could be on a wobble-ball, or laying on the floor." Some participants mentioned that students who had previously been identified as behavior problems in traditional school settings, have not experienced behavior issues in this type of flexible setting. A specific example of this scenario was shared by Participant 25, who went on to add, "It was such a huge, phenomenal difference for this child, and changed his life. Now he is set up for success." Participants also shared that visitors who are more familiar with traditional school settings are thrown by students being in the halls frequently and moving so much, to which Participant 26 tells visitors, "They are collaborating, or they're on their way to shoot a video, or they're on their way to do this. It's becoming more popular."

Teacher agency. A best practice that was frequently recurring in the data revolved around teacher agency. Much in the same way as it is important for students to have agency in their learning, it is important for teachers to have agency in their learning as well. Participants discussed the importance of having professional development that is relevant to their needs, in a timely manner. As a standard practice at these schools, teachers have regular common time for collaboration with grade level peers, or co-teachers, during which learning experiences are planned and the needs of students are

discussed. Both schools have created additional time for teachers to share new learning. They also utilize newer digital platforms, such as Twitter, to share information and curate new learning. School A uses a Professional Learning Community (PLC) model, where teachers can share best practices, new learning and try out new ideas that are timely and relevant. Teachers at School B have created their own structure for professional learning. They have dubbed it "Two Cent Tuesdays"; the opportunity for them to, "bring our two cents to share with one another," explained Participant 18. They collaboratively decide what topics are challenging, of interest, or have relevance at that time. They draw on the expertise of others in the group to present some topics, and bring in outside experts when warranted. They read professional educational publications as well to continue expanding their knowledge base. Leadership at School B has acknowledged this model has been effective providing teachers an, "opportunity to explore, and kind of dive into anything and everything," as Participant 12 shared.

Both schools demonstrate a best practice in cultivating an environment of teacher agency in their own learning, and allowing them to push themselves together as a community of learners. The mindset of a commuity of learners was a recurring comment throughout interviews and observations. Participants frequently discussed intentionally creating learning environments that allow students and teachers to learn side by side, or even allow the student to lead. An example of this mindset of community of learners was relayed by Participant 17 and involved a specific technological process that the teacher could not answer. Undaunted, the teacher simply asked the class, "Who can help?", and another student was able to provide the necessary information. Participant 18 added the

significance for students to see teachers as learners and as an example of a growth mindset to see, “There is always more to learn. Continuous learning is important.”

The mindset of a community of learners as a best practice was observed ad hoc, by the researcher during the course of one of the focus group interviews. On two different occasions during the same interview, participants broke off on a tangent sparked by a comment, which led to an impromtu collaboration session. During one of these impromptu sessions, participants discussed best approaches for an upcoming science unit that one grade level was preparing for. During the second impromptu session, participants discussed strategies for implementing, or enhancing, the “Focus Circle”, discussed in Theme 1, in other grade levels. This confirmed to the reseacher, the authenticity of the community of learners mindset, upon which a Participant 16, a newer member to the team, remarked to the researcher, “I get to learn along side these amazing ladies.”

Theme 3: Belief that relationships amongst stakeholders fosters learning as a partnership

Creating and sustaining positive relationships amongst and across all stakeholder groups was a prevalent theme in these schools. Stakeholders express this atmosphere of benevolence and nuturing influence positive conditions for learning.

Table 11

Frequency and Source Totals for Theme 3

Theme	Frequency	Sources
Belief that relationships amongst stakeholders fosters learning as a partnership	134	16

This theme was observed from 16 sources and recorded 134 frequency counts, which was the third highest recorded theme. The data for this theme was sorted into two categories: sense of family, engaging partnerships.

Sense of family. "This is one of the lovingest schools I've ever been to!" exclaimed Participant 2. A best practice evident at these schools was a strong sense of family that had been fostered within the school culture. Interviews throughout all stakeholder groups, supported by observations across both schools, confirmed this fundamental belief. References were made across all stakeholder groups, that all stakeholder groups care for each other, and are supportive of each other, while maintaining a clear focus on the wellbeing of students. Participants spoke of supporting, nurturing and encouraging the students when they are having a bad day, or needed encouagement much as a family would support each other. "Sometimes kids need to hear, 'it's okay', or 'you can do anything you set your mind to'," as Participant 5 shared. This support for students was also evident through interactions teachers had with students. For example, during Observation 1, the teacher could be heard encouraging students with phrases such as, "What is in that beautiful, brilliant mind?" Phrases such as, "Take chances," or "It's okay to take a risk" were repeatedly heard throughout observations at both schools, from teachers and students.

The nurturing, supportive environment that staff create for students, could also be seen filtering down between the students themselves. Frequently, students could be heard just as readily supporting and encouraging each other using the same verbiage. During Observation 6, for example, students were engaged in an interactive activity. When a student would become perplexed, fellow students could be heard energetically

encouraging, “You can do it! Take chances!” It was also observed by the researcher, particularly during Observations 7 and 12, that students eagerly offered assistance to each other when challenges arose. Offers of assistance were readily accepted. These exchanges were collaborative, friendly, supportive, and focused on problem solving in genuine benevolence.

The concept of family was further emphasized during focus group interviews during which participants expressed the connection between various stakeholder groups. On multiple occasions during interviews, comments were made declaring the school environment to be a close knit school-family. Participant 23 declared, “It’s such a positive environment between the staff, between the kids, and the parents. It’s just a fun place to be.” Participant 25 added, “It doesn’t feel so much like a job, because you are working with friends, the parents, the staff.” Summarizing the close connection felt in the school community, Participant 26 affirmed, “It’s very much a family.”

As a best practice, parents are regarded as an integral partner in their child’s education. Multiple opportunities exist for parents to volunteer, and in a variety of capacities, both inside and outside the school, in an effort to accommodate parents whose schedules don’t allow them to come in during the regular school day. Those parents who do come in, help wherever the help is needed, in any classroom or other space, not solely their own child’s classroom. Participant 2 shared, “You may be helping with math, or helping in the office.”

Teachers use both traditional and digital formats, such as class webpages or email, to communicate with parents and parent volunteers. The researcher observed, some teachers had placed a folder next to the classroom door with a QR code on front. Parents

used a smart phone to scan the QR code, which opened a document describing what specific volunteer activity needed to be done that day. Examples of activities included helping students finish presentations, projects, or helping students with academic skills. Participant 14 stessed, "I have never once had to photocopy or staple. When I'm here, I am helping kids with presentations, I am working with them on math skills. It's very meaningful and makes me want to come back." Multiple participants expressed, such as Participant 18, that parent volunteers, "don't just come in for parties. They are asked to be a partner in their child's education. So, they take quite an investment in it." Parents expressed comfort in knowing their children are safe and cared for, and how excited their children are about learning. In turn, parents report getting excited for their children, which Participant 15 proclaims, "leads to parents being more engaged."

Engaging in partnerships. Engaging in partnerships is another best practice employed by these schools. Partnerships with community organizations, business, and with other schools, enhance the educational experience for students. While discussing partnerships, both schools began by praising their PTO and PTA respectively. Participants lauded the significance of support provided by parent organizations, such as donations of classroom supplies, equipment, and financial contributions that cover field trip costs as mentioned by Participant 1.

Engaging in partnerships with community members and community organizations was highly regarded by stakeholders as a best practice. Some participants stated their grade level standards involve learning about the community. As such, established partnerships in the community enrich student's experiences as they learn about the community, such as trips to the local grocery store, library, or senior center. Moreover,

knowing that the cost of field trips out to the community can be prohibitive, schools also engage community members to come into the school to share their expertise, career or interest. Visiting community members may include those with personal expertise such as a musician, artist or author, or those with career interests such as "a school board member or veterinarian," as Participant 22 shared. Community services agencies are also engaged as partners, such as "the fire department," as Participant 1 shared. Participant 11 explained the benefit community partnerships have for the students, stating, "our kids see that not only is the teacher an expert, we have experts in our community."

Schools engage local businesses in partnerships as well. School A discussed a recent partnership from a new local business, who offered raffle items as a motivator encouraging student attendance and performance. School B shared a specific partnership example that their fifth grade class has with a local grocery store. The store also operates a community garden. Students help work at the community garden in the fall and spring, while they learn techniques for managing a garden. Students apply some of these tips and techniques in the school's own garden that the fifth grade students manage. This particular partnership is based on a PBL unit for fifth grade. In fact, Participant 11 indicated, "Every PBL unit I've mentioned is based upon a partnership which fosters the creativity, critical thinking, communication… and obviously, we're collaborating with them." Often when a culminating event involves a performance, the local library or a large church building nearby is used to house the event to engage not only parents in the event, but the community is invited as well.

School B has the added benefit of being located directly across the street from one of the district's high schools, and within close proximity of a university. Fostering the

mindset of engaging community, students from both the high school and university come into the school to work with various grade levels to act as community "experts" to enhance specific curricular areas. Participants reported that high school students come into the school to conduct "immersion" days twice a year, such as the highly anticipated science immersion day that was about to occur the week following the researcher's visit to the school. In these immersion days, high school students prepare and conduct experiments with the elementary students to explain various science concepts, such as scientific method, which are differentiated by grade level. Participant 16 commented, "Everyone is instantly engaged, and they really get it [the concept] after that." Participant 18 expanded on the benefit the high school students get in return having to teach a concept, or "get feedback from a kid." Specialty topics happen as well, for example the high school drama department was working with second grade to produce a rendition of the rhythmic performance, "Stomp". "The high school is a nice resource," stated Participant 19.

Participants across all stakeholder groups recognize and expressed the benefit to the elementary students from the partnership with these schools. Participants discussed that these older students provide another expert, besides the classroom teacher, who can engage students in the learning experience. Further, they emphasized the anticipation students feel prior to the visits by the high school and college students. "The students think they are they're idols," summed up Participant 16.

Finally, an important informal partnership with the community that both schools engage in as a best practice, is opening up their wifi network for community use outside of school hours. Administrators from both schools proclaimed the significance of

technology in education, however, recognized that not all students have connectivity at home. In addition to promoting local businesses and libraries that offer free wifi, both schools make the school wifi available to anyone in the community after school, throughout the weekend, and during breaks. "Sometimes when I come up here on the weekends, I have students that are sitting outside on the sidewalk because they are using the school's wifi to do projects," affirmed Participant 1. Furthermore, the researcher witnessed a community member drive into the parking lot of one of the schools, and use a device from his car on a Sunday afternoon. This practice confirms the schools' committment to supporting connectivity for the greater community, which by association, benefits their students.

Theme 4: The classroom extends to the world beyond the school building

A prevalent theme reported primarily from the teacher and administrator stakeholders was providing learning experiences for students that extends beyond the walls of the classroom or school building.

Table 12

Frequency and Source Totals for Theme 4

Theme	Frequency	Sources
Classroom extends to the world beyond the school building	81	9

This theme was the fourth highest theme, and was recorded in 9 sources with a frequency count of 81. The data for this theme was sorted into two categories: Project Based Learning (PBL), and global focus.

Project based learning. Project Based Learning (PBL) is a student centered approach to instruction allowing students to explore, discover, problem solve, and create

over an extended time, based on an authentic real-world question or challenge (Holm, 2011). Both schools use PBL as a best practice to design engaging learning experiences. PBL units can often be the impetus for extending learning experiences, either physically or virtually, beyond of the walls of the classroom or school building. In the fifth grade garden example discussed in theme three, the community partnership with the community garden stemmed from a PBL unit addressing food insecurity, and its repercussions on a person's well-being. Through this unit, fifth-grade students go out into the community to work at two different community gardens, and also help work at a community food bank to experience firsthand what goes into donating, organizing, and finally providing food for those in need. According to student design, this PBL culminated in a "Hunger Awareness" event and canned food drive that the students planned, organized, and hosted, raising over $2,000 and 3,000 cans of food to donate back to the food bank they worked at. This type of engagement and direct involvement demonstrates to the students, authentic impact on their community. Participant 13 elaborated, "Our goal is, how can you take what you've learned, and show what you know. Or, think differently than they did before."

A best practice used in designing PBL experiences, is starting with standards as the basis for the learning experience. Participant 18 shared, "we start with the standards, so we know the ins and outs of what the students are expected to do." From there, teachers explore "driving questions" stimulate connections to authentic experiences or global events to guide a PBL unit. For example, third grade standards in one school include the water cycle. Therefore, a third grade PBL unit focused on allowing students to explore and understand the intricacies of the water crisis globally. Students learned

different contributing factors that can lead to different conditions of a water crisis, such as drought or tainted water sources. Students researched how they could authentically make a difference with the water crisis and found "water.org". Students planned a fund raiser, and prepared a "Gala" at the local community library where they shared information they learned about the global water crisis, creating awareness for parents and the community. Participant 11 shared that through this authentic engagement, "they raised six hundred dollars for water.org through making beads and selling beads [at the Gala]."

A culminating part of the authentic PBL experience is planning for the publication of student research and work, or Gala as one school refers to. In a follow up interview, Participant 11 described how the students are entirely in charge of planning and running these events, including creating the public relations to advertise the event. "Sometimes it is hard to step back and stay out of the way," exclaimed this participant. PBLs can also be used as the foundation to engage a community partnership, such as the community garden. In the water cycle PBL, the Gala was held away from the school at the local library, one of the school's community partnerships, making it more accessible to the community at large to attend.

A best practice, and foundational premise of PBL is allowing students to drive the inquiry process with the teacher acting as a facilitator to the inquiry, rather than lecturing on content. This can occur at the launch of a major PBL unit, or during the unit to introduce or reinforce an academic concept. Both practices were observed during the course of the site visits. During observation 12, the teacher started the unit launch by preparing inquiry projects throughout the classroom, designed for students to experience

concepts of Force and Motion through inquiry. The teacher circulated around the room acting as a facilitator to help guide student's thinking if they got stuck. Observations 3 and 10, on the other hand, allowed students to explore and stretch their understanding of an academic concept through the teacher guiding students' inquiry with specific questions designed to stimulate thinking. During these observations, teachers could be heard using questions such as, "What do you think?" Followed by, "How do you know?"

Global focus. "The world is our classroom!" remarked Participant 13. A best practice seen at both schools is extending the classroom to the world beyond the classroom walls through a global focus. School A specifically identifies themselves as a school with a global focus. School A offers a formal Spanish immersion program in all grade levels, Kindergarten through fifth-grade, wherein 90% of the daily instruction is conducted in Spanish, with an itinerant teacher pushing in for 10% of the day for academic support in English. A large part of their focus, however, is building an awareness, appreciation for, and acceptance of other cultures, languages, and traditions. Participant 1 described to encourage the mindset of globalization, each wing of the school building has been named and takes on the identity of a different continent, such as North America, Africa, Asia and Europe. Displays could be seen on the walls of each respective hallway representing the corresponding global theme. The layout of the school insures that most students will transition hallways each year as they advance in grade levels. Participant 1 shared that teachers spend time with their students at the beginning of the year learning about the specific countries, culture, traditions, food and languages for the theme of their hallway. Throughout the year, the site participates in various global events, such as Global Awareness Week, where several different countries

and cultures are highlighted, and students engage with all of them. During that week, parents are invited to a parent night, where students can showcase their continent, and countries they have studied in their given hallway theme. This Global Awareness Week and parent night were highly anticipated, as the researcher learned this event was scheduled to occur the week following the researcher's visit.

Teachers take opportunities to integrate the global theme in PBL, and other learning experiences, as Participant 9 shared. "Like in Texas, with the hurricane." Participant 9 stated that even though it isn't global, it was relevant. Students learned about the culture of the area, about the hurricane just experienced, and with that information, students evaluate the impact to the state's culture or way of living. Students then "write a [PBL] project based on what they would do to help that situation," stated Participant 9. Other teachers relayed using past events such as the earthquake and Tsunami in Japan. Even though it occurred in the past, students can collaborate to research, engage with content and create awareness for that topic, or event, through a video, poster, or any other means. Participants expressed the importance of global studies, indicating that that many children attending School A have never been out of the city limits. However, Participant 6 shared this approach to educating a global learner, is creating awareness, stating "Kids minds are like opening. They talk about other countries. They want to travel." Participant 7 added, "They are more aware of the possibilities, and what's out there."

A best practice the researcher observed was teachers utilizing the available technology to engage in global studies through virtual field trips. During an informal classroom visit, the researcher observed a first grade Spanish immersion class connected

via Skype with another school in Columbia, during which the students engaged with similar aged students in the Columbian school, all speaking Spanish. The researchers limited comprehension in Spanish, indicated the first-grade students were talking about what recess is like. During interviews, other participants confirmed this was a common practice. Participant 6, who is also a parent of two children in the school, commented that due to these experiences, her younger child will frequently say things such as, "We met a person named Tracy, and she lives "down under", in Australia." All stakeholder groups recognized the influence this global focus has had on developing a growth mindset at the school. Further, as witnessed by the researcher, students and staff demonstrate an interest and appreciation of diversity and culture. Participant 1 commented, "I am really proud of people being able to work together and appreciate people for who they are, and accept their culture, and the kids accept it, too."

Theme 5: Implement a system of varied measure that inform decision making

A best practice revealed in the data was the use of varied assessments or measures that help inform decision making for students individually, and in general for the continuous improvement process.

Table 13

Frequency and Source Totals for Theme 5

Theme	Frequency	Sources
Implement a system of varied measures that inform decision making	67	12

This theme was ranked fifth among the themes, and was recorded in 12 sources with a frequency count of 67.

"Data is like everything," stated Participant 18. Informed decision making has long been regarded as a best practice in education, and is a best practice employed by these schools. Assessment and data collection occurs both formally and informally. While specific types of data collected at each school varies slightly, participants at both schools report formal assessment typically includes end of year state testing, end of semester benchmark assessment, periodic mid-term standards assessments, and weekly or daily progress monitoring. Informal assessment may include observation, projects, or real-time data from digital learning programs.

At the time of the site visit, participants at School A were preparing students for Standards Mastery Assessments, or SMAs. Whether it was evidence of the school's focus on standards, or coincidence of timing, the SMAs were the most prevalently discussed assessment at School A. Participants explained SMAs are frequent district-wide assessments based on mastery standards that occur in coordination with the district pacing guide. Students take SMAs on the chromebooks, in ELA and mathematics, and teachers have immediate feedback as to student performance. Teachers are provided half day release time to review data together as a grade level. Data is reviewed by student, by class, and by grade level. As a best practice, the school uses this information to determine students' understanding of the specific standards, then "we come up with a plan", stated Participant 1. Participant 7 explained, "we regroup for every standard, and we do remediation, 'Safety Net'. We do that for every standard." Participants explained that Safety Net is one of the tools implemented by the school for informed decision making. Safety Net is a specific time of day, daily, that grade levels group students for intervention and remediation based on identified standards. Every grade level is given

extra support personnel during this time to support intensive instruction of standards. Additionally, older students chart and monitor their performance on the SMAs as well, so they can visually see their own growth. Participant 9 explained, "It's not just the teacher looking at the data. I'm showing you we're all in a team." Parents acknowledged the frequency of formal assessment, commenting they feel well informed and appreciate seeing their children's growth. Participant 2 remarked, "They do a lot of assessments to see where your child is at now, from where they were a month ago."

Participants at School B, acknowledged benchmark assessments as one method, of many measures, used to determine student growth. Across administrator, teacher and parent stakeholder groups, there was a clear focus on all students making progress. Participant 11 likens this focus on progress to the analogy of running a marathon, stating "Everyone runs at their own pace, but everyone moves forward." As a best practice, teachers discussed utilizing data from the digital programs used for ELA and mathematics on a daily basis. Moreover, they use the data to determine groups "you can pull, and do RtI the next day". Teachers indicate this process allows them to adjust and respond to student needs immediately, rather than waiting until the next benchmark test. Participant 12 affirms using these digital tools in real time, "Allows us to inform instruction in the moment."

School B has an established focus on "Inspiring Creativity", which is part of their motto and mantra. By extension, the school acknowledges a focus on other 21st century skills as well. In order to validate student's growth in 21st century skills, the school has adopted a rubric, developed by EdLeader, designed to measure student's growth on 21st century skills. This information is reported to parents as a standard part of the report

card. In this way, parents are not only aware of their child's growth in ELA and mathematics, but also in their development towards creativity, critical thinking, collaboration, and communication. Parents recognize 21st century behaviors are part of what is reported to them. Parents also recognize and express appreciation for periodic reports from digital learning programs identifying their child's reading level. Participant 15 echoed the concept of students making progress, saying these reports let parents "know exactly what they're doing. Are they making progress?"

Finally, teachers at School B report looking at assessment differently. As a best practice, teachers have reframed their thinking, realizing assessment is "not necessarily having to have a paper quiz to see if they know what to do, if they can show it in other ways," declares Participant 18. As a district, there has been a focus on John Hattie's work on Visible Learning. This approach equips teachers with strategies for evaluating student knowledge and understanding through purposeful observation. Participant 20 explained, "You watch them, and listen to them. Just working along side them, you are collecting a lot of information." Additionally, teachers use publishing, presentation, showcase, and Galas as a means to evaluate student understanding of content knowledge, and as a means of reporting to parents. Participant 11 indicated that showcases and Galas are used in place of traditional Parent Nights and Awards Assemblies. Instead, students authentically publish and present their learning. Parents report being impressed by the quantity and quality of presentations students create. Participant 14 asserted favorably, that students are "making videos and presentations constantly."

Theme 6: Intentionally practicing inquiry and reflection as part of the learning process

Inquiry can be described as the process of collecting and examining something. Reflection is described as the process of thinking critically about ones own behaviors, attitudes and beliefs (Sheninger & Murray, 2017). A best practice that emerged in these schools was an intentional focus on practicing inquiry and reflection as part of the learning process.

Table 14

Frequency and Source Totals for Theme 6

Theme	Frequency	Sources
Intentionally practicing inquiry and reflection as part of the learning process	51	21

This theme was ranked sixth among the themes, and was recorded in 21 sources with a frequency count of 51. Interestingly, while this theme ranked sixth amongst frequency counts, it ranked third in the number of sources recording this theme. The data for this theme was sorted into two categories: student behaviors, and adult behaviors.

Student behaviors. "Well, you have to design. And then you have to build. And then you have to test it out, and you go, 'Oops! That didn't work!' So, you go design, build…" Participant 21 shared this rendition of the design process as told by a kindergarten student explaining inquiry and reflection. Participants throughout both schools discussed the importance and best practice of giving students time for inquiry, time to discover, time to fail, and time to reflect. "We always give them time to Tinker," stated Participant 18. All participants at School B confirmed they provide students with

"Tinker Time" as a vehicle for inquiry and reflection. Though not directly discussed in interviews, similar inquiry time was observed during informal observations in some classrooms at School A.

Teachers, primarily at School B, discussed the connection between PBL and the inquiry process. By design, most PBLs and many standard lessons, start with an inquiry rather than traditional lecture or direct instruction. An example of this was seen in Observation 12 which started on day one of a new PBL science unit on Force and Motion. Rather than starting with whole group instruction, the teacher only relayed logistical information, then sent student groups to their stations. Some stations had minimal instructions of what the task was at that station. Other stations had none. Student groups relied on the inquiry process to discover initial concepts of force and motion at their given station. Consistent with best practices in PBL, the teacher circulated throughout the groups, listening to conversations, and redirecting groups that were stuck or had misunderstandings. The teacher gave no direct instruction to stuck groups. Rather, she stimulated their reflective processes by asking probing questions or statements such as:

- "What have you tried?"
- "How close did you get?"
- "How did it work?"
- "Live and learn. Make adjustments."

The researcher observed these probing questions or statements helped student groups refocus, and cooperatively restrategize their attempts in completing a task or challenge.

In one particular station, there was no instruction at all, simply a QR code to access an app. The teacher later informed the researcher this was intentional as part of the inquiry process. Other teachers echoed using the same intentional vagueness. "Kids naturally take that on, because they want to know more," asserted Participant 21. Participants indicated that being vague and open ended was challenging to them when they first started using the inquiry process. As teachers, they had previously used more direct instruction, or had been more step, by step. Participant 18 summarized this intentional vaugeness, sharing:

> If you give a project to a kid, and you get 30 of the same thing back, or 50 in our case, that's a 'recipe' for them to follow, not a 'project'. So a 'project' is getting anything and everything back.

Participants indicated this process over time has motivated students to be more willing to investigate, take risks, reflect, and think differently.

During observations at both sites, the researcher noticed an intentional focus on risk taking. Often, this was followed by an overt celebration of failure in the pursuit of inquiry. Teachers prompted students with statements encouraging risk taking, and approving of failure. During five separate observations, the researcher documented teachers genuinely encouraging students using comments including:

- "It's okay to take chances."
- "Take a risk!"
- "Investigate options!"
- "It's okay to fail."

The concept of celebrating failure was further discussed as a best practice during focus group interivews. Participants discussed helping children understand how to reflect on failure as a natural part of the inquiry and learning process. From the youngest ages, particpants emphasized helping students develop a growth mindset, seeing failure not as a negative, but as an opportunity to reflect and learn. Teachers intentionally lead students through the reflection process, helping them how to reflect and learn from both successes and failures. This activity was observed by the researcher in a first grade class. Students were asked to reflect on what went well and what did not. This was followed with students reflecting on why, and finally thoughts about what they will do differently the next time they engage in this activity. Participants report further encouraging students to record their experiences in an ongoing Reflection Journal, or similar method. Intentionally teaching this process beginning at the youngest ages, helps students frame failure as a natural part of the learning process. Participant 17 affirmed reinforcing growth through the reflection process stating, "You learn through failure."

Participants indicated over time they have seen students develop a growth mindset through the inquiry and reflection process. They report students have learned the design process is a messy process, often with no clear outcome. Participants relayed early on, that students struggled with vaugness. However, over time, student have learned to be comfortable with inquiry being a messy process. Rather than trying to have a finished product at the start, students have embraced the revision process, learned to see failures as learning opportunities, and through inquiry have learned to use the tools available to them. Participant 18 shared a vignette of a student who had created a video with several advanced features that had not been taught. When asked how he learned how to do it, the

student responded, “Well, it has the question mark.” This demonstrated the student had applied self reliance to use the tools available, and had used the inquiry and reflection process to apply the learning to create an engaging video. “This process enriches them to be thinkers,” shared Participant 21.

Adult behaviors. In addition to encouraging students to reflect, as a best practice, participants stated using reflection to improve their own professional practices. Participants report using the reflection process at the end of the day to evaluate what went well, what didn’t, and “How can I reach that learner tomorrow?” as shared by Participant 18. Participants use the reflection process to improve their own professional practice, indicating they use the same reflection process taught to students, but as adult learners. Participants indicated they have all grown together through creating a community of reflection. They also learn from their mistakes. As Participant 17 added, “We’re not there doing it perfectly every single time. We’re going to learn from our mistakes.”

Participants report that the inquiry and reflection process is used to improve school wide practices as well. Participants from most stakeholder groups reported seeing evidence over time of the positive impact the practice of reflection has had on the overall school wide program. Administrators report the practice of reflection supports and encourages teachers to seek out new strategies, or pilot new programs, in pursuit of conitnuous improvement. As an example, Participant 1 discussed experimenting with flipped classroom models, and variations on blended learning. Participant 13 confirmed this concept particuarly as it related to PBL stating, “We are highly reflective on our practice, to continue our own growth… [our PBLs] have definitely been evolving.”

Participants from parent stakeholder groups acknowledged this evolution, stating there are different programs in place now than just a few years ago. Participant 15 explained, "They continue to refine the tools that seem to work best." Participant 11 reiterated the importance of the reflection process in influencing the growth process, "We are always reflecting and getting better. We're different people than we were yesterday, the day before, because our focus is to do what's best for kids."

Theme 7: Publish for authentic purposes

Publishing for authentic purposes emerged as a prevalent theme primarily among teacher and administrator groups, however was also acknowledged by parents.

Table 15

Frequency and Source Totals for Theme 7

Theme	Frequency	Sources
Publish for authentic purposes	27	9

This theme was ranked seventh among the themes, and was recorded in 9 sources with a frequency count of 27.

Participants discussed the best practice publish for authentic purposes. Teachers reported the variety of creations they are incorporating now, as opposed to traditional essays. "Publishing" can still include written essays, poems, and pictures. Teachers report variations on publishing, and incorporating voice and choice, can be more engaging to students. Some variations on publishing can include, songs, drama, blogging and vlogging, creating a presentation or video, or creating a website. Participants stressed the significant factor making publishing a best practice was the aspect of "real

audience". Participants indicated students are more vested in the work they produce when it is not just for the teacher, but for an authentic purpose.

Participant 18 validated the importance of authentic audience when sharing the apprehension students expressed before they were willing to post their blogs. The students were concerned about any errors they may have made, and that people would see. "They constantly went back and revised, and revised, and revised. No fourth grader does that on their own unless they have some kind of stake in it," contended Participant 18. This statement was quickly affirmed by the other participants in the focus group.

The configuration of an authentic audience may be different for different purposes, and perspectives. The researcher observed on several occasions during site visits, teachers posting student writing on the document camera to highlight various features of text. Participant 21 shared during one such occasion, a student pleaded with her to take it down, saying his 'b' was a 'd' and other kids kept telling him. The teacher complied, the student fixed the error, and the teacher put it back up. The exchange made the teacher realize the difference in perspectives; to a kindergartener, the real audience can be their peers. Participants report that publishing for an audience can take many forms, including creating a public service announcement (PSA) type video to post on a website, or creating a PSA type website, such as first grade students created to inform the community how they could practice better health habits.

As discussed in theme four, School B hosts multiple showcases, or galas, throughout the year to showcase to parents or the community, awareness of something they have learned, typically as a culminating event to a PBL unit. These showcases, or galas, are not only used as a PBL culminating event, but they also become a platform for

publishing for an authentic audience. Depending on what the topic lends itself to, students could create a skit, a Reader's Theater presentation, a presentation using presentation software, a song, or a video. These are presented to parents and community members, provoking a vested interest in the students to publish their best work, since it would be viewed by an authentic audience. Participant 12 summed up, "There's a whole lot of emphasis on creativity and the production piece, and that can be leveraged to increase quality in a product." Parents concur that students are deeply vested in their products for showcase, and get incredibly excited. Participant 14 stated enthusiastically, "You would have thought it was, you know, a Broadway show they were putting on. They were so bought in, and so excited." This mindset reinforces the concept of publishing for an authentic purpose as a best practice.

Theme 8: Leadership promotes innovation and relevance for changing future

While not a theme with a high frequency count, a theme regarding leadership has significant implications for future school and district practices. This theme credits site and district leaders in promoting innovation and relevance in preparation for a changing future for students.

Table 16

Frequency and Source Totals for Theme 8

Theme	Frequency	Sources
Leadership promotes innovation and relevance for changing future	22	7

This theme was ranked eighth among the themes, and was recorded in 7 sources with a frequency count of 22.

"The world is so changing. We need to prepare them [students] for a constantly shifting world," stated Participant 13. This statement summed up the rationale for the best practice of promoting innovation and relevance for a changing future. Statements reflecting this sentiment were seen across all stakeholder groups, denoting the significance of this practice. Parents, teachers, and administrators all reflected on the ubiquity of technology, as Participant 2 simply stated, "We live in a technology world now." The significance of this statement was manifested in multiple participant comments of how technology could impacting the future. Participants remarked about the changes to society in general due to the presence of technology, remarking even the way we buy food and products has changed. As Participant 13 commented, "For a long time the world was pretty predictable, now it is not."

Adept leadership in these schools reflected on how this changing future has an uncertain effect on students. Therefore, they are creating environments that stimulate innovative educational practices to appropriately respond to these changing conditions. Participant 12 used the term, "Future Forward" referring to a best practice of scanning the horizon to see what is coming, not settling for status quo, and "always thinking about what's next." Along a similar mindset, Participant 1 discussed ubiquitous presence of technology, and encouraged teachers to move beyond the status quo, look to the future, and continually reflect on, "How are you preparing your classroom and our students to get there?" Support staff stakeholders recognized that leadership support of innovative practices helps spread best practices to other schools in the district. Participants 25 and 26 stated district leadership is allowing other schools in the district to remodel buildings to create open pod areas, similar to this school, to foster student agency in flexible

learning spaces. Participant 13 shared, "We use the world outside, and its own progress, to help us better prepare our kids."

Participants acknowledge the status quo is no longer adequate in preparing students for the future. They also acknowledge, the future is uncertain. "We are preparing them for life beyond the borders of a school", remarked Participant 18, "we're preparing them for jobs that don't even exist yet." This awareness brought participants back to the underlying urgency of equipping students with essential 21st century skills. "We can't prepare them for certain jobs. But we can prepare them to think for those jobs, and to problem solve," concluded Participant 18.

Theme 9: Stakeholders share common vision of the school

Similar to the theme eight, theme nine did not have a high frequency count. Nevertheless, a prevalent theme that emerged was a common vision shared by all stakeholder group across the school.

Table 17

Frequency and Source Totals for Theme 9

Theme	Frequency	Sources
Stakeholders share common vision of the school	21	7

This theme was the last ranked theme among all nine themes. It was recorded in 7 sources with a frequency count of 21.

A best practice at both schools, it quickly became apparent to the researcher that every stakeholder group shared a common vision and common language for the school. Each school had a unique focus and population. Nevertheless, within that scope, from the top administrator, to teachers, support staff and parents, a common vision and

common language was evident. This is significant, in that the focus and vision had been made publicly aware for all to know, the vision was shared by all, and the work amongst stakeholder groups within their capacity was aligned to the vision.

The focus for School A is Global Learning. Within the umbrella of global learning exists a focus on standards, and the 4Cs, with collaboration being mentioned most frequently. The specific terms, "global learning", and "collaboration" were repeated in interviews with every stakeholder group. Additionally, the during the initial interview, the principal shared a vision for the school that included: every student being college and career ready; importance of integrating technology; and continuous improvement for the school. These exact themes were repeated, albeit, in different verbiage and order, amongst all stakeholder groups. All groups specifically discussed collaboration as a means of fostering collegiality, camaraderie, respect, and sense of family, which was also observed by the researcher during formal and informal observations. All stakeholder groups discussed the importance of technology to prepare students for the future. Most stakeholder groups extended this vision and connected technology to global learning. For example, participants in the teacher, parent and support staff groups discussed virtual field trips, where students benefit from technology and global learning to experience another place, and culture, "so you can sit and feel like you're at that place", remarked Participant 2. This virtual opportunity is significant for this population, as some students have never been out of the city limits. Finally, there was a clear, common focus on all students being successful with college and career standards, with common language used throughout stakeholder groups. Support staff

further added the sense of responsibililty they feel in supporting the efforts of educating the students.

The focus in School B is Inspiring Creativity. Within that scope lies a focus on standards, the 4Cs, and technology integration. During the initial interview, the principal discussed a vision of authenticity. This was described as: an integrated focus on standards through the PBL model, which encouraged creativity; allowed students to work together collaboratively as people do in life; wove critical thinking throughout; and all built on a digital platform. While detailed, the clarity of this vision was evident throughout every stakeholder group. Teachers, support staff, and parents all spoke proficiently to the 4Cs and how each one contributed to student success; all with an emphasis on creativity. All groups, were versed with the terminiology pertaining to PBL, and its significance in the educational process. Albeit, parents used the terminology "projects". Support staff even acknowledged they were glad other teachers in the district were going to Buck Institute for PBL training. "So, everybody can share in what we know works," shared Participant 24. All stakeholder groups spoke to empowering partnerships with various businesses and organizations throughout the community, and with parents, to engage students in the understanding of collaboration as a life skill. All stakeholder groups spoke to the use of technology. However, across all stakeholder groups, the discussion of technology was secondary to the learning. Teachers discussed the focus being on, "rich learning experiences for kids" as Participant 21 summarized, "the technology is just an instructional tool, like a piece of paper and a pencil." Finally, all stakeholder groups discussed a focus on creating learning experiences to ensure all students are prepared to be successful in school and life. Participant 13 summarized a

common thread throughout all groups, “We don’t want them to love school. We want them to love learning. We want them to love creating. We want them to love that they can make a difference in the world.”

Summary

Chapter IV provided a detailed review of the purpose of the study, reseach question, and methodology, including population and sample. This chapter also provided a detailed presentation of the findings of the data as collected through interviews, observations and review of artifacts. Sources of data included a total of 26 interview participants, 13 classroom observations and 16 artifacts.

This study was designed to explore and identify best practices employed in two 21st century elementary schools outside California that have been recognized as exemplary by P21. Nine themes emerged as indicators of best practices contributing to the success of 21st century skill integration. Using data from the findings, Chapter V presents an outline of findings, conclusions, and recommendations for action.

CHAPTER V: FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Change is inevitable. Fundamental advancements in technology have created conditions for a changing landscape globally, in life, and in the workplace. As a result, employers require the future workforce to be equipped with 21st century competencies including collaboration, communication, critical thinking, and creativity, as well as soft skills such as perseverance or grit. Considering the significant responsibility of education to prepare students for the future workforce, it is imperative that schools transform traditional practices in order to maintain a competitive edge globally. Organizations such as P21 are showcasing schools successfully implementing 21st century learning environments. Understanding the best practices implemented in these schools, beginning at the foundational level in elementary school, will provide insight and implications for other schools to follow in their quest to transform traditional practices to prepare students for their future.

Purpose Statement

The purpose of this phenomenological study is to identify and describe best practices related to 21st century skill development in two elementary schools outside California that have been recognized as exemplary by the Partnership for 21st Century Learning (P21).

Research Question

One central research question guided this study: What are the best practices used in elementary schools identified as exemplary by P21?

Research Methods and Data Collection Procedures

A qualitative phenomenological approach was deemed the most appropriate for this study as it sought to investigate and understand the experiences of those associated with the phenomenon of exemplar schools, namely teachers, staff and parents in these elite schools. Consistent with Creswell's (2007) assertion, conducting research in the natural environment of the school, allowed the researcher access to interviews, observations and artifacts, while allowing for the complexities and natural interactions within the school environment to occur.

Site visits were conducted with the selected exemplar elementary schools. The visit at School A occurred over four days during November. The visit at School B occurred over three days in January. Data at both schools were collected in the form of interviews with individuals and focus groups. Interview data was triangulated with observations, and a review of artifacts.

Population

For the purpose of a phenomenological study, all participants should have experienced the phenomenon under review (Patton, 2015). The P21 Exemplar Schools program is open to early learning, K-12 schools, school districts, and beyond school programs identifying them as exemplar upon successful completion of a rigorous application and validation process. The population used for this study was schools that have successfully met the criteria for P21 exemplar status. To date, there are 79 PK-12 schools identified as exemplary by P21 which comprised the population for the study.

Sample

A sample is comprised of those individuals who can inform an understanding of the problem or phenomenon (Creswell, 2007). Currently, in 2018, there are 79 schools in the P21 Exemplar program, 17 being elementary schools. The focus for this replica study was schools outside California. Currently, California has four exemplar elementary schools. Therefore, the sample consisted of the remaining 13 exemplar elementary schools. Having met the criteria of being exemplar elementary schools outside California, two of these 13 schools were selected, and the schools agreed to participate. Participants from the identified schools, were randomly selected from each stakeholder group to participate in focus group interviews and observations.

Major Findings

Following data collection and analysis, nine themes emerged that detailed best practices at these exemplar schools which were described in Chapter IV. However, a profound finding of this study was that nothing at these exemplar schools occurred in isolation. Many of the best practices described in Chapter IV were inextricably integrated with each other. Related themes have been grouped here as they primarily relate to each other. However, even among the subsequent headings there is a certain amount of integration, or overlap, of practices between them. The convergence of these practices are outlined here.

Finding 1: Learning Experiences are Intentionally Integrated

It was evident that teachers intentionally designed learning experiences that originated with a focus on content standards, then integrated the application of 21st century skills, soft skills, technology, and opportunities for learner agency integrated

throughout. Moreover, learning experiences culminated in a variety of products, such as presentations, videos, websites, blogs or essays. These creations were authentically presented to an audience as evidence of student learning, such as creating a PSA video or website, or hosting a community showcase. These publications, in concert with formative assessment or evaluation along the way, became the basis for evaluating students. The focus of these integrated learning experiences was to immerse students in learning that simulates the integration of real world experiences.

Finding 2: An Integrated Practice of Agency Exists for Students and Teachers

As teachers collaborated to design units of study, one component consistently involved pertained to the specific opportunities students would have for voice and choice, or agency. Teachers were keenly aware that integrating authentic, meaningful opportunities for agency promoted deeper student engagement in learning experiences. Agency was practiced through student choice about how to demonstrate their learning; options for publishing; how, when, or where to engage in certain lessons; and occasionally personal interest projects of students' choosing.

This mindset of agency was further practiced by teachers, with support from school and district administrators. In addition to some required topics, teachers were encouraged to explore topics of professional learning they felt would improve their teaching or ability to create powerful learning experiences. If the expertise for the given topic did not already exist at the school, an expert would be brought in to facilitate teacher competency with the chosen topic.

Finding 3: Relationships Exist Across the School Community

It was ardently evident walking on each campus, there was an intense focus on students. These schools created a caring, nurturing environment for students where parents felt their children were safe, cared for, and their academic needs were met. As an extension, this environment created caring relationships across the school community, between teachers, students, staff members, families, and community members, all with a common focus on student success. The data reflected on multiple occasions the term "family" was used when describing the relationships in and among the school community. While it was directly stated only a few times, it was evident to the researcher these relationships created synergistic energy across the school community, further perpetuating meaningful engagement amongst the school community.

Finding 4: Learning is Extended to the World Beyond the Walls of the Classroom

"The world is the classroom", was a phrase cited verbatim during two different interviews, and implied in numerous others. These schools did not limit learning experiences to the four walls of the classroom. Rather, there was an intentional focus to utilize the technology and resources available to explore learning opportunities beyond the school building, either physically or virtually. Age appropriate experiences, as well as content relevance, were emphasized in orchestrating a myriad of ventures and partnerships engaging with the community, nationally, or globally.

Finding 5: Leadership Promotes a Culture of Inquiry and Innovation

Within each of these schools, the leadership promoted a culture of inquiry and experimentation with innovative practices. The leadership stays abreast of relevant research, legislation, and future trends affecting education. One leader referred to this as

"future forecasting". Information is readily shared with staff. Staff are encouraged to delve more deeply and experiment with topics they deem relevant to continually propel their practices forward. Staff spend time collaborating and intentionally reflecting on current and innovative practices, having the effect of promoting the prolific use of inquiry with their students.

A significant element of this inquiry process, is the celebration of failure. Consistent with Schank's (1997) guiding principle, "Real thinking never starts until the learner fails" (p. 3), failure is not viewed as a negative outcome, but rather a crucial element in the learning process. In these schools, teachers and students alike, are encouraged to try new things, take chances, and affirm that it is okay to fail. Failure becomes a springboard for inquiry and reflection as a natural part of learning. During the reflection process, probing questions are used to guide the learning process. Guiding questions may include:

- "What went wrong?"
- "What went right?"
- "How close did you get?"

Subsequently, this focus on inquiry facilitates a growth mindset across the school, and a willingness to take risks to innovate, further cultivating the skills employers seek in the future workforce.

Comparison of Findings

This study was a replica study of best practices in P21 exemplar elementary schools. The original study was completed by Dr. Kelly Wilbert focusing on P21 exemplar elementary schools inside California (Wilbert, 2016). This replica study

focused on P21 exemplar elementary schools outside California. While arranged differently, many elements incorporated in these findings echo those from the original study. Commonalities in the elements of findings between these two studies include an emphasis on integrating 21st century skills and life skills, or soft skills, into lesson design; integrating technology into instruction as requisite tool for learning; a culture of growth mindset and risk taking; and a culture of parent and community engagement. Distinctions in Dr. Wilbert's study found a more predominant focus on an emphasis on college expectations; and teamwork and collaboration as an independent finding. This finding, however, also included elements of parent and community engagement, which was included in similar findings. This replica study revealed a specific emphasis on building agency; learning experiences extending beyond the walls of the classroom; and a culture of inquiry and innovation. Figure 3 demonstates comparisons between these two studies.

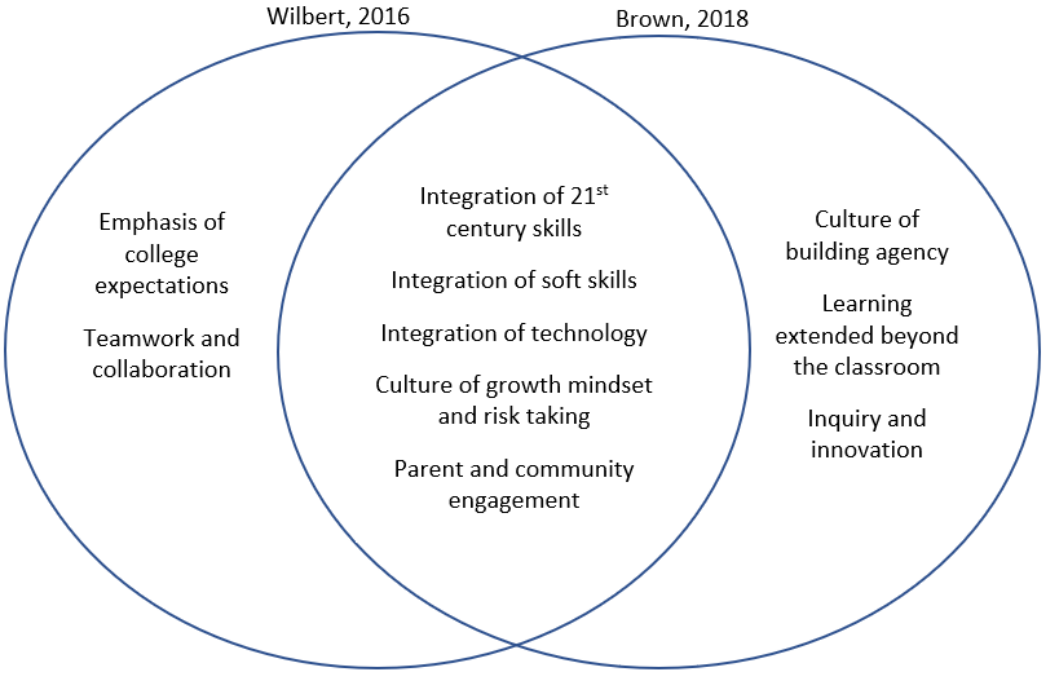

Figure 3. Similarities and differences of findings represented between the original study, Wilbert (2016), and this replica study.

Unexpected Findings

The researcher found three unexpected elements that emerged from the data. First, was the significance of a common vision. While this did not yield a high frequency count, it was remarkably apparent that a common vision was a driving force behind the practices these schools engaged in, keeping all initiatives congruently aligned. Relatedly, it was surprising to the researcher that identical terminology was used at one school from the district superintendent, to the custodian, and throughout parents, all possessed a complete understanding of how the elements of vision translated into providing a quality education to students. This unexpected finding of the significance of common vision, was also found in the original study from which this study is based.

The second unexpected finding, involved the perception of new teachers at these schools in their preparedness for teaching in a non-traditional 21st century school environment. A second year teacher exclaimed, "My teacher training program at the university did not prepare me to teach like this." While not investigated in Chapter 2, this perceived lack of preparation has been found in other studies as an emerging trend affecting the quality of instruction in schools (Ruettgers, 2013; Stein & Stein, 2016). One such study found teachers reported feeling unprepared even after recent changes had been made to the university's teacher preparation program (Hesson, 2016). For teachers at the P21 exemplar schools in the current study, the collaborative, inquiry based environment that existed at the school, created an avenue for new teachers to learn best practices from their colleagues. These teachers credit this opportunity for enabling them to learn the competencies needed to successfully plan and teach in a 21st century environment.

The third unexpected finding, was the preoccupation of one school towards outcomes on standardized assessment, and standardized assessment in general. It should be noted, the timing of the researcher's visit coincided with the timing of a county-wide standardized benchmark assessment initiating heightened anxiety levels amongst teachers. While evidence existed of quality, integrated learning experiences having occurred, much of what was directly observed involved preparing students for the impending benchmark assessment. Teachers expressed frustration with this predicament, knowing best practices for student learning were embedded in quality, integrated, learning experiences. They summarized, however, that "at the end of the day"

standardized tests, which are not collaborative, nor creative, were the reality of how the quality of their school would be evaluated by local, state, and federal agencies.

Conclusions

Based on the research findings, and connected to findings in the literature, four conclusions were drawn by the researcher as they pertain to best practices in exemplar 21st century schools.

Conclusion 1: Learning Experiences in These Schools Employed an Integrated Approach to Lesson Design, Content, Application of 21st Century Skills, and Evaluation, Rather Than Teaching and Testing Skills in Isolation

This study found learning experiences are intentionally integrated. Based on the finding that learning experiences are intentionally integrated, it can be concluded that a best practice in these exemplar schools is designing learning experiences that employ an integrated approach to lesson design, content, application of 21st century skills, and evaluation, rather than teaching and testing skills in isolation. Learning experiences modeled the workplace, where tasks seldom occur in isolation, and employees are empowered in their work with a sense of agency. In the workplace, it is more likely teams of colleagues would be collaborating to problem solve complex issues, using technology to access information and resources, with the opportunity to practice inquiry in the problem solving process, and have agency over the end product. Learning experiences in schools that mimic this type of integrated approach, help students learn and authentically apply critical 21st century skills such as collaboration and critical thinking, and related soft skills such as perseverance and reflection, that are sought by employers (Robinson & Aronica, 2015; Wagner, 2015).

To help students become proficient with 21st century skills alongside content knowledge, these schools employed this integrated learning experience approach, often through a PBL unit design, while integrating 21st century skills such as helping students authentically learn to collaborate and communicate with their peers. Learning experiences also empowered students to take ownership of their learning through meaningful opportunities of agency, as individuals and groups. Opportunities to engage in the art of inquiry in order to solve real problems was incorporated as part of the learning experience, often including sessions to guide the reflection process. Finally, students or groups were given agency to creatively present their findings for an authentic purpose, which also served as evaluation of their learning.

Conclusion 2: Relationships Are Fostered and Perpetuated Through Meaningful Partnerships in Schools Where a Clear Vision for the School Is Mutually Shared

Second, this study found relationships exist across the school community. Based on the finding that relationships exist across the school community, it can be concluded that a best practice in exemplar schools is building relationships that are fostered and perpetuated through meaningful partnerships in schools where a clear vision for the school is mutually shared by stakeholders. Both schools maintained a clear focus on student success at the core, while fostering caring, nurturing environments. This perpetuated a focus on reaching out to families and the community in support of student success by providing assistance commensurate to their abilities. This focus on student achievement, and building relationships created a synergistic energy that further perpetuated the relationships. Parents reported seeing their students successful and

excited about learning, made them excited as well, and motivated them to participate with the school more frequently, further perpetuating positive relationships.

Conclusion 3: Authentically Engaging Students in Community and Global Opportunities Beyond the Classroom as Part of the Educational Experience Will Promote Students to Become Global Learners

Third, this study found learning is extended to the world beyond the walls of the classroom. Based on the finding that learning is extended to the world beyond the walls of the classroom, it can be concluded that a best practice used by exemplar schools is to authentically engage students in community and global opportunities beyond the classroom as part of the educational experience promoting students to become global learners. These schools regularly broke through the walls of the classroom, taking students physically out into the community, or virtually out into the world. Providing students with these authentic opportunities to engage with the world beyond the classroom, either physically or virtually, will cultivate students who are globally competent and prepared to compete in a globalized world.

Conclusion 4: School and District Leaders Who Promoted Innovation and Experimentation, Subsequently Created a Culture of Growth Mindset and Adaptability to a Changing Landscape

Finally, this study found leadership promotes a culture of inquiry and innovation. Based on the finding that leadership promotes a culture of inquiry and innovation, it can be concluded that a best practice used by school and district leaders at exemplar schools is promoting innovation and experimentation. By employing this best practice, leaders subsequently created a culture of growth mindset and adaptability to a changing

landscape, which are critical soft skills for the 21st century. The world is rapidly changing, due in large part to the influences of technology. Schools with a culture based on a growth mindset, tend to embrace change as opportunities (Dweck, 2006). The culture of growth mindset, creates an environment of experimentation, risk-taking, and innovation without fear of failing. Consequently, creating an environment that is adaptable and accepting of the ever changing landscape of future innovations. An implication of this culture of growth mindset, is that it infiltrates to the classroom setting. Teachers who possess the growth mindset were observed cultivating this essential 21st century soft skill in their classroom environments with students.

Implications for Action

Change is inevitable. Changes in technology are having a profound effect on changing the workplace, and the skills employers seek. Technology has empowered instant access to a plethora of information, making rote memorization of facts irrelevant. Employers seek a workforce with the capacity to effectively use the information they have access to. Employers also seek a workforce who are creative innovators and problem solvers, who can think "out of the box", and are adaptable to change (Wagner, 2015). Further, the future workforce must possess the soft skills to function in a global society and global workplace.

In preparing students for their future in work and life, schools must in turn innovate and implement what has been learned regarding best practices in 21st century learning environments. As a result of this study of best practices used in exemplar schools that have successfully created 21st century learning environments, and the related findings and conclusions, ten implications for action are presented with assertions for

multiple stakeholder groups. These implications for action are meant to highlight tangible actions in transforming to 21st century learning environments in schools and across the larger educational system.

Implication for Action 1: School District Leaders Must Build Capacity Among the Teaching Staff with Ample Professional Development in Designing Learning Experiences That Authentically Integrate and Apply 21st Century Skills, Technology, Inquiry, Agency, Publishing and Evaluation

To facilitate the use of best practices intentionally designing integrated learning experiences, school district leaders must build capacity among the teaching staff. Ample opportunities for quality professional development must be provided multiple times per year, focusing on designing learning experiences that authentically integrate and apply 21st century skills, technology, inquiry, agency, publishing and evaluation. Two examples of models of instructional design that lend themselves to this type of engaging lesson design include Design Thinking (DT) and Project Based Learning (PBL). School level leaders must also be trained in the model equipping them to support teachers in this process on an ongoing basis at the school site. Additionally, time should be built into the day for teachers to collaborate and practice reflective inquiry regarding the efficacy of their lessons, and affording them the opportunity to make adjustments for improvement.

Implication for Action 2: Special Interest Groups Must Reach out to Partner With Schools and Teachers, Multiple Times per Year, to Help Strengthen Teacher Efficacy in Designing Learning Experiences That Authentically Integrate 21st Century Skills, and Authentic Means of Evaluating Student Progress

Special interest groups must reach out to partner with schools and teachers, multiple times per year, to help strengthen teacher efficacy in designing learning experiences that authentically integrate 21st century skills, and authentic means of evaluating student progress. Annually, these groups should host a forum with partner schools to showcase effective practices modeled by these partner schools, thereby empowering more schools with access to this information. These annual events can be hosted physically or virtually, allowing for maximum participation. These forums are not meant to become the annual national conference, but rather intended to directly connect with schools, making information and models readily available, at no additional cost. Action by these groups will build and sustain capacity for best practices among the teaching staff within schools desiring to transform to 21st century learning environments. Groups currently poised with this capacity include:

- P21 – Partnership for 21st Century Learning
- ACSA – Association of California School Administrators
- ISTE – International Society for Technology in Education
- ASCD – Association for Supervision and Curriculum Development
- FRS – Future Ready Schools

Implication for Action 3: School and District Teachers and Leaders Must Utilize Best Practices for Creating Meaningful, Ongoing Partnerships with Parents and Community Members

School and district teachers and leaders must utilize best practices for creating meaningful, ongoing partnerships with parents and community members. Opportunities for meaningful partnerships must be numerous, and ongoing, and could include opportunities to showcase authentic publishing that demonstrates student learning resulting from an integrated learning experience. Examples of organizations providing models for schools and districts to follow include:

- Center for American Progress – "Community Schools" incorporates six key strategies for bringing stakeholders from the school community, together to create a common vision for the school that is shared among stakeholder groups.
- Johns Hopkins National Network of Partnership Schools – "Promising Partnership Practices" contains a collection of successful partnership practices used by schools across the country with varying demographics.

Implication for Action 4: Local Community Leaders, Such as a Mayor or Chamber of Commerce, Must Promote Community Experts, Businesses, Organizations, and Higher Education to Seek out Partnerships with Schools to Render Support in the Capacity of a "Community Expert", or Mentor in the Associated Field of Expertise

A best practice exemplified in this study was schools engaging in partnerships with community experts to authentically engage elementary students with experts in the field related to specific topics of study. To facilitate this best practice, local community leaders, such as a Mayor or Chamber of Commerce, must promote community experts,

businesses, organizations, and higher education to seek out partnerships with schools to render support in the capacity of a "community expert", or mentor in the associated field of expertise. These experts have experience in fields such as fashion, arts, marketing, and engineering. Establishing partnerships between schools and these community experts will provide students access to an expert, beyond the teacher, who can mentor students on PBL or inquiry projects pertaining to the experts' field of expertise. Experts will donate time in schools throughout the year, sharing their real-world experiences in the field.

Implication for Action 5: Global Education Networks Must Actively Seek Partnerships with Schools, to Engage in Global Experiences as Part of the Regular School Program

The ability to function in a global society and global workplace will be a critical skill in for the future workforce. A best practice these schools engage in, is the connection with global education experiences. Therefore, existing global education networks must actively seek partnerships with schools, to engage in global experiences as part of the regular school program. At least once per year per school, global education networks will help connect teachers and classrooms around the world, as age appropriate, to engage in activities such as dialogue, cultural learning experiences, or collaborative projects. Examples of global learning organizations include:

- Global Education Conference – Network of resources connecting educators with classrooms worldwide.
- Particıpate – Network to support professional development for global learning, immersive dual language instruction, resources, and visiting teacher program.

- iEARN-USA – Network connecting classrooms worldwide to collaborate on common projects.

Implication for Action 6: Schools and Districts Evaluate Their Readiness and/or Capacity to Create an Immersive Dual Language Program

As a best practice to help prepare students to function effectively in a global society, is to immerse students beginning from an early age in learning another language, and learning to be sensitive to, and accepting of, other cultures. To facilitate this best practice, schools and districts should evaluate their readiness and/or capacity to create an immersive dual language program. Recruit teachers from around the world to support authenticity in language instruction, in addition to promoting and celebrating diversity and diverse cultures, such as practiced by Participate. This focus on dual language provides a foundation to authentically promote global learners who are culturally aware and sensitive to diversity. Upon evaluating readiness, schools supported by their districts should commence in planning for implementation of at least one dual language pathway.

Implication for Action 7: Professional Organizations Convene an Annual "Forum For The Future" to Keep Schools and District Leadership, and the Education Community at Large, Readily Abreast of Information Regarding Future Business Trends, Innovative Practices in Education, and New Technologies with Potential Impact Affecting Schools in Preparing the Future Workforce

This study highlighted innovation and inquiry a best practice utilized not only by students and teachers, but also by school and district administrators. To facilitate administration's capacity to evaluate innovative practices, professional organizations must convene an annual "Forum for the Future" to keep schools and district leadership,

and the education community at large, readily abreast of information regarding future business trends, innovative practices in education, and new technologies with potential impact affecting schools in preparing the future workforce. "Future Forecasting" shall be made readily available and heavily promoted to all schools and districts, not through annual paid conferences, rather through regional, virtual, or archived webinars accessible at no cost to schools and districts. Follow up access to professional networks to support implementation of strategies shall be included. Organizations with the current capacity to provide such a service include P21, ACSA, ISTE and Future Ready.

Implication for Action 8: Professional Organizations Must Continually Lobby State and Federal Policy Makers to Change Funding Models to Districts and Schools to Fully Fund 1:1 Educational Technology Devices And Infrastructure in Support of the Changing Landscape to Prepare Students for the Future

The primary mission of P21 is to engage, education, business and political leaders in keeping 21st century education at the forefront of the national conversation on education. A best practice found in the original study, and repeated in this replica study, is the significance of technology integrated throughout the learning experience, enriching the quality and depth of the learning experience, and promoting personalized learning, while discovering new applications of creativity not attainable by traditional means. Therefore, it is paramount that professional organizations, such as P21, must vigorously lobby State and Federal policy makers to change funding models to districts and schools to fully fund 1:1 educational technology devices and infrastructure in support of the changing landscape to prepare students for the future. The ubiquitous nature of technology in the workplace and in life renders full time access to technology in schools

as compulsory, not supplemental or optional. Therefore, technology and infrastructure must be fully funded as core curriculum in all schools.

Technology has become as requisite as paper, pencils and books, with students needing full access for studies at home, as well as school. Therefore, to ensure digital equity, state and federal funding must also subsidize contracts with mobile communications carriers to provide hot spots with educational filters as a mandatory issue to low income students lacking connectivity at home. Providing this access allows digital equity for low income students with connectivity at home for homework, research, and projects. An example of this model could include using a student's Title I NSLP status, or other qualifying social service, to qualify for free hot spots. Families complete a contract directly with a local carrier to check out a hot spot based on school enrollment verification and eligibility.

Implication for Action 9: P21 Update Exemplar School Application for K-12 Schools to Emphasize Significance of the World as the Classroom

A significant best practice discovered in this study was the finding that learning extends beyond the walls of the classroom. In one school, this was represented through global awareness and virtual learning experiences enabled through global partnerships. In the other school, this was represented through PBL based learning experiences that took these elementary students physically out of the classroom and out into the community engaging in active partnerships. Currently, the exemplar application for schools inquires about utilizing PBL and work based experiences in Section 3; cross cultural and global awareness in Section 4; and partnerships with business and civic leaders in Section 6. However, this falls short of emphasizing the significance of

engaging students in the world as the classroom. To promulgate the best practice of learning experiences extending beyond the walls of the classroom, the current P21 exemplar school application for K-12 schools, must be updated to include:

- Section 3 - Learning experiences that extend beyond the walls of the classroom (both physically and virtually)
- Section 6 – Global partnerships

By this action, P21 is making a clear statement about (a) global education as a priority to prepare students for a globalized society and workplace, and (b) learning experiences are significantly enhanced by engaging students in authentic application of learning outside of the classroom where practical, or by virtually connecting with experts or environments where it is not.

Implication for Action 10: Universities Must Routinely Realign Teacher Preparation and Credentialing Programs to Prepare Pre-Service Teachers to Effectively Teach in Learning Environments Found in P21 Exemplar Schools

An unexpected finding in this study pertained to comments made by teachers new to the profession, who were recent graduates from accredited universities. "My teacher training program did not prepare me to teach like this," commented a second-year teacher. University teacher preparation programs remain largely unchanged in preparing pre-service teachers, while the schools they are headed for are creating 21st century learning environments. To make a large scale change of this magnitude, affecting roughly 50 million students in 100,000 schools across the country, it is imperative that universities routinely realign teacher preparation and credentialing programs to prepare pre-service teachers to effectively teach in learning environments found in P21 exemplar

schools. Curriculum designers for these university programs should immerse themselves in P21 exemplar schools across grade spans, to adapt the teaching methods, planning practices, and evaluation used in these model schools to transform traditional teaching preparation programs.

Recommendations for Further Research

Based on the findings of this study the researcher recommends further research in the following areas that will support the continuing work of identifying and promoting best practices for 21st century learning.

1. The current study focused on best practices in public elementary schools that have been identified as exemplar by P21. Often charter schools have more flexibility due to the conditions of their charter, to implement innovative practices. A further study would include investigation of best practices in charter elementary schools that have been identified as exemplary by P21 to identify contributing best practices that may be limited or non existent in the public elementary setting.
2. The schools involved in this study differed significantly from each other in demographic makeup. A further study would focus on exemplar elementary schools with a high percentage of students identified for Free or Reduced Lunch Program, also having a high percentage of English learners, which will exemplify best practices effective with diverse populations.
3. This study focused on exemplary elementary schools for their part in setting the foundational 21st century practices to build upon in middle and high school. A further study would focus on preschools that have been identified as exemplary to

determine the role they play in preparing the mindset for 21st century skill development in elementary school.

4. This study reviewed schools that included elementary grades only. There are currently 12 schools identified as exemplar by P21 that are "multi-level" programs, including K-8, K-12, and 6-12 configurations. A future study would investigate the relation of setting foundational best practices in the lower grade span, and how those practices are transitioned forward into the higher grades. This information would expand the body of knowledge of how best practices transfer across the grade spans, maintaining the school environment and resources as a constant.
5. Based on the unexpected finding that some teachers felt impeded in their efforts to provide their students the best practices for 21st century learning during quarterly and year end assessment periods, a further study would include an investigation on the effect high stakes standardized testing has on 21st century skill development.
6. Along the vein of high stakes standardized testing, a further study would include an investigation of countries considered successful in preparing students with 21st century skills, and the effect that country's national assessment program has on preparing students with 21st century skills.

Concluding Remarks and Reflections

I find myself in the center of a perfect storm. Possessing an extensive background in curriculum and instruction, I currently serve as a district technology director, at the apex of the very time in the history of education that curriculum and technology collide. Further, at this time when technology is developing exponentially, causing profound effects in society and the workplace, I have had the good fortune to conduct this study.

This topic of best practices in preparing students with critical 21st century skills is not only relevant, and timely, but also of personal interest and passion. Since the beginning of education, the purpose of education was to produce productive citizens to work and live in society. Since then, education and society have remained largely unchanged and predictable, until recently.

Change is inevitable. At a conference I attended, a Microsoft executive shared that the Microsoft corporation had begun recruiting employees from other countries as they couldn't find qualified employees in the United States. He continued, indicating that education, as a whole, was not producing potential employees with the skills needed by Microsoft. While content knowledge was important, Microsoft needed employees capable of solving complex problems, collaboratively across multi-departmental teams to keep pace with advancements in technology. This statement had a profound effect on me, being sensitive to the responsibility schools have, and my own part as an educator, in preparing students for their future. This was the first time I heard this type of declaration from a business perspective that the education system, as a whole, was acutely failing kids; but it wouldn't be the last. Roughly the same time, a phrase was used at another conference, which I adopted as one of my mantras, "We have an obligation to prepare

kids for their future, not our past." Iterations of this statement recurred throughout the literature reviewed, emphasizing the significance of the message.

Learning about P21's initiative to highlight 21st century skills, and provide a framework for 21st century learning was inspirational, knowing that organizations like P21 were focusing efforts to build capacity in schools and teachers to adeptly teach 21st century skills. Moreover, part of the mission and purpose of P21 is to bring awareness to federal policy makers of the challenges and complexities of teaching 21st century skills to students in an educational structure still based in 19th century practices. We have an obligation to prepare kids for their future, not our past. It is promising to know that through P21, children have a voice advocating for policies that support best practices in 21st century education to prepare children for their future.

P21's efforts in showcasing schools experiencing success in creating 21st century learning environments is commendable in the effort to create a model, a contact, and a network of support for other schools desiring to implement 21st century learning practices. Thanks to the efforts of Dr. Kelly Wilbert, whose original study was the impetus for this replica study, studies of the best practices in these exemplar schools are identifying specific practices emerging from these exemplars, for other schools to implement in their transformational efforts. Continued efforts in this regard, will make information about best practices readily available to more schools, thus propelling the transformation effort forward.

I have two other mantras in education. The first, my amazing staff hears me recite regularly, "The only constant is change." Never has that been more true in education, and in life, than now. The second is a deeply personal question, which I ask

myself at the end of every day to keep myself centered on what matters in education, "What did I do today that was good for kids?" On this day, my answer is, "This." My sincere hope is that other schools will use the information contained in this dissertation, the stories of best practices that emerged from these exemplar schools, along with the research validating the need for change, in their transformation to 21st century learning environments, ultimately, having a positive impact on kids across the country.

REFERENCES

Achieve Inc. (2012). *The future of the U.S. workforce: Middle skills jobs and the growing importance of postsecondary education*. Retrieved from https://www.achieve.org/files/MiddleSkillsJobs.pdf

Ackerman Anderson, L., & Anderson, D. (2010). *The change leader's roadmap: How to navigate your organization's transformation*. San Francisco, CA: Pfeiffer.

Alliance for Excellent Education. (2011). *A time for deeper learning: Preparing students for a changing world*. Retrieved from Alliance for Excellent Education: http://all4ed.org/wp-content/uploads/2013/06/DeeperLearning.pdf

American Management Association. (2012). *AMA 2012 critical skills survey: Executive summary*. Retrieved from American Management Association: http://www.amanet.org/uploaded/2012-Critical-Skills-Survey.pdf

Anderson, D., & Ackerman Anderson, L. (2010). *Beyond change management: How to achieve breakthrough results through conscious change leadership*. San Francisco, CA: Pfeiffer.

Aragon, S. (2015). *Deeper learning: A primer for state legislators. ECS education trends*. Retrieved from https://files.eric.ed.gov/fulltext/ED559905.pdf

Autor, D. H. (2015). Why are there still so many jobs? The history and future of workplace automation. *Journal of Economic Perspectives, 29*(3), 3.

Bellanca, J. (2015). Advancing a new agenda. In J. Bellanca (Ed.), *Deeper learning: Beyond 21st century skills* (pp. 1-18). Bloomington, IN: Solution Tree Press.

Bellanca, J. (2016). Beyond project based learning. *P21 Blogazine, 3*(9). Retrieved from http://www.p21.org/newsevents/ p21blog/2054beyondprojectbasedlearning?tmpl=component&print=1&page=

Bevins, P. S., Carter, K., Jones, V. R., Moye, J. J., & Ritz, J. M. (2012). Producing a 21st century workforce. *Technology and Engineering Teacher, 72*(3), 8-12.

Boyle, J. (2015). Edutainment or effective technology integration? How to make differentiation drive your technology-integrated instruction. *Reading Today, 32*(4), 28-30.

Brown, C. (2014). *Patterns of innovation:Showcasing the nation's best in 21st century learning*. Retrieved from Partnership for 21st Century Skills: http://www.p21.org/storage/documents/exemplars/P21_Patterns_of_Innovation_Final.pdf

Brusic, S., & Shearer, K. (2014). The ABCs of 21st century skills. *Children's Technology and Engineering, 18*(4), 6-10.

Brynjolfsson, E., McAfee, A., & Manyika, J. (2014). Will your job disappear? *NPQ: New Perspectives Quarterly, 31*(2), 74.

Burrus, D. (2014). Is the US workforce prepared to thrive in the past or in the future? *E-Learning and Digital Media, 11*(4), 314-322.

Byrnes, N. (2016). Learning to prosper in a factory town. *MIT Technology Review, 119*(6), 64.

Casner-Lotto, J., & Barrington, L. (2006). *Are they really ready to work?: Employers' perspectives on the basic knowledge and applied skills of new entrants to the 21st century U.S. workforce*. United States: Conference Board: Partnership for 21st

Century Skills: Corporate Voices for Working Families: Society for Human Resource Management.

Ceze, L., Hill, M. D., & Wenisch, T. F. (2016). *Arch2030: A vision of computer architecture research over the next 15 years*. Retrieved from Computing Community Consortium Catalyst: https://arxiv.org/ftp/arxiv/papers/1612/1612.03182.pdf

Chareonwongsak, K. (2002). Globalization and technology: How will they change society? *Technology in Society, 24*, 191-206. doi:10.1016/S0160-791X(02)00004-0

Cho, P. (2012). *The key essentials for learning in the 21st century: Programs and practices.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses Global (3514146)

Chui, M., Manyika, J., & Mehdli, M. (2016). Where machines could replace humans-and where they can't (yet). *McKinsey Quarterly,* (Digital McKinsey). Retrieved from http://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/where-machines-could-replace-humans-and-where-they-cant-yet

Colbert, A., Yee, N., & George, G. (2016). The digital workforce and the workplace of the future. *Academy of Management Journal, 59*(3), 731-739. doi:10.5465/amj.2016.4003

Costa, A., & Kallick, B. (2015). Dispositions: Critical pathways for deeper learning. In J. Bellanca (Ed.), *Deeper learning: Beyond 21st century skills* (pp. 54-81). Bloomington, IN: Solution Tree Press.

Couros, G. (2015). *The innovator's mindset: Empower learning, unleash talent, and lead a culture of creativity*. San Diego, CA: Dave Burgess Consulting, Inc.

Crane, B. E. (2012). *Using Web 2.0 and social networking tools in the K-12 classroom*. Chicago, IL: American Library Association.

Creswell, J. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (Second ed.). Thousand Oaks, CA: Sage Publications, Inc.

Darling-Hammond, L. (2010). New policies for 21st century demands. In J. Bellanca & R. Brandt (Eds.), *21st century skills: Rethinking how students learn*. Bloomington, IN: Solution Tree Press.

Darling-Hammond, L. (2011). Restoring Our Schools: The Quest for Equity in the United States. *Education Canada, 51*(5).

Dede, C. (2010). Comparing frameworks for 21st century skills. In J. Bellanca & R. Brandt (Eds.), *21st century skills: Rethinking how students learn* (pp. 50-75). Bloomington, IN: Solution Tree Press.

Demski, J. (2013). Preparing teachers for the new standards. *THE Journal, 40*, 12-16.

DeNisco, A. (2015, January). What you need to know about 'deeper learning'. *District Administration,* 20.

DeRosa, D., & Lepsinger, R. (2010). *Virtual team success: A practical guide for working and leading from a distance*. San Francisco, CA: Jossey-Bass.

Dilley, A., Fishlock, J., & Plucker, J. (n.d.). *What we know about communication: Part of the 4Cs research series*. Retrieved from Partnership for 21st Century Learning: http://www.p21.org/our-work/4cs-research-series/communication

Dilley, A., Kaufman, J., Kennedy, C., & Plucker, J. (n.d.). *What we know about critical thinking: Part of the 4Cs research series*. Retrieved from Partnership for 21st Century Learning: http://www.p21.org/our-work/4cs-research-series/critical-thinking

Dunkle, C. (2012). *Leading the common core state standards: From common sense to common practice*. Thousand Oaks, CA: Corwin Press.

Duvall, J. (2016). *A case study of two 21st century schools: Are we preparing students for the global world?* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses Global (10120175)

Dweck, C. S. (2006). *Mindset: The new psychology of success*. New York, NY: Random House.

Enyedy, N. (2014). *Personalized instruction: New interest, old rhetoric, limited results, and the need for a new direction for computer-mediated learning*. Retrieved from National Education Policy Center: http://greatlakescenter.org/docs/Policy_Briefs/Enyedy_PersonalizedLearning.pdf

Fadel, C. (2015). 21st century curriculum: A global imperative. In J. Bellanca (Ed.), *Deeper learning: Beyond 21st century skills* (pp. 207-232). Bloomington, IN: Solution Tree Press.

Finneran, K. (2015). Educating the future workforce. *Issues in Science & Technology, 31*(4), 61-62.

Fisher, D., & Frey, N. (2010). Preparing students for mastery of 21st century skills. In J. Bellanca & R. Brandt (Eds.), *21st century skills: Rethinking how students learn* (pp. 221-240). Bloomington, IN: Solution Tree Press.

Fitzpatrick, A. (2016, April 11). Grappling with the right role for robots at work. *TIME, 187,* 22.

Friedman, T., & Mandelbaum, M. (2011). *That used to be us: How America fell behind in the world it invented and how we can come back*. New York, NY: Picador.

Fullan, M., & Langworthy, M. (2013). *Towards a new end: New pedagogies for deep learning*. Retrieved from Collaborative Impact: http://www.newpedagogies.nl/images/towards_a_new_end.pdf

Future ready frameworks. (n.d.). Retrieved from http://dashboard.futurereadyschools.org/framework

Gold, S. (2016). The future of automation—and your job. *Industry Week/IW, 265*(1), 8.

Gordon, D. (2011). Return to sender. *THE Journal, 38*(3), 30-32.

Gordon, E. (2013). Game plan for a future-ready workforce. *The Futurist, 47*, 43-46.

Gratton, L. (2011, May). The changing shape of jobs: Work the shift. *People Management,* 32-34.

Hallissy, M., Butler, D., Hurley, J., & Marshall, K. (2013). *Redesigning education: Meeting the challenges of the 21st century*. Retrieved from http://blog.teachnet.ie/docs/MSLearningPaperMay13.pdf

Hamilton, E. R., Rosenberg, J. M., & Akcaoglu, M. (2016). The Substitution Augmentation Modification Redefinition (SAMR) Model: a Critical Review and Suggestions for its Use. *TechTrends: For Leaders in Education and Training, 60*(5), 433. doi:10.1007/s11528-016-0091-y

Harris, A., & Rodriguez, N. (2012). *Implementing common core state standards and assessments: A workbook for state and district leaders.* Retrieved from https://files.eric.ed.gov/fulltext/ED540452.pdf

Heller, R., & Wolfe, R. E. (2015). *Effective schools for deeper learning: An exploratory study*. Retrieved from Boston, MA: http://www.jff.org/sites/default/files/publications/materials/Effective-Schools-for-Deeper-Learning-010416.pdf

Hesson, N. (2016). How do selected novice middle school teachers from various certification pathways perceive the effectiveness of their teacher preparation? *Middle Grades Review, 2*(1).

Hillman, N. (2012). *Learning 21st century skills: Implementation of programs and practices.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses Global (3513777)

Hilton, M. (2015). Preparing students for life and work. *Issues in Science & Technology, 31*(4), 63-66.

Holm, M. (2011). Project-based instruction: A review of the literature on effectiveness in prekindergarten through 12th grade classrooms. *InSight: Rivier Academic Journal, 7*(2).

International Society for Technology in Education. (2016). *Redefining learning in a technology-driven world: A report to support adoption of the ISTE Standards for Students*. Retrieved from International Society for Technology in Education: https://www.iste.org/standards/standards/for-students-2016

Johnson, R. B. (1997). Examining the validity structure of qualitative research. *Education, 118*(2), 282-292.

Kassel, A. (2017). Disruptive technology. *Online Searcher, 41*(1), 30-35.

Kay, K. (2010). 21st century skills: Why they matter, what they are, and how we get there. In J. Bellanca & R. Brandt (Eds.), *21st century skills: Rethinking how students learn* (pp. xiii-xxxi). Bloomington, IN: Solution Tree Press.

Kelly, K. (2016). *The inevitable: Understanding the 12 technological forces that will shape our future*. New York, NY: Viking.

Kelting-Gibson, L. (2013). Analysis of 100 years of curriculum designs. *International Journal of Instruction, 6*(1), 39-58.

Kereluik, K., Mishra, P., Fahnoe, C., & Terry, L. (2013). What knowledge is of most worth: Teacher knowledge for 21st century learning. *Journal of Digital Learning in Teacher Education*(4), 127.

Kharbach, M. (2015). Everything teachers need to know about Bloom's Digital Taxonomy [Blog post]. Retrieved from http://www.educatorstechnology.com/2015/04/everything-teachers-need-to-know-about.html

Kivunja, C. (2014). Do you want your students to be job-ready with 21st century skills? Change pedagogies: A pedagogical paradigm shift from Vygotskyian social constructivism to critical thinking, problem solving and Siemens' digital connectivism. *International Journal of Higher Education, 3*(3), 81-91.

Kivunja, C. (2015). Teaching students to learn and to work well with 21st century skills: Unpacking the career and life skills domain of the new learning paradigm. *International Journal of Higher Education, 4*(1), 1-11.

Koehler, M., Mishra, P., & Cain, W. (2013). What is technological pedagogical content knowledge (TPACK)? *Journal of Education, 193*(3), 13-19.

Kolb, D. G., Collins, P. D., & Lind, E. A. (2008). Requisite connectivity: Finding flow in a not-so-flat world. *Organizational Dynamics, 37*(2), 181-189. doi:10.1016/j.orgdyn.2008.02.004

Lemke, C. (2002). *enGauge 21st century skills: Digital literacies for a digital age*. Retrieved from North Central Regional Educational Laboratory: https://files.eric.ed.gov/fulltext/ED463753.pdf

Lindenmuth, D. (2015). A model for expanding tech use in classrooms. *School Administrator, 72*(9), 12.

Lynch, S., Spillane, N., House, A., Peters-Burton, E., Bechrend, T., Ross, K., & Han, E. (2017). A policy-relevant instrumental case study of an inclusive STEM-focused high school: Manor New Tech High. *International Journal of Education in Mathematics, Science and Technology, 5*(1), 1-20. doi:10.18404/ijemst.75656

Manyika, J. (2017). *Technology, jobs, and the future of work*. Retrieved from McKinsey Global Institute: http://www.mckinsey.com/global-themes/employment-and-growth/technology-jobs-and-the-future-of-work

Manyika, J., Chui, M., Miremadi, M., Bughin, J., George, K., Willmott, P., & Dewhurst, M. (2017a). *A future that works: Automation, employment and productivity*. Retrieved from McKinsey Global Institute: www.mckinsey.com/mgi

Manyika, J., Chui, M., Miremadi, M., Bughin, J., George, K., Willmott, P., & Dewhurst, M. (2017b). Harnessing automation for a future that works. *McKinsey Global*. Retrieved from http://www.mckinsey.com/global-themes/digital-disruption/harnessing-automation-for-a-future-that-works

McMillan, J., & Schumacher, S. (2010). *Research in education: Evidence-based inquiry*. Upper Saddle River, NJ: Pearson Education, Inc.

Merriam, S. (1998). *Qualitative research and case study applications in education*. San Francisco, CA: Jossey-Bass.

Miller, D., & Slocombe, T. (2012). Preparing students for the new reality. *College Student Journal, 46*(1), 18-25.

Miller, S. (2016). *Implementation of the 4C's of 21st century learning skills within the blended coaching model.* (Doctoral dissertation), Available from ProQuest Dissertations and Theses Global (10119299)

Mosley, V. (2012). *Technology adoption in K-12 education: A qualitative study using TAM3 to explore why technology is underutilized.* (Doctoral dissertation), Available from ProQuest Dissertations and Theses Global (3549137)

Myers, M. (2016). Building better skill sets: Time to move beyond the status quo. *BizEd, 15*(1), 60-62.

Nelson, S., & Simek, J. (2016). How will Watson's children impact the future of law practice? *Law Practice, 42*(1).

Norman, G., & Moorhouse, M. (2012). The stone age didn't end because they ran out of stone: Why our children can't wait much longer for a functional school system. *FORUM: for promoting 3-19 comprehensive education, 54*(2), 285-298.

November, A. (2010). Technology rich, information poor. In J. Bellanca & R. Brandt (Eds.), *21st century skills: Rethinking how students learn* (pp. 275-283). Bloomington, IN: Solution Tree Press.

Office of Educational Technology. (2017). *Reimagining the role of technology in education: 2017 National Education Technology Plan update*. Retrieved from U.S. Department of Education: http://tech.ed.gov

Organisation for Economic Co-operation and Development. (2016). *PISA 2015: Results in focus*. Retrieved from http://www.oecd.org/pisa/pisa-2015-results-in-focus.pdf

Partnership for 21st Century Learning. (2011). *P21 common core toolkit: A guide to aligning the common core state standards with the framework for 21st century skills*. Retrieved from Partnership for 21st Century Skills: http://www.p21.org/storage/documents/P21CommonCoreToolkit.pdf

Partnership for 21st Century Learning. (2015). *P21 framework definitions*. Retrieved from http://www.p21.org/storage/documents/docs/P21_Framework_Definitions_New_Logo_2015.pdf

Partnership for 21st Century Learning. (n.d.). 21st century learning exemplar program. Retrieved from http://www.p21.org/exemplar-program-case-studies/about-the-program

Partnership for 21st Century Skills. (2007). *The intellectual and policy foundations of the 21st century skills framework*. Retrieved from http://www.p21.org/storage/documents/docs/Intellectual_and_Policy_Foundations.pdf

Patton, M. (2015). *Qualitative research and evaluation methods*. Thousand Oaks, CA: SAGE Publications, Inc.

Pellegrino, J. (2015). Beyond the rhetoric. In J. Bellanca (Ed.), *Deeper learning: Beyond 21st century skills*. Bloominton, IN: Solution Tree Press.

Plucker, J., Kaufman, J., & Beghetto, R. (n.d.). *What we know about creativity: Part of the 4Cs research series*. Retrieved from Partnership for 21st Century Learning: http://www.p21.org/our-work/4cs-research-series/creativity

Plucker, J., Kennedy, C., & Dilley, A. (n.d.). *What we know about collaboration: Part of the 4Cs research series*. Retrieved from Partnership for 21st Century Learning: http://www.p21.org/our-work/4cs-research-series/collaboration

Poeter, D. (2015, May). How Moore's Law changed-and is still changing-history. *PC Magazine,* 12-16.

Roberts, C. (2010). *The dissertation journey: A practical and comprehensive guide to planning, writing, and defending your dissertation*. Thousand Oaks, CA: Corwin.

Robinson, K., & Aronica, L. (2015). *Creative schools: The grassroots revolution that's transforming education*. New York, NY: Penguin Books.

Romrell, D., Kidder, L., & Wood, E. (2014). The SAMR Model as a framework for evaluating mLearning. *Online Learning, 18*(2). doi:http://dx.doi.org/10.24059/olj.v18i2.435

Ross, A. (2016). *The industries of the future*. New York, NY: Simon and Schuster Paperbacks.

Ross, D. (2017, February 16). 21c skills are driver of global education change [Blog post]. Retrieved from http://www.p21.org/news-events/p21blog/2131-21c-skills-are-driver-of-global-education-change?tmpl=component&print=1&page=

Ruettgers, M. (2013). *A content analysis to investigate the evidence of 21st century knowledge and skills within elementary teacher education programs in the United States.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses Global (3556902)

Rugaber, C. (2017, February 24). US factory CEOs to Trump: Jobs exist; skills don't. *Chicago Tribune*. Retrieved from http://www.chicagotribune.com/business/ct-trump-manufacturing-ceos-meeting-20170223-story.html

Schank, R. (1997). *Virtual learning: A revolutionary approach to building a highly skilled workforce.* New York, New York: McGraw-Hill.

Schwab, K. (2016). *The fourth industrial revolution*. Geneva, Switerland: World Economic Forum.

Scott-Webber, L. (2012). Institutions, educators, and designers: Wake up! Current teaching and learning places along with teaching strategies are obsolete - teaching styles and learning spaces must change for 21st-century needs. *Planning for Higher Education, 41*(1), 265-277.

Sheninger, E., & Murray, T. (2017). *Learning transformed: 8 keys to designing tomorrow's schools, today*. Alexandria, VA: ASCD.

Soulé, H., & Warrick, T. (2015). Defining 21st century readiness for all students: What we know and how to get there. *Psychology of Aesthetics, Creativity, and the Arts, 9*(2), 178-186. doi:10.1037/aca0000017

Stein, L., & Stein, A. (2016). Re-thinking America's teacher education programs. *Clearing House: A Journal of Educational Strategies, Issues and Ideas, 89*(6), 191-196.

Stevens, Y. A. (2016). The future: Innovation and jobs. *Jurimetrics: The Journal of Law, Science & Technology, 56*(4), 367-385.

TED. (2016). Tony Wagner: Future innovators [Video file]: PwC Australia.

Track, E., Forbes, N., & Strawn, G. (2017). The end of Moore's Law. *Computing in Science & Engineering, Comput. Sci. Eng.*(2), 4-6. doi:10.1109/MCSE.2017.25

Trilling, B. (2015). Road maps to deeper learning. In J. Bellanca (Ed.), *Deeper learning: Beyond 21st century skills*. Bloomington, IN: Solution Tree Press.

Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times*. San Francisco, CA: Jossey-Bass.

Viltard, L. A. (2016). Unlimited, blurred limits in a borderless world. *Independent Journal of Management and Production, 7*(2), 380-412.

Voogt, J., Erstad, O., Dede, C., & Mishra, P. (2013). Challenges to learning and schooling in the digital networked world of the 21st century. *Journal of Computer Assisted Learning, 29*(5), 403-413.

Wagner, T. (2012). *Creating innovators: The making of young people who will change the world*. New York, NY: Scribner.

Wagner, T. (2015). The worst of times, the best of times. In J. Bellanca (Ed.), *Deeper learning: Beyond 21st century skills* (pp. 159-175). Bloomington, IN: Solution Tree Press.

Wilbert, K. (2016). *Transforming to 21st century leaning environments: Best practices revealed through a study of exemplar schools.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses Global (10248786)

William and Flora Hewlett Foundation. (2010). *Education program: Strategic plan*. Retrieved from William and Flora Hewlett Foundation: http://www.hewlett.org/uploads/documents/Education_Strategic_Plan_2010.pdf

Zhao, Y. (2015a). Paradigm shift: Educating creative and entrepreneurial students. In J. Bellanca (Ed.), *Deeper learning: Beyond 21st century skills* (pp. 83-108). Bloomington, IN: Solution Tree Press.

Zhao, Y. (2015b). A world at risk: An imperative for a paradigm shift to cultivate 21st century learners. *Society, 52*(2), 129-135.

Zipkes, S. (2015). All or nothing: A deeper learning experience. In J. Bellanca (Ed.), *Deeper learning: Beyond 21st century skills* (pp. 287-298). Bloomington, IN: Solution Tree Press.

APPENDIX A

P21 K-12 EXEMPLAR EVALUATION TOOL

P21 K-12 Exemplar Evaluation Tool

School: **Date of Visit:**

Name or Reviewer: **Reviewer Affiliation:**

Please evaluate the school's progress toward achieving each indicator:

	No Evidence	Planning	Initial Implement-ation	Clearly Evident	Embedded Practice	Not Applicable
1. Evidence of Commitment to College, Career & Life Readiness						
Commitment to support core subject and 21st century skills mastery is evident in strategic planning	NE	P	II	CE	EP	N/A
Partnerships with institutions of higher education have contributed to strategic planning/visioning	NE	P	II	CE	EP	N/A
Partnerships with local/regional agencies and businesses have contributed to strategic planning/visioning	NE	P	II	CE	EP	N/A
Implementation of 21st learning for college, career, and citizenship is clearly articulated in strategic planning	NE	P	II	CE	EP	N/A

Sources of Evidence for Commitment to College, Career & Life Readiness:

2. Education Support Systems & Intentional Design						
Data collection and its use plays a role in assessing your ability to implement your learning vision	NE	P	II	CE	EP	N/A
College and career standards form the foundation of student learning	NE	P	II	CE	EP	N/A

1

A college and career aligned curriculum is used to support student learning	NE	P	II	CE	EP	N/A
Instructional systems support acquisition of content knowledge and P21 skills	NE	P	II	CE	EP	N/A
Assessment systems support acquisition of knowledge and P21 skills	NE	P	II	CE	EP	N/A
Learning environments supports knowledge and P21 skills acquisition	NE	P	II	CE	EP	N/A

Sources of Evidence for Education Support Systems & Intentional Design:

3. Engaging Learning Approaches						
Project-based learning approaches are utilized regularly	NE	P	II	CE	EP	N/A
Inquiry-based instruction is utilized regularly	NE	P	II	CE	EP	N/A
Students have access to work-based learning	NE	P	II	CE	EP	N/A
Learning *incorporates* use of information, media and technology to support individualized learning	NE	P	II	CE	EP	N/A
Professional development is used to build capacity to achieve 21st Century outcomes	NE	P	II	CE	EP	N/A
Professionals and students have access to information, media and technology to support individualized learning	NE	P	II	CE	EP	N/A

Administrators, teachers and staff have expertise to support learning vision	NE	P	II	CE	EP	N/A
The curriculum is multi-disciplinary and integrated	NE	P	II	CE	EP	N/A

Sources of Evidence for Engaging Learning Approaches:

4. Equitable Student Access to 21st Century Learning						
All students have support to matriculate to college and develop career and life readiness	NE	P	II	CE	EP	N/A
Specialized training in cross cultural and global awareness is offered for students and staff to promote success of all students	NE	P	II	CE	EP	N/A

Sources of Evidence for Equitable Student Access to 21st Century Learning:

5. Evidence of Student Acquisition of 21st Century Knowledge and Skills						
Multiple measures suggest student learning and growth over time	NE	P	II	CE	EP	N/A
There is evidence of student mastery of citizenship skills	NE	P	II	CE	EP	N/A
There is evidence of student expertise in core subjects	NE	P	II	CE	EP	N/A
There is evidence of student expertise in P21 skills	NE	P	II	CE	EP	N/A
There is evidence of student expertise in P21 21st Century Themes	NE	P	II	CE	EP	N/A
There is evidence of student expertise in P21 Learning and	NE	P	II	CE	EP	N/A

Innovation Skills						
There is evidence of P21 Information, Media and Technology skills	NE	P	II	CE	EP	N/A
There is evidence of student expertise in P21 Life & Career Skills	NE	P	II	CE	EP	N/A

Sources of Evidence for Student Acquisition of 21st Century Knowledge and Skills:

6. Partnerships for Sustainable Success						
Parents and Families substantively contribute to sustainable success of partnership	NE	P	II	CE	EP	N/A
Community partners, including 'beyond school' partners contribute to sustainable success of partnership	NE	P	II	CE	EP	N/A
Business Community contributes to your sustainable success	NE	P	II	CE	EP	N/A
Higher Education partners contribute to your sustainable success	NE	P	II	CE	EP	N/A
Civic leaders contribute to your sustainable success	NE	P	II	CE	EP	N/A
Student and family service providers contribute to your sustainable success	NE	P	II	CE	EP	N/A
Policymakers contribute to your sustainable success	NE	P	II	CE	EP	N/A

Sources of Evidence for Partnerships for Sustainable Success:

P21 K-12 Exemplar Evaluation Tool

Key to Rating Categories:

No Evidence	Planning	Initial Implementation	Clearly Evident	Embedded Practice	Not Applicable
Evidence of indicator is not apparent	School is planning to implement activities related to this indicator	School has begun addressing this indicator but outcomes are not yet evident	School has addressed this indicator and outcomes are becoming evident.	Indicator is fully implemented and continuous improvement is evident	Indicator is not applicable to this school or context

Site Visit Summary

Strengths Relative to the P21 Framework:

-

Areas for Improvement Relative to the P21 Framework:

APPENDIX B

INTERVIEW QUESTIONS

Teachers/Administration

1. **Evidence of a commitment to college, career, and life readiness includes a** commitment to support core subjects and 21st century skill mastery in planning. This includes integration of:

   a) The 4Cs in instructional practices: critical thinking, communication, creativity, and collaboration

   b) Life and career skills

   c) Technology skills

   Describe how you implement examples of these practices into your classroom environment. (A, B, C)

2. **Strategic planning and support of 21st century integration is key to a successful 21st century exemplar program. Components include:**

   a) College and career standards that form the foundation of student learning

   b) Data collection and assessment that support 21st century skills

   c) Ongoing professional development opportunities that build on 21st century practices

   Describe how these components (A, B, C) support 21st century skill integration in your classroom.

3. **Engaging learning approaches**

   Engaging learning approaches may include project based learning, STEAM, and technology integration.

   Identify and describe engaging learning approaches that you incorporate in your classroom.

4. **Equitable student access to 21st century learning**

   How do you ensure that all students have access to 21st century learning opportunities?

5. **Evidence of student acquisition of 21st century knowledge and skills**

   Evaluation of student progress can be incorporated through multiple measures. *Describe how you assess progress of student acquisition of 21st century knowledge and skills.*

6. **Partnership for sustainable success**

   A partnership with parents, community members, and higher education is an indicator of successful exemplar 21st century programs.

   How do these group contribute to the success of 21st century skill integration at your school?

7. **Follow up**

   Technology is becoming increasingly prevalent in education.

   How does technology promote the development of 21st century skills at your school?

Parents

1. A partnership with parents, community members, and higher education is an indicator of successful exemplar 21st century programs.

   Describe volunteer opportunities that are available to parents either in your student's classroom and/or at the school.

2. *How is your student's progress assessed?*

3. *Describe what technological devices and/or programs are available to your student.*

4. *Tell me about your student's experiences using technology for educational purposes.*

Support Staff

1. *Describe what technological devices and/or programs are available to students.*

2. A partnership with parents, community members, and higher education is an indicator of successful exemplar 21st century programs.

   How do these groups contribute to the success of 21st century skill integration at your school?

Interview Questions adapted from Wilbert, K. (2016). *Transforming to 21st century leaning environments: Best practices revealed through a study of exemplar schools.*

APPENDIX C

INTERVIEW PROTOCOL SCRIPT

At beginning of interview:

- Good morning/afternoon. My name is Susan Brown. I am a doctoral student at Brandman University in California, and the primary investigator of this research study on best practices of 21st century skill development. Before we begin, I want to thank you for taking time out of your busy schedule today to participate in this interview. Your participation is greatly appreciated, and the information you provide will help inform what we know about best practices in exemplar schools.

- I understand that you have had the opportunity to read, review and sign the informed consent, and to ask any questions. Before we begin, I want to provide you with another copy for your review, and give you another opportunity to ask any questions. (Hand out. Pause for review.) Are there any questions I can answer for you?

- The purpose of this qualitative phenomenological study is to identify and describe best practices related to 21st century skill development in elementary schools recognized as exemplary by the Partnership for 21st Century Learning.

- As we begin, I want you to be aware that this research was reviewed and approved by BUIRB, which stands for "Brandman University Institutional Review Board". This is a committee that reviews and approves research involving "human subjects", or people. Their purpose is to assure that research is conducted in a way that minimizes risks, both physically and mentally, and protects your right to participate or not.

- As a reminder, I will be audio recording this interview to make sure I capture all of our questions, responses, and follow up questions. You will also see me jotting some notes during the interview. The audio recording will be converted to a transcript. To ensure accuracy of the transcript, I will send a copy for your review. Please remember that names will remain anonymous. If names are used during the interview, they will be removed in the transcript.

- Also as a reminder, your participation, while very much appreciated, is completely voluntary. If at any time you have questions or concerns, or simply need a break, please feel free to stop me. I will honor your time and will end at the agree upon time of ____. Are there any questions?

Concluding remarks at end of interview:

- Thank you again for taking time out of your busy schedule to participate in this interview today. As a small token of my appreciation, please enjoy a gift card to _____.

APPENDIX D

PARTICIPANT INFORMED CONSENT FORM

INFORMATION ABOUT: Best Practices in 21st Century Learning Environments: A Study of Two P21 Exemplar Schools

RESPONSIBLE INVESTIGATOR: Susan Brown, Ed.D. candidate

PURPOSE OF STUDY: You are being asked to participate in a research study conducted by Susan Brown, a doctoral student from Brandman University. The purpose of this research study is to identify best practices related to 21st century skill development in exemplar elementary schools.

This study will fill the gap between what is known about what 21st century skills are and best practices of how they are applied at elementary schools who have proven success applying them, having been identified as exemplary by the Partnership for 21st Century Learning. The workplace is changing. The skills that employers are looking for have also changed. Therefore, schools must change how they prepare students for the future workplace. P21 exemplar schools have been identified as successfully transforming to a 21st century learning environment.

The results of this study can contribute to the body of knowledge by identifying best practices used by exemplar elementary schools and thereby, providing a model for other elementary schools desiring to inform their transformation to 21st century learning. The results of this study can also contribute to the knowledge base for policy makers as they plan for educational reforms supporting 21st century learning.

By participating in this study, I agree to participate in a focus group interview, one-on-one interview, and/or observation setting. The focus group interviews, and one-on-one interviews will be conducted in person and are anticipated to last approximately 30-45 minutes. The observations will likely last approximately 45-60 minutes and are designed for minimal disruption. The research is anticipated to take place between October, 2017 and December, 2017.

I understand that:

a) There are minimal risks associated with participating in this research. I understand that the Investigator will protect my confidentiality by keeping the identifying codes and research materials I a locked file drawer that is available only to the researcher.

b) The possible benefit of this study to me is that my input may help add to the research regarding 21st century skill development in exemplar schools. The findings will be available to me at the conclusion of the study and will provide new insights about 21st century skill development. I understand that I will not be compensated for my participation.

c) Any questions or concerns about this research can be directed to Susan Brown at (909)844-1812, or sbrown17@mail.brandman.edu.

d) My participation in this research study is voluntary. I may decide not to participate in the study and can withdraw at any time. I can also decide not to answer particular questions during the interview if I so choose. I understand that I may refuse to participate or may withdraw from this study at any time without any negative consequences. Also, the Investigator may stop the study at any time.

e) No information that identifies me will be released without my separate consent and that all identifiable information will be protected to the limits allowed by law. If the study design or the use of the data is to be changed, I will be so informed and my consent re-obtained. I understand that if I have any questions, comments, or concerns about the study of the informed consent process, I may write or call the Office of the Vice Chancellor of Academic Affairs, Brandman University, at 16355 Laguna Canyon Road, Irvine, CA 92618, (949)341-7641.

I acknowledge that I have received a copy of this form and the "Research Participant's Bill of Rights". I have read the above and understand it and hereby consent to the procedure(s) set forth.

_____

Signature of Participant or Responsible Party

_____

Signature of Principal Investigator

_____

Date

APPENDIX E

BRANDMAN UNIVERSITY INSTITUTIONAL REVIEW BOARD

Research Participant's Bill of Rights

Any person who is requested to consent to participate as a subject in an experiment, or who is requested to consent on behalf of another, has the following rights:

1. To be told what the study is attempting to discover.
2. To be told what will happen in the study and whether any of the procedures, drugs or devices are different from what would be used in standard practice.
3. To be told about the risks, side effects or discomforts of the things that may happen to him/her.
4. To be told if he/she can expect any benefit from participating and, if so, what the benefits might be.
5. To be told what other choices he/she has and how they may be better or worse than being in the study.
6. To be allowed to ask any questions concerning the study both before agreeing to be involved and during the course of the study.
7. To be told what sort of medical treatment is available if any complications arise.
8. To refuse to participate at all before or after the study is started without any adverse effects.
9. To receive a copy of the signed and dated consent form.
10. To be free of pressures when considering whether he/she wishes to agree to be in the study.

If at any time you have questions regarding a research study, you should ask the researchers to answer them. You also may contact the Brandman University Institutional Review Board, which is concerned with the protection of volunteers in research projects. The Brandman University Institutional Review Board may be contacted either by telephoning the Office of Academic Affairs at (949)341-9937 or by writing to the Vice Chancellor of Academic Affairs, Brandman University, 16355 Laguna Canyon Road, Irvine, CA 92618.

APPENDIX F

Observation Log

Date:	Time:	Class:
21st Century Skill Framework **Key Subjects:** ☐ 3 R's _____ ☐ 21st Century Theme _____ **Learning and Innovation Skills:** ☐ Creativity and Innovation ☐ Critical Thinking and Problem Solving ☐ Communication ☐ Collaboration **Information, Media and Technology Skills:** ☐ Information Literacy ☐ Media Literacy ☐ ICT Literacy **Life and Career Skills:** ☐ Flexibility & Adaptability ☐ Initiative & Self Direction ☐ Social & Cross-Cultural Skills ☐ Productivity & Accountability ☐ Leadership & Responsibility		**Exemplar Topic Area** ☐ Civic literacy ☐ Environmental literacy ☐ Financial literacy ☐ Global awareness ☐ Health literacy ☐ Leadership ☐ Partnerships ☐ Student Voice ☐ Technology ☐ Other_____
Narrative Evidence:		

APPENDIX G

Certificate of Completion

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

Date of completion: 05/22/2016.

Certification Number: 2073434.