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Transforming to 21st Century Learning Environments: Best Practices Revealed through a Study of Exemplar Schools

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Transforming to 21st Century Learning Environments: Best Practices Revealed through a Study of Exemplar Schools

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Philippians 4:13

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ABSTRACT

Transforming to 21st Century Learning Environments: Best Practices Revealed through a Study of Exemplar Schools

by Kelly Wilbert

As the world's economy shifted from the Industrial age to the Knowledge age, the prerequisites of current and future careers also transformed. Trends revealed that students in school now are preparing for jobs that do not currently exist. Investigating strategies to meet the challenge of transforming instructional practices was a focus of this research. The purpose of this phenomenological qualitative study was to identify and describe best practices used at elementary schools in California recognized as exemplary by the Partnership for 21st Century Learning. To support the essential research question, what are the best practices used in identified exemplary schools, data was collected from two identified exemplar elementary schools in the state of California through interviews, observations, and artifacts.

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CHAPTER I: INTRODUCTION

In today's global economy, enterprises compete in an environment dominated by inter-connected knowledge where immediate communication is expected and technology develops at exponential rates. As the world's economy shifted from the Industrial Age to the Knowledge Age, the prerequisites of current and future careers also transformed. Trends revealed that students in school now are preparing for jobs that currently do not exist (Rshaid, 2014; Trilling & Fadel, 2009). Similarly, jobs such as a Data Scientist, Cloud Architect, and Digital Content Developer did not exist 10 years ago. Although technological advances forced changes in job opportunities, education has not adequately transformed to meet the current needs of employers (Bellanca, 2010; Elmore, 2014). As a result, students in the United States routinely emerge from high school unprepared to fulfill the needs of the changing economy (Conley, 2008; Gordon, 2013). Essential skills in the areas of communication, writing, and critical thinking were sorely lacking according to research studies compiled by hiring executives (Trilling & Fadel, 2009). America has not maintained the educational system it created that was highly ranked on a global scale in the twentieth century; in the 21st century it ranked 18th among 23 industrialized nations (Chen, 2010). When compared with students on an international level, "American students score lower than the average on the Programme for International Student Assessment (PISA), the benchmark assessment in reading, mathematics, and science for the developed countries of the world" (Bellanca & Brandt, 2010, p. xviii). The impact of these trends could be far reaching and greatly affect future job opportunities and skills.

The failure of education in the United States (U.S.) to adapt to ever changing work place opportunities significantly impacted the U.S. economy by widening student achievement gaps resulting in an overall diminished capacity of the future workforce (Bellanca & Brandt, 2010). Solutions to reverse this trend were explored but not simple. To meet the challenges of transforming educational expectations and ultimately ensuring the future success of student learning, finding effective models to integrate 21st century skills into the learning environment is a strategy. The Partnership for 21st Century Learning (P21, 2016) outlined elements of these skills in their framework that included learning, literacy, and life skills. Although specific predictions on what high-demand careers might look like in the future cannot be fully anticipated, students equipped with the 21st century skills needed to adapt and thrive in a rapidly changing economy will promote global competitiveness.

The P21 (2016) framework was widely adopted for effectively responding to the shifting needs of students. Interdisciplinary themes that encompassed learning, literacy, and life skills provided the platform of basic structural components of the framework (P21, 2016). Critical thinking and problem-solving were at the heart of the organizational structure (Trilling & Fadel, 2009). P21 (2016) advocated for the infusion of 21st century skills and provided tools and resources to accomplish these goals. To analyze progress and recognize exemplary schools, P21 established a program to identify schools across the United States that successfully integrated the framework into the school learning environment. The call to transform teaching remains a complicated challenge, thus it is necessary to research best practices employed by successful schools that result in successful student outcomes. Understanding how exemplary schools

currently meet this need would provide potential strategies to the U.S. educational system to help equip the next generation of learners with the hope of ensuring graduates remain globally competitive and ultimately meet the demands of the future economy.

Background

The Global Economy

The global economy radically transformed from the Industrial to the Information Age. Society now lives in a world marked by an abundance of information, rapid changes in technological tools, and the ability to collaborate and make individual contributions on an unprecedented scale. This changing movement revealed that the job market and opportunities were vast and in constant flux (Marzano & Heflebower, 2012; Rshaid, 2014; Trilling & Fadel, 2009). Although impossible to precisely know the future direction of specific careers, predictions indicated that students who possessed 21st century skills would be more marketable and able to adapt. Research indicated that workers now entering the work force would transition through approximately 6-11 careers in a life span (Bellanca & Brandt, 2010; Schrum & Levin, 2009). This was in stark contrast to the past where college programs adequately prepared learners for singular careers. To address the challenge of adequately preparing students, schools must embrace a new pedagogy to engage students and enable them to acquire and master 21st century skills to be prepared appropriately for jobs that do not exist today.

Education in the United States: A Look at the Past

Appreciating the development of past economies was integral to understanding the need to redesign educational practices. When America was cited as a nation that offered superb education opportunities, it was designed to meet the needs of an agrarian

culture (Rothstein, 1995). School calendars were tailored to meet the farming economy of the eighteenth and nineteenth centuries so it made sense that students attended school from September to June. The approach to education was to focus on "learning and building stocks of knowledge that would be used later in the appropriate situation" (Brown, 2006, p. 23). The educational system was successful at meeting these needs in a stable, slowly changing world where a student could expect to use the same set of skills throughout a lifetime (Brown, 2006; Friedman & Mandelbaum, 2011). In today's age of information described as a flat world of connected knowledge, work, global markets, tele-linked citizen, and blended cultural traditions, the 21st century demands a fresh set of responses (Friedman & Mandelbaum, 2011).

Changing trends. The continual, rapid advances of technology shifted the skill requirements of future careers (Bellanca & Brandt, 2010; Trilling & Fadel, 2009). Although the need to build content knowledge remains a necessary skill, research indicated employees were more marketable when they could collaborate, explain their thinking, and demonstrate creativity (Lichtman, 2014). Changing job market trends revealed that a large percentage of career paths did not exist ten years ago (Casserly, 2012). For example, Social Media Managers and Application Developers were unimaginable until technology demanded these skills (Casserly, 2012; Morgan, 2016). Instructional practices must evolve to adapt to the needs of the future. Rather than prepare students for specific skills for a single career, students must gain proficiency in skills that will allow them to adapt. Learning no longer needs to be solely confined to the school calendar or the classroom. At a time of instant access to information with interconnectivity, people learn everywhere and anywhere (Rshaid, 2014), leaving behind

the days where education was built on the paradigm that learning involved a process where information was transferred from one higher authority to the student. As evidenced by Rshaid (2014) and Brown (2012), the trend for education in the 21st century shifted to a more immediate one with learning that takes place anytime and anywhere. Identifying these trends and understanding the skills students need in the future was therefore necessary.

21st Century Competencies

In response to the ongoing technological change that in turn directly influenced educational possibilities, possessing 21st century skills emerged as essential (Brown, 2012). Maximizing 21st century competencies such as critical thinking, collaboration, creativity, and communication became essential. Maintaining an emphasis on life and technological skills was equally central to the future changing economy. As job opportunities change, it was impractical to send an employee through repeated formal training because by the time the educational process was completed, the field was likely to have morphed yet again (Brown, 2012). Ensuring that educational systems aligned to meet this growing demand is a complex transition that involves changing mindsets and behaviors. Examining change drivers involved in this needed transition is therefore necessary.

Drivers for Educational Change

To fully appreciate the scope of the changes necessary to transform the educational system with a focus in 21st century skills in the U.S., specific modifications must take place (Schrum & Levin, 2009). Such reforms would be complex and involve

vast adjustments to a system that long worked in the past. Recognizing the drivers involved is necessary to fully understand the extent of this massive undertaking.

Learning curriculum to lifelong learning. The objective of schools must shift from delivering content to accumulate knowledge directly passed from the teacher to a mindset that learning is continual (Chen, 2010; Fullan, 2014). Moving away from a one-size-fits-all mentality to a system that empowers students to acquire the skills needed throughout life is integral to the overall principals of 21st century skills.

Teaching to learning. Appreciating that teachers and students are perpetual learners is necessary to illustrate continual learning for all. Fullan (2013) called for placing a higher emphasis on the learning side of the instructional process rather than solely relying on improving teacher techniques. Transforming schools from a place where teachers teach and students learn to a place where everyone from the district leadership to the student learns in the organization is a necessary to address the needs of 21st century students (Chen, 2010; Rshaid, 2014).

Content to skills. Highlighting the importance of acquiring skills rather than simply content and curriculum was a major cornerstone of 21st century competencies. Schools must commit to move away from simple recall and memorization to a culture that expects students to collaborate and communicate thinking patterns (Trilling & Fadel, 2009). Through this method, creativity and learning expanded far past simple recitation of the text in a district adopted curriculum to providing skills needed beyond the school setting.

Fixed learning to learning in itself. Learning opportunities must evolve to give students opportunities that extend beyond the school calendar and content standards

(Frey, Fisher, & Gonzalez, 2010; Lindsay & Davis, 2013). Moving away from a batch processing system to a continuous, personalized process should be the objective. To help students master certain requirements, ensuring a system of continual assessment rather than solely grading within a fixed time period would provide continual learning experiences for students. Fixating on the learning itself as a process and delivering a more tailored method could provide enhanced opportunities for engagement and potentially result in nurturing a zest for lifelong learning.

Learning out of the classroom. Removing the constraint of specific learning locations would be another key shift aligned with 21st century competencies. Successful blended learning environments showcased the capability for learning to take on various effective models. With mobile technology and instant access to information and collaborative tools, endless opportunities were exposed where students were not limited by the classroom (Chen, 2010; Evans, 2015).

Technology for learning. Transitioning from using technology to teach a concept to employing it as a learning tool would revolutionize the educational system. Removing time constraints, taking learning beyond traditional classroom walls, and exceeding specific and uniform standards would better prepare students to meet the changing demands of the future job market. Abandoning a one-size-fits-all educational system was not only obvious, but necessary; despite research validating this need, the actual change in educational transformation has been slow (Daccord & Reich, 2015; Evans, 2015; Herold, 2015; Rshaid, 2014).

The Partnership for 21st Century Learning

P21 (2016) is an organization with the mission to be a catalyst for 21st century learning by building collaborative partnerships among education, business, community and government leaders so all learners gain the knowledge and skills needed to flourish in an ever-changing world. Although various accepted frameworks focused on similar skills, P21 spent ten years examining and collaborating on the needed skills for optimal student future outcomes and established itself as a leader.

Stemming from the belief that all learners need and deserve 21st century learning opportunities to thrive as tomorrow's leaders, workers, and citizens, P21 (2016) collaboratively created a framework to respond to the complex educational need for reform. The framework emphasized student outcomes focused on key subjects, learning and innovation skills, life skills, and technology skills. The desired outcomes were supported by systems that included standards and assessments, curriculum, professional development, and the learning environment. Figure 1 outlines the essential elements for 21st century student outcomes and support systems.

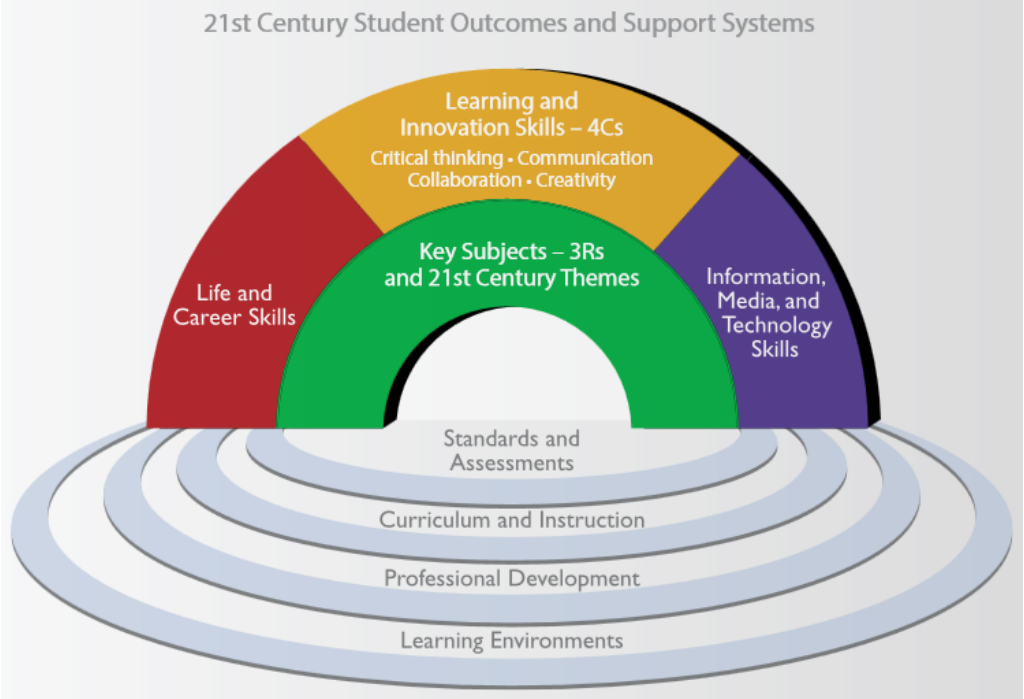

Figure 1. 21st century skills student outcomes and support systems. Source: P21, 2016.

The framework provided a vision to highlight best practices employed in schools in the U.S. To recognize schools that successfully integrated 21st century skills into the learning environment, P21 designed a process to evaluate and identify schools as exemplar using a specific process designed to communicate expectations and recognize success.

The evaluation process. P21 (2016) employed a structured process to evaluate and identify exemplar schools. Any PK-12 school could nominate another school or self-nominate. Following a successful application that demonstrated meeting the requirements, site visits were arranged and schools were evaluated based on the following criteria:

1. Evidence of commitment to college, career, and life readiness
2. Educational support systems and sustainable design

3. Engaged learning approaches

4. Equitable student access to 21st century learning

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

6. Partnerships for sustainable success (P21, 2016)

Site visits employed a standardized rubric created to assess implementation of 21st century learning and identify best practices. Following successful identification of achieving exemplar status, schools benefited from media exposure and were recognized on the P21 website (P21, 2016).

Although schools were identified, evidence in the body of literature indicated limited research focused on how these schools prepared for the integration of 21st century skills and ultimately created a culture of 21st century learning. Taking time to research and identify key practices that led to the positive outcomes described in the P21 framework would provide fundamental background to bridging the reasons behind the transformation and add to the existing research focused on identifying indicators of successful schools.

Summary of the Background Review

Skill sets needed by future learners require the paradigm of education to change. The P21 (2016) framework for 21st century skills proposed a pathway to create this change. As the technology advances drove the change in the global economy, so must the application of technology drive changes in education. Today's learners must have access to an education system that provides the prerequisites for careers that do not currently exist. Trends in education pointed to a need for school systems to embrace and

systemically transform what occurs in and out of the classroom so that social change can follow technological changes.

Statement of the Problem

Technological advances shift at an exponential rate, such as how mobile phones evolved from heavy, brick forms to light, sleek portable computers that also make phone calls. These dramatic changes provided immediate access to information and connectivity around the world. As a result, ways of performing everyday tasks also changed. Information can be accessed over the Internet instantly and progress consequently permeated the dynamics of doing business.

In the past, it was common to prepare for a singular career; however, research indicated that future job seekers will transition through approximately 6-11 careers in a life span (Bellanca & Brandt, 2010; Schrum & Levin, 2009). Continual technological growth fundamentally changed the job market, making it difficult to accurately predict professions that will be in demand in the future. For this reason, exclusively preparing for a singular career is no longer sufficient to navigate the changes of the future job market. As a result, it is imperative that educational practices respond to this trend in an attempt to fully meet this shift so emerging high schoolers remain globally competitive with their counterparts around the world. To address the challenge of effectively preparing students, schools need to incorporate 21st century skills as an underlying platform to support this need (Bellanca & Brandt, 2010; Chen, 2010; Lichtman, 2013; Trilling & Fadel, 2009)

To adapt, learners need 21st century skills that include the ability to be collaborative, creative, think critically, and communicate, with solid life skills and

proficiency in technological skills (P21, 2016). Gone are the days of high schools mandating the completion of keyboarding class; this ability is now an expectation embedded in everyday behaviors and habits. Schools therefore, must combine these 21st century skills in daily instruction. Although these concepts may be simple to communicate, actual school outcomes proved implementation was difficult. According to Bellanca and Brandt (2010), many schools across the U.S. failed to make this transition and continued to teach the same as in decades past. Several factors inhibited the process to completely transform school systems, but continued progress was made in some schools across the nation. To leverage what is already known about integrating 21st century skills in the classroom, there is a pressing need to investigate best practices employed in schools that already mastered this shift.

P21 (2016) constructed a framework to support the integration of 21st century skills in education. To that end, the P21 network recognized schools across the U.S. that demonstrated the capacity to integrate 21st skills. Selected schools were identified following successful application submissions and assessment by P21 staff using a uniform evaluation tool. Subsequent to this process, selected applicants received an onsite evaluation by the organization. These methods were effective for the purpose of recognizing and celebrating exemplar schools, and provide an opportunity to dig deeper.

Substantial research centered on obstacles to achieving 21st century school transformation (Bellanca, 2013; Friedman & Mandelbaum, 2011; Lichtman, 2014) whereas others focused on the rationale for this transition (Bellanca, 2013; Kay & Greenhill, 2013; Trilling & Fadel, 2009). Limited research focused on how these schools prepared for the integration of technology and created a culture of 21st century learning,

and current research indicated strong support for the need to achieve the transformation (Chen, 2010; P21, 2016; Rshaid, 2014). Investigating best practices employed by identified schools through a qualitative lens provided a richer understanding of underlying factors involved in achieving this phenomenon. Without understanding these causal reasons, educational practices could be destined to remain largely unchanged. Engaging in a study that reached beyond the *what* and communicated the *how* behind 21st century classroom integration was urgently needed. Reversing data trends by bridging the gap to unlock the keys needed to transform education ensured students were effectively prepared, and ultimately met the changing job demands of tomorrow.

Purpose Statement

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

Research Question

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

Significance of the Study

Futurists used to be thrilled when they could forecast developments five years out, but today it is closer to one year (Thornburg, 2014). As technological trends continued to change at increasingly rapid rates, so did job opportunities. However, the U.S. education system did not effectively evolve to meet the skill needs of students competing for the same jobs as students from around the world. Current data showed that business leaders

were not finding qualified and globally competent students emerging from American schools to meet their needs and were looking elsewhere to fill positions (Jascik, 2015).

Evidence from studies and organizations, including P21 (2016), revealed many schools across America transformed their focus to a global mindset where 21st century skills were the norm (Bellanca & Brandt, 2010). This transformation however, continued to change at a slow rate. Numerous factors inhibited the conversion from past traditional styles of teaching, but current literature pointed to the critical need for a massive makeover in education where 21st century learning would thrive (Chen, 2010; P21, 2016). It is no longer conceivable to convey the amount of information students will need or to be certain that the information conveyed will be relevant over time, so the learning mindset in education must change to respond to an ambiguous future with relevant skills (Chen, 2010; Lichtman, 2014).

With the onset of instant access to information, extensive research explained why education should no longer be confined by the school calendar or the classroom walls. Learning can and must happen anyway at any time in an effort to individualize learning where students feel empowered to communicate, collaborate, create, and engage in critical thinking skills. P21 (2016) described these key skills as the 4Cs and provided exemplar schools an opportunity to be identified as examples. Although P21 accomplished much to further progress in education, there was little evidence of substantial research focused on how these schools prepared for the integration of 21st century skills. The body of literature cited described key factors of a 21st century learning environment and emphasized the importance of achieving this state, (Bellanca,

2013; Chen, 2010; Lichtman, 2014; Trilling, 2009), but there was a gap in the literature that failed to address the developments that led to the success.

Identifying key practices through a qualitative study would attempt to grasp reasons leading to the success of a transformed environment with the intent of ensuring students of the future thrive and have the opportunity to effectively compete with students around the world. Deeply understanding the journey to being identified as an exemplar school, the culture of the school, and the leadership and motivation behind the path to transformation contributed to the existing research on 21st century skills and K-12 education. Exploring best practices employed by identified 21st century schools and understanding how this state was achieved provided the necessary keys to link the gaps missing in current research with the goal of providing guiding recommendations and a more encouraging path to a school system in need of transformation.

Definitions

21st Century Skills: The knowledge and expertise needed to succeed in work and life; it is a blend of content knowledge, specific skills, expertise, and literacies (P21, 2016).

Collaboration: The aptitude to work towards a common goal with diverse teams and environments while demonstrating respect for individual perspectives (P21, 2016).

Communication: This needed skill involves the ability to effectively communicate through various verbal, written, and non-verbal formats in a range of environments (P21, 2016).

Creativity: The ability to use a variety of creation techniques to facilitate new ideas, process, communicate, and evaluate them (P21, 2016).

Critical Thinking: The capacity to employ various types of reasoning supports the development of critical thinking skills. Moreover, it involves systems thinking, the ability to problem solve, and successfully analyze and evaluate information (P21, 2016).

Differentiated Instruction: An approach to teaching where curriculum, teaching methods, resources, and learning activities are modified to address the needs of individual students and small groups of students to maximize the learning opportunity for each student in the classroom (Frey, 2012).

Exemplar School: Schools that successfully applied for and were recognized by P21 for their demonstrated integration of exemplary 21st century learning practices that improved student learning based on the criteria of the P21 framework (P21, 2016).

Growth Mindset: An outlook that most basic abilities can be developed through dedication and hard work and that brains and talent are just the starting point. Carol Dweck, a leading researcher in this field posits that this view creates a love of learning and a resilience that is essential for great achievement (Dweck, 2015).

Learning and Innovation Skills: Learning and innovation skills are skills that are needed to prepare students for the multifaceted life and work environments in the 21st century. A focus on creativity, critical thinking, communication and collaboration is crucial to prepare students for the evolving dynamics of a changing job market. They are commonly referred to as the 4C's (P21, 2016).

Life and Career Skills: These essential skills encompass thinking skills, content knowledge, and social and emotional competencies needed to traverse across complex life and work situations. P21's essential Life and Career Skills include flexibility, initiative, social skills, productivity, and leadership components (P21, 2016).

Partnership for 21st Century Learning: Also known as P21, it is an organization whose mission is to serve as a catalyst for 21st century learning to build collaborative partnerships among education, business, community, and government leaders so that all learners acquire the knowledge and skills needed to thrive in a world of constant change and where learning never stops (P21, 2016).

STEAM: An integrated approach to teaching that involves the sciences, the incorporation of technology, principles of engineering and design, the arts, and the application of mathematics (p21.org).

Delimitations

Delimitations are choices made by the researcher that describe the boundaries established for the study (Patton, 2015). The delimitations of this research were bound by the access, proximity, and availability of the researcher. In choosing the sample, the researcher began with all exemplar schools in the U.S. and set the delimitations with two criteria: (a) geography and (b) school characteristics. Exemplar schools were described as sites that successfully transformed student learning experiences by incorporating 21st century learning into teacher practice, curriculum, assessment, and professional development (Bellanca and Brandt, 2010).

As of 2016, 59 school sites were identified that spanned 22 states in the nation. Considering the boundaries established, the researcher focused on P21 exemplars in the state of California. Of the 59 schools nationwide, 20 exemplar schools were in California. California was selected due to convenience and access. The second delimitation was grade levels served, specifically focusing on elementary schools. Of the 20 California exemplar schools, 2 were elementary schools.

Organization of the Study

This document is broken down into five chapters. The first chapter introduced the problem, significance, and basic background information of the study. It also presented the purpose of this phenomenological study and the research question. Chapter II provides a comprehensive literature review that synthesizes essential works and studies related to 21st century learning. Furthermore, it reveals patterns and addresses variances relayed by renowned leaders in education. Chapter III is composed of the methodology, which includes a detailed procedure of how the research was conducted. Chapter IV follows with a presentation and analysis of the data. Lastly, the summary of the study, conclusions, and recommendations form Chapter V, which is the concluding section of the investigation.

CHAPTER II: REVIEW OF THE LITERATURE

Overview

The review of literature examined research and literature focused on the topic of 21st century skill best practices. It assessed how rapidly evolving technology directly influenced the global economy. An analysis of how these key components impacted the future job market and the needs of the educational system was evaluated. Past and present educational practices were reviewed. This chapter reflected on the concept of 21st century education and how this transformation related to the Common Core State Standards (CCSS), as well as other new college and career standards. The Partnership for 21st Century Learning (P21) framework was utilized as a benchmark to define 21st century skills and exemplary schools based on their current evaluation process.

This chapter begins with a brief introduction to 21st century learning and delves into a review of the literature to closely examine 21st century skills and how variables including technological advances, job market trends, and the development of education through the ages are deeply related. Key research is presented to explain patterns, variances, and an overall synthesis of the studies. This chapter concludes with a summary of how these elements were related and identifies the gaps in research and literature relating to the best practices employed by schools to reach exemplar status.

Change Drivers Affecting Education

Educators must currently prepare students for jobs that do not exist (Trilling & Fadel, 2009). The massive shift from the Industrial Age to the Knowledge Age produced an economy driven by abundant information with globalization highly impacted by consistently evolving technology. This dynamic changed the face of job market

demands. Because the world continues to change at such a dramatic rate, schools need to rethink what is taught and how it is taught (Bellanca, 2013; Darling-Hammond, 2010; Gardner, 2009). Understanding how these conditions developed and how to effectively take action is critical to transforming education so that students can be successful in a competitive global arena.

To ensure fully prepared students for the job market of tomorrow, 21st century skills were identified and need to be incorporated into the education system. An education based on the world today will not suffice for living and working in the world of tomorrow (Bellanca, 2013; Chen, 2010, Darling-Hammond, 2010). Overall, change in the education field is slow, especially compared with the rapid technological advances. Seizing opportunities to gain insight from schools that achieved success in making these critical transformations could launch a blueprint to support other schools in this massive initiative.

Technological Advances

Technological advances occur at an exponential rate. The global economy was immensely impacted by the ability to access and share information instantly and the ability to communicate with others around the world in a variety of capacities (Friedman & Mandelbaum, 2011). Improvements transformed the way people go about their daily lives. Today, people are attached to their technology and able to connect in an instant for personal or professional reasons. To illustrate the progress, consider that in 1998, only 41% of households owned a computer, whereas in 2015, 90% of households in the U.S. reported owning a PC (Dubravac, 2015). As a result, the dynamics of the work force changed bringing improvements as well as challenges. With new opportunities

consistently presented, the implications for global competitiveness and job security remain extensive (Gladwell, 2000; Wagner, 2008).

Many facets surround technological change. The global economy's interconnected system of knowledge coupled together with technological advances created dramatic shifts in consumer needs and desires. Research revealed that as technologies rapidly change, the life cycle of new products and the underlying processes were shortened (Audretch, Lehman, & Wright., 2012; Lichtman, 2013). The ability to share knowledge across countries in various industries, companies, and environments propelled the emergence of innovation, thus driving competitive opportunities. Product and process innovation was the result, which generally increased economic growth.

Technological progress was recognized for benefiting the overall economy, yet consistent findings indicated there were critical implications to consider as well. Understanding how to manage and effectively adapt to ongoing change systematically with strategic intent was an ongoing challenge (Friedman & Mandelbaum, 2011; Galliers & Leidner, 2009). An innovative product could be enormously successful one moment, then rendered suddenly extinct when a new idea demonstrated more beneficial capacities. The flux that potentially resulted from such change was far reaching. Research indicated that although rapid globalization and technological progress brought substantial benefits to American consumers in the form of better and cheaper goods and services, this progress was associated with reduced job security (Bartik & Houseman, 2008; Friedman & Mandelbaum, 2011). Realizing this trend and how to respond was critical to the future of a healthy economy whose job skills could readily adjust to increasingly competitive and fast changing markets (Friedman & Mandelbaum, 2011; Roblyer, 2013).

Job Market Trends

Looking through job search websites easily revealed the type of positions in demand. Positions such as cloud capacity manager and security analyst were just a sampling of the information technology jobs currently in demand that did not exist ten years ago (Casserly, 2012). The job skills of tomorrow will require advanced technical skills, but because technology changes rapidly, it was difficult to accurately predict the specific jobs that would be in demand in the future (Dubravac, 2015; Morgan, 2016). This fact was exemplified by the fact that despite a recovered economy from the global recession of 2008, a recovery in employment rates in the U.S. remained impacted by a continued mismatch of available skill sets and job positions (Dubravac, 2015). Furthermore, statistics indicated that one million computing jobs will remain unfilled due to a lack of appropriate preparation of the future work force (Morgan, 2016).

Research predicted that the career sectors that will be in demand in the next ten years would be: (1) research and development, (2) information technology, (3) operations, (4) management, and (5) sales (Gordon, 2013; Morgan, 2016). Completing a general education may no longer be sufficient to meet the demands of the future workforce. Employees require additional skills that employers demand. Moreover, people cannot simply to be prepared for the workforce, but must remain competitive at a time when global economies constantly compete with one another (Friedman & Mandelbaum, 2011).

Technological progress occurred faster than labor markets were able to adjust (Brynjolfsson & McAfee, 2012; Gordon, 2013; Wagner, 2008). Although organizations and businesses were compelled to match their needs with available talent, a shortage of

talent remained. To highlight this issue, the World Economic Forum issued a report on the future of jobs that declared urgency for adaptive action (Buchanan, 2016). To adequately prepare for this systemic problem, an understanding of how technological advances influence the job market is needed.

Technologies of the Future

Jobs of the future continue to be impacted by the evolution of advancing technologies. Although U.S. productivity continued to increase due to advanced technological machinery and services, fewer workers were needed to perform the same tasks (Brynjolfsson & McAfee, 2012; Friedman & Mandelbaum, 2011). Traditional industry positions will continue to be disrupted by the exponential advancements of the technology age. One illustration of these transitions included the company Uber, which is a software tool and the biggest taxi company in the world without owning any cars; Airbnb is another example, which holds the title of the largest hotel company in the world yet does not own any properties (Goodwin, 2015).

The internet of things. The concept of connecting any device to the Internet and/or to each other formed the basis for the topic of the Internet of Things (Dubravac, 2015; Morgan, 2016). When products from a wearable device to the jet engine of an airplane can be connected, it created a massive network of connectivity and the possibilities were endless (Morgan, 2016). Increased ways to gather, store, and analyze data were a direct result from the ability to connect. As broadband Internet became more available to users around the world, opportunities expanded exponentially. With the goal of bringing the Internet to everyone on the planet, competing companies such as OneWeb and SpaceX intend to employ tiny satellites designed to beam high-speed Internet down

to Earth (Patterson, 2015). Despite the support of multi-billion dollar companies, the process remains an enormous undertaking. Advocates believe that granting connectivity around the world would provide equal access to education, and other research suggested it could end poverty (Audretch et al., 2013; Gordon, 2013; Patterson, 2015). Debate from analysts continued regarding the actual number of connected devices and how much of the world was actually connected and/or could be connected during the next quarter century; however, current data reflected an approximate prediction of eight billion connected devices (Hamilton, 2016).

Artificial intelligence. The capability of computer systems to perform tasks that normally required human intelligence remains a quickly evolving area of computer science (Ford, 2015). The ability to incorporate visual insight, speech recognition, decision-making, and translation between languages were areas highlighted in the technology industry. Although intelligent machines progressively took over tasks previously accomplished by humans, evidence revealed this area was still in its infancy stages despite the introduction of the term in 1956 by John McCarthy and evidence of consistent progress over the last sixty years (Smith & Anderson, 2014).

Robotics. As artificial intelligence and robotics continued to integrate, new opportunities expanded to infiltrate job tasks and everyday life. According to a 2014 Pew Research Center report, these technologies will permeate wide segments of daily life by 2025, with huge implications for a range of industries such as healthcare, transportation and logistics, customer service, and home maintenance (Smith & Anderson, 2014). Due to this progress, there will be an increasing need for highly skilled workers in these technological positions. Although research asserted that many jobs and parts of jobs

would be replaced by robotics and artificial intelligence, there were substantial data that demonstrated that these replacements would serve to make the worker's responsibilities easier, allowing him/her to be more productive and ultimately more efficient (Brynjolfsson & McAfee, 2012; Smith & Anderson, 2014).

Impact on the Future

Due to the impact that technological advances will bring, it is necessary to be prepared with the needed skills that employers will require. Although it is difficult to pinpoint what jobs will be most in demand in the next ten years, job seekers and students are called to carefully evaluate the transformation taking place and to be prepared to respond and plan accordingly (Conley, 2008; Wagner, 2008). The literature asserted that a vast majority of people will go through six to seven careers in their lifetime (Bellanca & Brandt, 2010; Darling-Hammond, 2015) and all careers will be impacted by globalization by some measure (Friedman & Mandelbaum, 2011). Considering how the world is changing at such a dramatic rate, renowned leaders in education called on the education system to adapt (Bellanca & Brandt, 2010; Trilling & Fadel, 2009; Lichtman, 2014).

Transformation in the Educational System

The education system in the U.S. emerged in the Industrial Age, long before the creation of the Internet. School systems continued to develop during a manufacturing economy. Some literature contended that mass education was designed to pre-adapt children for industrial work conditions that were crowded, noisy, and regulated by the clock and whistle (Toffler, 1970; Trilling & Fadel, 2009). Similar to a batch processing method, knowledge, which was confined to the textbook, was the sole link between the teacher and student (Trilling & Fadel, 2009). The school calendar and structure of the

school day were designed to conform to the needs of the economy of the time. The system of passing on concepts from teacher to student was the format employed in schools. In a fixed model of knowledge, students were expected to focus heavily on content and recall. Uniform modes of teaching were employed where students were expected to learn at the same rate and in the same way. Assessments were employed to evaluate mastery based on a timeline rather than on a focus to master a skill or objective (Trilling & Fadel, 2009). This approach to education worked well in a stable and slow changing world where students could expect to use one set of skills throughout their career (Elmore, 2004; Fullan, 1993, Kotter & Cohen, 2002). Understanding these transitions reflected in society's goals from the related era was key appreciating the urgent need to adapt to an ever-changing job market. Table 1 outlines the characteristics of each age and provides an alignment of the intended main goals.

Table 1

Society's Educational Goals Throughout the Ages

Goals for Education	Agrarian Age	Industrial Age	Knowledge Age
Carry traditions and values forward	• Pass on farming knowledge and traditions to the next generation • Raise children in the ethnic, religious, and cultural traditions of parents and ancestors	• Pass on knowledge of a trade, craft, or profession to the next generation • Maintain one's own culture and values amid a divesity of tradtions in urban life • Connect with other cultures and geographies as communication and transportation expand	• Pass on knowledge in a field and apply principles across fields to create new knowledge and innovations • Build identify from and compassion for a wide range of cultures and traditions • Participate in a wide diversity of traditions and multicultural experiences • Blend traditions and global citizenship into new traditions and values to pass on
Contirbute to work and society	• Grow food for family and others • Create tools and crafts for basic needs • Partiicpate in the local cottage eocnomy	• Serve society through a specialized profession • Apply engineering and science to contribute to industrial progress • Contirbute to a long chain of production and distribution	• Contribute to global information • Innovate new services to meet needs and solve problems • Pariticpate in the global economy
Exercise and develop personal talents	• Learn the basic 3Rs • Learn farming and craft skills • Use tools to create useful artifacts	• Achieve basic literacy and numeracy • Learn factory, trade, and industry skills • Learn managerial and administrative skills, enginnering, and science	• Enhance technology-powered knowledge and productivity tools • Use expanded global opportunsities for work and entrepreneurship • Use knowledge and technology to develop talents throughout life
Fulfill civic responsibilities	• Help neighbors • Contribute to local village needs • Support essential local services and community celebrations	• Participate in social and civic organizations, organized labor, and political activities • Contribute to local and regional improvement	• Participate in community decision-making and political acitivty • Engage globally in issues • Use technology to contirbute to local and global causes

Note. Adapted from *21st century skills: Learning for life in our times* by B. Trilling and C. Fadel (2009).

The table above explained the progression of educational practices from the agrarian age, industrial age, and finally to the knowledge age. More importantly, it illustrated the alignment from educational goals and current technological progress (Trilling & Fadel, 2009, Wagner, 2008). Two major shifts were identified by examining the above chart. First, general goals remained consistent through the ages, but strategies to achieve them evolved that paralleled the ongoing development of technology. Second, a shift from a society perspective to a broader global outlook was illustrated across the goals. For example, a contribution to work and society was fulfilled by growing food for the family in the Agrarian Age. In the knowledge age however, this same goal was achieved by ensuring contributions to global society with innovative services that resolved problems. Additionally, traditions in the knowledge age encompassed a wide range of cultures and traditions, thus highlighting the importance of developing global citizenship. Understanding these evolving patterns, emerging technologies, together with their impact on global competition, reflected an urgent need for transformation in school systems across the nation (Wagner, 2008).

Global Competition

Researchers agreed the public education system was on the verge of a tipping point and that a new model of 21st century learning was needed to effectively prepare students for the demands of citizenship, college, and careers in the millennium (Bellanca & Brandt, 2010; Friedman, 2011; Lichtman, 2013; Rshaid, 2014). In a highly interconnected world where globalization and information technology further promoted competition and encouraged innovation, the stakes became higher for students in the U.S. who were competing for jobs with students around the world. According to the United

Nations, Population Division (2016), the global population was estimated at 7.4 billion in June, 2016, which was an all-time record high. The United Nations estimated it would further increase to 11.2 billion by the year 2100 (United Nations, 2016).

When American students were regularly outperformed by competing nations that focused on developing a strong curriculum and thoughtful, open-ended assessments that demanded students be able to demonstrate what they learned through an application of skills, the urgency for education reform was clear (Bellanca & Brandt, 2010). An example of this was demonstrated in the data from an education report that high school graduation rates were approximately 70%, which was well behind countries such as Denmark, Japan, and Poland that maintained graduation rates from 92% to 96% (Wagner, 2008).

Need for Transformation

Data from multiple sources of literature indicated the current education system did not adequately prepare students for an economy infiltrated by constant change. Results from the Programme for International Student Assessment (PISA), which measured how well fifteen-year-olds responded to problem-solving skills, were telling. Overall scores for the U.S. indicated a placement of twenty-ninth, just after the Russian Federation and barely ahead of Portugal (Wagner, 2008).

Researchers and education leaders agreed that only people with the knowledge and skills to negotiate constant change and reinvent themselves for new situations will succeed (Bellanca & Brandt, 2010; Kay, 2010; Wagner, 2008). Despite access to connectivity and opportunity, studies indicated the majority of American schools employed an outdated calendar that included three-month summer vacations whereas

counterparts such as Germany and Japan maintained longer school hours and days (Chen, 2010). However, the call for reform demanded a much different approach than simply changing the schedule by extending the school day.

Students need skills that prepare them to think, learn, work, solve problems, communicate, collaborate, and contribute efficiently throughout their lives (Bellanca & Brandt, 2010; Schrum & Levin, 2009). They need to be perpetual learners who desire to grow and adapt to the fluctuating needs of the economy. To accomplish this, an overhaul in the current education system is needed. Continued widespread features of education today that include the regimentation; lack of individualization; rigid systems of seating, grouping, grading; and the authoritarian role of the teacher prohibit the change urgently needed (Brown, 2006; Kay, 2010; Wagner, 2008). Now well into the 21st century, consistent findings in the literature indicated it is time to transform from an outdated education system to ensure the students of tomorrow are equipped, successful, and competitive (Bellanca & Brandt, 2010; Chen, 2010; Trilling & Fadel, 2009; Wagner, 2008).

Leading Change

To succeed in transforming schools, effective leadership is vital to the process (Fullan, 2014). Change is generally difficult so leaders must be able to mobilize others to serve a common purpose (Kouzes & Posner, 2006). This commitment comes with sacrifice and the willingness to serve others (Kouzes & Posner, 2006). Research however, reveals that leadership isn't confined to the single person who single handedly brings change; rather accomplishment is achieved in teams (Kouzes & Posner, 2006, DuFour & Marzano, 2011).

Effective leaders recognize the need to build the capacity of teams and draw out the skills, backgrounds, and experiences to develop a solid framework poised to influence change (Kouzes & Posner, 2006, DuFour & Marzano, 2011). When teams work together, they are able to collaborate, influence, and support one another while achieving results Fullan, 2014). Developing a vision alongside a strategic plan for transformation that employs the unique abilities of an organization through collaborative communities that value all stakeholders will yield the potential for optimum results (DuFour & Marzano, 2011, Fullan, 2014; Muhammed, 2009). To achieve this, a positive school culture must be in place that involves skillful leadership coupled together with a focus on learning, institutionalized celebration, and ongoing professional development (Muhammed, 2009). When conditions are optimal, there is a simultaneous focus on both instruction and culture (Bambrick-Santoyo, 2012).

Attaining a positive school culture is achieved through a myriad of factors with leadership playing a leading role. In order to roll out a vision supported by productive, collaborative teams that consistently evaluate progress and push to exceed expectations, a framework must be initially established that emphasizes the importance of school culture. This dynamic provides the support system needed to produce teams willing to delve into the hard work of creating change. It is not enough for a leader to maintain vision, energy, and drive. Since a school's growth potential is directly related to its personnel potential, nurturing leaders is integral to effectively ensuring transformation (Maxwell, 1995). As the demands of a 21st century school environment consistently expand to meet the dynamics of a changing workforce, so must leaders adapt, maintain flexibility, and consistently reflect on progress.

21st Century Education

The world of education moved from an era where information was limited to an environment where information is everywhere and can be accessed anytime. According to a PEW survey, 95% of students aged 12 to 17 went online on a regular basis (Richardson, 2012). Communicating, collaborating, innovating, and learning no longer needs to be confined to the walls of a classroom in between specific time periods throughout the day. Standards in the classroom needed to be reformed to set a new vision aligned with the college expectations as well as the fluctuating demands of the job market and overall global economy, which was fulfilled by the CCSS.

Common Core State Standards

Recognizing this continuum of transformation, teams of stakeholders came together to collaboratively develop the CCSS that were released in 2010. They were initially divided into categories: the college- and career-readiness standards, which addressed what students were expected to know and understand by the time they graduated from high school, and the K-12 standards, which addressed expectations for elementary school through high school. After revisions, the college- and career-readiness standards were incorporated into the K-12 standards in the final version of the CCSS. The massive initiative was created to ensure students would be prepared for college, career, and life.

The CCSS were developed to replace individual state standards in an effort to standardize objectives throughout the nation. Although state education standards existed since the early 1990s, individual states developed and adopted their own unique learning standards for students. Proficiency levels varied from state to state making it difficult to

compare and evaluate progress. Adopting a common set of standards removed this barrier. The new standards aimed to address expectations missing from past standards and included major modifications.

Significant changes by the CCSS in English language arts included:

1. Regular practice with complex texts and academic language
2. Reading, writing, and speaking grounded in evidence from texts, both literary and informational
3. Building knowledge through content-rich nonfiction (CCSS Initiative, n.d.)

Changes by the CCSS in mathematics included:

1. Greater focus on fewer topics
2. Coherence through linking topics and thinking across grades
3. Rigor to pursue conceptual understanding, procedural skills and fluency, and application with equal intensity (CCSS Initiative, n.d.)

Proponents of the CCSS contended that implementation of a common set of rigorous standards, aligned to expectations of colleges, workforce training programs, and employers would ensure all students had the skills and knowledge necessary to succeed in college, career, and life upon graduation from high school, regardless of where they live (Calkins, Ehrenworth, & Lehman, 2012). There continues to be debate about CCSS implementation and its intended effectiveness. Due to the initiative still in the infancy stages, conclusive evidence has yet to be evaluated. At the time of this study, 40 of the 50 states used the CCSS, although more originally adopted the CCSS then changed to their own standards (CCSS Initiative, n.d.). To fully transform education, past practices surrounding the learner, classroom, and instruction must also change.

21st Century Skills

Consistent findings in the literature pointed to specific characteristics of 21st century skills. Although debate continues amongst educational leaders about labelling all of these skills, there was general agreement revolving the need for critical thinking, information, communication, technology literacy, and life skills that included such characteristics as flexibility and social skills. For example, some experts used the term critical thinking whereas others used the term systems thing, but the concepts were similar (Kay, 2010). No matter the label, they agreed these were the skills students needed to function effectively and thrive within the knowledge era (Rshaid, 2014; Trilling & Fadel, 2009).

Studies reported that students graduating from high schools, colleges, and universities lacked specific skills, including:

- Oral and written communications
- Critical thinking and problem-solving
- Professionalism and work ethic
- Teamwork and collaboration
- Working in diverse teams
- Applying technology
- Leadership and project management (Trilling & Fadel, 2009, p.7).

Higher learning environments were quick to share data that showed these deficiencies. Results from surveys conducted by the National Center for Education Statistics (NCES) that collected data on the percentage of students enrolled in remedial coursework found that 28% of first-year students who entered 2- or 4-year degree-

granting postsecondary institutions were enrolled in remedial courses in both 1995 and 2000 (Parsad & Lewis, 2003). Moreover, this also posited that high schools were designed to prepare students to be eligible for college but were not necessarily successful. Integrating 21st century skills could pivot this thinking from students wishing to be college eligible to college successful (Conley, 2008). This shift must occur long before college. Rather, it must be integrated at the earliest elementary levels through the integration of 21st century learning for a complete and successful transition to occur. Focusing on how to better integrate these skills into the daily standards should be critical to the future of a well-educated workforce.

The 21st Century Classroom

The 21st century classroom was a far contrast to the typical classroom most people experienced growing up in the U.S (Brown, 2012). It did not consist of desks permanently arranged in rows with students facing forward and quietly listening to the teacher in the hope of collecting knowledge. It was not limited by the bell schedule, nor restricted by the confines of a room. This model, used for most of the twentieth century, was built on the notion that teaching was necessary for learning to occur (Brown, 2012). In contrast, the 21st century classroom understood that learning happened anywhere and anytime when the world's learning resources were always available (Bellanca, 2013; Chen, 2010; Rshaid, 2014).

To fully embrace 21st century skills, the concept of the 21st century classroom must support the intended environment needed to sustain critical elements such as collaboration, communication, creativity, and problem-solving, as well as technological devices. Although the idea of the classroom may sound contradictory when referring to

21st century skills, it was intended to define a shift about how teaching and learning occurred (Rshaid, 2014).

21st Century Instruction

Data suggested that the call to completely transform instruction is a daunting challenge. In his reports, Richardson (2012) estimated that out of the hundreds of schools visited, 95% of them had done little to prepare students for the future job market. Yet, despite these data, collective research indicated that every major job sector depended on the capacity to effectively educate students to a higher level than generations past (Chen, 2010; Lichtman, 2013). Although the critical need was multi-faceted and involved numerous interrelated factors, consistent findings indicated that 21st century instruction is the clear pathway to make progress toward this education overhaul. Understanding how students are impacted by these factors is necessary as schools of the future attempt to adapt to these needs while addressing impending changes to the job market.

Student engagement. As the availability of connectivity and technological devices continued to expand and improve, students were exploring and learning at different rates and in different ways (Wagner, 2008). With young people adept at researching on their own through the use of technological tools, so too must educators be aware and sensitive to this changing dynamic of learning. To continue to deliver instruction though a *sage on the stage* model would only exasperate some students while disengaging many others. With the current state of transformation needed for students to become successful in college and career, there is an urgency to understand the underlying reason for the lack of student engagement.

Students growing up during this time held a new set of desires and expectations based on their life long immersion in all things digital (Trilling & Fadel, 2009). Based on a study of eleven thousand individuals born between 1978 and 1998, eight common attitudes, behaviors, and expectations were identified:

1. Freedom to choose what's right for them and to express their personal views and individual identity
2. Customization and personalization, the ability to change things to better suit their own needs
3. Scrutiny-detailed, behind-the-scenes analysis so they can find out what the real story is
4. Integrity and openness in their interactions with others and from organizations like businesses, government, and educational institutions
5. Entertainment and play to be integrated into their work, learning, and social life
6. Collaboration and relationship to be a vital part of all they do
7. Speed in communications, getting information, and getting responses to questions and messages
8. Innovation in products, services, employers, and schools, and in their own lives (Trilling & Fadel, 2009, pp. 29-30)

Considering these expectations from current generations, attempting to teach in a traditional form would ultimately disengage many students and potentially continue to contribute to inadequate high school graduation rates (Wagner, 2008).

Personalized learning. Rather than employ a one-size-fits-all approach, a more personalized learning environment needs to be adopted to give students the ultimate opportunity to succeed in high school, college, and in the job market (Wagner, 2008). Cookie cutter delivery of instruction where every student accessed information and ideas in the same way was ultimately proven unsuccessful (Brown, 2006; Chen, 2010). People naturally process content in different ways and at different rates. (Chen, 2010). Understanding this dynamic was essential to ensuring that instruction is delivered to meet the unique learning needs of all students (Kay, 2010).

Problem-based inquiry. Students need opportunities to explore, collaborate, research, and engage in problem-based inquiry (Casap, 2015). Learning from mistakes and persevering from the process built life skills. Proponents of this model believed in shifting the focus away from asking students what they wanted to be when they grow up to asking which problem they wanted to solve (Casap, 2015).

Innovation. As global competition for new and improved goods and services dominated the job market, the demand for creativity increased. As such, opportunities to learn though innovation and imagination must be critical components imbedded in the education framework. To support this notion, economists also contended that innovation was the fuel for today's knowledge-based economy (Dubravac, 2015; Lemke, 2010).

Assessment. As part of the teaching process, assessment remains a critical tool to gauge progress, evaluate, and determine next steps (Marzano & Heflebower, 2012). Allowing flexibility to master a standard outside of a constricted window while providing creative opportunities to achieve that standard highlights the real purpose of education while engaging the learner. Linking the progress of 21st century integration to formal

assessments in the classroom has shown integral to revealing the relationship and need for both components (Chen, 2010; Marzano & Heflebower, 2012).

Technology. Literature contended that a key component of 21st century learning included the ability to access technology and the Internet (Frey & Fisher, 2012; Kay & Greenhill, 2013). Students were able to leverage learning through heightened engagement and personalization when using technological tools (Lichtman, 2013). In a Speak UP survey conducted in 2013, students reported using smartphones, tablets, and laptops to complete homework assignments, facilitate projects, collaborate with classmates, self-remediate through online videos and social networks, and pursue self-directed activities regarding academic topic of interests (Project Tomorrow, 2014). The opportunities were vast when considering technology as a learning tool.

Implementing technology all on its own may not positively affect student progress if not integrated strategically or without a focused pedagogical vision at the forefront. Examples of school districts committing enormous financial resources without ample planning typically failed with this approach. The Los Angeles Unified School District's (LAUSD) ambitious plan to integrate iPads was a prime example; in an effort to put iPad's into student hands, $1.3 billion dollars were spent without the proper collaboration or professional development and it failed (Walker, 2015). Consistent findings in the literature advised educators to focus on the purpose of the learning objective rather than the tool itself (Frey & Fisher, 2012).

To help maintain emphasis on the purpose of technology integration, research demonstrated focusing on the function of technology and how it could serve to better enhance learning was key (Lichtman, 2013; Millman, 2011). When educators

deliberately integrated technological tools that enhance the learning goal, important aspects of 21st century learning were realized. Some essential skills included collaboration, creativity, communication, and critical thinking, commonly referred to as the 4Cs. For example, introducing technological tools where students had the ability to communicate through video conferencing or Twitter expanded opportunities for students to gain proficiency in this area while also enhancing student engagement (Bellanca, 2013; Frey et al., 2010). Examples of how tools could be used for specific functions is illustrated in Table 2.

Table 2

Tools Organized by Function

Function	Tool	
Searching	• Lycos • Yahoo	• Google • Bing
Sharing	• YouTube • Flicker • Blogs	• Picasa • Vlogs
Producing	• Comic Life • iMovie	• GarageBand • Voki
Storing	• MP3 players • CD/DVD	• Flash drives • E-book readers
Collaborating	• Wikis' Voice Thread • Crowdsourcing	• Google Docs
Presenting	• PowerPoint • Smartboards	• Keynote • Wimba
Communication	• Text messaging • Digg	• Twitter • Video conferencing
Listening and Viewing	• iTunes • RSS feeds • Streaming media	• Screencasts • Podcasts • Hulu
Networking	• Facebook • Instagram	• LinkedIn • Ning

Note. Adapted from Frey et al., 2010.

21st Century Challenges

Transformation is typically not an easy process (Audretch et al., 2014; Chen, 2010; Wagner, 2008). Identifying key factors that supported progress was fundamental to advancing the education-to-employment system for the talent requirements of a 21st century workforce (Gordon, 2013; Trilling & Fadel, 2009). Bellanca (2013) stated that specific changes must be achieved for this transformation. Although some literature delved deeper into detailing the changes, there was common agreement that instruction must prepare students to:

- Master core content
- Think critically and solve complex problems
- Work collaboratively
- Communicate effectively
- Learn how to learn and be a lifelong learner
- Transfer skills from content to real life (Bellanca, 2013)

Significant challenges exist to fully accomplishing this vision for 21st century learning (Wagner, 2008). Although examples of pockets of success were found across the U.S., abundant literature highlighted reasons why the needed transformation was not more pervasive in schools today.

Industrial age education. Past educational models that were the standard practice for over a century were difficult to change (Trilling & Fadel, 2009). Changing mindset when past practices worked was difficult to overcome. Many of the current educators and leaders were comfortable with the way past education models functioned and were therefore hesitant to embrace change that required a significant paradigm shift.

Generation gaps. With school districts that maintain a variety of generation gaps in their workforce ranging from baby boomers to millennials, diverse perspectives generally persisted (Gordon, 2013). Finding a common vision was therefore difficult to grasp, especially when a wide spectrum existed from employees who opposed technological practices to employees who expected to integrate the newest and latest technological practices as soon as possible (Friedman, 2011).

Technological access. The ability to access technological tools to enhance differentiated instruction was not even accessible across the country (Darling-Hammond, 2010). Depending on the location of the district, some cities and towns had easier access to internet connections. Some of this was due to infrastructure whereas other reasons were simply attributed to levels of affluence that permeated the town. Additionally, technological access at school also influenced the mindset of city and district leadership. Some districts perceived connectivity at school and home as essential whereas others were apprehensive about potential security threats that ultimately prevented them from moving forward. As a result, there was a wide spectrum of thinking, producing unbalanced accessibility to the tools that researchers indicated were needed for future jobs (Elmore, 2014; Herold, 2015).

Progress

Despite challenges to progress of 21st century education, there was progress and significant pockets of success stories. Many schools that achieved success addressed the change drivers through transition plans while others adopted a framework to follow (Trilling & Fadel, 2009), such as that of P21 (2016). P21 identified 59 schools through its Exemplar Program that showcased the power of using its framework for 21st century

learning. As this program continues to develop, opportunities to learn from others' success should expand significantly (P21, 2016).

Technology Education Frameworks

In an effort to support the transition to 21st century learning, various frameworks emerged to guide the transformation (Voogt & Roblin, 2012). Four frameworks that involved technological competencies were identified as more common or adopted: the International Society of Technology in Education (ISTE), the Technological Pedagogical Content Knowledge (TPACK) model, the Substitution Augmentation Modification Redefinition Model (SAMR), and the P21 framework.

International Society of Technology in Education (ISTE). To assist in developing targeted and appropriate objectives, ISTE developed standards in 2007. This organization serves educators dedicated to empowering linked learning in a connected world. The ISTE organization offers what they coined as Essential Conditions, which are the 14 critical elements necessary to effectively leverage technology for learning (ISTE, n.d.). These components offered educators and school leaders a framework to guide implementation of the ISTE standards and tech planning to better support a system wide change. These standards and support systems were widely adopted and recognized in a vast amount of literature addressing the importance of 21st century skills (ISTE, n.d.).

Technological Pedagogical Content Knowledge (TPACK). In an effort to connect technology, pedagogy, and content, TPACK emerged as a framework to support and guide educators in the effective integration of technology into meaningful instruction for students. Although similar frameworks exist, TPACK was one the most established and recognized of its kind. Since its introduction in 2006, and recently revised in 2016,

there was much research garnered in how to apply the model (Voogt, Fisser, Pareja Roblin, Tondeur, & van Braak, 2013). Substantial research demonstrated that teachers continued to lack the skills and knowledge needed to enable them to teach adequately with technology (Chai, Koh, & Tsai, 2010; Nies, 2005). Although the concepts outlined in this framework aligned with the need to transform to 21st century learning environments, there continued to be dispute regarding varying interpretations of the system (Voogt et al., 2013).

Substitution augmentation modification redefinition model (SAMR). SAMR was developed by Ruben R. Puentedura in 2006 and offered a process of examining how computer technology impacted teaching and learning. This framework posited that computer technology needed to be woven into the demands of effective teaching and learning (Romrell, Kidder, & Wood, 2014). Furthermore, this model sought to evaluate mobile learning by assessing the four classifications of the structure: substitution, augmentation, modification, and redefinition. Rather than using technological practices simply for the sake of implementation without the strategic intent to transform instructional practices, the SAMR model was arranged to align learning activities to classifications of technology use:

- Substitution: Technology provided a substitute for other learning activities without functional change
- Augmentation: Technology provided a substitute for other learning activities but with functional improvements
- Modification: Technology allowed the learning activity to be redesigned

• Redefinition: Technology allowed for the creation of tasks that could not have been done without the use of the technology (Puentedura, 2006)

Partnership for 21st Century Learning framework. P21 was established in 2002 by a collaborative effort between educators, businesses, and government to transform education into 21st century learning environments in the U.S. and beyond (Trilling & Fadel, 2009), a vision that remains at the forefront of collective efforts of the organization. After detailed analysis and numerous revisions, the framework was constructed to support the wide range of content and skills that encompassed 21st century learning, resulting in a comprehensive framework intended to illustrate a roadmap to achieve 21st century learning outcomes.

The framework was developed to illustrate the underlying core subjects, 21st century themes, learning and innovation skills, and information and media skills. With the advent of the CCSS and revised 21st century expectations, teachers were no longer relegated to teaching outdated skills and extraneous material. On the contrary, teachers must help students realize how to better "gather and interpret information, challenge assumptions, summarize and communicate new insights," and transfer these skills to the application of a variety of concepts (Bellanca, 2013, p. 2). The fundamental base of the framework called for learning that included the 4Cs: critical thinking, creativity, communication, and collaboration (P21, 2016). It also called for a rigorous, relevant, and results-directed curriculum. The framework outlined elements of student outcomes in four separate key categories, but emphasized the need to interconnect all the components for success.

Key subject and 21st century themes. P21 (2016) noted that key general subjects found in school should be combined with 21st century themes that included global awareness, such as learning how to work collaboratively with various cultures. In the same way, financial, economic, and entrepreneurial literacy would assist students in understanding the role of the economy in society and how these elements were interrelated. Additionally, learning how to participate fully in civic duties was also important to develop citizens who understood their rights and responsibilities of citizenship at every level. Literacy in health was an important factor; understanding the dynamics of proper diet, physical exercise, and nutrition was important, but extending this knowledge to the larger picture to appreciate the impact on national and global public health was also important. Finally, environmental literacy was an essential learning objective where students demonstrated knowledge of environmental facts and addressed challenges that affect local to global matters (P21, 2016).

Learning and innovation skills. These 21st century fundamental skills were often referred to as the 4Cs: creativity, critical thinking, communication, and collaboration. Being able to think creatively was a tremendous value to organizations and companies seeking the next best product or service (Lemke, 2010). Complementary to this was the desired ability to innovate by transforming ideas into action, especially when in a collaborative effort. The ability to problem-solve by demonstrating critical thinking was an essential skill, and standardized testing transformed by expanding critical thinking into end-of-year assessments. The art of communicating effectively through verbal and written measures was also a much needed skill (Lemke, 2010). Whether collaborating on a team project, completing a simple letter, or effectively employing the latest

technological tools, communication and collaboration were integral components of 21st century learning.

Information, media, and technology skills. As technology continued to impact everyday living, it must be included in the 21st century learning environment (Gordon, 2013). Students must be able to access a variety of media and apply appropriate technology effectively. By gaining experience with a range of digital technologies, an ability to evaluate and create information would be established. Ensuring that students had the opportunity to develop information, media, and technology literacies would enable them to be more marketable in an ever-evolving information economy (Gordon, 2013).

Life and career skills. The ability to adapt in changing economies will be essential to the future job applicant (Kay & Greenhill, 2011; Rshaid, 2014). Technological advances continue to impact job responsibilities, thus the ability to take initiative, remain flexible, and demonstrate a commitment to lifelong learning should be a desired outcome for all workers. For these reasons, these skills must be fostered in the school system through goal setting, monitoring progress, and working in diverse teams (Chen, 2010; Rshaid, 2014).

Exemplary School Identification by P21

In an effort to promote the importance of 21st century skill learning and identify U.S. schools that demonstrated the capacity to successfully integrate 21st century skills, P21 (2016) developed a systematic method to recognize this achievement. In addition to recognizing their accomplishments, this program sought to highlight them as a means to encourage support from organizations and policymakers. Currently in its fourth year,

P21 identified 59 schools to date. Schools that wish to apply for the recognition must undergo an evaluation and ultimately be selected following a successful outcome.

Evaluation Process

To be considered, any Pre-K through 12 school site must apply using the online application (P21, 2016). As part of the process, candidates forward documentation to support claims of embedded 21st century learning practices that demonstrated improvement in student learning. If a school successfully passed through this phase, representatives from P21 completed visits to the school site for follow-up observations and evaluation. During the team visit, two to four P21 representative members met with stakeholders that included the superintendent, principal, community members, teachers, and students. Classroom visits also took place. To best capture strategies and practices used, photographs and video were sometimes used during the evaluation process. Once a school was selected, the exemplar status was valid for a one-year period.

Evaluation Tool

Schools were evaluated through the use of a rubric (Appendix A) composed of six components:

1. Evidence of 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. Evidence of student acquisition of 21st century knowledge and skills
6. Partnerships for sustainable success (P21, 2016)

Evaluators scored candidates on a range from *no evidence* to *embedded practice*. Each of the components relied on additional data as evidence to support the given ranking. The final section of the tool required a summary of the visit that reviewed strengths and areas for improvement relative to the framework (P21, 2016).

Learnings from Identified 21st Exemplar Schools

P21 partnered with the Hewlett Foundation and Dr. Jonathan Plucker to identify and share 21st century best practices through a report on common trends found in identified exemplar schools. These trends were labeled as patterns of innovation. Research indicated that these patterns, which were separated into five categories, formed the main components of transformation into a 21st century learning environment (Brown, 2012). The diagram below outlines the essential, interconnecting components represented as Student Agency, Distributed Leadership, a Climate of Achievement, Engaged Community, and the application of Evidence and Research (P21, 2016)

Figure 2. Exemplar interactive ingredients. Source: P21, 2016.

Student agency. Student agency was defined as a "cluster of academic mindsets and learning strategies that have been demonstrated to advance learning and achievement" (P21, 2016). It directly related to student sense of belonging, leadership, and initiative to learn. It was listed as possibly the most powerful of all the ingredients of a successful 21st century school.

Distributed leadership. This element composed of the interactions between a shared leadership system where all stakeholders participated in the vision and evaluating its progress. Constant engagement and assessment of community needs was reflected in strategic planning.

Climate of achievement. This condition referred to the atmosphere and tone of the school. Effective 21st century schools maintained a positive environment where efforts and achievements were consistently recognized and celebrated.

Engaged community. This significant component related to successful relationships established between all stakeholders who worked together toward common goals. Enlisting the commitment of administrators, teachers, students, parents, and community members offered diverse perspectives and further strengthened resources available to the school.

Evidence and research. The commitment to pursue a rich variety of approaches supported by research was evident in 21st century schools. Although strategies varied, the pledge to improve remained constant. Most of the identified schools revealed they are engaging in the implementation of the CCSS as a means to dig deeper into the concepts (P21, 2016).

Using the Learnings to Explore Best Practices: Next Steps

P21 accomplished much to advance the need to transform educational practices. From releasing an updated framework in 2007 to introducing the exemplar program in 2012, P21 continued to concentrate on the learning needs of the future. Continuing to partner with community members, policymakers, and researchers, P21 committed to communicating the need to transform educational practices in an effort to prepare students for the ever-changing needs of tomorrow.

Research indicated that distinguishable patterns existed in identified 21st century exemplar schools (Kay & Greenhill, 2013; Trilling & Fadel, 2009). For example, in a research study involving over 400 schools across the U.S., common practices emerged. Trilling and Fadel (2009) described them as:

1. Learning that was deeply engaging and personalized
2. Teaching where educators were model learners and guides
3. Evaluation that was varied and incorporated into everyday learning
4. Culture where there was a climate of high expectations
5. Development that included a commitment to embedded coaching and leadership
6. Technology that was widespread and used to support learning

To examine best practices, a critical review recognizing related 21st century learning practices and skills was completed (Bellanca & Brandt, 2010, P21.org). The P21 Exemplar School Program was used as an instrument to consider exemplary school identification. To study the broader picture, however, several associated, precipitating variables were investigated as well. They included a review of historical educational

practices, ever-evolving technological advances, and the global economy. All these interrelated elements and their impact to the future job market were examined.

Consistent findings revealed how these factors directly influenced education transformation to effectively prepare students for the future job market (Chen, 2010; Rshaid, 2014). More importantly, the urgency to make this transition was pervasive in the literature (Wagner, 2008). Studies generally identified similar needed competencies and skills; however, the difference lied in the labels provided and significance attributed to them. Researchers agreed the need for reform was urgent (Bellanca & Brandt, 2010; Chen, 2010, Friedman & Mandelbaum, 2011; Wagner, 2008).

Substantial literature and data supported that the rapid change in technology directly impacted the future job market, compelling the education system to prepare students for jobs that simply do not exist (Chen, 2010; Trilling & Fadel, 2009). Although precisely predicting the makeup of future jobs is difficult, research strongly agreed that such skills as adaptability and critical thinking would be a key to one's success.

Ample research dictated obstacles to achieving this transition while other studies delved into identifying successful indicators of 21st century learning (Rshaid, 2014; Trilling & Fadel, 2009; Wagner, 2008). However, little information on how identified schools effectively prepared for the transformation or the best practices employed during the process existed. Although the P21 exemplar program, currently in its fourth year of development, is still new, insights relating to best practices were expanded. A close look at current identified schools revealed an array of approaches used to achieve 21st century skill integration (P21.org). With 59 identified schools, there is ample opportunity to investigate potential patterns that exist, especially as the P21 Exemplar Program

continues to develop and expand. Other noteworthy data signified a higher density of identified exemplar schools in particular states as shown in Table 3:

Table 3

Distribution of Exemplars by State

State	Number	State	Number
Arizona	1	Missouri	1
California	9	New York	3
Connecticut	1	North Carolina	8
District of Columbia	2	Ohio	1
Florida	1	Pennsylvania	5
Illinois	3	South Carolina	2
Indiana	2	Tennessee	1
Iowa	4	Texas	2
Kentucky	3	Virginia	2
Massachusetts	2	Washington	1
Michigan	1	Wisconsin	3

Note. Data extracted from P21, 2016.

Furthermore, patterns existed in themes identified by topic in exemplar schools as illustrated in Table 4, which represents the number of schools that cited a specific 21st century theme as being integrated at their respective school sites. Although California maintained the highest number of exemplars in the nation, only two were elementary schools, one in Northern California and one in Southern California. Both reported professional development and technology as the 21st century themes integrated at their school sites.

Table 4

Exemplars by Theme

Exemplars	Number	Exemplars	Number
Assessments	15	Instruction	20
Civic Literacy	12	Leadership	20
Collaboration	20	Life and Career	20
Communication	17	Partnerships	20
Creativity	20	Podcast	12
Critical Thinking	20	Professional Development	20
Early Learning	3	Standards	6
Environmental Literacy	5	Student Voice	20
Financial Literacy	4	Technology	20
Global Awareness	14	Video	15
Health Literacy	3		

Note. Data extracted from P21, 2016.

Considering the limited research that exists on the P21 Exemplar Program, coupled with the urgent call to transform education to efficiently prepare students for the future workforce, there is a need to fill this void. The literature clearly supported a need for research that identifies and describes 21st century skill best practices used at schools already identified as exemplar. This research revealed strategies to assist other school districts to make this urgent transition. Exploring best practices employed in identified 21st century schools and understanding how this state was achieved could provide the necessary keys to connect the gaps missing in current research, in the hope of providing guiding recommendations and a more encouraging path to a school system in need of transformation.

Summary

This chapter reviewed scholarly literature associated with the variables involved in this phenomenological research study. They included the global economy,

technological advances, 21st century competencies, drivers of change, and the P21 framework. A comprehensive summary of the P21 Exemplar Program and its related components was also presented. Seminal author findings and key data were synthesized to better understand how existing research could provide a framework to further advance the integration of 21st century skills in educational practices throughout the U.S. Literature clearly signaled a need for more empirical research that delves into best practices used in exemplary schools as recognized P21.

CHAPTER III: METHODOLOGY

Overview

This chapter outlines the methodology used in this research. It details the design of the research, including instruments used and the method of the data analysis employed. Methodological assumptions and limitations of the study are presented and the chapter concludes with a culminating summary of the material presented.

This qualitative study employed a phenomenological approach to explore 21st century best practices used at exemplary schools in California. Data were collected through a variety of tools including interviews, observations, and artifacts. The purpose statement and questions established the base of the study.

Purpose Statement

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

Research Question

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

Research Design

This qualitative study employed a phenomenological approach (Patterson, 2015) to explore and identify best practices used in elementary schools identified as exemplary by the Partnership for 21st Century Learning (P21). This approach was deemed the most suitable to determine the response to the research question, which sought to understand

the meaning and essence of the lived experience of this phenomenon of exemplary schools. Data were collected through interviews, observations, and artifacts.

When qualitative methods are used, the researcher constructs open-ended questions to gather rich data from participants as opposed to closed-ended surveys that characterize a quantitative model (Johnson & Christenson, 2008). Quantitative approaches can be limiting because respondents are restricted by the construct of the questions, whereas qualitative methods provide opportunities for gathering information that is less confined. When participants were free to respond to questions using their own terminology, the prospects for collecting valid data regarding lived experiences increased (Creswell, 1994).

In qualitative investigations, the researcher may collect data from interviews, observations, and artifacts collected. During this phase, the researcher must ensure that boundaries of the study are established, information is systematically collected, and protocols for recording information are clearly communicated (Creswell, 1994).

Qualitative data can be collected through various approaches, including observational notes, taping of an interview, photographs, or a videotape of a particular social situation as appropriate (Creswell, 1994). Once this information is gathered, the researcher analyzes the data and sorts information into themes with the intent of determining emerging patterns or trends. Because the researcher is primary instrument in the collection of data, reliability and validity of the process should be corroborated through triangulation to minimize potential bias and strengthen findings (Creswell, 1994).

In an effort to truly capture the essence of the unique experience of staff and parents at exemplary 21st century elementary schools in California, executing a

phenomenological approach distinctively collected how participants perceived, described, felt, and judged their own experiences (Patton, 2015). Employing this approach allowed for a deeper understanding of how exemplar schools in California achieved this rare state of success.

To conduct this phenomenological study, two exemplar elementary schools engaged in the research process. One was in northern California and the other was in southern California. Both schools demonstrated a successful educational model in employing 21st century skills in their respective school setting and were identified as exemplar schools by P21 following a comprehensive selection process.

Each school was visited by the researcher where a series of focus groups and interviews were conducted by the researcher to determine best practices used in these exemplary elementary schools. To gain varying perspectives, different focus groups were composed of teachers, support staff, and administration. Each group was asked to respond to between two and six open-ended questions that focused on variables relating to 21st century skills. All interviews were recorded and transcribed following appropriate communication and consent procedures.

Other data collection techniques included observations and artifact review to allow for triangulation of the data (Creswell, 1994). The strategy of collecting data from multiple sources provided a more robust and authentic description of 21st century best practices used at the schools. The researcher conducted observations as a non-participant observer during classroom instruction, assemblies, and staff meetings, as well as observing transitions and activities in the hallways. To assist with data collection, a journal was used to capture field notes. In the same way, artifacts such as pictures and

flyers were included in the data collection process to further support the findings. In summary, using a variety of methods was intended to gain the "descriptions of what people experience and how it is that they experience what they experience" (Patton, 2015, p. 117).

Population

Population was defined as a group of individuals or events that met specific criteria and to which results could be generalized (Johnson & Christensen, 2008). The P21 program, currently in its fourth year, identified 59 exemplar schools in the United States, which included elementary, middle, and high schools. To be recognized as an exemplar school, specific conditions were met through a successful application and visitation process that included being evaluated based on a rubric measuring implementation of successful 21st century learning. The 59 schools identified as exemplar by P21 were the population for this study.

Sample

A sample refers the group of subjects or participants for which data were collected and is intended to be illustrative of a specific population (Johnson & Christensen, 2008). To narrow the selected population and complete a phenomenological study, two elementary sites were selected based on purposeful sampling. Criteria for selecting sites included:

1. Exemplar school identified by P21
2. Elementary school
3. Located in California

To date, P21 identified only two exemplar elementary school sites in the state of California, one in northern California and one in southern California. Thus, the sample for this study was the two exemplar elementary schools in California, which are referred to as School A and School B. Data from the California Department of Education provided background on the demographics of each elementary school. In addition to achieving recognition for being the only two exemplar elementary schools identified by P21 in California, other similarities included similar enrollment sizes. In contrast however, more differences preside, as can be seen in Table 5.

Table 5

Characteristics of Participating Schools

	School A	School B
Location	Northern California	Southern California
Grades Served	K-6	K-5
Enrollment	691	780
Free/Reduced Lunch	82%	65%
English Language Learners	61%	27%
Programs	New Tech Network	District STEAM school

Note. Data extracted from the California Department of Education website, 2016.

Instrumentation

Instrumentation in this study consisted of the open-ended interview protocol, the observation protocol, and documentation of artifacts collected by the researcher. Although there was an established set of six interview questions planned for each focus group (teachers, administration, support staff, and parents), follow-up questions were used to clarify or further expand concepts as warranted (Appendix B). These follow-up questions differed depending on the flow and responses of the participants. A schedule was used to ensure that all focus groups received an equal amount of initial interview time that ranged from 30-40 minutes. An interval of 15-20 minutes between group

interviews provided a set time for the researcher to review protocols and allow for a quality review check.

Observations were also used for data collection. The researcher observed a total of 14 classroom settings where 21st century skills were integrated. The researcher used an observation log for taking field notes. Other instrumentation tools include an artifact collection log whereby the researcher reviewed such data as flyers, photographs, newsletters, and information from school web sites.

Validity and Reliability

Validity

Validity in a qualitative study related to whether the research truly measured what was intended to be measured, thus determining the accuracy of the results (Patton, 2015). To solidify the validity of the research, specific steps were taken in the procedures. Criterion validity, or the extent to which a measure was related to an outcome, was addressed through the completion of a pilot interview. The goals of this interview were: (1) provide validation on the interview skills such as pacing and appropriateness of follow-up questions, and (2) field test the interview questions as a measure of validity. The pilot interview was conducted with a doctoral student who was also a school district technology director and oversaw the district's technology plan, implementation, and integration. The interviewee also provided feedback about the structure and format of the questions, which was then incorporated into the interview protocol. Once finalized, the questions employed remained uniform for all interview candidates to maintain the content validity. A standard protocol script that provided a brief introduction and overview of the process was also employed to maintain consistency for all participants.

Characteristics of the researcher must also be considered and potential bias revealed when evaluating internal validity in a qualitative study. For this reason, it must be noted that the researcher is a female, married with three children. The researcher spent the last 12 years in education, starting as a classroom teacher, and currently serving in a public school district as an elementary school principal. At the time of the study, the researcher was in the process of integrating 21st century skills at her school, with a focus on critical thinking and communication. This initiative was further enhanced by a recent technology grant to the school that included 50 tablets, which was spearheaded by a new school site technology leadership team. This initiative generated the researcher's interest in the topic and was the primary impetus for this study. The research intended to use the findings from this study in her own school, as well as disseminate the information about best practices to benefit other schools.

Reliability

Reliability refers to the degree to which an assessment tool produces stable and consistent results (Patton, 2015). Through this process, the researcher had the opportunity to gain a clearer understanding of the phenomena experienced by the participants to help identify and describe 21st century skill best practices in identified exemplar elementary schools in California. Ensuring reliability in the methodology was critical to establishing conclusive results. Moreover, literature supported the use of multiple sources of data to create a fuller and more accurate synthesis of data (Creswell, 1994).

Internal reliability. To establish internal reliability, the researcher triangulated three types of data, interviews, observations, and artifacts. Interviews were recorded by

the researcher, reviewed, and transcribed. An additional researcher reviewed the themes prior to the final coding procedure. This member served as an additional check throughout the analysis process. Furthermore, reliability was supported through the maintenance records of all data. All journal notes were accurately maintained and reviewed to monitor for potential researcher bias during the entire study.

External reliability. External reliability refers to the extent to which a researcher could reproduce a study and obtain the same or similar results to the original study (Saldana, 2016). However, the purpose of this phenomenological study was not to be replicated. Instead, it sought to ensure that data collected were reliable to produce dependable results. Thus, external reliability was not a concern for this study.

Intercoder reliability. Intercoder reliability is the commonly used term for the degree to which independent coders evaluate a characteristic of a message or artifact and reach the same conclusion (Lombard, Snyder-Duch, & Bracken, 2002). This was an integral aspect of qualitative research that sought to ensure that explanations of the data were supported with consistent conclusions. As part of the procedure, a consistent protocol was used to evaluate intercoder reliability:

1. The primary researcher selected two transcribed interviews, one from each school site.
2. The transcription from the interviews was coded into the program NVivo by the primary researcher.
3. A second researcher reviewed the two transcribed interviews separately to check for parallels and validate the themes developed by the primary researcher.

4. The second researcher independently coded the two samples of the data using the same procedures as the primary researcher.
5. A comparison of results between the primary researcher and the second researcher revealed the need for further discussion on some of the identified themes. The desired result was 80% or above agreement on the frequencies of the codes (Lombard et al., 2002). A lower percentage would have required further discussion focused on patterns of thought between the researchers.

Data Collection

Using a phenomenological lens, the researcher gathered data on the experiences and perspectives of the participants and then analyzed the data to make comparisons, draw out trends, and identify best practices used at the exemplary elementary school sites. Site visits occurred between August, 2016 and September, 2016.

Planning site visits to school sites was arranged by the researcher, district superintendents, and site principals. Emails to engage the potential school sites were directed to school administration and were followed up with phone calls by the researcher to provide an overview of the research and any needed clarifications. Schedules were discussed with final determinations made based on collaboration between the sites and the researcher. Expectations between both parties were also discussed to ensure clarity. It was important to consider school calendars for staff to be sensitive to participant responsibilities. After commitments were made, the researcher extended a thank you note and provided an anticipated timeline for site visits.

Using these two schools specifically to complete data collection provided valid samplings of exemplar elementary schools in California that were recognized as

demonstrating 21st century learning practices because these were the only two elementary sites that received this recognition to date. Validity was further strengthened by the use of other data collection measures, including the observation of classroom instruction, assemblies, staff meetings, and other school property areas that include the playground, cafeteria, and hallways. Artifacts such as meeting agendas, minutes, pictures, and fliers were also collected as part of the process.

Of the two schools sampled, eight classrooms were observed in school A and six classrooms observed in school B. Interviews and focus groups were conducted with 29 total respondents, 19 from School A and 10 from School B. Participants included district administrators, site administrators, classroom teachers, support staff, and parents of students. Focus groups were conducted with 2-4 participants with the exception of administrators who were all interviewed individually. The breakdown of participant groups and number of respondents is presented in Table 6.

Table 6

Breakdown of Participant Respondent Groups

Administrators	Teachers	Support Staff	Parents of Students
4	17	4	4

Types of Data

Multiple sources of data collection were incorporated into the research process to allow for the triangulation of findings. Interviews, observations, and artifact collection created opportunities for rich and meaningful data for the researcher to review, code, and ultimately decipher themes and patterns that emerged from participant experiences. All types of data collection aligned with the purpose of the study, which was to identify and

describe 21st century skill best practices in exemplary elementary schools in California that were recognized by P21.

Interviews. During the face-to-face interviews, rich data were collected through the use of pre-determined, open-ended questions that allowed respondents to verbalize their lived experiences. Due to the semi-structured nature of the protocols, there were opportunities for additional questions depending on the flow of the conversation and the need to expand or clarify comments. All conversations targeted the purpose of identifying and describing 21st century skill best practices. Interviews and focus groups occurred at the respective school sites and the location on campus was determined by the school administrator.

Participants were asked the six initial open-ended questions that were created based on the P21 Framework (2016), with distinct consideration given to variables cited in the structure. Focus group sessions did not exceed one hour, with groups ranging from two to four members. This allowed for the investigation of best practices used in exemplary elementary schools through the lived experiences and perceptions of the participants. To ensure all data were captured, the researcher employed an audiotape to record all verbal communication following consent of the participants. The conversations were transcribed and a copy was sent to the participant as a member checking strategy to strengthen validity. This process further enhanced the value of the data (Creswell, 1994). Furthermore, the researcher used a notebook to take field notes regarding data that could not be captured on audiotape, such as body language, tone, and facial expressions that added to potential trends.

Observations. The researcher gathered data through detailed observations at both school sites. Specific settings at the school sites were selected based on the attempt to collect diverse data through a variety of locations and situations focused on the observation of practices used to implement 21st century learning. A comprehensive schedule was collaboratively created by the researcher and site administration based on this criterion as well as teacher willingness and availability. All field notes were collected in a journal with one for each site. The journal itself was separated in categories by location and data collection method, and included areas of interest such as the location, setting, resources available, and interactions. The journals were used to record verbal comments from various participants as well as notes taken on the actual environments observed. As recommended by Creswell (1994), the researcher recorded personal feelings and thinking throughout the research process.

Artifacts. Items collected during the data collection phase of the research that supported 21st century best practices included photographs of bulletin boards, presentations, classroom instructional materials, technology integration tools, and other materials that were seen on the days of research involving 21st century learning. Documents collected included meeting agendas, parent and community flyers, public communication letters to parents, and pictures of the school environment. Although a wide variety of artifacts were collected based on availability and the willingness of participants to share, final analysis of these data concentrated solely on artifacts that supported 21st century learning practices.

Data Collection Procedures

Prior to the collection of data, the research methodology and instruments were evaluated and approved by the Brandman University Institutional Review Board (BUIRB; Appendix C). The researcher ensured that participant rights were protected by following all IRB rules and regulations. Following verbal and written agreement from school site administration to participate in the phenomenological study, an arrangement was made to have potential participants contacted initially by the principal to communicate the purpose of the study. The procedures were categorized by preparation and initial steps, interviews, observations, and artifact collection.

Preparation for data collection. To initialize organization for the actual collection of data, steps were taken to convey the purpose of the study to district and site administrators. The research used the following steps during the planning process:

1. Contacted the district superintendent and site principal in June, 2016 through email and telephone calls to provide an overview and purpose of the study. An inquiry about using their respective sites as a potential sample in the study was made. Subsequent to an agreement to participate in the research study, a follow-up with a summary of the conversation, beginning with an expression of appreciation and detailing next steps was emailed. Action steps were calendared as appropriate.
2. Planned and completed an initial site visit to school site B in August, 2016 to meet the site principal. An overview of the study was conducted over the telephone for school site A in June, 2016 and was followed up with emails from August-September, 2016. Hard copies of all invitation and consent

forms were hand delivered to school site B and mailed to school site A. Electronic copies of all forms were emailed to site principals. During the visit to school site B, a tour of the school and the designated interview setting was completed. Next, informal introductions between the researcher and potential participants occurred prior to the actual interviews. In addition, the researcher provided additional copies of all forms asked for them to be reviewed in advance to ensure there was an opportunity for participants to ask questions and receive any needed clarifications. The benefits and low risks of the study were communicated, expressing the value of participant input to generating results concerning 21st century best practices. Once this was completed, signed forms were collected from participants and each was thanked for his or her role in the study. The site principal assisted the process by forwarding all invitation and consent forms to potential participants and aided in the collection process as well.

Interviews. After the preparation steps and initial introduction visits were completed at the school sites between June and August, 2016, the researcher conducted interviews using the following steps:

1. Prior to any participation in the study, all participants received a research invitation letter that provided an overview, purpose of the study, and detailed procedures (Appendix D). Potential risks as well as benefits were explained. Participants were invited to ask questions through email or telephone call by contacting the primary researcher, whose contact information was on the invitation letter. Additionally, a Starbucks gift card was given to each

participant who engaged in an interview. A schedule of the interviews was completed in collaboration between the site principal, teachers, and researcher.

2. The researcher arrived on the agreed upon date to initiate data collection with all completed forms and needed tools including:
    - Completed BUIRB approval form, journal, writing pads, and writing tools (pens, pencils, highlighters)
    - A primary and backup recording device
    - A primary and backup camera
    - Extra blank invitation, consent, and assent forms
    - Extended portable file folders for a collection of artifacts

On the scheduled day of interviews, the researcher met each focus group, provided any needed clarification regarding the process, and confirmed that informed consent forms were signed; this form reviewed the purpose of the study and outlined expected time allotments for the actual interview (Appendix E). It also explained that participation was voluntary, respondent names would remain anonymous, and that breaks could be taken as needed. In addition to providing consent to participate in the interviews, participants were also asked for consent to be audiotaped during the discussions. The recordings provided accurate and complete details of the questions and responses. Furthermore, the consent form reviewed potential risks and benefits of participation in the interview process. Consistent protocols were followed for all participants through the use of uniform instructions (Appendix F). The signed consent forms were kept by the researcher and stored in a secure location.

Teachers were clustered by grade spans to create focus groups. The setting of the interview was chosen by the principal and was characterized as a comfortable, low-anxiety room. School site A used a staff conference room and school site B employed a staff meeting classroom. Support staff and parent participants were also clustered in their respective groups. Administrators were interviewed individually. The researcher audio recorded all interviews and used the scripted interview questions, which were preceded by a consistent introductory protocol process. A timer was also used to monitor and respect time commitments.

The researcher maintained a journal throughout this process to document personal reflections throughout the interview process. Once the interview was completed, participants were thanked and reminded that a copy of the completed transcription would be forwarded to them for member checking. This provided an opportunity for the participant to evaluate the truth of the data (Creswell, 1994). Each interview participant was provided with a $10.00 Starbucks gift card as a token of appreciation for their time and participation.

Observations. Observations were conducted between August and September, 2016. The following procedures were employed for conducting the observations:

1. In collaboration with the site principal, specific teachers in a variety of grade levels were invited to participate in a classroom observation. The researcher provided a research study invitation letter to the prospective teachers (Appendix G). The letter explained that all data collected in relation to the observation, including teacher and student names, would remain anonymous.

Following agreement to participate, a signed informed consent form was collected from the teacher (Appendix H).

2. Potential risks and benefits were detailed in the letter. Although there were no major known risks associated with this research, there could have been an inconvenience to the teacher who was observed. Potential discomfort with being observed was also a consideration. Similarly, there were no major benefits for the teacher observed beyond opportunities to share expertise on 21st century practices and add relevant data to the body of current research in this specific area. Signed consent forms from the involved teachers were collected prior to the start of any classroom observations.
3. Teachers were exclusively observed in their natural class setting during regular instruction. The researcher remained a silent observer while taking notes for a period of up to 30 minutes.
4. Several factors were considered when creating the observation schedule. The school bell schedule played an integral role in determining availability. In an effort to collect varied 21st century best practices, the researcher observed various classrooms for a duration of ten to thirty minutes. Data collection included notes on the room environment, as well as verbal dialogue captured from student responses and/or group dialogue. Verbal instruction delivered by the teacher was detailed in the notes by the researcher. All data remained anonymous with no personally identifying links.
5. Participant school site administrators received an email thanking them for their role in the research study.

Artifacts. In addition to interviews and observations, artifacts were collected to enrich the consistency of the findings. The following procedures were used to collect artifacts:

1. The researcher communicated the intent to collect artifacts that addressed 21st century learning from both school sites to the principal. Public information such as data collected from district and school web sites and informational flyers that related to 21st century skill practices were gathered prior to the visit. Examples of artifacts collected on-site included public flyers available to parents in the school hallway, school calendars that detailed relevant practices, and pictures of school and classroom bulletin boards.
2. Prior to departure from the school site, the researcher verbally thanked the school principal and staff, and a tentative date of completion of the research and copy of findings to each site principal was offered. A follow up thank you email to the superintendent and principal was completed.

Data Coding and Analysis

Proper coding was considered an essential part of the qualitative research process (Saldana, 2016). Prior to analyzing the data, analysis procedures were organized to effectively identify and group themes.

Data Coding

Following each site visit, the researcher gathered and sorted the various forms of data. All recordings from the interviews were transcribed and sorted by the participant title. Subsequent to this step, the coding process was completed. This involved the categorization of codes. A code is usually a "word or short phrase that symbolically

assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (Saldana, 2016, p. 4). In keeping with qualitative research, all interviews, observations, and artifacts were scanned and reviewed multiple times for themes. The data ranged from a single word, to a phrase, or even an entire paragraph. Once themes were labelled, the coding of data continued with the assistance of the online program NVivo. The coding involved a process where all data were grouped into categories. An evaluation of the codes was repeated by the researcher and again by another research student to increase validity. NVivo assisted in the organization of sorting and coding all collected qualitative data. Furthermore, it provided additional tools to assist the researcher in manipulating the data. Due to the nature of a phenomenological study, the researcher was not confined to a linear data collection step followed by coding and analysis. Instead, the researcher was able to move back and forth between data gathering and coding throughout the investigation. Although the program provided a way to manage the data, the researcher made the determinations regarding patterns and themes that emerged.

Data Analysis

Once the data were coded into themes, the researcher reviewed NVivo reports to evaluate trends and patterns that coincided with the identification of best practices used in an effort to describe successful 21st century integration. To support a theme, it needed to be reinforced by data from multiple sources. Triangulation of data, which is an approach where the researcher used multiple methods of data collection to seek a convergence of results (Creswell, 1994), followed the initial reviews. For this reason, interviews, observations, and artifacts were collected. Evaluating multiple resources strengthened

the research, ultimately leading to more definitive conclusions. Findings were positioned into a matrix to explore patterns and relationships that emerged between the school sites.

Limitations

A limitation is a potential weakness of the study (Creswell, 1994). Several limitations should be considered when evaluating conclusions in this research study.

Researcher Bias

Anytime the researcher is an instrument, bias exists in the interpretation of data. Questions were formed by the researcher and the choice of which artifacts and observations to include were also decided by the researcher. Procedures were enacted and followed to limit bias, but the potential for research bias remained.

Geography

Another essential point to consider was the fact that only two identified exemplary elementary school sites existed in the state of California during the data planning stages. This made it problematic to compare with other school sites around the country that were also identified as exemplar 21st century schools. The schools involved in the research had demographics unique to their surroundings. As such, generalizations made from this study cannot effectively be applied to all 59 exemplar schools that spread across the United States.

Time Frame

The data collection time period was limited to August and September, 2016. The collection of interviews, observations, and artifacts was restricted to the accessibility of participants and happenings of this timeframe, which may not have been representative of other times during the school year.

Bias of Participants

Volunteer participant responses were evaluated based on their personal state at the time of the interview. For example, participants may have felt compelled to assist their grade level team in the research or they may have had other personal or professional responsibilities to attend to, thus impacting their focus during the interview process. Additionally, participants could have been impacted by potential discomfort felt by responding to questions about their experiences to a researcher, who was essentially a stranger. It is possible participants did not offer their full perceptions of their experiences. Responses were also limited to participants' recollection of event and willingness to share, which could have been reduced for a number of factors.

Reducing Limitations

To reduce the effects of potential limitations, the researcher made every attempt to moderate them. For example, data were collected from multiple sources using multiple methods for triangulation. An additional researcher was used to review question construct, data coding, and trend analysis. To increase familiarity between the researcher and applicants, the researcher either visited the school site campus in advance to simply meet the principal or completed an introduction over the telephone and through emails prior to the visit. This provided an opportunity to get acquainted and ask any clarifying questions to ease any potential anxiousness regarding the process.

Summary

This chapter provided an overview of the methodology of this research. Starting with the purpose statement that leads the direction of the investigation, the research question was presented to bring further focus to the process in this qualitative,

phenomenological study. The research design was detailed by describing components of the process, participants involved, and the method of gathering data. The chapter concluded with an explanation of the data analysis protocol and finally a reflection of potential limitations to the research.

CHAPTER IV: RESEARCH, DATA COLLECTION, AND FINDINGS

Overview

The global economy changed at a profound rate due in large part to rapidly developing technological advancements (Bellanca & Brandt, 2010). As a result, emerging career and job opportunities were available for those who possessed the necessary skills to fill positions. In this era of rapid change, educational practices must transform to complement future needs. Doing well in school no longer guarantees success in a career when research indicated that the future norm expected the average person to hold different jobs and in multiple fields (Bellanca & Brandt, 2010). For this reason, people who sustained competencies in 21st century skills, were adaptable, and prioritized lifelong learning had greater opportunities for advancement in the global job market.

This chapter presents and synthesizes the findings from this phenomenological, comparative study by examining data collected from two elementary schools in California identified as exemplar by the Partnership for 21st Century Learning (P21). In this chapter, a narrative of the participants involved, the research methods, and the data collection process is detailed. It concludes with an analysis and summary of the findings.

Purpose Statement

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

Research Question

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

Research Methods and Data Collection Procedures

A qualitative, phenomenological method was chosen to examine the experiences of administrators, teachers, and support staff in exemplar elementary schools identified by P21. The two identified elementary schools were chosen as a result of their recognition for successfully integrating 21st century skills. Data were collected through interviews, observations, and artifacts. Using this approach allowed the researcher to explore and identify 21st century best practices by collecting an assortment of data from multiple sources. This approach was deemed the most suitable to determine the response to the research question which sought to understand the meaning and essence of the lived experience of this phenomenon.

Population

A population is a group of defined individuals or events that meet specific criteria to which results can be generalized (Johnson & Christensen, 2008). The P21 program, currently in its fourth year, identified 59 exemplary elementary, middle, and high schools across the United States. To be recognized as an exemplar school, specific conditions were met through a successful application and visitation process during which schools were evaluated based on a rubric measuring implementation of successful 21st century learning. Eligibility was extended to any PK-12 school or district in the United States. Using P21 recognition as a study criterion, the population for this study was the 59 schools identified as exemplary by P21.

Sample

A sample is the group of subjects for which data are collected and is illustrative of a specific population (Johnson & Christensen, 2008). Given limited resources, it was not possible to study all 59 schools from the population, so a sample was drawn. To narrow the selected population and complete a phenomenological study, two elementary sites were selected based on purposeful sampling. The criteria for selecting sites were (1) identified by P21 as exemplar, (2) served elementary grades levels, and (3) located in California.

Based on the selection criteria, two eligible schools were identified and the administration from both sites agreed to participate in the study. Participation included interviews, observations, and the collection of artifacts. Figure 3 outlines the number of interview participant at each level from the two school sites. As illustrated, half of the interview participants were represented in the teacher group whereas the other half represented administrators, support staff, and parents.

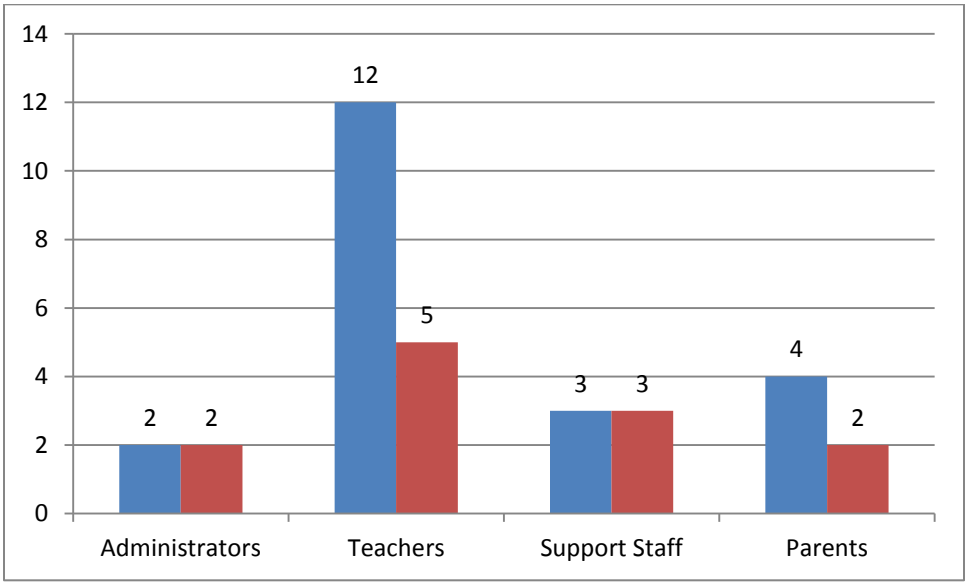

Figure 3. Number of participants interviewed from each school site.

In total, 16 classroom observations were conducted and 9 artifacts were collected from the schools. Table 7 illustrates the number of classroom observations and artifacts collected from each school site.

Table 7

Number of Classroom Observations and Artifacts Collected from each School Site

	School A	School B
Observations	10	6
Artifacts	5	4

Data collection from both school sites was completed based on study needs, availability, and willingness of participants. The researcher completed three full days of data collection at School A and two half days at School B. The bulk of interview sources were composed of teacher participants; teacher interviews were completed during lunch periods in School A and after school hours with teachers from School B. Although 12 teachers participated in panel interviews in School A, they were restricted to a 30-minute time block. Conversely, 5 teachers participated from School B; however, most of them opted to remain for a full hour which allowed for more detailed responses.

Demographic Data

Specific demographic data were not collected directly from participants. However, the average years of teacher experience from the 2014-15 school year were obtained from the California Department of Education, Educational Demographics Office. Both sites had the same number of average years teaching with 11.

Presentation and Analysis of Data

The findings presented in this chapter are the outcome of a comprehensive data collection process that included group interviews, individual interviews, classroom

observations, and artifact review. In seeking to identify best practices employed in identified 21st century elementary schools in California, the researcher was heavily interested in the cumulative findings of the data rather than extracting patterns from specific sources. Triangulating the data allowed the researcher to substantiate data from multiple sources, thus increasing the validity of the findings (Creswell, 2002). This chapter was arranged by starting with the presentation of general discoveries and follows with refined details of the analysis of the data.

Identification of Key Themes

After all the data were collected, the researcher scanned the information to form a preliminary list of potential themes. An additional researcher was enlisted to review the list of themes and after thorough discussions of categorizing and wording, a refined list of themes was created. What began as a list of 14 themes was scaled back to 9. During the coding process, it became evident that two of the themes required child themes to further extract deeper meanings on the findings of the references. The final themes were:

1. Use of Engaging Learning Strategies
    a. Use of Technology
    b. Use of Project-Based Learning
    c. STEAM Integration
2. Emphasis on College and Career Mindset
    a. Integration of the 4Cs
    b. Student Self-Direct Learning
    c. Demonstration of a Growth Mindset
3. Community Engagement

4. Constant Collaboration between all Stakeholders
5. Culture of Teamwork
6. Common Vision Supported by Clearly Communicated Goals
7. Culture of Continual Learning
8. Ongoing Assessment of Programs by Stakeholders
9. Extended Learning Opportunities for Students

To further support the identification of prominent themes and to gain a visual appreciation of the distribution of themes, hierarchy charts were created for both sites. The hierarchy chart for School A (Figure 4) aligned with the finding that revealed an emphasis on a college and career mindset and the use of engaging learning strategies. The integration of the 4Cs was the most predominant child theme. A culture of teamwork, constant collaboration, and community engagement constitute the next group of themes that were highlighted in the data.

Figure 4. Hierarchy data presentation chart for school Site A.

Although distinct similarities existed between school site A and B (Figure 5), the most apparent difference noted was the flip of the two main themes: emphasis on college and career mindset and the use of engaging learning strategies. A closer look at the diagram revealed a varied emphasis on the child themes within the parent themes. For example, STEAM strategies were referenced much more in School B than A, yet a demonstration of a growth mindset was highlighted much more in School A than B.

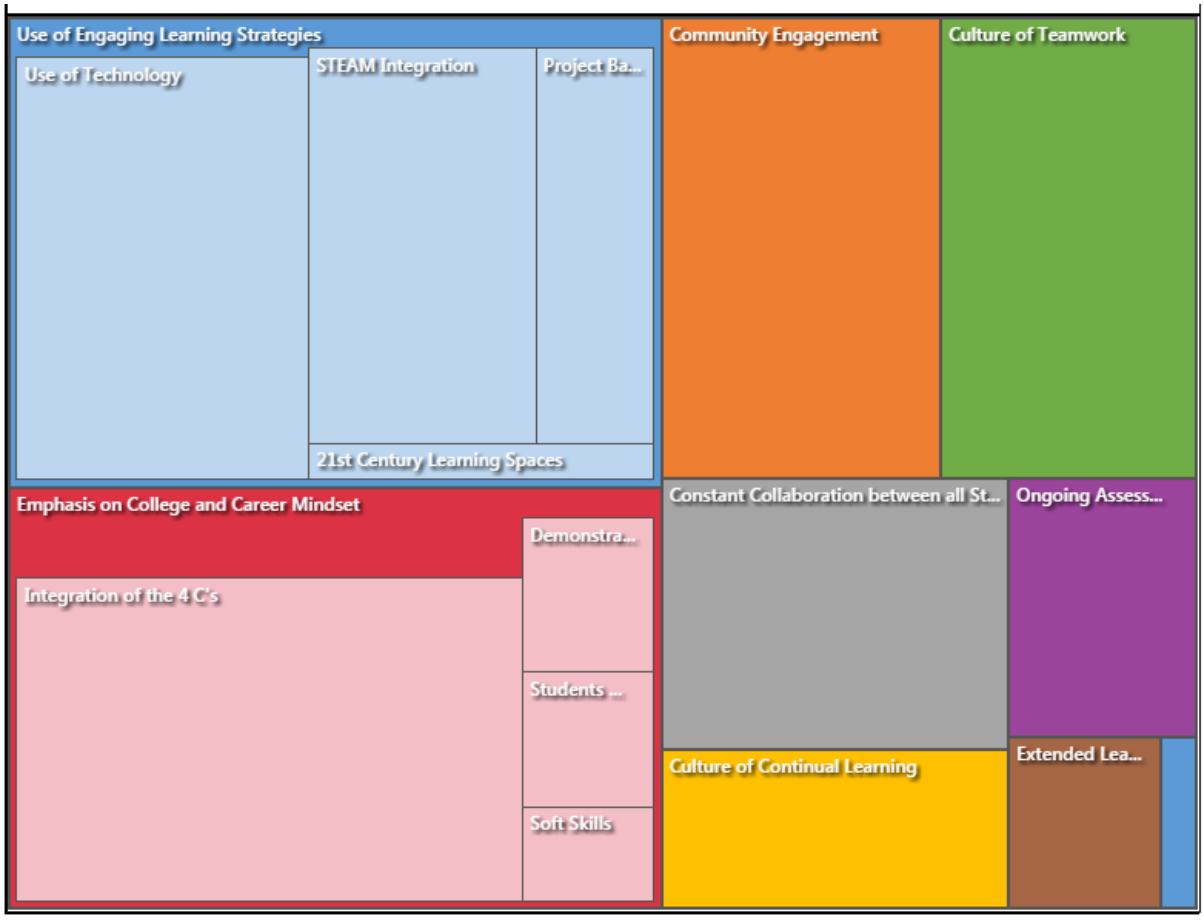

Figure 5. Hierarchy data presentation chart for school Site B.

Figure 6 below details an overall snapshot of the number of references collected cumulatively by all sources at both school sites. The chart was organized by theme from greatest to fewest number of references.

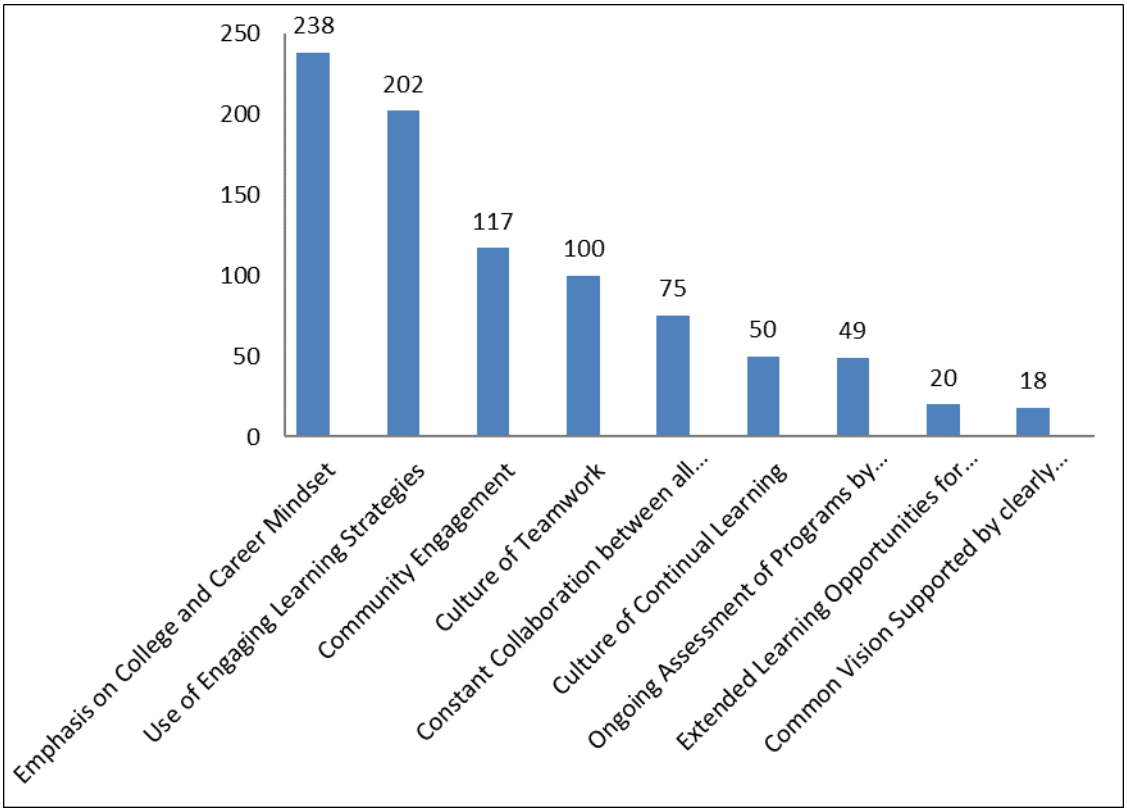

Figure 6. Identified themes organized from largest to smallest number of references; total number of references = 869

Although the data reflected the results of nine initial identified themes, two themes materialized with a much more pronounced concentration of references, Emphasis on College and Career Mindset and Use of Engaging Learning Strategies. These two themes accumulated nearly double the amount of references from all the sources than the next most populated theme. Recognizing this, the researcher categorized these two themes into child themes in an effort to further explore specific best practices employed.

The parent theme of Use of Engaging Learning Strategies was subdivided into Use of Technology, Use of Project-Based Learning, and STEAM Integration. A further

review of the data showed that the majority of the themes fell into the Use of Technology code, followed by Use of Project-Based Learning (Figure 7).

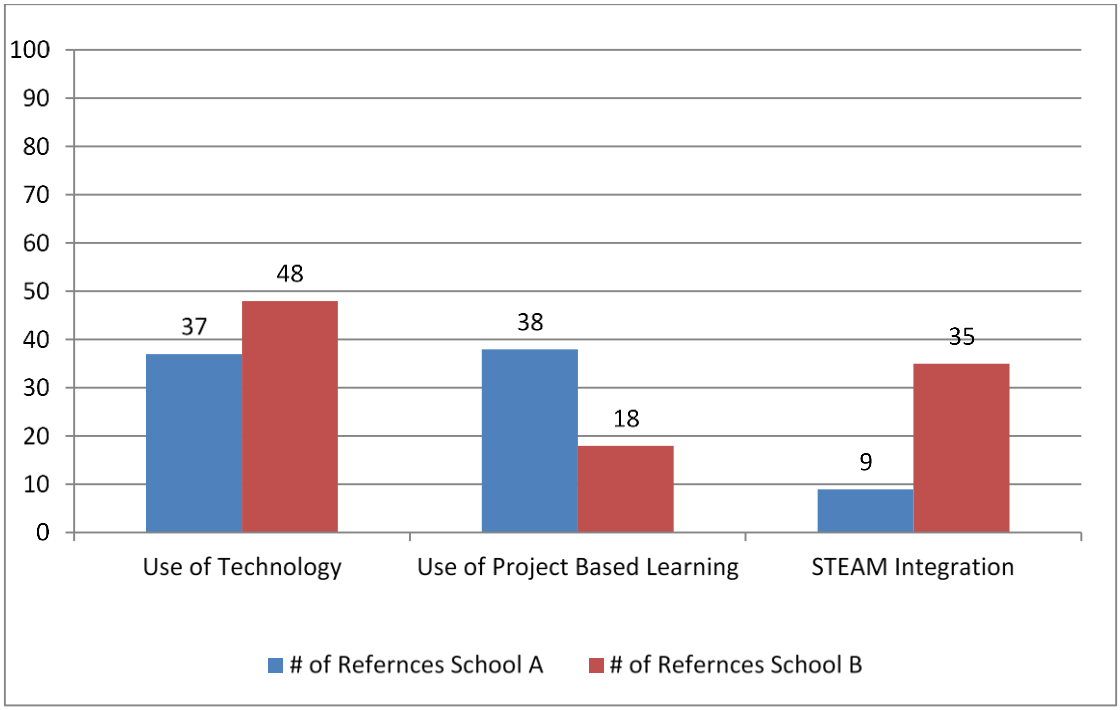

Figure 7. Number of references collected on the Use of Engaging Learning Strategies theme; total number of references = 869.

Similarly, Emphasis on College and Career Mindset was subdivided into Integration of the 4Cs, Student Self-Direct Learning, and Demonstration of a Growth Mindset. Further looking at the data within the College and Career Mindset theme, Integration of the 4Cs emerged as the dominant practice in both school sites (Figure 8).

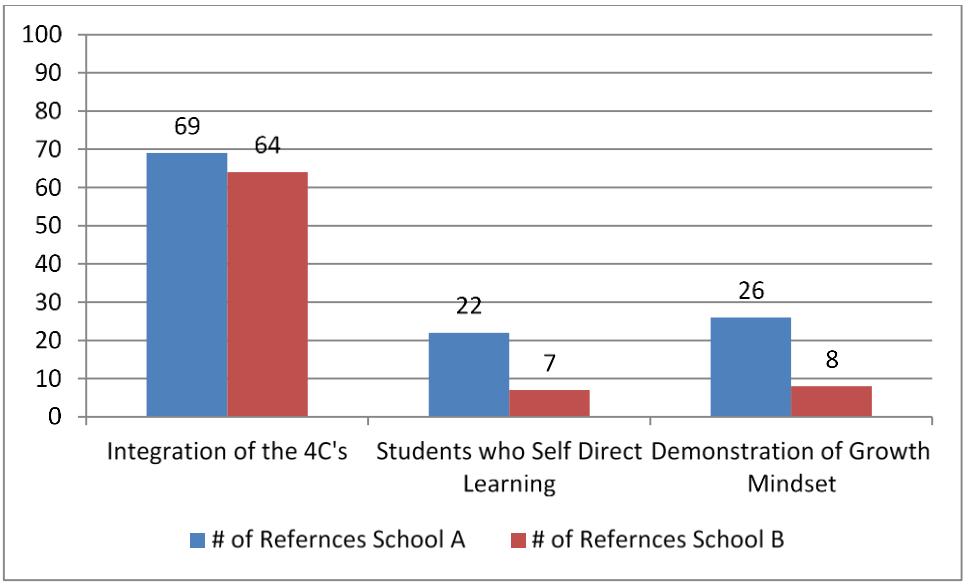

Figure 8. Number of references collected on emphasis on college and career mindset.

Following an investigation of the overall patterns that emerged from the data, a deeper examination of the key themes was completed. Considering the overall picture was a key first step in the analysis that preceded the detailed view gathered by the lived experiences of the participants involved; coupled with the observations and artifacts that were collected.

Emphasis on College and Career Mindset

The Emphasis on College and Career Mindset theme emerged as most prominent early in the preliminary phase of identifying themes. Recognizing this pattern, the researcher subdivided this parent theme into three child themes to gather a clearer analysis of identified best practices employed at the school site.

- **Integration of the 4Cs**: The skills of collaboration, communication, critical thinking, and creativity form the 4Cs. Competency in collaboration was defined as the ability to work effectively with others (P21.org). Proficiency in communication involved mediated and digital communication, as well as

interpersonal, written, and oral communication. The competence to be a critical thinker involved strategies used to think in organized ways to analyze and solve problems (P21.org). Creativity was defined as the "interaction among aptitude, process, and environment by which an individual or group produces a perceptible product that is both novel and useful as defined within a social context" (Plucker, Beghetto, & Dow, 2004, p. 90).

- **Students who Self-Direct Learning**: This skill was described under the life and career skills area as students who took initiative to track their own learning and analyze growth (P21.org).
- **Demonstration of Growth Mindset**: A growth mindset centered on how the ability to learn was perceived. Students who believed their intelligence could be developed reflected growth mindset and a focus on the process that led to learning. On the contrary, students who believed their intelligence was fixed as indicative of a fixed mindset (Dweck, 2015).

Overall, there was a clear indication that the focus on college and career readiness permeated day-to-day activities at both school sites. Integration of this emphasis was discovered in activities, workshops, presentations, classroom tasks, and assemblies. School A cultivated this thinking with classroom cheers and chants. It was evident that all students were unquestionably aware of their year of graduation. Every classroom identified with a different college and recited their own college cheer. Entire hallways were decorated with murals outlining the 4Cs in vivid, graffiti type font. In the same way, colorful signs garnished walkways with encouraging words and reminders. For example, one sign read, "No excuses. We are college bound." A growth mindset was

integrated into classroom instruction and was evident through student writing displayed on the wall. In an attempt to grasp if students really comprehended the concept of growth mindset, the researcher asked a random student in a second grade classroom if he could explain the definition of a growth mindset and he responded, "Well, you know, a growth mindset is like perseverance. It's when things get hard or you don't get it but you know you keep going and you don't give up."

In School B, students demonstrated indicators of the 4Cs throughout all classroom observations. All sources, including teachers, support staff, parents, and administrators referred to components of college and career mindset. Collaboration, for example, was threaded in professional development opportunities for teachers and parents. Additionally, this was fully integrated into classroom tasks. Teachers never presented as a sage on the stage. In contrast, they talked very little. Students at Site B were often in pairs or groups exploring their own path to completing an assignment. In one fifth grade classroom, the teacher did not shy away from articulating the importance of learning from one another. Students in his classroom used mobile technology to learn a new relevant program for themselves and were able to compose a project, present it to the class, and detail their thinking. An example of a growth mindset was also observed in a third grade classroom when the teacher asked a student why she had moved on to employing the same skill with larger numbers that had not been taught yet. The student responded, "I am going to try this with larger numbers because I need to challenge my brain."

Examples such as these were evident throughout both school sites and although the child themes were all closely linked, the researcher deemed it important to separate them to extract the components that created a mindset focused on college and career.

Figure 9 illustrates a comparison of collected references on a college and career mindset from each school site:

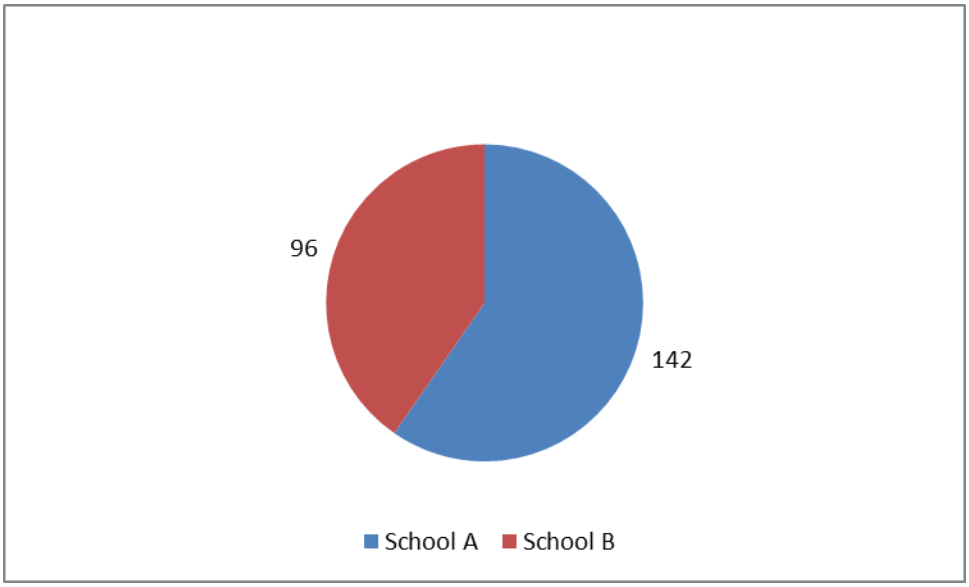

Figure 9. Both schools highly emphasized the College and Career Mindset theme.

To further illustrate the distribution of sources attributed to each reference, Table 8 outlines the results of the references to the Emphasis on College and Career Mindset theme gathered from each school site.

Table 8

Number of References to Emphasis on College and Career Mindset

Theme	# of Sources	# of References
Total (A and B)	15/16	238
School A	10/11	142
School B	5/5	96

Integration of the 4Cs. Integration of the 4Cs emerged as the theme most referenced under the main parent theme of Emphasis on College and Career Mindset. The skills of communication, collaboration, critical thinking, and creativity were not skills taught separately, but rather they were incorporated into the daily events and tasks

of expectations. The researcher quickly observed what derived from student competencies in these areas and their willingness to take risks. Although there was an overwhelming amount of data that validated immersion of the 4Cs, the overarching result revealed that students were open to trying something new. They readily tried new computer programs and laughed at their own mistakes. Students were proud of their accomplishments and were eager to share samples of work, growth mindset strategies, and even silly stories. They were not afraid of making mistakes. In contrast, they seemed to recognize this as part of the learning process. Even responding to questions, students were compelled to explain their thinking. This was evidenced in whole group discussions with the teacher leader and also in small collaborative groups. It was common for a student to challenge another student. For example, in one fourth grade classroom, a student reminded another student that she had not fully provided evidence to support a response. In a first grade classroom, similar encounters occurred with age appropriate responses. For example, one student was cited as saying, "Ya, but you didn't prove it yet." Examples like these were modeled after the teachers and staff who set the same expectations for themselves.

Teachers modeled this frame of mind in the classroom and among each other. One teacher briefly stopped his class and communicated to the researcher that it was difficult to keep up with all the new technological programs and that experimenting and learning were just a natural part of the process. He turned to the researcher and said, "We embrace the struggle."

Teachers at both schools modeled consistent usage of the 4Cs. Listening to the process of implementing project-based learning and STEAM projects, it was evident that

the progression was never an easy one at both school sites. On the contrary, it was described as a messy process with teachers needing to accept the challenge of moving forward, despite not knowing all the answers and knowing they were doing things differently from colleagues at other school sites in their district. One of the key differences that made a striking impact on the researcher was their willingness to take the risk. They were willing to work hard, make mistakes, and continually reflect on progress as a team. Nobody worked independent of one another on separate goals that pertained to a school wide vision. Rather, teachers and staff all appeared to know what was going on in each other's classroom. Both school sites modeled practices of communication, collaboration, critical thinking, and creativity. Table 9 breaks down of the total number of references and sources coded for Integration of the 4Cs.

Table 9

Number of References to Integration of the 4Cs

Theme	# of Sources	# of References
Total (A and B)	15/16	133
School A	10/11	69
School B	5/5	64

The following example quotations offer additional insights into the schools with regard to Integration of the 4Cs:

- "I model the way for them as a person who thinks deeply about teaching and learning and it does include the 4C framework. It's always been about the pedagogy. It's more about technology as a tool."
- "I think one of the mind shifts that we've had in this process that we've been through would be that we shifted the way the teacher was in the classroom.

Where before it was the teacher who would present and students would follow and copy. We totally shift that to where students became the ones facilitating, the ones guiding, the ones helping each other. Even the way we setup our classrooms is different."

- "Well, I'm not speaking for just myself, but we've been fortunate at our school to do things as a team, as a unit. It's been that way for the last six, eight years, probably even more. There's a history and there's a strategy and a practical theory. That is, we were in unison and that's one of the reasons why we can be successful across the grades because we build on top of that and we've decided years ago that, first of all, we would implement critical thinking."
- "Kids leave and they're used to speaking to people. They're used to communicating their learning and it's not just, 'What are you doing?' No, they're well-prepared to speak to an audience."
- "I think it's changed the trajectory of the kids, but looking at the 4Cs, we didn't sit down with a list of the 4Cs and think, 'How can we do this more?'... Opportunities arose and we jumped in, not knowing what was going to happen, but when we saw the kids communicate and we saw the kids become creative and we saw the kids collaborate and we saw the kids using critical thinking and we saw the learning that was happening as a result, then we looked for ways to grow it."

These quotations were reflective of the practices incorporated to integrate the 4Cs. A closer look at the responses to the interviews signified the instructional practices

employed to deliver lessons. For example, it was clear from the first few responses that teachers viewed themselves more as facilitators to the learning process rather than the deliverer of knowledge.

Students who self-direct learning. Students who direct their own learning exhibit initiative and take responsibility for their own learning (Trilling & Fadel, 2009). P21 (2016) described this characteristic as student agency. This skill was demonstrated in both the project-based learning and STEAM projects at the school sites. Students often had choices in meeting the standards related to the project, and there were always various forms of self-reflection and peer editing that related to the learning process. Moreover, students were observed challenging themselves and attempting more challenging word problems after completing the required assignment in one particular classroom. In this instance, the teacher had not provided this suggestion; rather the student took it upon himself to attempt to build upon the skill just taught. Another illustration of self-directed learning involved the expectation that students were both aware of their progress and able to communicate personal goals. To build upon this expectation, the traditional parent-teacher conference was reinvented. Rather than having teachers simply communicate progress, the students were responsible for organizing and presenting progress and goals to parents with the support of the teacher by their side. Table 10 breaks down of the total number of references to the Students who Self-Direct Learning theme, including the number of sources, aggregated and separated by school site.

Table 10

Number of References to Students who Self-Direct Learning

Theme	# of Sources	# of References
Total (A and B)	9/16	29
School A	6/11	29
School B	3/5	7

The following example quotations offer additional insights into the schools with regard to Students who Self-Directed Learning:

- "Student agency has a lot to do with 21st century learning. There are a lot of opportunities to present and get in on their own learning."
- "When we do our STEM fair, the kids take ownership and we step back."
- "The students are responsible to record what they're doing and be able to share out what they learned. They make little presentations. They're taking pictures. They're collecting data. They're going to explain that to us…every student needs to be able to individually let us know what they learn."
- "The student actually works on their conference. They have a nice display either on their iPad or their notes or whatever they work on. The teacher is there for support, but the student is actually explaining what they learned, what they haven't learned, and what they want to learn."
- "They each had to write a goal target. If, for example, they determined they were somewhat below standard in getting work done on time, then their goal target would be, 'I can complete my work to support a team.' …They had to write a target goal, and then they would go and look at, revisit their contracts and try to use language from the collaboration rubric in the contract."

The content of the quotations relating to Students who Self-Direct Learning indicated that students were aware of learning targets communicated by the teacher and created personalized goals based on unique needs. Threaded in the responses, it was noted that responsibility for learning was placed on the students rather than exclusively on the teacher. As one teacher expressed, "The kids take ownership and we step back."

Demonstration of growth mindset. Demonstration of a growth mindset, or how students perceived their abilities, was identified as a child theme under the general theme of College and Career Readiness. Ingrained in the patterns of thinking, this focus positively impacted the motivation of stakeholders including administrators, teachers, and students. An overarching pattern observed at both school sites was that the thinking process appeared more important than achieving the correct answer. Although learning targets and objectives were central to delivery of instruction, the development of problem-solving or supporting theories was recognized. One teacher explained, "Sometimes teachers have a hard time with new technology, but we don't give up. Sometimes the students see us struggle in front of them and it's important for them to see this and so we don't give up." Table 11 presents the number of references and sources citing Demonstration of a Growth Mindset.

Table 11

Number of References to Demonstration of Growth Mindset

Theme	# of Sources	# of References
Total (A and B)	8/16	34
School A	5/11	26
School B	3/5	8

The following example quotations offer additional insights into the schools with regard to Demonstration of Growth Mindset:

- "Learning targets is an example of how we do this as well. We have the teachers writing targets for skills like this as well. Not just the skills of the content or the common core standards. They are writing skills on things like being persistent. Having a growth mindset is part of it."
- "I think on a lot of levels it was really academic mindsets or even mindset stuff that we were missing. We stumbled upon the Habits of Mind. The Habits of Mind actually gave us some specific language to use."
- "We know things might change, but that's okay because of my mindset."
- "It's messy sometimes. You came into the classrooms and you can see, especially with the lower grades, it's messy when we're asking the kids to be accountable for learning in a new way and we're asking them to develop student agency and they're eight years old."
- "We've always said that failure is our first attempt in learning. That was one of the things when we first started this STEM thing. That was our motto. Fail forward. Fail forward. Fail forward."
- "One of the things is to get back to learning approaches. One of the things that we do allow students to do is have a second go at something. I mean we do a bridge project. Okay, that was a failure. Let's not end on that. What can we do to improve this?"

The responses shared relating to a growth mindset exposed the thinking that mistakes were accepted and part of the learning process. Grounded in the responses was

the message that it was okay to fail, but it was not okay to give up. A theme of persistence was revealed in the expectations of both teachers and students.

Use of Engaging Learning Strategies

Use of Engaging Learning Strategies was identified as the second major theme. With 202 references out of 869, this theme represented 23.24% of the total references from all sources. Once this was recognized, the researcher subdivided this theme into three child themes to identify which engaging learning strategies were referenced and described. They were categorized into Use of Technology, Use of Project-Based Learning, and STEAM Integration. Figure 10 illustrates a comparison of the references collected from each school site related to the Use of Engaging Learning Strategies.

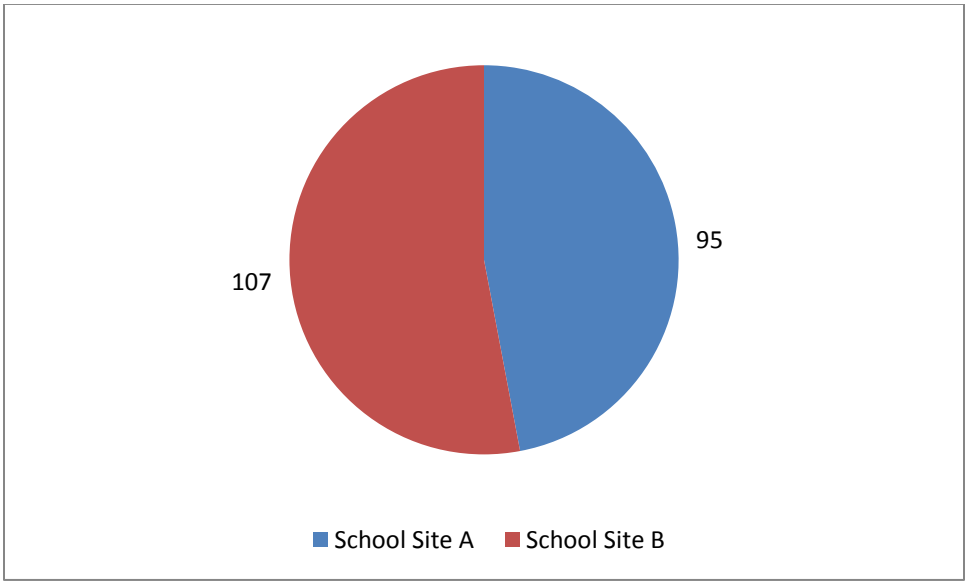

Figure 10. The Use of Engaging Learning Strategies theme was cited by both schools.

Use of technology. Interview participants were asked to describe examples of how technology skills were implemented into classroom practices. Of the 16 sources at both schools, which included 33 interview participants, 16 classroom observations, and 9 artifacts, 14 sources described various examples of integration of technology in the

classroom. Table 12 provides a summary of the number of sources and references to the Use of Technology theme.

Table 12

Number of References to Use of Technology

Theme	# of Sources	# of References
Total (A and B)	14/16	85
School A	9/11	37
School B	5/5	48

The data revealed that the integration of technology permeated the daily activities at both school sites. This was evident in everything from classroom instruction to schoolwide presentations and parent workshops. Student engagement was largely supported by various forms of technology available to students and parents. Administrators, support staff, and parents communicated numerous examples of how technology was integrated across content areas. It was evident in classroom instructional practices and discussed as a focus for continued and ongoing growth for students, staff, and parents.

Separate computer labs were not observed at the school sites. Rather, all technological devices were mobile and varied. There was a range of hardware employed at both school sites that included iPads, Chromebooks, and other tablets and laptops. Students appeared comfortable with an array of programs and applications, and were often observed sharing practices across a variety of electronic devices. It was common to see students helping their peers with minor technological glitches; troubleshooting seemed to be common practice. Rather than express frustration when programs froze or documents appeared lost, it was the norm to see students jump in to assist and problem-

solve as the need emerged. This standard was observed beginning at the first grade level. The level of student engagement was high in classrooms that were using technology during the time of observation. This was evidenced by the time on task, the amount of tasks completed, and their willingness to present using technology.

Teachers expressed an overwhelming desire to learn new technology. It was common to hear about struggles with technology, but there was a common thread of technology integration noted amongst participants. The following quotations provide examples into how the schools demonstrated the Use of Technology theme.

- "Tech integration is important at this site. I mean, we have a lot of classes that are one-to-one, but also where we're located, I mean Silicon Valley is in our backyard. Integrating and working with other companies, like HP who was generous enough to give a couple of us a Sprout to use in our classrooms."
- "In this project we're doing right now, we're using the camera on the iPads and we're using an app that kind of distorts stuff out and gives them filters. They're taking those pictures then filtering them and then putting them into a comic life on the iPad. They're creating a campaign poster with three adjectives about themselves. We're using the technology to actually create a product. All able to do it on the iPads as long as they have the apps."

The data in these and others quotations revealed that technology was clearly integrated into the lessons and used as a tool to enhance learning practices. Projects were clearly used to evaluate growth on goals and there was flexibility and creativity infused

into the process. Integration of technology was often cited in conjunction with use of the 4Cs to increase the level of student engagement and interest. Additionally, students were able to use technology to gauge their own progress.

Use of project-based learning. The Use of Project-Based Learning theme was a strategy observed at both school sites; however, implementation was structured differently. Collectively, references to Use of Project-Based Learning were found in 11 of 16 sources. As part of a new initiative, School A engaged in project-based learning whereas School B integrated projects with their STEM program. What was uniform in both learning environments was that projects were inquiry-based and student-led. Students were often directed to seek out real-world problems and connect them to the learning objective, relative to the assignment. Moreover, projects that were observed were highly relevant. For example, Site A implemented projects around various garden initiatives, including delving into hydroponics. A group of teachers were quick to share challenges, but just as eager to communicate how they brought in district staff and community members to help students with the project.

A central outcome observed from project-based learning initiatives was that students appeared engaged with their tasks. This was evident by the energy in classrooms observed and students' desire to share. Collaborative conversations were fully integrated in most of the activities observed; thus, students appeared comfortable communicating, presenting, and exchanging ideas. More importantly, because of the environment and expectations fostered, students were not afraid of taking risks. They did not shy away from sharing ideas, but rather appeared anxious and excited to

communicate thinking. Table shows the break down or sources and references to the Use of Project-Based Learning theme.

Table 13

Number of References to the Use of Project Based Learning

Theme	# of Sources	# of References
Total (A and B)	11/16	56
School A	8/11	38
School B	3/5	18

The following example quotations offer a deeper perspective into the schools with regard to the Use of Project-Based Learning theme.

- The best way we've found at this point is a project, a well-designed product, but an inquiry-based project. This idea that it's around relevance and meaningful experiences and these experiences are messy as they're built together with other things and other content."
- "The best level of it, the highest aspiration of it, is that we're able to write a driving question that has some authentic purpose in the students' lives and maybe some real impact on the community or on global conversations or needs like world hunger or cancer, where we have kids do projects like that."
- "Ultimately, I think the part that's about engagement is having authentic problems, hands on work, having understanding, having purpose for that work, and then being accountable to share that work with others. No matter what those things are, we make sure we have those elements to it."
- "I think with project-based learning or PBL, it's really important, especially in sixth grade, that we have this umbrella of a driving question, but it's not really

teacher-led. They get to choose their own topics under that big umbrella at this point and then with that, they develop their critical thinking."

- "When the project is this big messy place where you get to do all these skills, integrated together, which is where they are in life. They're not in silos. That's where you get to fumble through these things."

The quotations above illustrated the importance of employing inquiry-based projects that nurtured opportunities to explore content that was relevant, yet offered creativity and flexibility at the same time. Students were able to investigate real-life problems, collaborate with team members, and present to one another. Throughout the responses, it was evident that students were involved in the projects from beginning to end.

STEAM integration. The Integration of STEAM, or science, technology, engineering, arts, and math, was represented as a child theme under the umbrella of the parent theme Use of Engaging Learning Strategies. It was clear that both school sites fully integrated various opportunities for students to engage through the use of technology; however each school site had approached the route to engagement slightly differently. School A was fully immersed in project-based learning with a separate class for STEM, whereas School B committed to integrating a STEM program throughout the content classes. Table 14 illustrates the distribution of sources and references collected from each school site related to STEAM integration.

Table 14

Number of References to STEAM Integration

Theme	# of Sources	# of References
Total (A and B)	7/16	44
School A	3/11	9
School B	4/5	35

The following example quotations offer additional insights into the schools with regard to STEAM Integration.

- "Each kid in each class had their own hydroponics tank and they were responsible for taking care of their fish and all that. Each kid in their class had their own job, I guess you could say. They each had a job, so one would take care of feeding the fish. Other people would test the plants or see if there's algae growing in the water."
- "I will share about our robotics program. First, I will tell you that next Thursday, we are going to teach teachers how to program a robot."
- "That's where we started finding those components of having them do more of the investigating. We created the aquaponics, we created the garden, we created the robotics program, to show you can learn through project-based learning."
- "It's not just like you build a robot with recycles. It's build a robot with recycles that is going to help the world, so they do like medical robots."
- "We've had students go and present at conferences, at the first STEM conference in San Diego actually. We always want to take a risk because we ask our students to take risks. We feel that our students deserve those

opportunities of technology, of being able to speak in front of an audience, and to publish what they are writing and saying."

As evidenced by the responses to the interview questions, the participants shared experiences related to a variety of STEAM activities. Throughout the examples of references, it was evident that students were integral to the learning process and integrated components of the 4Cs while engaged in project-based learning activities related to STEAM.

Community Engagement

Community engagement emerged as the theme with the third most references. Expanding the commitment to progress as a team alongside the community was a predominant trend in both school sites. Figure 11 illustrates the distribution of references collected from each school site related to Community Engagement:

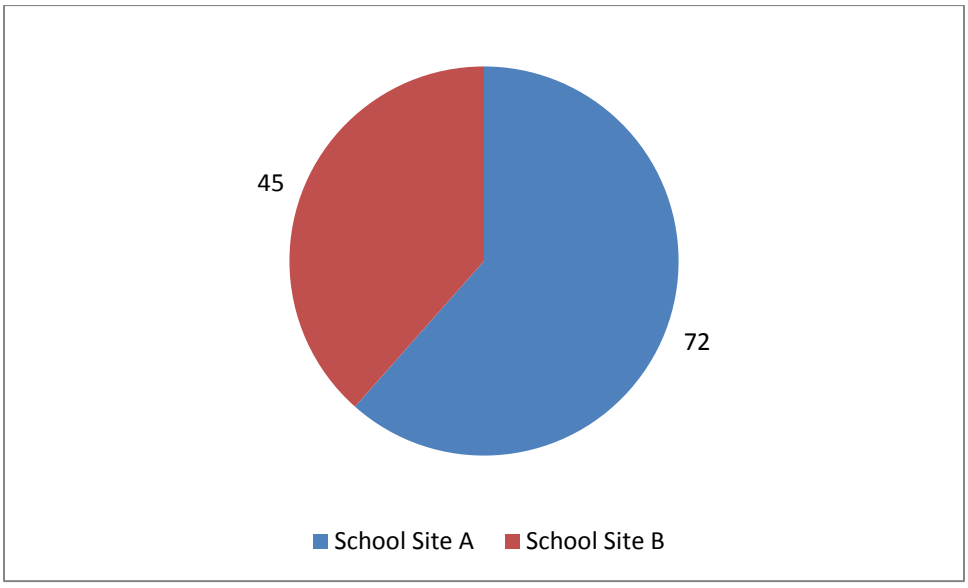

Figure 11. References to the Community Engagement theme were somewhat more evident at School A.

This involvement went far beyond the traditional parent-teacher associations, English Learner Advisory Committees, and Local Accountability Funding Formula meetings. Most noticeable was the general feeling of the school campuses. It was apparent that students and staff were used to visitors and welcomed them. This was evidenced by the exchange of smiles and greetings. Additionally, students did not hesitate to introduce themselves and were typically eager to present projects in front of visitors. The principal of one school site explained the importance of ensuring that parents felt welcomed and the doors remained open to them. There appeared to be many activities down the hallways, in the office, and in different classrooms. Even the visitor sign in sheet was full by mid-day at one site despite the fact there was no scheduled event that morning. To ensure that families felt welcomed on the campus by opening classrooms and providing an array of parent workshops and trainings, both of these schools leveraged their community resources.

Tapping into community resources was integral to the relationship between the school and community. In addition to the established parent relationships, both schools demonstrated an exemplary job with reaching out to local businesses, collaborating with local schools, and leveraging the experiences and skills of family members. There were multiple examples of businesses providing donations or coming to present to students. Local college and university relationships were established as well. This was demonstrated through field trips, donations from colleges, and college students who volunteered after school. Parents even provided leadership for clubs after school. Examples such as these were prevalent; however, it was striking that community

engagement involved far more than just teachers and parents. It was not relegated to a one-sided arrangement where the site waited upon parents to support all the initiatives.

Students at both school sites were used to hosting an array of visitors that came anywhere from local communities to countries as far away as Australia and Brazil. Students shared examples of demonstrating projects at local offices of education, presenting at conferences, and sharing technological practices with teachers across school districts in numerous states across the country. The students were giving back to the community in their effort to share best practices, ideas, and progress. Rather than exhibit shyness, the vast majority of students appeared confident and willing to take risks, whether sharing ideas in front of classmates or teaching parents how to use a computer program. Community engagement involved a two-way relationship with numerous give-and-take opportunities that were fostered in daily activities.

In one conversation that seemed to capture the essence of community engagement, one staff member explained the collective nature of the community and how teachers could only do so much alone. Additionally, he communicated that he needed the community help because he was concerned about what happened at school and what happened on the way to and from school. What evolved from specific concerns was the Walking School Bus program with parents responsible for monitoring the sidewalks as children walked to school. As a result of community initiatives such as this, a feeling of family and teamwork developed that placed the accountability of success on everyone. This common thread was evident at both school sites and permeated the social-emotional and academic goals. Table 15 illustrates the distribution of sources and references

gathered from each school site as well as collectively for the Community Engagement theme.

Table 15

Number of References to Community Engagement

Theme	# of Sources	# of References
Total (A and B)	11/16	117
School A	6/11	72
School B	5/5	45

The following quotations provide additional insights into the Community Engagement theme.

- "In classrooms, I know many teachers allow the parents to come in and just join any reading or even in the science lab."
- "Right now it's every Wednesday, it's walking around Wednesdays and they all get together and walk from the apartments this way. There's a couple different routes, but that's the biggest one, and when the kids enter the campus, there's music playing, they hand out prizes for the kids, just to get them really excited. It's really to get a kid seen so the neighbors are aware that there are kids here, slow down, make it a safer route for them to get to school."
- "You can kind of just see the excitement in their parents. They want this so much for their kids because they understand that the world is changing type of thing. I think just having them kind of involved and excited about it trickles down to the kids and you can just see that they are also excited about it as well."

- "If they're excited about it, the kids are also going to be excited about it. If we didn't have the partnership with the parents, it's going to be almost impossible to grab that student's attention."
- "I know they call it support staff, but they really do support the staff. It's so welcoming. When you come in you feel welcome. It's the vibe."
- "One of the things that came out of it was watching the kids speak to an authentic audience, watching them speak to teachers and administrators, including the state superintendent and his wife, and showing them how to do things and making little show me videos, and the wife says, 'Well, can I do this?' The student says, 'Yes, but not on this one. You've got to stay on topic. If you want to do that, if you're going to have to make a new video.'"

Some key references captured from the theme of Community Engagement clearly demonstrated the positive impact that family had on the school environment. Both school sites recognized the value and importance of creating and sustaining various opportunities for community involvement. More so, each stakeholder group was perceived as part of a team, all responsible for nurturing a united vision for students.

Culture of Teamwork

The theme of teamwork obtained the fourth most references with 100 coming from eight different sources. Interestingly, there was no question on the interview script that asked specifically about teamwork; however, both school sites discussed this concept repeatedly, as evidenced by the numerous quotes below. Figure 12 illustrates a comparison of references collected from each school site related to Culture of Teamwork.

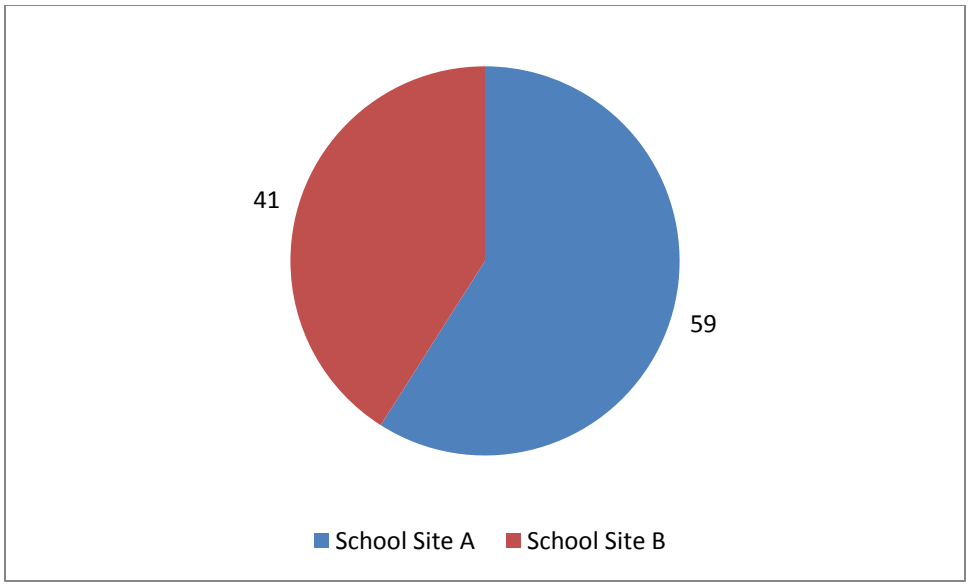

Figure 12. A culture of teamwork of evident at both school sites.

It was clear that all staff members perceived they were part of a team. Moreover, there were no feelings of *this is not my responsibility*, or *this is not in my contract*. That sort of sentiment never surfaced. On the contrary, staff members, including the office staff, explained that it was part of their job to ensure students learned. A health aide provided examples of staying beyond her day to help prepare students for a presentation at the local county office of education. Several examples confirmed that a mutual respect for all staff members was established. One teacher explained that it did not matter if you were the superintendent or the custodian, everyone pitched in as needed. In another example, a site principal described teachers' willingness to build needed STEM equipment, explaining that their only requests were where to purchase it from and that they would build it as a team. Under this umbrella of teamwork and commitment to the students, the clubs and activities provided after school by staff members were not paid assignments but volunteered. This thread of teamwork was rampant in both school sites.

Table 16 illustrates the number of sources and references gathered from each school site, as well as collectively, as related to the theme Culture of Teamwork.

Table 16

Number of References to a Culture of Teamwork

Theme	# of Sources	# of References
Total (A and B)	8/16	100
School A	5/11	59
School B	3/5	41

The following quotations provide additional insights into the Culture of Teamwork theme.

- "I tell them there are only three rules, but you break those rules, that's a major violation. You won't just have me; your colleagues will take you down. It really is a big deal to not work together with your team. That's part of the culture though."
- "It's all hands on deck because I've heard of other schools where you'll hear 'That's not my job.'"
- "We're a team and if they need assistance, I'm not a teacher, but I'll help whatever she needs."
- "Well, it's the teamwork. Everybody dives in. I don't care if you're the principal or the custodian or whoever. We all love that part. It's what makes it so special."
- "I advise that to my students. I said, 'You don't have to know everything, but you need to know how to work within a team.' They'll see me [and] call…I'm not sure, what do I do about this again?'"

- "We all work together. We respect each other. I don't have to know everything, but we work well as a team and we support each other. If I don't know, I'm going to find out. We'll ask around and we'll get the answer for you. I think that's good too."

The common thread of teamwork was evidenced by the content of the quotations and the numerous references to the word *we*. Teachers, staff, and parents supported one another with common goals, no matter the task. A certain level of trust and comfort was evidenced in the responses that served as a foundation to the universal expectations related to teamwork and collaboration. There was no uncertainty as to whether teachers should or would collaborate.

Constant Collaboration Among Stakeholders

The theme of Constant Collaboration Among Stakeholders produced the fifth most references out of the nine themes. With 75 total references coming from 8 sources, evidence of collaboration was assimilated into the fabric of practices that involved goal setting, planning, and evaluating. Figure 13 illustrates the division of the references collected from each school site.

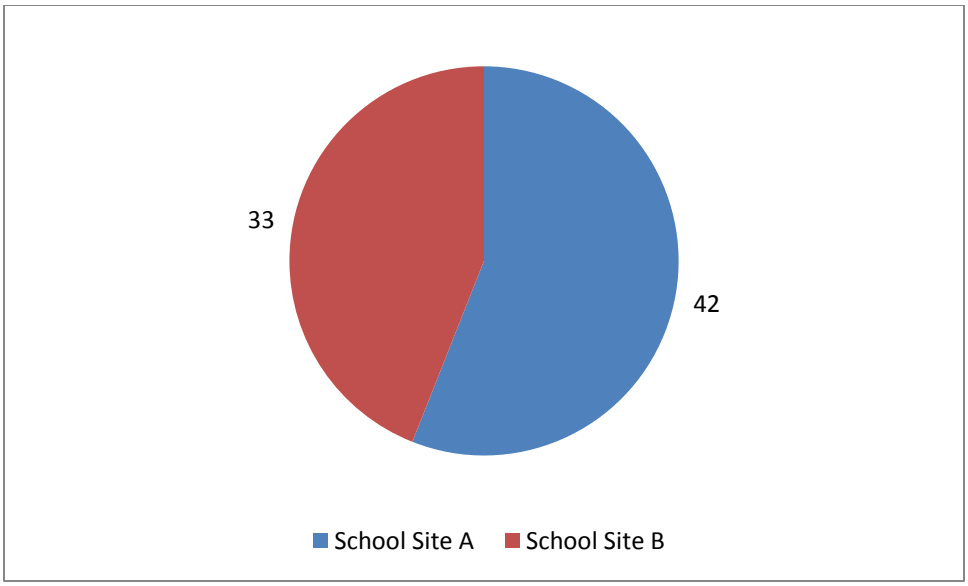

Figure 13. Collaboration among stakeholders was common at both sites.

The themes related to collaboration and teamwork closely aligned with each other; however, collaboration among all stakeholders emerged and demonstrated a commitment to involve all parties in decision-making opportunities. As numerous examples of collaboration were noted, it revealed more than stakeholders taking time to exchange and support one another. Equally important, it demonstrated underlying values at the core of their beliefs: continual learners who respected the experiences and skill of all stakeholders, and the progress and growth of students to constantly collaborate and evaluate. One teacher explained, "This is sometimes hard, but we embrace the struggle." Table 17 illustrates the distribution of sources and references gathered from each school site, as well as collectively, related to the theme Constant Collaboration Among Stakeholders.

Table 17

Number of References to Constant Collaboration Among Stakeholders

Theme	# of Sources	# of References
Total (A and B)	8/16	75
School A	5/11	42
School B	3/5	33

The following sample quotations demonstrate examples of the theme Constant Collaboration Among Stakeholders and provide a glimpse into the overall belief system of the staff.

- "We have a higher demand on ourselves for using professional learning time. We don't waste that time, that's for sure."
- "People can come and go from your classrooms and that's just how it's going to work and we've done that forever. Getting a thousand visitors in two years actually accelerates that."
- "They don't mind teaching in front of each other. I think that comes though by lots of protocols and lots of sharing in staff meetings. We feel exhilarated, floating."
- "You just inherit this culture. You don't get all the building blocks of it, but at first when we did critical friends, you turned around. When two people would talk, they'd talk to each other about this person. They literally turned around because putting your back to them actually helped it be a third-party conversation."

- "I don't differentiate necessarily for this is for students and then this is for adults. This is good for humans and what's the developmental difference. Collaboration is something I think is important."
- "We depend on each other. Sometimes they'll have a question that I can't answer. I'll say, 'You know what. I bet you Mr. Z knows. Let's go ask him. Send a note and let's find out. That's a great question. I never thought of that.'"
- "Showing them, look we all work together. We respect each other. I don't have to know everything, but we work well as a team and we support each other. If I don't know, I'm going to find out. We'll ask around and we'll get the answer for you. I think that's good too."
- "I mean it only makes sense. Why would we all spend time doing the same thing? I've got to go do my lesson plans. You've got to go do your lesson plans. Well, let's just do them together."

These references captured the essence of a key practice at both schools. The continual collaboration among stakeholders involved teachers, administrators, parents, support staff, and students. The fact that the word *we* was used 14 times in the responses was a key indicator of the mindset that was pervasive throughout both school environments.

Culture of Continual Learning

The theme of Culture of Continual Learning emerged as a common pattern at both school sites. The content of the references demonstrated a variety of methods that

reflected a desire for continual growth. Figure 14 illustrates a division of the references collected from each school site:

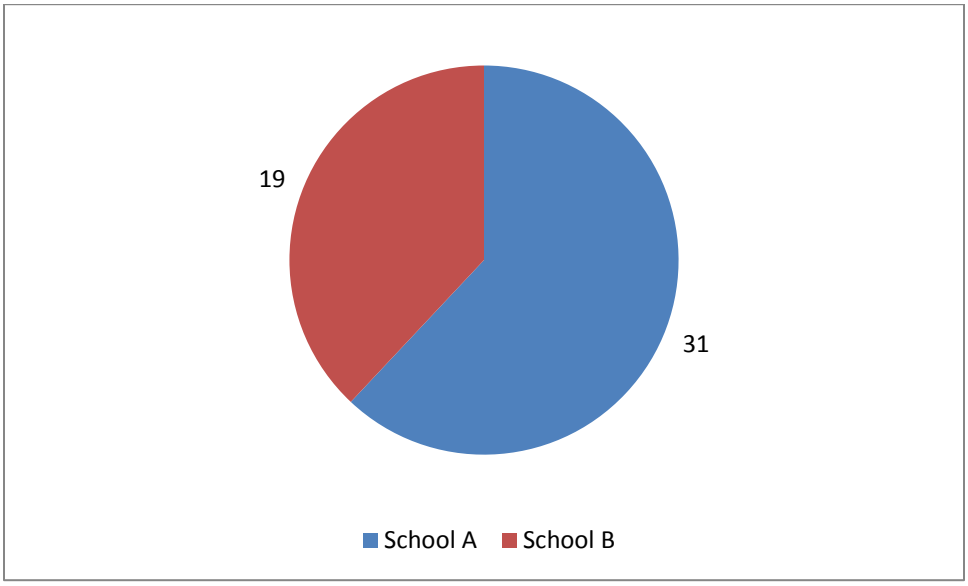

Figure 14. The Culture of Continual Learning theme was expressed somewhat more at School A compared to School B.

Although there were numerous instances of workshops and trainings offered by both districts, the teachers cited several examples of taking the initiative to seek out professional development opportunities to meet the needs of their students. It did not appear that any staff members simply waited to see what the site or district offered in terms of learning opportunities. On the contrary, many attended additional trainings, sometimes paying for them on their own or engaging in an online webinar. This theme was not solely revealed in the form of professional development opportunities, but also threaded in the culture and mindset of the schools.

Teachers exhibited a mindset of continual learning in front of students. Several instances of teachers who freely acknowledged they were not certain of the correct answer were observed. Rather than panic or feel compelled to seek out the solution and

return with it, teachers commonly asked for teams or partners to problem-solve. One teacher explained to a group of third graders, "You need to problem-solve. You won't always have the answers so what do you do when you don't know what to do next." This thinking was ingrained into the college and career culture that compelled students to embrace a growth mindset, and it was significant so that teachers modeled the same expectations for themselves as they did for students. Learning opportunities were always presented in a positive light. Administrators, teachers, staff, and parents embraced professional development and continually sought additional opportunities for growth. Table 18 illustrates the distribution of sources and references gathered from each school site, as well as collectively, as they related to the theme Culture of Continual Learning.

Table 18

Number of References to Culture of Continual Learning

Theme	# of Sources	# of References
Total (A and B)	7/16	50
School A	3/11	31
School B	4/5	19/39

The following quotations provide additional insights into the Culture of Continual Learning theme.

- "I think when we started the journey, we started with ourselves. We started with reading and trying to figure out what are college and career standards. Really understanding and doing our professional development before we can really go out there. I think part of it is the component that we start is changing ourselves first and then going into well, how does this look in the classroom."

- "I feel like our district does a really good job of providing a lot of trainings in different areas. Just setting aside time, this is my 15th year and I just remember there's always been something that we're learning."
- "We're all leaders. It's not like we have one leader. We're all leaders and we're lifelong learners. We're open to it. We know that even though we're the teacher, we can learn from the students and I tell them that. 'You are my teacher too and you're going to guide in which direction we go and I learn so much from you guys, maybe as much as you learn from me.'"
- They don't mind teaching in front of each other. I think that comes though by lots of protocols and lots of sharing in staff meetings. We never skip one."
- "What I really appreciate about our school is the ongoing professional development and that we find a need that we have at the school and that it's something that we want to work on with the students or even within ourselves, and then we find a way to get that professional development. Last year what I really enjoyed doing was the PLCs. It was across grade level teams. We were looking at the different components of the eight elements of the teaching standard."

The content of the references above reflected the culture of continual learning that was demonstrated at both school sites. The responses indicated that learning was achieved by various means. Professional development opportunities were provided by the school district and by the individual sites; however, the learning extended far beyond organized workshops. Instead, teachers sought out their own methods to learn new practices, often taking the initiative to teach in front of each other to learn new strategies.

Ongoing Assessment of Programs by Stakeholders

The theme of Ongoing Assessment of Programs by Stakeholders was references 49 times from 6 sources. Responses were chiefly gathered from the one question on the interview list that specifically asked about data collection and assessment support for 21st century skill integration. Figure 15 shows this theme was cited more often at School A compared to School B.

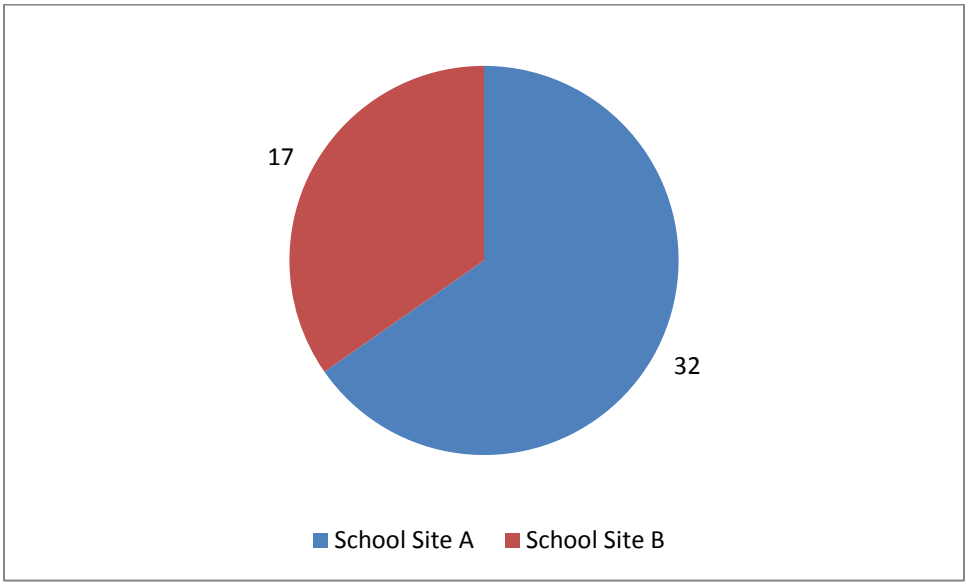

Figure 15. References to the Ongoing Assessment of Programs by Stakeholders theme was cited more often at School A than School B.

It was evident that collecting data on the progression of 21st century integration was a daunting task. In the early stages of implementation, both sites shared common practices of borrowing templates to gain preliminary feedback; however, both sites realized that more was needed to gain a clearer representation of how well 21st century skills were integrated. To meet the unique needs of students, teachers discussed various ways that rubrics were developed. For example, one common element of assessment included visiting classrooms and evaluating implementation. In addition, surveys were

used from established organizations such as P21, Leader 21, New Tech, and the Buck Institute. Evaluations that worked one year needed to be completely revamped to meet new goals the following year. Finally, teachers appreciated the process of integration was constantly evolving and in flux, despite acknowledging the need for continual reevaluation of programs. Table 19 illustrates the distribution of sources and references gathered from each school site, as well as collectively, as related to the theme Ongoing Assessment of Programs by Stakeholders.

Table 19

Number of References to Ongoing Assessment of Programs by Stakeholders

Theme	# of Sources	# of References
Total (A and B)	6/16	49
School A	3/11	32
School B	3/5	17

The following quotations provide additional insights into the Ongoing Assessment of Programs by Stakeholders theme.

- "We vetted it against rubrics of all P21 and Leader 21, New Tech, Buck Institute, the state standards. We just went through everything we could and we sent them to a lot of other people to look at and review until we had this working definition of what we thought was what we wanted out of children."
- "After focusing on that one thing, now we know that we can start collecting data on whether or not we're doing it and seeing it and spending time working on that piece."
- "The biggest issue was at first, we used other people's critical thinking rubrics and we looked at those. They failed. We'd collect data, but it wasn't

informing our instruction. It wasn't really informing what we were seeing. Our eyes didn't trust what we were collecting. Our experiences, we didn't have trust in what we were collecting. We had to go back to the drawing board and this was the work of last year."

- "We use a lot of rubrics from other people. This one we built ourselves. I don't know that everyone would call it a rubric. I've never marketed it as that. They just think of it as a critical thinking task. It really is, because it's very, very detailed. Actually, it stood the test of time because we changed the grade levels a lot in the last year and this year; people looked at them and were like, 'yeah those are pretty good.'"
- "But it's different to where I have to know this because back in the day we used to look at data and it was like, 'Who has the highest scores?' It was almost like shaming the teacher that had low scores. Then it was just stressful to be in those data meetings. Whereas now, it's not about that. It's where we are and what do we need to grow and what worked and what didn't?"
- "What we created too was with each unit, we also created a rubric. With that rubric, when they do their habitat, they send it home so the parents know they will be graded on communication. They will be graded on communication. They will be graded on how well they were listening."
- "We're still figuring out the best ways to evaluate. We're still figuring out the best ways to give kids the communication skills they need, like really training them and showing them. There's no book necessarily. We use the 21st Century Frameworks and we're just trying to figure out how we can give them the

skills because they are, often times, very immature, and you have that. These are nine-year-olds, eight-year-olds. How do we get them to collaborate and work together? Heck, sometimes we can't work with people, right? The struggle is real."

The quotations that supported the theme of Ongoing Assessment of Programs by Stakeholders illustrated the evolution of the process. Respondents clearly described various methods critical to evaluation of practices and programs, but conceded that the rubrics needed continual development to meet the needs of the goals. Other challenges included the alignment of the assessments to inform instruction, citing that ongoing improvement was needed.

Extended Learning Opportunities for Students

Extended Learning Opportunities for Students produced 20 references from 5 sources derived from the interviews, classroom observations, and artifacts. Plenty of examples of extended learning opportunities for students outside of the school day existed, but this theme was not predominant amongst the other themes that emerged. Figure 16 illustrates the division of references collected from each school site.

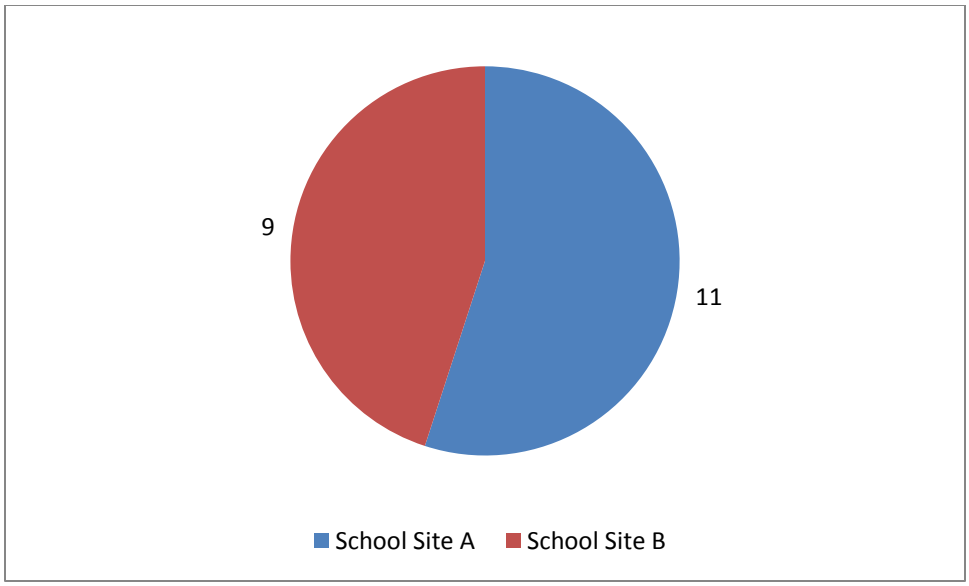

Figure 16. Both sites mentioned the Extended Learning Opportunities for Students theme.

The extended learning opportunities discussed at both school sites included clubs, interventions, and enrichment prospects. The focus of the responses on this topic emphasized numerous opportunities for students to present their learnings to other adults locally and/or in other cities and states. Table 20 illustrates the distribution of sources and references gathered from each school site.

Table 20

Number of References to Extended Learning Opportunities for Students

Theme	# of Sources	# of References
Total (A and B)	5/16	20
School A	3/11	11
School B	2/5	9

The following quotations exemplified the theme Extended Learning Opportunities for Students.

- "We have a teacher in program that they'll do robotics. I know after school we have an after school girls coding club. There are different things that the kids, based on their interests, can kind of gravitate to as far as technology."
- "We presented at the STEM Symposium in San Diego and a lot of people wanted to come visit. Well, come visit us at our STEAM fair."
- "We have a teacher liaison who works with the YMCA coordinator. The big thing that they kind of collaborate on is PBL. Making sure that when they have enrichment classes, because they do offer different classes for those students at the YMCA, they talk about PBL and project-based learning and what they can do to bridge it together."
- "As far as programs, there is a genius program or it's a club, genius club, where there's a few students upper grade. I think it's fourth, fifth, and sixth graders. These are geniuses that have, or they get, the skills to help others with tech like issues. They're called our geniuses."

The sample quotations above illustrated examples of the extended learning opportunities that were available to students. Although project-based learning methods were employed at both sites, Site A heavily emphasized this strategy and Site B emphasized STEM integration. Continual chances to collaborate, communicate, and exhibit critical thinking and creativity skills were infused into the learning strategies. Furthermore, the culture of teamwork was an overarching theme that also supported the extended learning opportunities beyond the classroom.

Common Vision Supported by Clearly Communicated Goals

The theme of a Common Vision Supported by Clearly Communicated Goals was initially believed to be a common theme; however, it did not present itself as such according to the data. After final analysis, there were only 18 references that supported this theme and nearly all of them came from one school site (Figure 17).

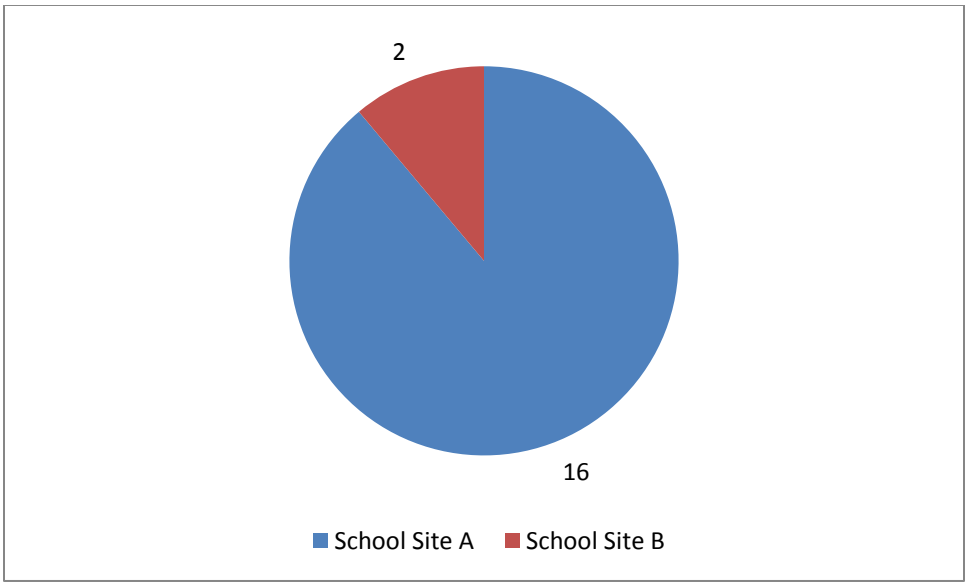

Figure 17. The Common Vision Supported by Clearly Communicated Goals was much more evident at School A than School B.

A common vision was established at both school sites, although it did not surface as a main theme in the end. This could be attributed to the absence of a specific question relating to goals. Another potential factor related to the nature of the ongoing changes that took place, often causing goals to evolve. Table 21 illustrates the distribution of sources and references gathered from each school site, as well as collectively, as related to the theme Common Vision Supported by Clearly Communicated Goals.

Table 21

Common Vision Supported by Clearly Communicated Goals

Theme	# of Sources	# of References
Total (A and B)	5/16	18
School A	4/11	16
School B	1/5	2

The following quotations provide additional insights into the theme Common Vision Supported by Clearly Communicated Goals.

- "On the smaller end of it and kind of the day-to-day reality, it's just having purpose in everything we're doing. It's having small purpose too. Learning targets is an example of how we do this as well."
- "We took all those elements and we scaled it down to one little piece of it, as small as we could make it, and that became our school-wide focus."
- "By having the overarching target and then what are the incremental steps to get to that target. We have a rubric that actually works in different directions. Because we not only say how well the kid's doing toward that standard, but you can also say how well they're doing toward the ultimate goal, the ultimate standard. It kind of works in both directions."
- "A hyper-focus on one piece that we can measure and then making small changes, but also of that work being done by the practitioners is my approach. It's giving them good problems, good questions, supporting them through it, building the capacity where they need it, but also letting them be where they are and move forward through it."

The quotations above captured the theme of a Common Vision Supported by Clearly Communicated Goals. Participants described the critical need for purpose behind every activity and task. References to rubrics and a continual refinement of evaluation practices were also mentioned. Although clear learning targets and objectives were outlined, participant responses also highlighted the emphasis on building student capacity to gauge individual progress.

Summary

Chapter IV provided a detailed review of the study's purpose, research question, and methodology, which included the data collection process, population, and sample. A comprehensive explanation of the data analysis method followed the overview of the study. The presentation and analysis of the findings developed from a combination of group and individual interviews, classroom observations, and artifact review. This included a total of 33 interview participants, 16 classroom observations, and 9 artifacts.

This study was designed to explore and identify best practices employed in two 21st century elementary schools in California recognized as exemplary by P21. Nine themes emerged as common indicators of best practices contributing to the success of 21st century skill integration. Using the data from the findings, the following chapter will outline findings, conclusions, and recommendations for action.

CHAPTER V: FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Global economies are changing at a profound rate due in large part to rapidly developing technological advancements. As a result, emerging careers and job opportunities are available for those who possess the necessary skills to fill the positions. In this era of rapid change, educational practices must transform to complement these future needs. Doing well in school no longer guarantees success in a career when research indicated that the average person will have different jobs in multiple fields (Bellanca & Brandt, 2010). For this reason, people who obtain competencies in 21st century skills, who can adapt and prioritize lifelong learning, will have greater opportunities for advancement in the global job market.

This chapter presents and synthesizes the findings from this phenomenological, qualitative study by examining data collected from two elementary schools identified as exemplar by the Partnership for 21st Century Learning (P21) in California. In this procedure, a narrative of the participants involved, the research methods, and the data collection process is detailed. It concludes with an analysis and summary of the findings.

Purpose Statement

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

Research Question

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

Research Methods and Data Collection Procedures

A qualitative, phenomenological design was chosen to examine the experiences of administrators, teachers, and support staff in elementary schools identified as exemplar by P21. The two identified elementary schools were chosen as a result of their recognition for successfully integrating 21st century skills. Data were collected through interviews, observations, and review of artifacts. Using this approach allowed the researcher to explore and identify 21st century best practices by collecting an assortment of data from multiple sources. This approach was deemed the most suitable to address the research question, which sought to understand the meaning and essence of the lived experience of this phenomenon.

Population

P21 identified 59 exemplary elementary, middle, and high schools in the United States. To be recognized as an exemplar school, specific conditions were met through a successful application and visitation process that used a rubric to measure implementation of successful 21st century learning. Using P21 recognition as a selection criterion, the population for this study was the 59 recognized schools.

Sample

To complete this phenomenological study, two elementary sites were selected based on purposeful sampling. Criteria for selecting sites were:

1. Exemplar school identified by P21
2. Elementary school
3. Located in California

Two sites met the study criteria. Both were contacted and agreed to participate in the study and comprised the sample for this study.

Major Findings

The purpose of this research study was to investigate best practices used at schools identified as exemplary by P21. In this phenomenological study, the experiences of teachers, support staff, parents, and administrators were collected from two elementary schools in California through interviews, classroom observations, and review of artifacts.

To effectively capture data relating to 21st century integration in identified exemplary schools, the researcher employed a semi-structured interview process where small groups and individuals were interviewed using questions that directly aligned to the 21st century evaluation tool used by P21. Through this qualitative methodology, the researcher collected evidence from a total of 33 interview participants, 16 classroom observations, and 9 artifacts from the two study schools.

The data collected from the elementary school sites provided key insights into the best practices used to integrate 21st century skills into the school environment. Collectively, the varied forms of data generated solid conclusions and implications for action to assist schools in the needed transition to effectively integrate 21st century skills into classroom instructional practices. The major findings outlined in this chapter offer a general overview of the discoveries. Following that, the conclusions are presented with recommended action steps to effect the urgent change required in schools today.

An Emphasis on College Expectations

Data collected from both elementary school sites reflected integration of a college and career mindset. This outlook was established on the assumption that all students had

the capability to learn. As a result, fostering a climate that set the expectation that all students would attend college was the norm. This dynamic set the stage for effectively integrating 21st century skills that included communication, collaboration, critical thinking, and creativity (the 4Cs) in addition to life skills such as self-directed learning. Furthermore, these concepts were ingrained and observed in the fabric of everyday school activities.

A Growth Mindset Taught and Modeled

Findings from the data analysis revealed a cyclical tendency that was observed at both school sites. Administrators and teachers led the charge to systematically teach components of a growth mindset and it was consistently modeled and reiterated in classroom and schoolwide presentations. For example, teachers allowed students to watch them struggle with a new piece of technology or with not knowing the answer to a problem. Rather than demonstrate frustration or a feeling of inferiority, teachers seized the opportunity to problem-solve as a team. Sometimes they were observed processing possible solutions with students or brainstorming with a fellow colleague in the next classroom. As a result of ongoing opportunities to persevere, students were generally more apt to take risk by sharing ideas and exploring options without a fear of being incorrect. In the same way, students did not shy away from presenting in front of the classroom; rather, they appeared to embrace it. To summarize, teachers modeled, taught, and developed a growth mindset with their students, leading them to take risks with new ideas that often involved further exploration, collaboration, and debate. There was an energy and excitement exhibited in classroom observations and through verbal responses in interviews. The attitudes of administrators, teachers, and support staff were

consistently positive and they all appeared driven to do what was in the best interest of students. This optimistic outlook was instrumental and an essential finding in the integration of 21st century learning.

Integration of Mobile Technology

The integration of mobile technology was a prevalent practice employed in both school sites. Incorporating various forms of hardware and applications provided an efficient process to support personalized instruction while implementing the 4Cs of communication, collaboration, critical thinking, and creativity. Students were repeatedly observed employing various technologies as tools to engage in collaborative groups to complete assignments or explore options for a project. In other situations, students were working individually on tablets to respond to surveys or evaluative measures. All the students observed, beginning in kindergarten, appeared comfortable with the integration of mobile technology. Rather than perceive it as a novelty, students viewed the technology as a learning tool. It was apparent they were engaged in their learning as evidenced by the time on task observed and desire to share assignments with the researcher, often taking time to explain and teach concepts.

Teamwork and Collaboration

The data collected surrounding components of teamwork and collaboration among stakeholders was overwhelming. The findings showed a culture of teamwork, constant collaboration, and community engagement was integral to the structure of both schools. Administrators employed a collaborative leadership style that was, in turn, modeled by teachers, students, and parents. This was evidenced in the teacher conversations in meetings as well as the discussions of students observed by the

researcher. For example, there were as many questions as actions. The thread of conversation generally included questions similar to, "What do you think?" or "How should we change the schedule?"

The culture of the schools reflected values focused on teamwork. Teachers perceived all the students in the school to be their responsibility as opposed to only those on their classroom roster. Even in conversations, responses often began with *we* rather than *I*. When there was a need, people jumped in to help whether it was another student, staff member, or parent. For example, a student who was struggling with the daily math objective was sent next door because the teacher felt that a colleague who was also on the same lesson may be able to better explain the concept. Examples such as these were abundant and were incorporated into the daily expectations of the school culture.

Unexpected Findings

The theme of Common Vision Supported by Clearly Communicated Goals was supported by data at both school sites; however, it did not emerge in the interviews as a prevalent indicator of best practices as initially perceived by the researcher. Whereas clear evidence of a common vision surfaced, it did not yield the amount of references expected. Literature points to the positive impact of leadership and vision so the absence of significant data relating to this factor was an unexpected finding (Elmore, 2014; Fullan, 2014; Kay et al, 2013). The results can be attributed to a few factors: 1) the structure of the interview questions 2) the inherent dynamic that coincides with evolving changes relating to 21st century skill integration 3) the ratio of respondents that included a total of 4 administrators relative to the 33 total sum of the participants.

Conclusions

Several conclusions resulted from the data regarding best practices employed at exemplar 21st century elementary schools. Through the experiences shared from administrators, teachers, support staff, and parents at the two elementary schools, conclusions were formed that related to the key findings and established literature relating to 21st century skill integration.

Conclusion 1: Nurturing a Growth Mindset in Students and Staff Supports the Integration of the 4Cs.

The emphasis on a college and career mindset emerged as the most predominant of the nine themes. A total of 238 references collected from 14 out of the 16 sources references the College and Career Mindset theme. This theme was categorized into three key child themes: Integration of the 4C's, Students who Self-Direct Learning, and Demonstration of a Growth Mindset. Based on the data collected related to 21st century skill practices, school sites that supported structured implementation of a growth mindset would transition easier to integration of the 4Cs. Existing research supported the key role that the 4Cs played in 21st century skills (Bellanca & Brandt, 2010; Kay, 2010; Trilling & Fadel, 2009). When students were exposed to ongoing opportunities to practice problem-solving skills and learned how to persevere, students were more willing to participate in collaboration, communication, critical thinking, and creativity. Carol Dweck, a leading authority in growth mindset, supported the concept that the perception of one's ability played a critical role in motivation and achievement (Dweck, 2015). Because students with a growth mindset believed their intelligence could be developed, they exhibited a

willingness to take risks while developing their communication, collaboration, critical thinking, and creativity skills (Dweck, 2015).

Conclusion 2: Students with Ongoing Opportunities to Practice a Growth Mindset Share Ideas and Demonstrate Skills without the Fear of being Wrong

When students were immersed in a growth mindset environment, additional opportunities for academic and emotional growth were established (Dweck, 2015). Because this mindset embraced challenges and learned from criticism, students were more apt to take risks. Taking risks lent itself to openly sharing ideas, presenting in front of audiences, and self-reflection. Understanding how these practices were related increased chances to effectively transition to integrating 21st century skills. More importantly, when administrators and teachers modeled a growth mindset in addition to teaching it, the concepts were further reinforced.

Conclusion 3: The use of Mobile Technology Heightens Student Engagement and Motivates Students to Enthusiastically Direct their own Learning

Mobile technology was pervasive in both school sites**.** Based on the data collected, it was concluded that the inclusion of mobile technology motivated students to be self-directed learners. Studies revealed that the integration of technological tools in learning provided heightened engagement in an era that recognizes the characteristics of the digital native (Bellanca, 2013; Chen, 2010; Darling-Hammond, 2010). Additionally, observations and interviews revealed that students were engaged in the learning tasks and able to personalize their own learning while tracking progress. Through the implementation of various technological programs, students received immediate feedback, were able to make corrections, and try again. Because of this dynamic, students were aware of personal learning targets, strengths, and weaknesses.

Furthermore, this structure created expectations for success where students were given multiple opportunities to try again, collaborate, and learn from others to ultimately achieve individualized goals. Based on the data collected, the use of the mobile technology and programs provided the access and tools needed to generate motivation to persevere.

Conclusion 4: Parents Inherently want to be Involved in School Initiatives.

Based on the data collected from references under the themes of Community Engagement, Culture of Teamwork, and Constant Collaboration Among Stakeholders, it was concluded that parent engagement flourished when opportunities existed**.** Joyce Epstein, a leading author in parent involvement, expressed the importance of community partnerships and how effective programs increased potential for student success (Epstein, 2009). The data revealed that schools that created an inviting atmosphere where community members were welcomed established an involved parent network. When schools literally opened doors, invited parents to share in the decision-making, and provide multiple opportunities for involvement, communities got involved (Epstein, 2009). An interconnected relationship between students, parents, administrators, teachers, and community members was cultivated at each school site where goals appeared unified. Rather than view the teachers as solely responsible, parents accepted shared responsibility for student success. The data showed that constructing opportunities for parents generated an involved parent community that positively impacted student success.

Conclusion 5: The Synergy Created Through the Three Elements of Teamwork, Collaboration, and Community Engagement Creates a Model for Growth in 21st Century Learning

Studies revealed that collaborative teams had the potential to transform major aspects of teaching and learning. (DuFour & Eacker, 1998; Marzano & Hefleblower, 2010). Based on the findings that reflected a high percentage of references in teamwork, collaboration, and community engagement coupled together with the relatedness between the themes, it was concluded that these components generated a model of growth. Together, these themes represented 392 of the total references, reflecting almost 50% of all references. The data revealed that when all stakeholders worked toward goals through teamwork, collaboration, and community engagement, students thrived. These components were essential to the integration of 21st century learning. The teachers, administrators, support staff, and parent groups consistently communicated with one another and assessed progress. The spirit of teamwork was reflected in the recurring use of the word *we* rather than *I*. If help was needed to complete a project or a task, multiple options were readily available.

Leveraging the skills and experiences of all groups was integral to the process of integrating 21st century learning. Teachers were well-aware of strengths of team members and did not hesitate to ask for help. Support staff members were completely involved in various projects as well. For example, one office member relayed her involvement in helping to prepare students for community presentations by organizing name tags and rosters, and taking time during her break every day to listen to their presentations. In another example, a teacher relayed the ongoing commitment of a

district gardener who visited the campus on the weekends to check on the student garden when temperatures soared over 90 degrees.

Parents were also willing to provide ample support throughout the day and after school. Parents were observed walking groups of students to school, tutoring in classrooms, and monitoring the playground during recess. To utilize parent skills, various clubs were organized and led by parent groups; some were aimed to provide intervention in reading or math, others were focused on offering enrichment opportunities in the arts, sewing, and gardening. Collectively, all stakeholder groups perceived their specific role in the larger team framework with a united focus on increasing opportunities for students while providing support in any and all areas needed. Figure 18 reflects a model of the relationship between teamwork, collaboration, and community engagement.

Figure 18. Model for student growth

Conclusion 6: Trust between Stakeholders is an Integral Component of 21st Century Skill Implementation

Although individual parent and child themes clearly emerged from the data that identified best practices employed in exemplary elementary schools, similarities between

the themes established the underlying need for trust that provided the platform for transformation to occur. Integrating 21st century skills required teamwork and collaboration, but to establish an atmosphere where these components flourished, trust was essential to the process. According to Covey (2006), high-trust environments fostered the collaboration and teamwork required for success in the global economy. Additionally, he explained that in the absence of trust, collaboration was merely cooperation, which failed to achieve the true benefits of collaboration in the knowledge age (Covey, 2006).

The identified practices did not evolve in a short time frame. Rather, they took several years to integrate. Ongoing communication, planning, and reflection appeared at the root of the identified themes of:

- Emphasis on College and Career Mindset
- Use of Engaging Learning Strategies
- Community Engagement
- Culture of Teamwork
- Constant Collaboration Among Stakeholders
- Culture of Continual Learning
- Ongoing Assessment of Programs

Equally important, however, was the inference that to affect change in all these areas, a climate of trust was maintained between all stakeholders. For example, parents and teachers expected and trusted they would be included in decision-making. Teachers needed to trust each other to maintain the comfort level of asking for help and volunteering to host numerous visitors walking through their classroom. Additionally,

students trusted that it was okay to not know the answer, to be wrong, and to try again. As a result, the relationship between trust and growth mindset evolved. Specifically, confidence in the process continued to build a growth mindset that was demonstrated among students, teachers, parents, and administrators.

Implications for Action

This phenomenological research study provided conclusions and implications for action based on the data collected from the two identified exemplary elementary schools in California. To address the challenge of adequately preparing students with 21st century skills, the study collected data regarding best practices employed in successful schools in an attempt to provide specific steps to transform educational practices. Substantial research exists on the rationale for this needed transition (Bellanca, 2013; Kay & Greenhill, 2013; Trilling & Fadel, 2009), and this study provided support for schools desiring to initiate this needed change. The following implications for action were based on a combination of findings and conclusions and were intended to provide the reader with recommendations on how to effectively transition and sustain a 21st century skill learning environment in schools.

Implication 1: To Ensure Students are Effectively Prepared for College and Career, the Integration of 21st Century Skills in Schools is Critical

To effectively integrate 21st century skills, a college and career mindset must be established in the elementary grades. District leaders must lead this initiative to ensure the goal is communicated to all school sites, while also providing training to instructional leaders so that it may be successfully transferred to teachers, staff, parents, and students. The training should begin with an overview of the need for the transition so a background

is established. Following that, instructional strategies that involve the 4Cs, life skills (growth mindset), and technological skills must be explained with a purposeful plan to delegate the unrolling of the initiative.

In addition to the trainings, site leadership teams should include an overall emphasis on the expectation that every student is capable of going to college. Rather than holding a yearly college day, schools need to ensure the expectation is brought to the forefront by communicating the vision through various forms of media. To maintain the expectation, multiple and consistent opportunities to practice the 4Cs must be offered to students and teachers alike. Additionally, activities that illustrate the focus must be incorporated into the school year. Some examples should include transforming buildings and/or classrooms with flags, signs, murals, or bulletin boards. Other activities could include weekly spirit days where staff and students are encouraged to wear college clothing. Presentations, field trips, and speakers could also support the vision by offering the same message from a variety of perspectives.

Implication 2: To Provide a 21st Century Learning Environment, Mobile Technology for Students must be Accessible at a Minimum of a 2:1 Ratio

For students to benefit from technological practices, they must be fully integrated into classroom instruction where students take ownership of the hardware. Rather than teach technology as isolated skills in a building separate from the classroom such as the computer lab, it is critical to integrate technology as a tool to learning in the classroom. Ideally, students would have 1:1 access to mobile technology; however, a 2:1 ratio is sufficient. To accomplish this, professional development surrounding the use of integration of technology must be completed by administrators and teachers.

Furthermore, teachers should be willing to consistently explore and test programs as applications emerge to remain current. Budgeting is an obvious critical factor in this process, so ensuring buy-in of a critical mass to start is essential. If restriction of resources does not permit the purchase of technology as advised, then starting with a grade level rolling, mobile computer cart is advised.

Implication 3: Principals Leading Schools to Integrate 21st Century Skills need to Partner with Parents and Provide a Range of Opportunities for Parent Involvement

The conclusions revealed the desire of parents to be involved in schools and the integral role they played in the student growth model; thus, multiple opportunities for involvement must be constantly provided. To achieve this, parents must feel welcome on the campus. A variety of activities should include events outside of the school day whereas others should offer structured opportunities to be involved during the instructional day. Communication is essential to effectively enhance parent engagement in schools and should be the responsibility of the site leader in partnership with the office and parent leadership groups. Acknowledging and appreciating the vast array of experiences and skills in the community is also a key ingredient in successfully strengthening parent involvement in schools.

Implication 4: To Transform to a 21st Century Learning Atmosphere, a Climate of Teamwork and Collaboration must be Fostered Among Stakeholders

To effectively integrate 21st century skills, a climate of teamwork and collaboration must provide the foundation for the initiative. Based on established conclusions, implications for action include the cultivation of an atmosphere that works and collaborates as a united team. This mindset should begin with district leadership, and

site leaders have a responsibility to ensure the spirit of teamwork is modeled through day-to-day activities. At the root of effecting this climate lays the critical importance of trust among stakeholders. Consequently, trust building activities should be incorporated into workshops and meeting opportunities. Some examples may include modeling active listening, establishing norms and protocols for meetings, and engaging in reflection. To conclude, strengthening relationships through trust building activities will essentially build the platform needed to solidify a spirit of teamwork and collaboration.

Implication 5: To Sustain 21st Century Skill Integration, Administrators and Staff must Model a Culture of Learning Encompassing Ongoing Opportunities for Differentiated Professional Development that Mirrors the Dynamic Change

District leaders must encourage a culture of ongoing learning by ensuring that a multitude of professional development opportunities are available to site leaders, teachers, staff, and parents. In addition to providing workshop opportunities based on district goals, creating opportunities based on the unique needs of schools sites and parent groups is advised. Accomplishing this goal should to be established in the Local Control Accountability Plan (LCAP) so that needed funds may be effectively allocated and distributed.

The integration of 21st century skills involve a need to remain current; a culture of ongoing learning also needs to be modeled by site principals. Professional development offerings at a district level communicate the intended vision, but site leaders must model and participate in the initiatives alongside teachers. When this expectation is successfully met by all stakeholders, students ultimately benefit directly by the new trainings and indirectly by participating in the school-wide culture of learners.

Recommendations for Further Research

Based on the findings and limitations of this study, it is recommended that further studies be conducted on best practices employed in identified exemplar schools to expand the body of research in this field. These include:

1. The current study focused on 21st century skill best practices employed in identified exemplar schools in California. Due the limitations established by unique demographics relating to the state of California, a further study investigating best practices in different states is recommended.
2. Based on the overwhelming evidence collected related to emphasis of a college and career mindset, further research that delves into the relatedness of developing a growth mindset and the integration of the 4Cs is recommended.
3. The current study explored P21-identified exemplary elementary schools. To further develop research in 21st century best practices, a recommendation to investigate best practices employed in middle schools and/or high schools would effectively expand the body of research.
4. This study revealed that an emphasis on a college and career mindset is a best practice in elementary schools. Therefore, it is recommended to conduct a comparative, longitudinal study tracking college matriculation rates of students from exemplar schools versus non-exemplar schools.
5. Expanding the current research by investigating potential correlations between exemplar schools and state assessments is recommended.

6. The data collected in this study exposed that integrating mobile technology was a best practice essential to 21st century skills. Completing a study that focuses on best practices employed with technology is recommended.

Concluding Remarks and Reflections

This research study began with a passion to effect change in school systems. Reviewing the history of instructional practices compelled me to reflect on how education evolved over the last century and more importantly how technology impacted learning. Understanding that the demands of the job market are directly linked to rapidly changing technology, it was important to explore how schools best prepare students to meet these demands. An overwhelming amount of research existed that communicated how students graduating from high school were not effectively prepared for college work. Furthermore, other statistics revealed that employers reported that college graduates were not fully equipped to meet the changing demands of the job market.

Other reports exposed that failure of education in the United States to fully transform to the changing needs of the economy left students ill-equipped to globally compete for jobs. This adverse scenario compelled me to seek out effective ways that successful schools are integrating 21st century schools. P21 provided a framework of 21st century skills, but also an exemplar program that identified and celebrated schools that were successful in their transformation. In its fourth year as a program, there was little research on best practices of exemplar school. In an effort to discover best practices, I launched into a phenomenological research study to investigate and communicate the lived experiences of those involved in identified exemplar elementary schools in the state of California.

After completion of this research study, I am further convinced that the need to integrate 21st century skills in all levels of education is urgent. Having the ability to examine the mindset, initiative, and engagement of students, teachers, and parents, it was absolutely clear that these students will be equipped to express ideas, effectively collaborate with teams, present in front of groups, and evaluate perspectives through critical thinking – all without fear of failure. These skills were developed over time and were built on a foundation of trust between all stakeholders. Furthermore, the administrators, teachers, support staff, parents, and students were engaged and excited about learning. They consistently expressed the desire to expand and better practices. I will not soon forget the response of a teacher who was being observed when technology failed. He calmly looked over and without any apparent frustration explained, "We embrace the struggle." This mindset was overwhelmingly consistent in both schools and I marveled with the impact I knew this was making with students. Students were watching, processing, and learning from exemplar growth mindset practices.

While this research definitively revealed best practices used in identified exemplary elementary schools, the mission to effectively evaluate the progress and positive impact of 21st century skills continues to be a need. While a variety of rubrics that aligned with the progress of objectives were observed at both sites, it was clear that these essential skills did not successfully align with standardized assessments. Just because a school demonstrated proficiency in the integration of 21st century skills did not necessarily mean that this was reflected in traditional state mandated benchmarks. Knowing that the research points to a need for 21st century skills and that the current assessments do not appropriately reflect such skills is a dilemma that demands

recognition and a call for further research. Furthermore, this dynamic reveals the need to educate the public of this misalignment between state testing and some critical 21st century skills. Investigating how to best evaluate these key skills is absolutely necessary.

Although the two most predominant themes were a College and Career Mindset and Use of Engaging Learning Strategies, it was clear that other key themes provided the initial foundation for these practices. Specifically, it was the themes related to community engagement, teamwork, collaboration, and continual learning that paved the way for the complete transformation. Without successfully integrating these related practices, ultimate transformation that included the most predominant themes would not have been effective. Ultimately, these components collectively provided the framework and hope for 21st century skill integration to follow in all schools in the United States.

REFERENCES

Audretch, D., Lehman, E., & Wright, M. (2014). The technology transfer in a global economy. *The Journal of Technology Transfer, 39*(3), 301-312.

Bambrick-Santoyo, P. (2012). *Leverage leadership.* San Francisco, CA: Jossey-Bass.

Bartik, T. J., & Houseman, S. N. (Eds.). (2008). *A future of good jobs? America's challenge in the global economy*. Kalamazoo, MI: Upjohn Institute.

Bellanca, J. A. (2013). *The focus factor: 8 essential twenty-first century thinking skills for deeper student learning.* New York, NY: Teachers College Press.

Bellanca, J. A., & Brandt, R. S. (2010). *21st century skills: Rethinking how students learn.* Bloomington, IN: Solution Tree Press.

Brown, J. S. (2006). New learning environments for the 21st Century: Exploring the edge. *Change*, *5*, 18.

Brown, J. S. (2012). *Learning in and for the 21st century*. Singapore: National Institute of Education. Retrieved from http://www.johnseelybrown.com/CJKoh.pdf

Brynjolfsson, E., & McAfee, A. (2012). *Race against the machine: How the digital revolution is accelerating innovation, driving productivity, and irreversibly transforming employment and the economy.* Lexington, MA: Digital Frontier Press.

Buchanan, J. (2016, June 13). Seeking computer programmers for the future. *U.S. News*. Retrieved from http://www.usnews.com/opinion/articles/2016-06-13/how-many-computer-programmers-are-needed-to-handle-artificial-intelligence

Calkins, L., Ehrenworth, M., & Lehman, C. (2012). *Pathways to the common core: Accelerating achievement*. Portsmouth, NH: Heinemann.

Casap, J. (2015). What problem do you want to solve? *Business Innovation Factory* [Online]. Retrieved from http://www.businessinnovationfactory.com/summit/story/what-problem-do-you-want-solve

Casserly, M. (2012). 10 jobs that didn't exist 10 years ago. *Forbes* [Online].

Chai, C. S. Koh, J. H. L., & Tsai, C. (2010). A review of technological, pedagogical, and content knowledge. *Education Technology & Society, 13*(4), 61-73.

Chen, M. (2010). *Education nation: Six leading edges of innovation in our schools*. San Francisco, CA: Jossey-Bass.

Conley, D. T. (2008). *College knowledge: What it really takes for students to succeed and what we can do to get them ready*. San Francisco, CA: John Wiley & Sons.

Covey, S. (2006). *The speed of trust: The one thing that changes everything.* New York, NY: Free Press.

Creswell, J. W. (1994). *Qualitative and quantitative approaches.* Thousand Oaks, CA: Sage.

Daccord, T., & Reich, J. (2015). How to transform teaching with tablets. *Educational Leadership, 8*, 18.

Darling-Hammond, L. (2010). *The flat world and education: How America's commitment to equity will determine our future*. New York, NY: Teachers College Press.

Dubravac, S. (2015). *Digital destiny*: *How the new age of data will transform the way we work, live, and communicate.* Washington, DC: Regnery Publishing.

DuFour, R & Eaker, R. (1998). *Professional learning communities at work.* Bloomington, IN: Solution Tree Press.

DuFour, R. & Marzano, R. (2011). *Leaders of learning*. Bloomington, IN: Solution Tree Press.

Dweck, C. (2015, October 9). Carol Dweck revisits the 'growth mindset'. *Education Week*. Retrieved from http://www.edweek.org/ew/articles/2015/09/23/carol-dweck- revisits-the-growth-mindset.html

Elmore, R. (2014). *School reform from the inside out: Policy, practice, and performance*. Cambridge, MA: Harvard University Press.

Epstein, J. (2009). *School, family, and community partnerships: Your handbook for action.* Thousand Oaks, CA: Corwin.

Evans, J. (2015). More verbs, fewer nouns. *Educational Leadership, 8,* 10.

Ford, M. (2015). *Rise of the robots: Technology and the threat of a jobless future*. New York, NY: Basic Books.

Frey, N., & Fisher, D. (2012). Literacy 2.0: Finding, using, creating, and sharing information – Information literacy is a vital part of 21st century learning that requires a shift of the skills students need to be successful. *Principal Leadership, 8,* 58.

Frey, N., Fisher, D., & Gonzalez, A. (2010). *Literacy 2.0: Readings and writing in 21st century classrooms*. Bloomington, IN: Solution Tree.

Friedman, T. L., & Mandelbaum, M. (2011). *That used to be us*. New York, NY: Picador.

Fullan, M. (1993). *Change forces: Probing the depths of educational reform*. Retrieved from http://eric.ed.gov/?id=ED373391

Fullan, M. (2013). The new pedagogy: Students and teachers as learning partners. *Learning Landscape, 6,* 2.

Fullan, M. (2014). *The principal: three keys to maximizing impact.* San Francisco, CA: Jossey-Bass.

Galliers, R. D., & Leidner, D. E. (2009). *Strategic information management: Challenges and strategies in managing.* New York, NY: Routledge.

Gardner, H. (2009). *Five minds for the future*. Boston, MA: Harvard Business School Press.

Gladwell, M. (2000). *The tipping point: How little things make a big difference*. Little Brown and Company.

Goodwin, T. (2015, March 3). The battle is for the customer interface. *Tech Crunch.* Retrieved from https://techcrunch.com/2015/03/03/in-the-age-of-disintermediation-the-battle-is-all-for-the-customer-interface/

Gordon, E. E. (2013). *Future jobs: Solving the employment.* Santa Barbara, CA: Praeger.

Hamilton, L. (2016, June). Research estimates more than 8 billion connected devices worldwide. *CED Magazine.* Retrieved from https://www.cedmagazine.com/news/2016/06/research-estimates-more-8-billion-connected-devices-worldwide

Herold, B. (2015). Why ed tech is not transforming how teachers teach; Student-centered, technology-driven instruction remains elusive for most. *Education Week, 35*.

International Society for Technology in Education. (n.d.). The International Society for Technology in Education website. Retrieved from http://iste.org

Jascik, S. (2015, January 20). Well-prepared in their own eyes. *Inside Higher Ed.* Retrieved from https://www.insidehighered.com/news/2015/01/20/study-finds-big-gaps-between-student-and-employer-perceptions

Johnson, B., & Christensen, L. (2008*). Educational research: Quantitative, qualitative, and mixed approach.* Thousand Oaks, CA: Sage.

Kay, K. (2010). 21st century skills: Why they matter, what they are, and how we get there. *21st Century Skills: Rethinking How Students Learn*, 2091-2109.

Kay, K., & Greenhill, V. (2011). Twenty-first century students need 21st century skills. In G. Wan and D. M. Gut (Eds.), *Bringing Schools into the 21st Century* (pp. 41-65). New York, NY: Springer.

Kay, K., & Greenhill, V. (2013). *The education leader's guide: 7 steps toward 21st century schools and districts*. Upper Saddle River, NJ: Pearson.

Kotter, J. P., & Cohen, D. S. (2002). *Heart of change - real-life stories of how people change their organizations*. John P. Kotter and Delloitte Consulting, LLC.

Kouzes, J. & Posner, B. (2006). *A leader's legacy*. San Francisco, CA: The Leadership Challenge.

Lemke, C. (2010). Innovation through technology. In J. Bellanca & R. Brandt (Eds.). *21st century skills: Rethinking how students learn* (pp. 243-273). Bloomington, IN: Solution Tree Press.

Lichtman, G. (2013). Take aim at innovation! *Learning & Leading with Technology*, *2*, 12.

Lichtman, G. (2014). Zero-based strategic thinking: Real innovation shifts the focus to the future. *Independent School, 73*(3).

Lindsay, J., & Davis, V. (2013). *Flattening classrooms, engaging minds: Move to global collaboration one step at a time*. Upper Saddle River, NJ: Pearson.

Lombard, M., Snyder-Duch, J., & Bracken, C. C. (2002). Content analysis in mass communication: Assessment and reporting of intercoder reliability. *Human Communication Research*, *28*(4), 587-604.

Marzano, R. J., & Heflebower, T. (2012). *Teaching & assessing 21st century skills.* Bloomington, IN: Marzano Research Laboratory.

Maxwell, J.C. (1995). *Developing the leaders around you.* Nashville, TN: Thomas Nelson, Inc.

Morgan, S. (2016, January, 16). One million cybersecurity job openings in 2016. *Forbes*. Retrieved from http://www.forbes.com/sites/stevemorgan/2016/01/02/one-million-cybersecurity-job-openings-in-2016/#ae6d52a7d274

Muhammad, A.(2009). *Transforming school culture.* Bloomington, IN: Solution Tree Press.

Nies. M. L. (2005). Preparing teachers to teach science and mathematics with technology: Developing a technology pedagogical content knowledge. *Teaching and Teacher Education*, *21*, 509-523.

Partnership for 21st Century Learning. (2016). Partnership for 21st Century Learning website. Retrieved from http://www.p21.org

Patton, M. Q. (2015). *Qualitative research and evaluation methods*. Thousand Oaks, CA: Sage.

Patterson, T. (2015). Google, Facebook, SpaceX, OneWeb plan to beam internet everywhere. *CNN Wire*. Retrieved from http://www.cnn.com/2015/10/30/tech/pioneers-google-facebook-spacex-oneweb-satellite-drone-balloon-internet/

Parsad, B., & Lewis, L. (2003). Remedial education at degree-granting postsecondary institutions in fall 2000 (NCES 2004-010). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.

Puentedura, R. R. (2006). Transformation, technology, and education in the state of Maine [Web log post]. Retrieved from http://www.hippasus.com/rrpweblog/archives/2006_11.html

Pew Research Center. (2014, August). *AI, robotics, and the future of jobs*. Washington, DC: Author. http://www.pewinternet.org/files/2014/08/Future-of-AI-Robotics-and-Jobs.pdf

Plucker, J., Beghetto, R., & Dow, G. (2004). Why isn't creativity more important to educational psychologists? Potentials, pitfalls, and future directions in creativity research. *Educational Psychologist, 39*, 83-96. doi:10.1207/s15326985ep3902_1

Richardson, W. (2012, September 10). *Why school? How education must change when learning an information are everywhere* [Ted Talk]. Retrieved from http://blog.ted.com/why-school-ted-ebook-author-rethinks-education-when-information-is-everywhere/

Roblyer, M. D. (2013). *Integrating educational technology into teaching* (6th ed.). Upper Saddle River, NJ: Pearson.

Romrell, D., Kidder, L.C., & Wood, E. (2014). The SAMR model as a framework for evaluating learning. *The Journal of Asynchronous Learning Networks*, 18(2).

Rothstein, S. W. (1995). *Class, culture, and race in American schools.* Westport, CT: Greenwood Press.

Rshaid, G. (2014). *The 21st century classroom.* Englewood, CO*:* The Leadership and Learning Center.

Saldana, J. (2016). *The coding manual for qualitative researchers.* Thousand Oaks, CA: Sage.

Schrum, L., & Levin, B. B. (2009). *Leading 21st century schools: Harnessing technology for engagement and achievement*. Thousand Oaks, CA: Corwin.

Smith, A., & Anderson, J. (2014, August 6). *Predictions for the state of AI and robotics in 2025*. Washington DC: Pew Research Center. Retrieved from http://www.pewinternet.org/2014/08/06/predictions-for-the-state-of-ai-and-robotics-in-2025/

Thornburg, D. (2014). *From the campfire to the holodeck: Creating engaging and powerful 21st century learning environments.* San Francisco, CA: Jossey-Bass.

Toffler, A. (1970). *Future shock.* New York, NY: Random House.

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

United Nations. (2016). Population data. Retrieved from www.un.org/esa/population

Voogt, J., Fisser, P., Pareja Roblin, N., Tondeur, J., & van Braak, J. (2013). Technological pedagogical content knowledge-A review of the literature. *Journal of Computer Assisted Learning, 29,* 109-121.

Voogt, J., & Roblin, N. P. (2012). A comparative analysis of international frameworks for 21st century competences: Implications for national curriculum policies. *Journal of Curriculum Studies, 44*(3), 299-321.

Wagner, T. (2008). *The global achievement gap*. New York, NY: Basic Books.

Walker, Tim. (2015). Are school districts getting smarter about education technology? *NEA Today.* Retrieved from http://neatoday.org/2015/12/01/school-districts-getting-smarter-education-technology/ http://www.worldometers.info/

APPENDICES

Appendix A: Partnership for 21st Century Exemplar Program Evaluation Tool

P21 PARTNERSHIP FOR 21ST CENTURY LEARNING

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:

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 4C's 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 <u>all</u> 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 groups contribute to the success of 21st century skill integration at your school?

Parents

A. 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.

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

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

D. *Tell me about your student's experiences surrounding project based learning/STEAM.*

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?*

APPENDIX C: BUIRB APPROVAL

BRANDMAN UNIVERSITY INSTITUTIONAL REVIEW BOARD
IRB APPLICATION ACTION – APPROVAL
COMPLETED BY BUIRB

IRB ACTION/APPROVAL

Name of Investigator/Researcher: Kelly Wilbert

☐ Returned without review. Insufficient detail to adequately assess risks, protections and benefits.

☐ Approved/Certified as Exempt form IRB Review.

☑ Approved as submitted.

☐ Approved, contingent on minor revisions (see attached)

☐ Requires significant modifications of the protocol before approval. Research must resubmit with modifications (see attached)

☐ Researcher must contact IRB member and discuss revisions to research proposal and protocol.

Level of Risk: ☐ No Risk ☑ Minimal Risk ☐ More than Minimal Risk

IRB Comments:

IRB Reviewer: Dr. Michael Moodian

Telephone: Email: moodian@brandman.edu

BUIRB Chair: Dr. Douglas DeVore Date: 8/18/16

REVISED IRB Application ☐ **Approved** ☐ **Returned**

Name:

Telephone: **Email:** **Date:**

BUIRB Chair:

Brandman University IRB Rev, 11.14.14 Adopted November 2014

APPENDIX D: RESEARCH STUDY INVITATION LETTER

Dear Prospective Study Participant:

You are invited to participate in a research study about best practices used in exemplary elementary schools. The primary investigator of this study is Kelly Wilbert who is a Doctoral Candidate in Brandman University's Doctor of Education in Organizational Leadership program. You were selected to participate in an interview because you are a staff member who works in a California 21st century exemplar district or school site that has been identified by the Partnership for 21st Century Learning.

PURPOSE: The purpose of this qualitative study is to identify and describe best practices used in exemplary California elementary schools as recognized by the Partnership for 21st Century Learning.

PROCEDURES: If you agree to participate in this study, you will be invited to participate in a face to face semi-structured interview conducted by the primary investigator. The interview will be conducted in a focus group format, composed of grade spans of teachers. Duration of the interview will last up to an hour. The interview will be recorded and transcribed. A copy of the transcription will be forwarded to you for review.

POTENTIAL BENEFITS: While there are no major benefits for your participation, potential benefits are substantial. The data collected because of your willingness to share your expertise will contribute to the knowledge base of best practices used in exemplary 21st century schools. The results will be intended to inform researchers, policy makers, and educators in an effort to transform other schools into 21st century learning environments.

POTENTIAL RISKS: While there are no known major risks to your participation in this research study, minor potential risks may include inconvenience due to the timing of the interview and emotional discomfort with sharing personal exemplary 21st century learning practices and experiences.

ANONYMITY: Records of information provided by participants in this study and any personal information will not be linked or identified in any way. Essentially, no identifying data will identify you as the person who provided any specific information for this study. On the contrary, all interview participants will be assigned a number. The recorded interview session will not reference your name, but rather your number. Any names used by participants in a recorded interview will be redacted from the transcript. These transcriptions will be forwarded for your review and feedback.

You are encouraged to ask any questions throughout the research process. Please do not hesitate to contact the researcher, Kelly Wilbert. If you have further questions or concerns about this study, you may write or call the Office of the Executive Vice Chancellor of Academic Affairs, Brandman University, and 16355 Laguna Canyon Road, Irvine, Ca 92618, (949) 341-7641

Respectfully,

Kelly Wilbert, Primary Researcher

APPENDIX E: PARTICIPANT INFORMED CONSENT FORM

RESEARCH STUDY TITLE: Identifying Best Practices in Recognized Exemplar 21st Century Elementary Schools through a Phenomenological Study

Brandman University
16355 Laguna Canyon Road
Irvine, CA 92618

RESPONSIBLE INVESTIGATOR: Kelly Wilbert, Doctoral Candidate
TITLE OF CONSENT FORM: Research Participant's Informed Consent Form
PURPOSE OF THE STUDY: The purpose of this qualitative study is to identify and describe best practices used in exemplary California elementary schools as recognized by the Partnership for 21st Century Learning.

In participating in this research study, you agree to partake in a face to face semi-structured interview which will extend up to one hour which will be audio recorded and transcribed. During this interview, you will be asked a series of questions related to your experiences in an identified exemplar 21st century school.
I understand that:
My participation in this study is voluntary and that I may refuse to participate or withdraw at any time.

The study will be audio-recorded and the recordings will not be used beyond the scope of this research project.

The audio-recordings will be transcribed and sent to me for review.
Data collected will remain anonymous. No names will be transcribed; rather numbers will be used identify participants.

While there are no known major risks to your participation in this research study, minor potential risks may include inconvenience due to the timing of the interview and emotional discomfort with sharing personal exemplary 21st century learning practices and experiences.

While there are no major benefits for your participation, potential benefits are important. The data collected because of your willingness to share your expertise will contribute to the knowledge base of best practices used in exemplary 21st century schools. The results will be intended to inform researchers, policy makers, and educators in an effort to transform other schools into 21st century learning environments.

Any questions or concerns I have will be responded to by the primary investigator, Kelly Wilbert, Brandman University, Doctoral Candidate who can be reached on her mobile number or through her email address.

I will receive a one-time $10 gift card for my participation in the interview.

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 or concerns about the study or the informed consent process, I may write or call the Office of the Executive 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 voluntarily consent to the procedures(s) set forth.

_____ _____

Signature of Participant or Responsible Party Date

_____ _____

Signature of Witness (if appropriate) Date

_____ _____

Signature of Kelly Wilbert, Primary Investigator Date

Brandman University IRB August, 2016

APPENDIX F: INTERVIEW PROTOCOL SCRIPT

"Good morning. My name is Kelly Wilbert and I am the primary investigator of this research study. Thank you for offering to participate in this interview today. I appreciate it. I understand that you've had an opportunity to read, review, and sign the consent forms, and also ask questions but I want to provide copies again in case you have any questions before we begin." (Hand out and pause)

"Does anybody have any questions?" (Respond to questions and concerns as needed)

"The purpose of this qualitative, phenomenological study is to identify and describe 21st century skill best practices in exemplary elementary schools in California as identified by the Partnership for 21st Century Learning."

"I want to make sure you are aware that this research was reviewed and approved by BIRB which stands for Brandman Institutional Review Board. This is a committee established to review and approve research involving human subjects. The purpose of the IRB is to ensure that all human subject research be conducted in accordance with all federal, institutional, and ethical guidelines."

"As a reminder, we will be audio recording this interview to make sure I capture all of our questions and responses. You may also see me taking notes during the interview. To ensure accuracy however, I will send transcriptions of the interview and ask that you review it and approve it. Please remember that any names will remain anonymous so if any names are used, they will be removed from the transcription. Again, your participation is voluntary. Feel free to stop me at any time and let me know if you have any questions, concerns, or if you simply need a break. I will be using a timer to make sure we don't exceed our time commitment of one hour. Again, thank you so much. Does anyone have any questions before we begin?"

End: "Thank you for your participation. As a small token of appreciation, please enjoy a $10 gift card."

APPENDIX G: RESEARCH STUDY INVITATION LETTER – CLASSROOM OBSERVATION

August 1, 2016

Dear Prospective Study Participant:

You are invited to participate in a research study about best practices used in exemplary elementary schools. The primary investigator of this study is Kelly Wilbert who is a Doctoral Candidate in Brandman University's Doctor of Education in Organizational Leadership program. You were selected to be observed in your classroom during instructional time because you are a staff member who works in a California 21st century exemplar district or school site that has been identified by the Partnership for 21st Century Learning.

PURPOSE: The purpose of this qualitative study is to identify and describe best practices used in exemplary California elementary schools as identified by the Partnership for 21st Century Learning.

PROCEDURES: If you agree to participate in this study, you will be observed in your classroom during instruction by the primary investigator for a duration of 10-30 minutes at which time the investigator will silently observe while taking notes.

POTENTIAL BENEFITS: While there are no major benefits for your participation, potential benefits are substantial. The data collected because of your willingness to share your expertise will contribute to the knowledge base of best practices used in exemplary 21st century schools. The results will be intended to inform researchers, policy makers, and educators in an effort to transform other schools into 21st century learning environments.

POTENTIAL RISKS: While there are no known major risks to your participation in this research study, minor potential risks may include inconvenience due to the timing of the interview and emotional discomfort while you are being observed.

ANONYMITY: Records of information provided by participants in this study and any personal information will not be linked or identified in any way. Essentially, no identifying data will identify you as the person who was observed or any of the students in your classroom. On the contrary, all classroom observation participants will be assigned a number. You are encouraged to ask any questions throughout the research process. Please do not hesitate to contact the researcher, Kelly Wilbert, by phone or email. If you have further questions or concerns about this study, you may write or call the Office of the Executive Vice Chancellor of Academic Affairs, Brandman University, and 16355 Laguna Canyon Road, Irvine, Ca 92618, (949) 341-7641

Respectfully,

Kelly Wilbert

Primary Researcher

APPENDIX H: PARTICIPANT INFORMED CONSENT FORM – CLASSROOM OBSERVATION

RESEARCH STUDY TITLE: Identifying Best Practices in Recognized Exemplar 21st Century Elementary Schools through a Phenomenological Study

Brandman University
16355 Laguna Canyon Road
Irvine, CA 92618

RESPONSIBLE INVESTIGATOR: Kelly Wilbert, Doctoral Candidate
TITLE OF CONSENT FORM: Research Participant's Informed Consent Form – Classroom Observation
PURPOSE OF THE STUDY: The purpose of this qualitative study is to identify and describe best practices used in exemplary California elementary schools as identified by the Partnership for 21st Century Learning.

If you agree to participate in this study, you will be observed in your classroom during instruction by the primary investigator for a duration of 10-30 minutes at which time the investigator will silently observe while taking notes.

I understand that:
My participation in this study is voluntary and that I may refuse to participate or withdraw at any time.

Data collected will remain anonymous. Instead, numbers will be used to identify participants.

While there are no known major risks to your participation in this research study, minor potential risks may include inconvenience due to the timing of the classroom observation and emotional discomfort while being observed.

While there are no major benefits for your participation, potential benefits are important. The data collected because of your willingness to share your expertise will contribute to the knowledge base of best practices used in exemplary 21st century schools. The results will be intended to inform researchers, policy makers, and educators in an effort to transform other schools into 21st century learning environments.

Any questions or concerns I have will be responded to by the primary investigator, Kelly Wilbert, Brandman University, Doctoral Candidate who can be reached on her mobile number or through her email address.

I will receive a one-time $10 gift card for allowing the researcher to observe me in my classroom for a period of 10-30 minutes.

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 or concerns about the study or the informed consent process, I may write or call the Office of the Executive 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 voluntarily consent to the procedures(s) set forth.

_____ _____

Signature of Participant or Responsible Party Date

_____ _____

Signature of Witness (if appropriate) Date

_____ _____

Signature of Kelly Wilbert, Primary Investigator Date

Brandman University IRB August, 2016