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Pepperdine University

Graduate School of Education and Psychology

AN ENQUIRY INTO CALIFORNIA SCHOOL DISTRICT SUPERINTENDENTS: THEIR ROLE IN CREATING, PROMOTING AND SUSTAINING A DIGITAL-AGE LEARNING CULTURE

A dissertation submitted in partial satisfaction

of the requirements for the degree of

Doctor of Education in Organizational Leadership

by

Chester Tadeja

January, 2015

Linda Purrington, Ed.D. – Chairperson

This dissertation, written by

Chester Tadeja

under the guidance of a Faculty Committee and approved by its members, has been submitted to and accepted by the Graduate Faculty in partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

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DEDICATION

My completion of this degree has been an unrelenting, emotional, and incredibly rewarding journey altogether. It has changed my life in ways that I never thought possible. While I have experienced many of the hardships and joys of this journey alone, the pursuit of this degree was far from a solitary undertaking.

I am forever indebted to my wife, Christina. Without her belief in me, I would have never considered pursuing a doctoral degree; without her encouragement after initial disappointments, I would have never been accepted to a doctoral program; and without her constant love, compassion and support, I would have never made it to the end of this long and difficult journey. Throughout my pursuit, she was a steady and unwavering pillar of strength. I owe this achievement to her.

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I also acknowledge Dr. Paul Sparks and Dr. Dale Marsden,

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I am forever grateful

For all of you.

VITA

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Companion Website: http://www.routledge.com/cw/garland-9780415809788/

Others

Tadeja, C. (2011). Strategic Leadership in T. Coleman (Ed.) *Leading with Social Intelligence*. Strategic Leadership (pp. 44-51). Dallas, TX: Chair Academy.

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PRESENTATIONS

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Tadeja, C., Uribe, B., Garatli, A., Martin, R. (March 2010). *Group Analysis: Leadership Characteristics Enquiry of Select Senior Level Leaders*. Paper presented at the annual meeting of the Hawaii International Conference on Education (HICE), Waikiki, HI.

Tadeja, C. (November 2007). *Powerful Ideas on Teaching and Learning.* Paper presented at the 2007 Technology in Education International Conference and Exposition (TechEd), Ontario, CA.

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ABSTRACT

The responsibility of ensuring that students are educated both academically and socially lies squarely on the shoulders of California K-12 public school district superintendents and the dominating presence of technology in everyday life necessitates that district superintendents lead a digital-age learning culture within their districts. The purpose of this survey study was to investigate and describe strategies utilized by California K-12 public school district superintendents to create, promote, and sustain, a digital-age learning culture as operationalized in the International Society for Technology in Education Standards (ISTE) for advancing digital-age leadership. A second purpose of the study was to investigate what these superintendents perceive to be the greatest challenges related to leading a digital-age learning culture and what they believe is needed to address the challenges.

A survey was administered online to the census population of 1,051 California K-12 public school district superintendents. The survey consisted of 3 background questions, 5 quantitative-based questions and 2 open-ended qualitative questions. Ninety two superintendents responded to the survey.

Analysis and interpretation of the data resulted in the following conclusions:

(1) The superintendent's leadership for developing and stewarding a shared vision for technology-supported learning for all students is key.

(2) Translating a vision for a digital-age learning culture for all requires superintendents to: a) prioritize funding, b) provide educators with access to current technology, and c) promote continuing learning opportunities.

(3) Promoting collaboration about the use of technology within the district is another key.

(4) Superintendents need more funding than currently exists in order to provide current technology, access to technology services, and professional development for educators; and,

(5) There is a need for a statewide vision among state leaders, district leaders, and technology industry leaders.

Based on the findings of this study, it is recommended that superintendents need to develop a clear vision, place heavy emphasis on professional development, and collaborate with the community to make funding the utmost priority.

Chapter 1: Introduction

Background of the Study

New and emerging technologies have dramatically changed the way that people communicate and interact in what is now described as a digital-age society in the United States and globally. These same technologies are also transforming the way that teachers teach, students learn, and administrators lead digital-age learning cultures in K-12 school districts. Leadership of this transformation is requiring new knowledge and skills on the part of K-12 site and district administrators and leadership standards and expectations have evolved to guide leadership for technology in education. Superintendents, given their executive leadership role in districts, have a very important role to play in creating sustaining, and promoting a digital-age learning culture for all students. In order to support superintendents in this role, more needs to be studied and shared about the successful practices that superintendents are using and that might be replicated. In addition, more needs to be learned about the challenges that superintendents encounter in becoming digital-age learning culture leaders and the resources they believe are needed to address these challenges. This study proposes to conduct a study of superintendent digital-age learning culture leadership practices in California, a state with a very large and diverse student population and a reputation for technology innovation.

Digital-age society. Commercialized internet access began to emerge in the late 1980s (McKnight, 2014). In the early 21st century, individuals were introduced to online shopping, PDFs, PDAs, and the introduction of the dot com industry (McKnight, 2014). Since that time, new technologies have continued to evolve and emerge. Today, individuals telecommute, use cloud computing, and are continually attached through a network of social media on their phones, tablets, and computers.

The United States continues to increase its dependency on technology and technology has changed our world and our lives (Flynt, 2011). Technology is used in nearly every industry from medicine and engineering to farming and design (Flynt, 2011). As the world becomes more networked, individuals begin to interact and collaborate, share opinions and ideas, solve problems and create problems. For better or worse, technology and our ability to be constantly connected has changed the way we work, play, and learn. A few recent examples of technologies that have transformed our world and lives include the Internet, cell phones, high definition television, electronic gaming devices, and the use of virtual reality. Technology is now an integral part of our social, economic, and political lives. It is embedded into our culture, including the learning culture in school districts (Callan, 2011).

Digital-age learning cultures in districts and schools. A digital-age learning culture seamlessly integrates technology and technology applications that develop the skills that learners will need to function in a digital world into the repertoire of tools that students use daily. In digital-age learning, there is an increased emphasis on connected educators who are deemed essential to positive teaching and learning environments (School Superintendents Association, [AASA], 2013).

Levin and Schrum (2013) described schools where technology has been fully integrated. In these schools, students tracked their own progress and teachers created common assessments across disciplines and grade levels. These schools embraced data-driven decision-making and collaborated with all stakeholders before technology was added or changed. One major difference between these schools and the schools where technology was not fully integrated, according to Levin and Schrum (2013), related to the level of trust that educators and staff placed on the learner. The trust placed on learners was comparatively a lot higher in the schools where

technology had been fully integrated. Many of these schools allowed learners to take school-owned laptops and other technology home or even bring their own technology devices into the schools (Levin & Schrum, 2013). In so doing, these schools had created a culture where students and staff felt safe using technology, even if it was through trial and error (Levin & Schrum, 2013).

In digital-age learning cultures, modern technology allows learning to be portable, constant, and interactive. It provides learners with an expanded audience who can provide global perspectives (McKnight, 2014). Learning opportunities now extend beyond the classroom walls into a global network where students can learn from other peers or complete strangers. The teacher is no longer the provider of information. He or she is the facilitator of information.

According to John Flynt (2011), from the University of Colorado, "the introduction of social media alone into a classroom can exponentially change the number of ways that learning can take place" (p. 14). "These expanded opportunities come in the form of online degrees, MOOCs (massive open online course), and online professional development. The learner gains greater control of what he or she will learn, when they learn, and how they learn" (p. 15). Learning no longer has to take place during normal business hours. Learning and working can take place anywhere.

As digital-age learning is ever evolving, the educators' interconnectivity with it becomes increasingly more important, at least according to the article, *Learning and Leading with Technology* (McKnight, 2014). In this article, the authors outlined the considerations for digital-age leaders, which include making sure that there is visionary leadership, an established digital-age learning culture, and excellence in professional practice. Through the proper utilization of technology, a learning culture that harnesses such connectivity can be developed – one that is

self-sustaining and produces more energy than it consumes (Prensky, 2010). At conferences such as the National Conference on Education, educators from around the country can gather to connect and learn from each other, and then allow the learning to continue through participation in an online learning community. This can extend the learning and collaboration that occurs at these events.

Learners today are socially connected and collaborative. They are constantly in contact with one another and they want immediate results. They are used to instant access, instant information, and instant communication. With this constant contact, the learner is bombarded with information, which they must learn to sort through. In many cases, the gatekeepers of information quality have been removed, leaving the learner in a sea of information. The new role of the educator is to help students learn how to swim and educators need leadership, resources, and support from site and district administrators to fulfill this new role (International Society for Technology in Education, 2009). Administrators, in turn, need professional development, resources, and support as well. Standards and expectations for technology leadership in education have been developed by professional organizations and have continued to evolve in support of leadership for digital-age learning cultures.

Interstate School Leaders Licensure Consortium (*ISLLC standards)*. Expectations for educational administrators for technology leadership were introduced in 1996 by the Interstate School Leaders Licensure Consortium (ISLLC), a consortium of state and professional associations. ISLLC lists six standards for the cultivation and promotion of a healthy school culture (Pearson, 2011). Though each standard is different, together they work to improve academic leadership in school districts, thus improving the student's experience (Interstate School Leaders Licensure Consortium, 2008).

- The first standard explains that the administrator must facilitate the "development, articulation, implementation, and stewardship of a vision of learning that is shared and supported by the school community" (p. 1).
- The second standard explains how a school administrator must advocate, nurture and sustain school culture and instructional programs conducive to student learning and staff professional growth.
- The third standard focuses upon management of the organization, operations, and resources, noting that an administrator must strive toward a safe, efficient, and effective learning environment.
- The fourth standard explains the importance of collaborating with families and community members, responding to diverse community interests and needs, and mobilizing community resources.
- The fifth standard holds superintendents to the standard of acting with integrity, fairness, and in an ethical manner.
- The sixth and final standard explains that such leaders must actively work to understand, respond to, and influence the larger political, social, economic, legal, and cultural context (Pearson, 2011).

California Professional Standards for Educational Leaders (CPSEL). In California, the California Professional Standards for Educational Leaders (CPSELs) were generated from and closely aligned to the ISLLC Standards and adopted in 2001 (California School Leadership Academy, 2004). These standards include the following: (a) facilitating the development, articulation, implementation, and stewardship of a vision of learning that is shared and supported by the school community; (b) advocating, nurturing, and sustaining a school culture and instructional program conducive to student learning and staff professional growth; (c) ensuring management of the organization, operations, and resources for a safe, efficient, and effective learning environment; (d) collaborating with families and community members, responding to diverse community interests and needs, and mobilizing community resources; (e) modeling a personal code of ethics and developing professional leadership capacity; and (f) understanding, responding to, and influencing the larger political, social, economic, legal, and cultural context. The CPSELs did not specifically devote a set of standards to technology leadership, rather the preface to the CPSELS states that all standards are to be addressed through the ongoing use of

technology. Over nine hundred educators reviewed the CPSEL before they were finalized (California School Leadership Academy, 2004). In 2004, the California Commission on Teacher Credentialing officially adopted the CPSELs into their program standards for administrator licensure (California School Leadership Academy, 2004).

The California Professional Standards for Educational Leaders specifically note that inherent in the standards is a strong commitment to cultural diversity and the use of technology as a powerful tool (WestEd & Association of California School Administrators, 2004). The CPSELs focus on maintaining standards of excellence for educational leaders, including an emphasis on accountability, embracing technology, and keeping the students' needs at the forefront of all institution decisions (WestEd & Association of California School Administrators, 2004).

International Society for Technology in Education. While California began to implement the CPSELs, a number of resources emerged nationally and locally for the purposes of guiding and supporting technology in education. ISTE was formed in 2002 for the purpose of leveraging the use of technology in K-12 education to enable students to learn effectively and live productively in an increasing digital society (ISTE, 2009). ISTE is an organization for educators and education leaders geared towards advancing the use of technology in schools across the United States. ISTE represents more than 100,000 members globally. An important part of their mission statement is:

1) to engage educational leaders in improving learning and teaching;
2) to connect educators to the ways technology is used to provide systemic change in the U.S. school system; and
3) to ensure that technology use is improved in schools across the country.

ISTE developed National Educational Technology Standards for students, teachers, and administrators. These ISTE Standards have been broadly adopted across the United States and in many countries worldwide. ISTE also hosts an annual conference and leadership forum that focuses on exploring and developing critical issues in leadership and technology. ISTE standards for advancing digital-age leadership. ISTE developed the five National Educational Technology Standards for Administrators (NETS.A) in 2002 and then revamped the NETS.A in 2009. ISTE has specific standard sets that apply to students, teachers, administrators, coaches, and computer science educators, respectively. The ISTE Standards for Students evaluate "the skills and knowledge students need to learn effectively and live productively in an increasingly global and digital world" (p. 1). The ISTE Standards for Teachers (2009) evaluate "the skills and knowledge educators need to teach, work, and learn in an increasingly connected global and digital society" (p. 2). The ISTE Standards for Administrators evaluate "the skills and knowledge school administrators and leaders need to support digital-age learning, implement technology, and transform the instruction landscape" (p. 3). Finally, the ISTE Standards for Coaches evaluate "the skills and knowledge technology coaches need to support peers in becoming digital educators," while the ISTE Standards for Computer Science Educators evaluate "the skills and knowledge that computer science educators need to reach, inspire and teach students in computing" (p. 4).

The motivation for the development of the National Education Technology Standards (NETS) was the recognition that administrators play a pivotal role in determining how well technology is used in the school system today. Successful administrators model and promote the frequent and effective use of technology through setting standards to which their district can adhere. Through providing learner-centered environments that are equipped with technology and

learning resources to meet individual needs, administrators can tend to the diverse needs of all learners (International Society for Technology in Education, 2009). Moreover, they are able to ensure effective practices in the study of technology and its diffusion across the curriculum (Handler & Strudler, 2007). According to the National Education Technology Standards, educational administrators model and facilitate an understanding of social, ethical and legal issues and responsibilities related to an evolving digital culture (International Society for Technology in Education, 2009). Administrators work tirelessly to promote and model responsible social interactions related to the use of digital information and technology (International Society for Technology in Education, 2009). Furthermore, successful administrators utilize technology such as computers, cameras, cell phones, printers, headphones, and Google Docs to facilitate education (International Society for Technology in Education, 2014).

National Educational Technology Plan (NETP). Around the same time that ISTE revamped the NETS.A Standards, the Office of Educational Technology of the United States Department of Education published *Transforming American Education: Learning Powered by Technology*, also known as the National Education Technology Plan (NETP) in the spring of 2009. NETP was first developed in 2004 and the Department of Education was tasked with providing a system of support for student learning consistent with the educational goals of that time. The plan, which was updated in the spring of 2009 to address newer issues of technology and the propagation of the Internet, was developed by more than 300 individuals and educators from across the country. Leading educators and educational technology experts including various focus groups generated the initial ideas for the new plan and eventually implemented the second and most current version of the plan via their website in August 2009. Since then, both ISTE and

NETP have enjoyed a supporting relationship in helping educators and educational leaders find ways to address the broader issues of technology use in schools.

Superintendents' role in leading digital-age learning cultures. The emergence of national and state standards for technology leadership has important implications for superintendents. School district superintendents, as executive leaders, have the responsibility for advancing digital-age leadership including creating, promoting, and sustaining school district digital learning cultures. One of the recommendations of the California P-16 Council is that the state "fully fund the California High-Speed Network to ensure that every school, district, and county office of education has access to 21st century technology to help the students most in need" (California P-16 Council, 2008, p. 54). The California K-12 High-Speed Network (HSN) is a state program that provides high-speed internet access to educators and students in order to support learning and achievement. The council "is concerned that the districts most in need of internet access are still not receiving the service" (p. 55).

Determining the value of technology in schools has challenged educational administrators for more than 20 years and thereby accentuating student learning. Research studies by Bransford, Brown, and Cocking (1999); Gordon (2000), Roschelle (2003), and Means (2010) hypothesize that there are various new technological innovations and features, which when combined with the principles of learning, indicate commitment to improving the educational digital culture. This includes the use of Web 2.0 tools, social media, the propagation of tablets and other smart devices.

Leaders of educational establishments are accountable to ensure that the highest standards are met within their schools (Huber, 2010). Therefore, these individuals are also role models for both students and teachers alike. From this perspective, these leaders need to take

responsibility for creating, promoting, and sustaining a digital learning culture within their respective environments (Slater & Nelson, 2013). To ensure that this is possible, a number of codes of practice and standards have been developed (ISTE 2001a, 2001b, 2007, 2008, 2009). This helps to guarantee that these leaders adopt ethical, inspiring, and sustainable practices.

Barbara Levin and Lynne Schrum (2013) list eight qualities that highly effective district leaders need to focus on in order to integrate technology for the purpose of creating, promoting, and sustaining a digital learning culture: "(a) vision, (b) leadership, (c) school culture, (d) technology planning and support, (e) professional development, (f) curriculum and instructional practices, (g) funding, and (h) partnerships" (p. 36). The authors stress that to successfully integrate technology, the leader must focus on more than just planning and supporting technology. Each piece is integral for sustaining technology once the planning and purchasing are complete.

First, the leader must have a clear vision about why the use of technology is important and clearly convey that vision to others. It is important that the leader model this vision in the policies and practices that he or she creates. Second, the leader must empower others. Successful leaders use the distributive leadership model, which allows others to share ideas about technology implementation and spear head efforts to research its effectiveness. The leader must maintain high expectations of how the technology will be used and work collaboratively with all stakeholders to discuss what is best for the learner and how it is best implemented. The leader must ensure that ongoing professional development takes place in the form of peer mentoring, group discussions, and peer-led training. This training must help the teacher refocus their instructional strategies to match the skills and literacies needed for digital learning. Finally, the leader must find creative ways to fund technology by supporting learners who bring their own

devices and collaborating with community partners including parents, businesses, and local college who can provide grants, donations, human resources, and expertise.

Superintendent challenges and needs. In order to be successful, today's superintendents must understand how technology can support the mission of their respective school districts. Technology can be used to drive down costs, improve efficiencies, extend learning opportunities to more students (both inside and outside of school), and enhance teaching and learning (eSchool News, 2014). Specifically, the internet reduces costs for superintendents within their districts, as it simultaneously raises awareness. For example, social media reduces unnecessary spending as it allows districts to share information with the click of a mouse, rather than by using costly printed flyers, handbooks, etc. In addition to reducing spending, online campaigns raise billions of funding dollars annually, and there are even social media ROI (return on investment) calculators, dedicated to helping leaders, such as district superintendents, gauge the efficacy of online campaigns (Bull et al., 2008).

Superintendents can also utilize technology not just to share information but also to extend learning opportunities. It is important for education leaders to collaborate with one another in order to share best practices. The internet can aid with the development of digital learning communities, thus superintendents can not only find support in advancing their own vision, but can also demonstrate the importance of interconnectivity for other educators (Barkley, 2012).

With technology rapidly evolving, superintendents must lead their districts through an ever-transforming education landscape. In a digital-age society, superintendents can effectively utilize technology to cut costs, raise fund, share information and extend learning opportunities. Given the potentials of what technology can do to education through the leadership of

superintendents, it is a fact that superintendents face a number of challenges in achieving the aforementioned technological goals.

According to Nagel (2013), some of the challenges that face superintendents today in implementing technology in their school districts are the lack of opportunities for the professional development of staff in order for them to implement technological changes and the resistance to change on the part of some staff and school leaders. Another major challenge among superintendents in the implementation of technological change is their limited funding in purchasing software that schools need. According to the study of Natriello (2001), schools in areas with lower socio-economic status purchase software that was more geared towards rote memorization for drill and practice use; whereas, more affluent neighborhoods more often purchased software to promote creativity and independent work. This shows that access to relevant technology is a big challenge among school districts considering that it is what the 21st century education requires (Muth, 2012). In order for superintendents to be successful in achieving technological goals in improving education, they must first acknowledge their challenges and then begin to find solutions to their districts' specific problems and challenges.

Problem Statement

California K-12 public school district administrators have a responsibility and opportunity to ensure that classroom teachers and students are utilizing the most updated and emergent technologies today as well as ensuring that these technologies are used for improving student learning. The superintendent, as the top executive leader of a school district, has great influence and responsibility related to district policies, practices, budgets, resources and accountability in general. Superintendents play an important role in determining what value, time, attention and resources should be allocated to specific initiatives. With regards to

technology, as for other initiatives, a superintendent's beliefs, values, knowledge, and experience related to technology influence the nature of technology use district-wide (Velchansky, 2011). A key resource for superintendents concerning expectations and practices for leading in the digital-age learning culture are the NETS.A standards (Garland & Tadeja, 2013). The NETS.A standards on Digital-Age Learning Culture specifically relate to creating, promoting and sustaining a digital-age learning culture for administrators:

1. Ensure instructional innovation focused on continuous improvement of digital-age learning;
2. Model and promote the frequent and effective use of technology for learning;
3. Provide learner-centered environments equipped with technology and learning resources to meet the individual, diverse needs of all learners;
4. Ensure effective practices in the study of technology and its infusion across the curriculum;
5. Promote and participate in local, national, and global learning communities that stimulate innovation, creativity, and digital-age collaboration. Engage in an ongoing process to develop, implement, and communicate technology-infused strategic plans aligned with a shared vision.

Other training from the Technology Information Center for Administrative Leadership and Computers Using Educators organizations can be acquired as resources for superintendents. Harvard University hosts an annual leadership institute for superintendents that develop essential skills and strategies to implement systemic reform where effective leadership is necessary.

There is a need for district leadership in relation to student achievement. There are different technology tools for leaders to use and improve curriculum, instructional practice, student learning, and achievement. Standards have been developed to guide and inform district leaders as to how to implement key practices to support growth as well as recognize key knowledge and skills needed by leaders to successfully meet the expectations set forth by

national agencies. Some leaders have embraced standards and are working strategically and purposefully to meet standards; others are not, due to unawareness or the need for more guidance or support as to how to meet standards. In order to support these superintendents, more investigation is needed to learn exactly what they do know and to understand areas for further growth. Organizations, therefore, need a strategic agenda with respect to their technology planning that outlines how they will increase student achievement in the process.

Expectations for leading learning in a digital-age learning culture as well as resources to support the achievement of these expectations exist. However, no formal study has been conducted to determine how California K-12 public school district superintendents create, promote and sustain a digital-age learning culture for all students. In addition, no formal study has been undertaken to determine what California K-12 public school district superintendents perceive to be leadership challenges associated with creating, promoting and sustaining a digital-age learning culture and what is needed to address such challenges. Therefore, there is a compelling need to investigate how California K-12 public school district superintendents create, promote, and sustain a digital-age learning culture, and in so doing, raise awareness and provide superintendents with the means by which they will be able to assess their own technology use and readiness in creating, promoting, and sustaining a digital-age learning culture.

Purpose Statement

The purpose of this survey research study is to explore and describe how California K-12 public school district superintendents create, promote, and sustain a digital-age learning culture for all students. A second purpose of this study is to identify and describe what these superintendents perceive as the challenges related to creating, promoting, and sustaining a digital-age learning culture for all students and what they believe is needed to address these

challenges. A survey consisting of quantitative and qualitative questions will be administered electronically to all participating California K-12 public school district superintendents.

Importance of Study

An important purpose of superintendent-preparation programs and professional leadership organizations is to develop and support the required knowledge, skills, and dispositions of aspiring and existing superintendents to lead and improve student and adult learning. The results of this study may provide such preparation programs and organizations with data that may further enhance their curricula and services to better prepare and support aspiring and existing superintendents to lead learning using innovative technology. The results may provide insight as to how superintendent-preparation programs can better prepare incoming superintendents or other leaders at the global level in school leadership. This information may be valuable to an incoming superintendent and may help him/her to implement appropriate strategies as a leader.

Additionally, school boards that support superintendents' continuous learning may also benefit from the results of this study. Superintendents are challenged by the responsibility to demonstrate results in student learning and to show how technology is affecting the way in which student success is demonstrated. They might use the outcomes of this study to influence their local school board members as to the need for more support and resources for district leadership professional development related to technology use and to encourage greater attention and resource allocation for district planning in technology initiatives. In addition, given the challenging economic landscape nationally and in California and the need to be particularly prudent with school district money and resources, superintendents need to demonstrate fiscal

accountability for money expended for technology-related learning and the implementation of learning technologies.

Professional leadership organizations that support aspiring and current superintendents may also benefit from this study. These kinds of organizations have a history in developing school leaders at the global level. The information may prove to be valuable in adjusting the focus to the most current trends in developing leaders and their technology prowess.

Superintendents themselves who are interested in learning about the status of other superintendents creating, promoting, and sustaining a digital-learning age may be interested in learning more about the challenges and needs of their school district with respect to this study. Professional development as an ongoing and self-imposed training could help superintendents understand the latest use of technology and how leaders prepare for it in their school districts. The results could be valuable in their own planning of systemic changes in their respective school districts.

Definition of Terms

The following acronyms and terms will be frequently used in this study and throughout this dissertation:

- *21st Century Learner:* An individual who is electronically connected to other learners and resources around the world, which helps them to become problem solvers and effective communicators (McCoog, 2008).
- *Digital Age:* A period in history in which the wide use of information and computerization is used (Gray, 2011).

- *Educational Technology:* The study and practice of learning and improving performance by creating, using, and managing appropriate technological processes and resources in education (Nye & McConrville, 2007).
- *Emerging Technologies:* New technologies that are currently being developed and which are expected to substantially change the current business and social environment or practice (Gordon, 2000).
- *Innovation:* A significant or positive change, act, or process in which new ideas, devices or methods are introduced (Twigg, 2005).
- *Instructional Technology:* A field of practice that includes the design, development, use, management and evaluation of process and resources of learning with technology (Bower, Hedberg & Kuswara, 2010).
- *ISTE:* Acronym commonly associated with the International Society for Technology in Education, which is a membership association for educators and educational leaders in the field of educational technology.
- *K-12:* Acronyms commonly used to define the school grades of kindergarten through grade twelve (Wehling, 2007).
- *Learning Culture:* An organization committed to training and learning for the process of sharing and communicating shared goals (Argyris & Schon, 1978; Kim, 1993; Senge, 1990).
- *NETP:* Acronym commonly associated with the National Educational Technology Plan. (Wehling, 2007).
- *NETS.A:* Acronym commonly associated with the National Education Technology Standards for Administrators (International Society for Technology in Education, 2002).

- *Professional Learning Communities:* A conceptual model where educators work collaboratively in collective inquiry to achieve better results for the students they serve (Beetham & Sharpe, 2013; Palloff & Pratt, 2010).
- *Universal Design for Learning:* An educational framework that uses instructional materials and methods that make learning goals achievable by individuals with widely differing abilities (Summerville & Reid-Griffin, 2008).
- *Visionary Leadership:* An individual who is cable of creating and articulating a realistic and credible vision of leadership (Garland & Tadeja, 2013; Turner, 2013).

Conceptual Framework Introduction

The conceptual framework for this study is grounded in the findings of transformational leadership and organizational learning theory. Kenneth Leithwood's tranformational leadership theory contends that core leadership practices are continuously refined and improved upon. In creating a digital-age culture, leadership practices and improvements need to be both fluid and ever changing. Leithwood identifies three core leadership practices: leadership, setting direction, and the interplay between people and groups are all critical for successful leadership. The educational context of which these core leadership practices are a part is essential for successful leadership and ultimately for designing and influencing the culture of the workplace.

A second framework for this study relates to organizational learning theory as presented by Chris Argyris. Learning has been associated with organizational theory since the 1930s (Argyris, 1992). Organizational learning is a process of detecting and correcting error (Argyris, 1992). Argyris contends that if an individual is given an opportunity to make changes outside of the realm of his responsibilities, this double-loop learning allows individuals to detect and correct errors (Argyris & Schon, 1978). In creating a digital-age culture that both promotes and

sustains itself, administrators will need to constantly detect and correct errors in their leadership practices.

Research Questions

The following three central research questions will guide this study:

1. What practices are utilized by California K-12 public school district superintendents to create, promote, and sustain a digital-age learning culture for all students in their districts. What do California K-12 public school district superintendents perceive to be their greatest challenges concerning creating, promoting, and sustaining a digital-age learning culture for all students in their districts?
2. What do California K-12 public school district superintendents perceive to be their greatest challenges with regards to creating, promoting, and sustaining a digital-age learning culture for all students in their districts?
3. What do California K-12 public school district superintendents believe they need to address challenges related to creating, promoting, and sustaining a digital-age learning culture for all students in their districts?

Delimitations

The study will be delimited to currently practicing K-12 public school district superintendents in the state of California. Although there are five NETS.A technology leadership competencies, this study will be limited to the standard known as *Digital-age Learning Culture* and will include the topics of creating, promoting and sustaining a digital-age learning culture:

Ensure instructional innovation focused on continuous improvement of digital-age learning.

- Model and promote the frequent and effective use of technology for learning.
- Provide learner-centered environments equipped with technology and learning resources to meet the individual, diverse needs of all learners.

- Ensure effective practice in the study of technology and its infusion across the curriculum.

- Promote and participate in local, national and global learning communities that stimulate innovation, creativity and digital-age collaboration. Engage in an ongoing process to develop, implement and communicate technology-infused strategic plans that are aligned with a shared vision.

Limitations

Survey responses will be self-reported. The population will be invited and the sample will be made up of superintendents from California who volunteers to participate. Study results will not be generalized to the entire population of California superintendents or to superintendents outside of California. Bias may occur in the results of this study because it will be based on superintendents' self-perceptions, not on direct observations.

Assumptions

An assumption in this study is that superintendents influence learning culture in a school district. Another assumption is that superintendents are the most knowledgeable about their own technology use, preparation, challenges, and resources needed to adapt and make further changes. A third assumption is that superintendents will be open and candid and give honest, accurate, and thorough responses to the survey questions. In order to support such response, the researcher will protect the anonymity of respondents. A fourth assumption is that the ISTE Leadership Standards for Leading Digital-age Learning Cultures are well-developed and a credible source of expectations for educational leaders, including superintendents. Finally, it is assumed that technology plays a very important and positive role in 21st Century Learning and digital-age learning cultures in schools and districts.

Organization of the Study

This study will be structured in the following five chapters:

- Chapter 1 provides an introduction and background, statement of the problem, purpose of the study, research questions, significance of the study, limitations of the study, definitions of terms, and organization of the study.
- Chapter 2 reviews the literature on technology, communication, instructional technology, and leadership. The literature review focuses on the key elements within educational technology.
- Chapter 3 describes the research design and outlines the methodology used in this study. The qualitative approach will be used in the research instrument outlined in this chapter. The nature of the study, objective, analysis unit, population and sample, characteristics to be studied, definition of characteristics, data collection, analytical techniques, and summary are to be included.
- The results of this study will be outlined in Chapter 4. The data will be analyzed and presented using the appropriate statistical figures and tables to answer the original proposed research questions.
- Chapter 5 will outline the summary of findings, conclusions, implications for policy and practice, recommendations for further research.

Chapter 2: Review of the Literature

The main purpose of this survey research study is to explore and describe how California K-12 public school district superintendents create, promote, and sustain a digital-age learning culture for all students. A second purpose of this study is to identify and describe what these superintendents perceive as the challenges related to creating, promoting, and sustaining a digital-age learning culture for all students and what they believe is needed to address these challenges.

The content and organization of this comprehensive literature review includes the following: a) a description of the literature search strategies and extent and nature of the literature; b) the conceptual framework for the study; c) evolution of a digital-age society in the US and globally and discussion related to how technology has influenced contemporary personal and work-related communication and interaction; d) background for the emergence of digital learning cultures in K-12 education and the transformation of teaching practices and student learning; e) the origin and evolution of national and California professional standards for K-12 education leaders, including technology specific standards; f) the role and responsibility of the district superintendent for leading digital-age learning cultures; g) superintendent challenges related to leading digital learning cultures; h) superintendent perceive needs related to leading digital learning cultures; and finally i) a chapter summary.

Literature Search Strategies and Extent and Nature of the Literature

The researcher utilized multiple sources to search for literature on leading with technology. The majority of information was located in the various university Online Library in the Academic Search Elite, EBSCO, ERIC, and ProQuest databases. Textbooks from traditional libraries as well as commercial and consumer stores were also utilized.

Literature from multiple disciplines was accessed including psychology, education, business, and sociology. Peer-reviewed journals, dissertations, textbooks, websites and newspaper articles were utilized to find historical, empirical, and theoretical information pertaining to the topic. There was a large body of literature pertaining to leadership and change theory. However, there was little information on how superintendents lead with technology.

Conceptual Framework

The conceptual framework for this study is grounded in the research of Leithwood and Riehl who in a series of papers from 1994 to 2003 identified the importance of leadership practices that influence student learning and in the research of Argyris and Schon (1978) who are credited with developing organizational learning theory.

Leithwood and C. Riehl (2003) completed extensive research regarding the field of educational leadership at the school level. The core leadership practices first identified by Leithwood and Riehl (2003) were setting direction, developing people, and redesigning the organization. These core practices were further refined by additional research presented in Jones (2010). In their 2003 work, Leithwood and Riehl provided examples to show that the three core leadership practices are valuable in almost any educational context. Since the three leadership practices are essential for successful leadership and, ultimately, for student learning, these three categories and subcategories of leadership form the overall framework of this research study.

Setting direction is described by Leithwood and Riehl (2003) as a critical factor for success. According to their research, the school district administrator must be the catalyst for promoting positive working relationships among all the communities both within and outside the school, with a specific direction (vision) in mind. They describe how building relationships is a key factor in improving and sustaining an interdependent network of relations that continually

advance the institution with a common purpose. As a result, the ability to clearly communicate the goals and overriding vision of a school is identified as fundamental to ensuring success within a school.

Developing people and their skills is identified as another critical component. The interplay between people and groups is crucial for successful leadership, according to Leithwood and Riehl (2003). Isolation, therefore, does not grow an organization, and if the members of the organization are not connected to one another, the system is set up for failure – or at the very least, for mediocrity (Levy, 2010).

The third core leadership practice, redesigning the organization, is described by Leithwood and Riehl (2003) as the ability to mobilize an organization to take decisive action and constructively change the organizational body itself or the institution it encompasses. When this is fully realized, individuals are empowered to improve the organization. (Fullan, 2005).

Leithwood Seashore, Anderson, and Wahlstrom (2004) show that successful instructional leaders can play a significant role in improving student achievement. Their research demonstrates that leadership is second only to classroom instruction among all school-related factors that contribute to what students learn at school (Ibid., p. 3), and the direct and indirect effects of leadership on learning account for approximately a quarter of the total school effects as a key to successful reform implementation (Hallinger & Heck, 1996; Leithwood et al., 2004).

In addition to core leadership practices attributed to the research of Leithwood and Riehl (2003), the conceptual framework for this study is also informed by the work of Argyris and Schon (1978) in Organizational learning theory. According to these authors, an organization that learns works efficiently, readily adapts to change, detects and corrects errors and continually improves and engages in organizational learning (Argyris & Schon, 1978). The focus of the

research presented is how organizations and the people within them made sense of their knowledge. They described three types of learning in organizational learning: single-loop learning, double-loop learning, and deuteron-learning. Argyris and Schon (1978) explain:

> Organizational learning involves the detection and correction of error. When the error detected and corrected permits the organization to carry on its present policies or achieve its present objectives, then that error-detection-and correction process is single-loop learning. Double-loop learning occurs when the error is detected and corrected in ways that involve the modification of an organization's underlying norms, policies, and objectives. They reflect on and inquire into previous episodes of organizational learning, or failure to learn. They discover what they did that facilitated or inhibited learning. They invent new strategies for learning. (pp. 3-4)

> Argrys (1996) noted that most organizations have difficulties learning in the double-loop manner. Therefore, a third level of learning was proposed, namely "deutero-learning" or "triple-loop learning" which is "learning how to learn". While single-loop learning is about rules … and double-loop learning is about principles, … triple-loop learning is about strategies. … Triple-loop learning takes the form of "collective mindfulness" or awareness of ignorance gaps which motivates members of the organization to produce new structures and strategies for learning. (pp. 40-41)

Organizational learning theorists such as Argyris and Schon (1978), Kim (1993), and Senge (1990) postulate that for organizations to learn, individuals must learn. Argyris and Schon (1978) wrote, "individual learning is a necessary but insufficient condition for organizational

learning" (p. 20). Institutional learning is associated with a permanent change in individual capacity as a result of interaction with the environment according to Elliot (2001).

A digital learning culture entails involvement, ability for critical thought, cooperation and creative problem-solving (Johnson, 2013). An organization that has this capacity is defined by its leadership (Leithwood & Riehl, 2003). Organizational learning theory as developed by Argyris and Schon (1978) shows the importance of learning in order to create this kind of learning environment.

Evolution of a Digital-age Society

Personal computers emerged in the 1980s at an individual cost of about $2,000. The processing speeds at that time were a staggering one billion operations per second. But computers were stand-alone products and were not connected to a network or other systems (Sandoval, 2008). At that time, educators were asking how computers could be best utilized in the classroom; they were also afraid, however, that *they* would be replaced by computers and fearful of computer malfunctions (Shue, 2009).

The Internet and the World Wide Web was introduced to businesses, schools, and individuals in the 1990s. The Internet was widely discussed as a business tool and started providing services and advertising web pages (Gray, 2011). New graphics and multimedia tools were developed for the delivery of information and instruction using the Internet; many schools were rewiring for Internet access; a few schools installed web servers and provided faculty with a way to create instructional web pages.

Computer and Internet use has increased greatly over the past several years. Over 75% of American households have at least one computer as of 2011. Over 71% of Americans have Internet access (Technology in Education Consortium, 2014). This connectivity comes in the

form of laptops, smart phone, iPads, and other portable devices that allow the users to connect with others, share ideas and opinions, complete tasks more efficiently, and entertain themselves more easily. While these figures are high, they are also misleading. When compared by ethnicity, 76% of Caucasians, 83% of Asians, 58% of Hispanics, and 57% of Black households have internet access (Technology in Education Consortium, 2014). Inequity exists among different ethnic groups with regards to internet access.

Technology has also changed our workplace. According to Technology in Education Consortium, (2014), customer management, virtual meeting, project management, and accounting software has made the workplace more efficient and collaborative. Employees can now connect with resources and each other with ease. Workplace technology improves communication, encourages innovation, improves management, saves time, and increases mobility (Technology in Education Consortium, 2014). The downside to this is that with so much connectivity, it is difficult to leave work. Employees are finding that because their employer provides them with smart phones and laptops, they are expected to respond to calls and work outside of normal hours. Collaboration with individuals in different time zones may require overnight meetings. So while technology brings added benefit to the employer, it may create additional work for the employee who now struggles to balance work and home (Use of Technology, 2014).

In the field of education, advances in technology offer many benefits. Schools and individual teachers find it easier to communicate with parents and the community. Technology makes grading easier, lesson planning easier, provides access to additional information and resources, saves time, and helps the learner expand his or her learning opportunity beyond the classroom walls (Technology in Education Consortium, 2014; Nye & McConrville, 2007).

Technology also supports the theory of social learning by helping students collaborate and address authentic issues. One example comes from a *Delta Kappa Gamma* article about how two cities overcame racial tension after a sensational inter-racial crime (Nye & McConrville, 2007). The school officials in both towns used the fourth grade curriculum to create a bridge between the communities. The staff used video conferencing between the cities to discuss diversity and teach each other about the history and culture of their town. Students learned about their own history and culture, took pictures of historical places, and taught their peers across the river. The author states that although technology was an underlying factor of the project, it was never the focus (Nye & McConrville, 2007).

Advances in technology have also created problems. One issue involves information overload. Constant connectivity creates an environment where it is difficult to filter information or disconnect. In our media rich culture (including the school classroom), learners are continually bombarded with multimedia, unlimited information, and constant distractions (Shue, 2009). Other technology problems in the use of technology and internet include credibility of information, too much information and distraction, cyber-bullying and privacy of information. According to Chen, Pederson, and Murphy (2012), a human's working memory can only process approximately seven elements of information at a time, and thus, the information received so readily through today's technology is simply too much for them to process, which leaves little room for questioning its credibility.

The Emergence of Digital-learning Cultures

Digital-learning Culture is not precisely defined in literature. It is described by Garland and Tadeja (2013) as a connection to the daily life of children’s lives today. According to Garland, it is important and critical for educators to understand how children today think,

process, and learn in a digital world for them to integrate this knowledge within the school setting. Today, technology has evolved and both students and teachers are now leveraging its power in mobile use, social systemic media, gaming, and video.

One way in which students' interaction with curriculum has evolved is through the use of mobile learning devices. Utilization of these devices is becoming more and more prominent in society as it paves the way for learning at the school site level (Garland & Tadeja, 2013). Students today are now learning through interactive games and activities by utilizing MP3 players, iPads, smartphones, table PCs and other similar devices to enhance their learning experiences (Shelton & Scoresby, 2010; Schrum & Levin, 2009; Prensky, 2008). Videos are also now considered as powerful tools for learning ("Flipped", 2011) as they can jump-start the creativity of each learner (Twigg, 2005).

Like mobile learning devices, the use of social media and Web 2.0 tools is also making its way into the 21st-century classroom. Social media, which include Facebook and Twitter, are considered networking tools that provide opportunities for school leaders, teachers, and students to make connections. On the other hand, the Web 2.0 tools, which also utilize video and gaming to help students achieve their academic learning goals and understand complex situations in their subject area, are ever evolving and constantly changing (Bower, Hedberg & Kuswara, 2010). Students from kindergarten to 12th grade are now playing both simple and complex games on the Internet, which allows them to interact with the curriculum like never before (Shelton & Scoresby, 2011). Today, there is a veritable revolution taking place with the advent of media-rich social networking devices such as MP3 players, iPads, smartphones, tablet PCs and other devices. Because of these devices, today's learners are no longer interested in the old lecture format and they are tuning out the teachers who simply stand and deliver their lectures (Schrum

& Levin, 2009). However, as Prensky (2008) describes: “School instruction is still mostly cookie cutter and one size fits all, despite the fact that we live in an era of customization – students continually customize their buddy lists, photos, ring tones, cell phone skins, websites, blogs, and Facebook pages" (p. 43).

However, not all teachers, administrators, and learners have access to the new social networking tools because districts with limited or lesser funding cannot afford to acquire enough tools and equipment that a digital-age learning environment requires (Garland & Tadeja, 2013). Large organizations such as Dell and Verizon have recently provided grants and gifts of technology to many underserved children across the country (Schwartz, 2010). This effort addresses the National Education Technology Plan’s similar concern with diversity issues regarding underserved students needing technology. Although technology alone does not provide good pedagogy, digital-age tools can jump-start the creativity of each child (Twigg, 2005).

Transformation of teaching and learning practices. Though invented decades before, computers have begun to take prevalence in homes within the last two decades (Gearhart, 2011). Personal computers are now inexpensive and compact enough that they are found practically everywhere: in the home, in the school, in the library, etc. Further, smartphones are now capable of acting as stand-alone computer devices that can take pictures, search the Internet, and send e-mails. The development of such technology, which is increasing with every passing day, directly impacts the educational system (Gearhart, 2011).

Video is also a powerful tool for learning. The flipped school model, first developed by Johnathan Bergmann, is presented as a new approach and revolutionary way of thinking in which students watch video lectures at home and then ask questions during class time (“Flipped”, 2011). This type of inverted thinking and practice has made the learning system more student

centered as the students now get the opportunity to control what they want to learn, when to learn them and how they want to learn. The videos that are available for them to watch at home put the responsibility on the students as they are ones who must make the choice of watching the video or not at a time that is most convenient to them. This system is very different from attending a regular class session that has a prescribed schedule and venue. With the videos, a combination of the learning at home and enhancing what is learned at home during classroom discussions make the learning system more dynamic and interesting for both the students and the teachers.

Flipped learning gained popularity in 2007 after two high school teachers decided that they needed more time with their students in order to improve student learning. The result was a concept that has not only revolutionized education, but is making waves in the world of business as well. This instructional model flips the way traditional classroom instruction is taught. Flipped learning involves moving direct instruction and lower-level critical thinking activities out of the classroom environment and into the home environment and frees the classroom time up for differentiation, mastery, inquiry-based learning, and project-based learning. In a traditional classroom, most of the time is spent with direct instruction often in the form of lecture or group reading. In the flipped classroom, these activities are done at home using video and other multimedia freeing the instructor to help the students apply their understanding when they come to class (Bergmann & Sams, 2013).

In its most basic form, the teacher creates or locates a video that explicitly instructs students in a concept or objective. There are many places to acquire such videos online or the teacher may choose to create the video lecture his or herself. If the teacher is teaching for differentiation or mastery, the flipped classroom may be run through a learning management system such as Moodle, Blackboard, or one of several other online learning platforms. These

platforms often allow the teacher to place students in groups based on needs (such as English language learner, enriched, remedial) and assign different learning resources at targeted levels to each group. The teacher can also assign other lower-level critical thinking activities that students can do independently. Assessments can also be taken and graded online. Once the student comes to class, the teacher is free to support the students as they apply higher critical thinking skills, such as analyzing complex texts, performing labs, working on formative projects, or working collaboratively to solve problems.

Various types of technology can connect both teachers and students to resources that were not available a decade ago. However, when such is properly utilized, the technology will help individuals to think and express themselves, and thus, make them better prepared for their future (Kreuger, 2009). Hoyle (2014) reported that we will soon be seeing giant tablets and 3-D printers used in classrooms, showing how rapidly technology shifts.

Using a lot of technology in the classroom does not necessarily lead to increased student achievement. As history teacher, Richtel (2011), reports about a seventh grade classroom in Arizona, “Hope and enthusiasm are soaring here. But not test scores” (p. 3). He further describes that as exciting as technology is for students, teachers and administrators to use, if its use is not improving learning outcomes, it may not be worth the high cost required to acquire the technology and keep it working and updated. Richtel (2011) wrote that “schools are spending billions on technology, even as they cut budgets and lay off teachers, with little proof that this approach is improving basic learning” (p. 3).

The surge in self-paced virtual learning classrooms is driven by four factors: "rapid growth of virtual schools, the dramatic increase in online students, the recession, and state budget cuts" (“Virtual Schools”, 2011, p. 6). Schools are turning to virtual learning to replace

programs that have suffered due to budget cuts such as summer school, credit recovery classes, and other specialized elective classes. K12 is one popular virtual school. It is focused on helping students who may not fit in to a traditional school due to their busy schedules, physical disabilities, military lifestyle, or philosophical beliefs. The school also offers specialized reading programs, summer school, enrichment classes, and recovery credits. Students can also take courses, which are not offered at their local school.

According to Kerr (2011), "Online learning has emerged as an alternative to traditional face-to-face instruction in American K-12 education" (p. 28). Teaching and learning in an online environment takes a change in mindset. Instructors must be very interactive with students in order to provide authentic, timely feedback, which provides scaffolding for learning objectives (Starr, 2009). The teacher must also encourage students to engage with both the curriculum and each other (O'Donovan, 2012). Kerr lists several best practices, which include providing multiple sources of content, always providing timely, thorough feedback, providing opportunities for student choice, providing regular opportunities for students to self-assess and refocus themselves on the learning goals, providing rubrics for expectations, providing models of how to collaborate and examples of final products, helping students integrate through social collaboration, and being clear about expectations and requirements up front (Kerr, 2011).

Technology has made it so that students have a wealth of information at their fingertips; they can view videos and complete exams through personal computers (Moore, Hampton, Bagin & Gallagher, 2012). Students can solidify their knowledge through receiving real-time results with comprehensive feedback. In addition to supplementing their education, technology has made it so that students have access to readily available information and can complete online courses to receive various qualifications and degrees (Moore et al., 2012). Progressive

advancements in the use of technology for learning have influenced expectations for educational leaders responsible for leading learning cultures and leadership standards have evolved over time to include more specific expectations related to leading digital-age learning cultures in schools and districts.

Evolution of Professional Standards for Educational Leaders of Digital-learning Cultures

Interstate School Leaders Licensure Consortium (ISLLC). The primary standards for educational leaders, including superintendents and principles, are those issued by ISLLC as last revised in 2008. They are:

- Standard 1: Setting a widely shared vision for learning
- Standard 2: Developing a school culture and instructional program conducive to student learning and staff professional growth
- Standard 3: Ensuring effective management of the organization, operation, and resources for a safe, efficient, and effective learning environment
- Standard 4: Collaborating with faculty and community members, responding to diverse community interests and needs, and mobilizing community resources
- Standard 5: Acting with integrity, fairness, and in an ethical manner
- Standard 6: Understanding, responding to, and influencing the political, social, legal, and cultural contexts

Despite having been issued well into the digital age, these standards do not rely on or mention the role of technology in education leadership beyond narrow and general guidelines. Standard 2 requires an educational leader to have knowledge of the role of technology in promoting student learning and professional growth without specifying the nature of that role. Standard 3 requires effective use of technology to manage school operations. Specific recommendations for the use

of technology are left to the judgment of the educational leader (Interstate School Leaders Licensure Consortium, 2008).

California Professional Standards for Educational Leaders (CPSELS) The CPSELS standards were developed in 2010 by the Association of California School Administrators to closely align with and augment the ISLLC standards for use by California education leaders while providing additional guidance. They are:

- Standard 1: Facilitating the development, articulation, implementation, and stewardship of a vision of learning that is shared and supported by the school community.
- Standard 2: Advocating, nurturing, and sustaining a school culture and instructional program conducive to student learning and staff professional growth.
- Standard 3: Ensuring management of the organization, operations, and resources for a safe, efficient, and effective learning environment.
- Standard 4: Collaborating with families and community members, responding to diverse community interests and needs, and mobilizing community resources.
- Standard 5: Modeling a personal code of ethics and developing professional leadership capacity.
- Standard 6: Understanding, responding to, and influencing the larger political, social, economic, legal, and cultural context.

Like the ISLLC standards on which they are based, they do not include specific standards for the use of technology. Standard 1 requires the technology leader to leverage and marshal sufficient resources, including technology, to implement and attain the vision for all students and all subgroups of students, without any further guidance. Standard 2 requires that educational

leaders facilitate the use of a variety of appropriate content-based learning materials and learning strategies that recognize students as active learners, value reflection and inquiry, emphasize the quality versus the amount of student application and performance, and utilize appropriate and effective technology, again without becoming more specific (American Association of School Administrators, 2007).

International Society for Technology in Education (ISTE) The International Society for Technology in Education, which is made up of members who include teachers, educational administrators, and other leaders and is focused on helping schools use technology, developed a set of technology standards to assist school leadership in appropriate use of technology. The official mission of ISTE is to empower learners to flourish in a connected world by cultivating a passionate professional learning community, linking educators and partners, leveraging knowledge and expertise, advocating for strategic policies, and continually improving learning and teaching (ISTE, 2008). ISTE holds conferences and workshops where people who work in education can share ideas and also offers resources like journals and books it publishes as well as standards for many areas of education. ISTE Standards for Administrators were designed for evaluating the information and skills that school administrators need to install to support learning using digital technology. These standards provide a starting point for school districts in which the role of the superintendent is being redefined to match new duties brought about by the rising use of digital technology.

- The first ISTE Standards for Administrators states that educational administrators must inspire and lead development and implementation of a shared vision for comprehensive integration of technology (International Society for Technology in

Education, 2007). This visionary leadership promotes excellence and supports cohesive transformation throughout the organization (Stager, 2007).

- The second standard explains how educational administrators are to create, promote, and sustain a dynamic, digital-age learning culture (International Society for Technology in Education, 2014). Through providing rigorous, relevant and engaging education, students will be more proactive and motivated in their learning experience (Stager, 2007).
- The third principal of professional practice is that educational administrators have an obligation to promote an environment of professional learning and innovation that empowers educators (International Society for Technology in Education, 2014).
- The fourth standard addresses systemic improvement, as administrators must provide digital-age leadership and management, in an effort to continuously improve the organization through effective use of information and technology resources (International Society for Technology in Education, 2014).
- The fifth and final standard addresses digital citizenship, explaining how administrators model and facilitate an understanding of social, ethical, and legal issues and responsibilities related to an evolving digital culture (International Society for Technology in Education, 2014).

National education technology plan. The National Education Technology Plan was released in November of 2010, the Department of Education constructed the National Education Technology Plan (NETP) after careful examination of 18 months' worth of input from educators, government officials and industry folks ("Ed.gov", 2014). Education Secretary Arnie Duncan

explains that the NETP was established in response to an ever-growing digital age; in his words, the goal of the NETP is to "dramatically improve teaching and learning, personalize instruction and ensure that the educational environments we offer to all students keep pace with the 21st century" (Murphy, Yff & Shipman, 2000, p. 2).

The National Education Technology Plan has been established to emphasize 21st-century learning, including competencies that address critical thinking, complex problem solving, collaboration, and multimedia communication (Russell, Lippincott & Getman, 2013). The document is over one hundred pages. It outlines and calls to action an ambitious agenda that transforms teaching and learning through technology (Russell et al., 2013).

The NETP is unique in that it illuminates not just what necessary skills should be taught in academia, but also how they should be taught, explaining that technology can be leveraged to provide personalized learning and to move away from a one-size-fits-all education system (Pearson, 2011). The NETP examines how technology challenges the traditional model of a teacher isolated in a classroom, promoting instead the idea of a world of digital knowledge (Pearson, 2011).

The National Education Technology Plan addresses both student learning and assessment, and teacher professional development, including our ever-growing technology infrastructure (Russell et al., 2013). Specific components of the NETP include providing adequate broadband and wireless access inside and outside of school, guaranteeing at least one Internet-enabled device for every student and educator, and the encouragement of cloud computing for school districts, freeing local IT resources for other purposes (Russell et al., 2013). The NETP doctrine explains The opportunities for education technology are limitless, borderless, and instantaneous (Pearson, 2011). The NETP stresses better availability of

educational and technology resources as a principal component to successfully instituting the plan (Pearson, 2011).

The NETP also addresses federal issues of privacy and technology, reiterating the Obama administration's larger commitment to universal broadband access (Ray, 2011). Furthermore, the NETP cites that changes to the Family Educational Rights and Privacy Act could open access to student data and enable better data portability for student and financial records, while changes to the Children's Internet Protection Act will open access to the Internet and influence how filtering works in schools (Ray, 2011).

The Role and Responsibility of the District Superintendent

The superintendent is the chief executive officer of a school district. As such, he or she is accountable for the administration of the school system. Part of the superintendent's duties include representing the school at meetings, representing the district's interests within the community and with government agencies. He or she acts as a problem solver for issues presented to the board and works with the board to develop programs and policies that reflect the interests of the community and the interests of the learner. The superintendent also is responsible for the direct operations and activities of the school system. This includes enforcing rules and regulations, developing a vision and long-range plan for instruction, managing the allocation of staff and funds, and providing guidance to the staff and learners (Moursund, 2013).

These functions require political savvy and the appropriate use of power. Power is the relationship between two individuals or entities (Miller, Salsberry & Devin, 2009). One uses power to influence the other. Superintendents can use various types of power including positive reinforcement, punishment, controller of information or support, and authority of position or as an expert. It is important to note that in this world of politics, other stakeholders can also hold

equal or greater power. The superintendent must delicately balance the use of power in order to create a healthy culture and a productive school (Miller, Salsberry & Devin, 2009).

In the district, the superintendent is a leader as well. Leaders do more than manage however. They lead by example and serve their constituents. Superintendents occasionally use their position reluctantly to enforce mandates and make unpopular decisions. "Superintendents' told of several instances when coercive power, (i.e., the ability to inflict punishment), was used on them under provisions of the *No Child Left Behind Act of 2001* (NCLB), compelling them to take certain actions with staff and students out of fear of sanctions" (Miller, Salsberry & Devin, 2009, p. 28). Superintendents also use informational power to counter misinformation, solve problems, and explain decisions. This proactive form of communication can only be accomplished through positive engagement with the educational community. The superintendent uses the legitimate power of his or her position to provide the vision and support the community as they make the vision a reality. Today's superintendent is a problem-solver and an effective communicator, and this can only be accomplished through positive engagement with the educational community. The superintendent may be the executive officer of the district, but he or she must be in tune with the individual members of the learning community. The superintendent's role in leadership and shaping the district's culture calls for a visionary leader who is passionate, relentless, courageous, and understands the politics of leadership. It requires purposeful leadership and personal commitment.

NETS.A Standards. The International Society for Technology in Education developed the NETS.A standards in 2002 for education leaders that included many of the elements from the Technology Standards for School Administrators Collaborative. ISTE was developed with the United States Department of Education, and Apple Computer and was funded by the National

Aeronautics and Space Administration. Using input and feedback from teachers, administrators and other practitioners in the field, ISTE developed these standards for defining roles and responsibilities that school leaders can use in evaluating the skills and knowledge needed to support digital-age learning and leading (ISTE, 2002).

In 2009 ISTE revised NETS.A into five standards which includes: Visionary Leadership, Digital-age Learning Culture, Excellence in Professional Practice, Systemic Improvement, and Digital Citizenship. These standards aim to strengthen the use of technology at all levels to enable students to learn quickly and efficiently in this modern digital society (Loertscher, Williamson & Redish, 2010).

According to the first NETS.A standard, visionary leadership includes having the ability to inspire and facilitate as many stakeholders as possible and encourage an ongoing process to develop strategic plans (ISTE, 2009). In a case study near Marin County, approximately 20 miles north of San Francisco, a director of educational services at Dixie School District indicated that it is important to include all stakeholders at the beginning of the process when delineating your vision (Garland & Tadeja, 2013). In order for technology to have a lasting effect, school administrators and even superintendents need to be able to define and communicate the role of technology at any level. Administrators provide technology leadership to promote the culture of learning. However, it is also their role to define how technology can impact student learning and to secure the requisite funding even in the face of budget cuts.

The second NETS.A requires educational administrators to provide a demanding, relevant, and engaging curriculum to support a dynamic, digital-age learning culture for all students (ISTE, 2009). Perhaps the biggest challenge in meeting the standards is for access to be acquired by all students (Natriello, 2001). Administrators will need to provide guidance and

support and more importantly, find ways to fund appropriate technologies to support these kinds of changes (Chang, Chin & Hsu, 2008).

The fourth standard includes systemic improvement and states that educational administrators will provide digital-age leadership and management to continuously improve the organization through the effective use of information and technology resources (ISTE, 2009). Administrators must be able to identify organizational change that needs to take place in order for systemic change to happen. One consideration is based on Maslow's (1943) Hierarchy of Needs, which is recommended by Johnson (2003) and which considers that any person's physical needs must be met before psychological needs are met.

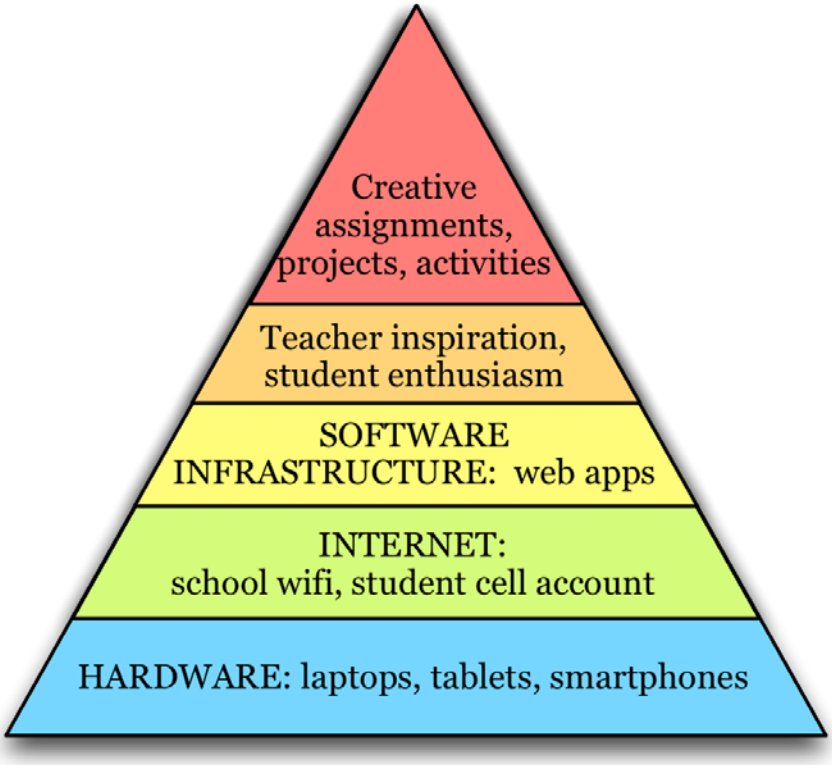

Figure 1. Johnson's Hierarchy of Educational Technology Needs (Johnson, 2003, p. 26).

Johnson (2003) suggests that a school's infrastructure and organizational SP infrastructure must be met before technology can be fully utilized or impact student learning. Administrators will not likely use technology if the technology continues to break down or if there are technical difficulties that make it unreliable or impractical. These needs are identified by Johnson and are necessary in order to provide teachers or administrators the support they need to effectively implement technology in the classroom.

Visionary leadership. The need for effective leadership in the use of technology is described as critical in literature (Miller et al., 2009). Chang defined a technology leader as "one who leads the school in improvement or restructuring, and uses emerging technologies as the core resources for educational change" (Chang et al., 2008, p. 241). The objective of technology leadership is to influence teachers to integrate information communication technology in their everyday instructional practices (Rivard, 2010).

The traits of visionary leadership were summed up by Turner (2013), who wrote that among other qualities visionary leaders are open to new information, sensitive enough that they can often see what others cannot, able to make accurate predictions from the present to the future, and have vivid imaginations combined with strong convictions. School superintendents with visionary leadership know how to "inspire hearts, ignite minds, and move hands" (Hoyle, 2005, p. 21). Their vision gives them ideas and shows them how to make those ideas become reality, while their leadership skills enable them to get others excited about the vision and be willing to go the last mile to make it work. Great leaders learn how to take risks, make strategic plans, actively listen to others, and "involve others in reaching their milestones and help the team members meet their personal goals" (Patrick, 2014, p. 5). Employment advertisements for superintendents now include the characteristic of visionary leadership as a requirement for an

administrator, such as a recent ad for a superintendent for the Plymouth-Canton School District in Michigan which “seeks an individual with visionary leadership” (“Superintendent”, 2012).

Superintendent Challenges

Digital-age learning culture. Digital technology has changed from being a supplemental component to an essential element of the educational environment (Krueger, 2010). Nagel (2013) discusses six major challenges to effective use of technology in schools; among those challenges is the lack of opportunities for professional development of staff and resistance to change on the part of staff and school leaders.

Laura Devaney, an editor for eSchool News, believes that the key to success for administrators despite the constant changes in technology is Teamwork. When school administrators, teachers, and staff members work together collaboratively, school operations and initiative are more efficient, (“eSchool News”, 2014). Devaney’s list of what superintendents need to do for successfully implementing technology includes engaging with other team members through conversations, getting feedback from other team members on their performance, complimenting other team members frequently, listening to team members, and interacting with team members outside of work to build good relationships.

The Partnership for 21st Century Skills created a framework of skills which students today will need to be successful in the workplace, including collaboration, creativity and innovation, critical thinking, communication, problem-solving skills, and information and media literacy and recommends that all these skills are necessary in helping students become more successful in all their learning endeavors (Partnership for 21st Century Skills, 2007). When students begin to have technology information and media literacy and when they know how to communicate and collaborate to solve problems, their creativity is encouraged and they are

challenged to think critically and thus become reflective in their thinking processes (Twigg, 2005). This is an environment where students are allowed to freely think and express themselves fully which enables them to become ready in taking the lead for further technology shifts in the future (Kreuger, 2009; Hoyle, 2014; Kerr, 2011). This type of learner within a technology-enabled environment is what the digital-age learning culture develops.

Schools have faced several challenges in attempting to implement these reforms while using technology in the teaching practice. A study done by Natriello (2001) revealed that schools in areas with lower socio-economic status supported purchasing software that was more geared towards rote memorization for drill and practice use; whereas, more affluent neighborhoods more often purchased software to promote creativity and independent work. Not addressing how technology can influence the vision or the digital divide suggests that access is still the most important aspect in using technology in the 21st century (Muth, 2012).

Krueger (2009) wrote that many superintendents do not consider technology as part of their job. Instead, they believe that keeping up with technology be left to the school district's technology officer. But for schools to be able to integrate cutting edge technology throughout the institution and get students ready for a world powered by technology, Steve Poling (2006) a blogger of the Dangerously Irrelevant website argues that the superintendent needs to lead the charge. Superintendents need to be able to visualize what is possible in spite of having little money or too few staff who can support technology. Being able to show off the latest gadgets can make an administrator seem up-to-date, but it is OK to lag behind the leaders and adopt solutions that are tried and tested writes O'Donovan (2012). Moersch (2010) presents a good case for using the LoTi survey along with the *LoTi Implementation* Cycle (Assess, Plan, Implement,

Sustain) to improve instruction, get students more engaged in learning, and increase achievement.

Excellence in professional practice. Superintendents who are effective will carry out regular monitoring of how much progress their school district has made toward goals related to achievement to make sure that these aspirations are what propel the district's actions (Waters & Marzano, 2006). Much has been written on the benchmarks necessary for these comparisons.

The LoTi educational consulting firm has developed three stages to use in addressing the rapid change in the roles of school administrators: Building Capacity, Implementing Change, and Sustaining Independence (LoTi, Inc., 2011) Superintendents who have exhibited excellent professional practices have used these tested techniques. Another organization, McREL, has considered whether or not how long superintendents stay in office affects student academic achievement and how their professional practice showed a positive correlation between superintendent longevity and achievement (“Editorial”, 2009).

Systemic improvement. Superintendents’ visions and plans or lack thereof can strongly influence motivation and studen achievement at a school. A report from the Center for Mental Health in Schools at UCLA states that to be able to have effective learning for all students, school leaders need to develop a framework that presents a coherent picture of a comprehensive, multifaceted, and cohesive set of interventions must be formulated and operationalized (“Transforming”, 2008). Developing a framework with those characteristics was shown to be a primary goal for a superintendent through McREL and has shown a statistically significant relationship (a positive correlation of .24) between district leadership and student achievement (Waters & Marzano, 2006).

From the meta-analysis of research on student success and school district leadership, Waters and Marzano (2006) identified five leadership responsibilities at the district level that showed a strong link to student academic achievement:

- The goal-setting process
- Non-negotiable goals for achievement and instruction
- Board alignment with and support of district goals
- Monitoring the goals for achievement and instruction
- Use of resources to support the goals for achievement and instruction (2006).

The superintendent responsibility that showed the strongest correlation with student achievement in this meta-analysis was in the area of having non-negotiable goals for achievement and instruction. Practices used in trying to meet those goals were modeling understanding of design of instructional, establishing clear priorities, adopting teaching methods that efficiently deliver the curriculum, incorporating varied teaching methods that work for a range of learning styles , adopting 5-year non-negotiable goals, and making sure that a preferred instructional program is followed (Waters & Marzano, 2006). Davis and Goodwin (2011) discuss pros and cons of the McREL teacher evaluation system that superintendents can use to assess how well teachers are doing in the instructional program that they implement.

Digital citizenship. Rules about proper use of tablets and other gadgets are being labeled by schools as part of "online ethics and digital citizenship" (Westervelt, 2013). School districts have enacted policies that govern what their idea of digital citizenship is and whether to filter or block some types of sites, including social media. Westervelt (2013) reports that some schools are taking the approach to educate students and their parents about appropriate use of devices instead of blocking social media sites, and many are putting into place systems of punishments for not using devices as mandated or rewards for using them well.

Johnson (2013) writes that the everyday definition of citizenship is being moved "to a new level, from the real-world interactions of years past to virtual interactions through social media" (p. 26). In some ways, a good digital citizen is not that much different from a good citizen in the community. Common sense rules of citizenship like respecting others and not causing discomfort or harm by bullying are becoming as valid in the cyber world as they are in the real world.

Ensuring instructional innovation. Instructional innovation is a key component to the NETS, as the administrators are encouraged to utilize an ongoing process to align with their vision of the development, implementation and communication of their technology-infused strategic plans (McElroy, 2004). Furthermore, the NETS intend to encourage administrators to advocate on local, state and national levels for policies, programs, and funding to support implementation of a technology-infused vision and strategic plan (McElroy, 2004). These standards are developed to facilitate systemic change such that teachers and students alike recognize the need for innovative teaching and learning methods that appeal to a greater audience than just traditional learners (McElroy, 2004). A large number of colleges and universities are moving away from the lecture base model of instruction and moving more towards the use of innovative instructional approaches intended on the continuous improvement of digital-age learning (Iverson, 2012). Many teacher education programs require its teacher candidates to take an entry-level educational technology class. Many administrators who were once teachers took the same required course. The course is foundational and needs continual revamping (Dunn, 2011). It often does not coincide with the kinds of technology that is being used in the classroom today making instructional innovation even more difficult. It is widely known that instructional design is a system of planning, implementing, and evaluating instruction

(Bolman & Deal, 2008). Although the research indicates that instructional design models to deliver technology enhance instruction can lead to effective teaching, there are few models for developing design skills that integrate technology into the education curriculum (Summerville & Reid-Griffin, 2008).

Modeling and promoting the frequent and effective use of technology. There are a number of policy standards that have been developed for use by educational leaders, which are based on empirical and quantitative research (Interstate School Leaders Licensure Consortium, 2008). These were relevant at the time they were published, however they are not meant as a static guide for all leaders (Darling-Hammond, Meyerson, LaPointe & Orr, 2009). Thus, these will need to be changed over time as technology evolves or as research identifies new approaches, which are applicable to educational leadership.

To ensure that technology use is promoted and effectively used within educational settings, models of expected behaviors have been developed (Ertmer & Ottenbreit-Leftwich, 2010). For example, administrators are expected to show that they personally and effectively use these technologies they must encourage their staff to do so to and ensure that they have access to the facilities that will enable them to learn to use these tools (ISTE 2001a; 2001b). Students must also be urged to utilize these different technologies to enhance their learning potential and experiences (Means, 2010). Students and staff utilize these standards in their classrooms so that they become embedded in learning practices (DiPaola, 2007). This will enhance student-learning opportunities whilst ensuring that the stipulated standards are met while technology is integrated into education (Nickerson & Zodhiates, 2013).

Providing learner-centered environments equipped with technology. Learners have different needs. They also learn in different ways and have stronger preferred learning modalities

(Polly & Hannafin, 2011). A teacher, for instance, cannot address all of the learning modalities of his or her students at any one given time despite the fact that a teacher is charged with this task on a daily basis in every classroom, in every class period, and every subject matter in which they teach. A computer, however, that is programmed in a student's preferred learning modality can actively increase the opportunity for that student to learn. A computer can do this every day, in every class period, in every subject area that is being taught. This can also be modified for English language learners, special needs, special education students, and other students of diverse learning needs.

Having a learner-centered environment requires teachers to recognize that their learners construct their own meaning (Narum, 2004). *How People Learn* reported that learning in these classrooms is viewed as the construction of a bridge between the learner and the subject matter, and the teacher in a learner-centered classroom watches both ends of that bridge (Driscoll, 2002). The incorporation of student as leader would be welcomed in such an environment. The philosophy of a learning-centered school is that of a learning association in which everyone remains an active learner, including teachers and administrators (Scruggs, 2009).

To implement a learner-centered philosophy, educators must have a clear perception of the ideology that guides the concept (Delaney, 1999). This philosophy requires an acceptance of fresh ideas and beliefs in technology and how it can be incorporated into the school districts. To ensure that all of the appropriate standards are met by superintendents, a number of diverse learning environments must be made available so that the needs of all students may be met (Beetham & Sharpe, 2013). For example, differing facilities will need to be made available for Geography (National Council for Geographic Education, 2013) or mathematics (Teachers of Mathematics Principles and Standards for School Mathematics, 2013). In conjunction with this,

the learning needs of individuals will also need to be considered alongside teaching strategies that could be used to meet these (Harris, Mishra & Koehler, 2009).

Thus, educational leaders need to consider a diverse number of factors such as, student learning styles, different technologies and how they may be utilized, teaching strategies or tools that will enhance learners' abilities (Means, 2010). Furthermore, superintendents must establish and share a vision with their staff so that flexible approaches to learning may be established (Ottenbreit-Leftwich, Glazewski, Newby & Ertmer, 2010). They must also consider how to integrate students' skills with innovative solutions to meet their learning needs through variable forms of technology media, which meet their educational needs (Pilgrim, Bledsoe & Reily, 2012). Each of these promotes diverse learning environments where all students' needs may be met (Lavigne & Mouza, 2013).

Barriers to implementing these requirements need to be considered (Bingimlas, 2009). For example, the way we communicate with all members of the school community must be considered. The use of technological solutions such as, blogs, wikis, podcasts, tweets or online forums may help to overcome these issues. However, this must be conducted in a safe and ethical manner (ISTE 2001a, 2001b). Therefore, clear parameters must be set before these technologies are used (An & Reigeluth, 2011). This will enable the effective use of these to implement efficient practices that will enhance the use of and the teaching of technology across the curriculum. Creating a digital-age learning culture means that administrators have to take a more proactive role and a more visible role in using technology at their school districts (Garland & Tadeja, 2013).

Many school districts are promoting a bring-your-own-device policy regarding smart phones, tablets, and other personal laptop computers (Walling, 2012). These kinds of devices

allow students to learn using the latest technologies that are available. It also allows teachers to utilize the latest technology to supplement their teaching and promote learning for all students. There is evidence that superintendents are working closely with their district technology coordinators to ensure that the latest technology is available in the district (Nelson, 2012).

Ensuring effective practice in the study of technology. To ensure that effective technology practices and the study of this is infused into the curriculum, a number of standards have been developed for diverse subjects (National Council for Geographic Education National Geography Standards, 2013; Teachers of Mathematics Principles and Standards for School Mathematics, 2013). In conjunction with these standards, technology tools and practices have been evolved for each subject areas to ensure that student learning is enhanced (Interstate School Leaders Licensure Consortium, 2008). The implementation of these standards also places a greater focus on the uses of technology in educational environments, ensuring that schools consider these elements when they develop their educational program.

Further to this are considerations for how technology may be utilized for learning. In the Interstate School Leaders Licensure Consortium Standard (2008), there are factors that must be considered for schools to focus on technology, its role and how it is related to educational leadership. Thus, from the top down, the role that technology plays in educational establishments is considered and learning is a two-way process where students study the use of technology while also learning about other subjects in their curriculum. As Clausen, Britten, and Ring (2008) have stated “to create essential conditions for effective technology use in schools, there needs to be an increased emphasis regarding both the knowledge and support administrators provide to teachers who want to integrate technology with instruction” (p. 20). These standards and the current uses of technology enable this to be implemented in practice.

There is considerable effort made on the part of teacher preparation programs to ensure that future educators include technology into their curriculum in order to supplement teaching (Rock, Gregg, Gable & Zigmond, 2009). Educators are now using computers as much or even more than students. Administrators are also using computers and many superintendents utilize blogs and websites to keep community stakeholders informed about the operations and well being of their respective school districts. Superintendents are asking more and more from their staff to incorporate technology into the school site (Schachter, 2010). District technology plans include proposals and strategies to incorporate the latest practice in technology into nearly all disciplines in the classrooms.

Promoting local, national, and global learning communities. The promotion of technology and its uses in an educational setting should also assist in fostering local, national, and global learning communities that stimulate innovation, creativity, and digital-age collaboration (Beetham & Sharpe, 2013). Here the standards, which have been developed to enhance and promote the use of technologies in schools, encourage teaching and learning strategies to be diverse (Interstate School Leaders Licensure Consortium, 2008). Administrators also need to consider how learning communities may be facilitated and maintained using different forms of technologies (Palloff & Pratt, 2010). The use of e-learning or online collaboration may lead to new learning opportunities for students and staff alike (Bonk & Graham, 2012).

There is growing evidence that school districts want parents and other community stakeholders to be involved in the growing technology needs of the students (Manzo, 2009; Esselman, Lee-Gwin & Rounds, 2012). School districts are working in collaboration with county and state offices to promote the use and innovation of technology. There is evidence of an

ongoing process to help school districts include a strategic plan to infuse technology for all students (Esselman, Lee-Gwin & Rounds, 2012). Teachers have the same opportunities to explore different teaching strategies, what has or has not worked in other learning environments (Bell, 2010; Dabbagh & Kitsantas, 2012).

Role of superintendent in shaping district culture. The role of school superintendent developed out of need. “The position of school superintendent is a product of growth and necessity. It was fashioned; it was not born.” (Wilson, 1960, p. 2). However, their responsibilities have developed with the needs of schools and the community they serve. The position of superintendent of schools in the United States did not have its origins in a pronouncement of a board of education or the creative mind of some board member (Thomas, 2002). Rather, it is a position “that evolved as the schools of this country evolved” (Norton, Webb, Dlugosh & Sybouts, 1996, p. 1).

The broad definition of the school superintendent is the chief executive officer of the school system that he oversees. However, the superintendent often times reports directly to the school board that often defines his role (Mirra, 2004). Superintendents became responsible for “planning and evaluation; organization; management of personnel; business, buildings, and auxiliary services; provision of information to the community; and coordination of the entire school system” (AASA, 1993, p.6). Besides serving a school board, the superintendent is often expected to respond to the community and other stakeholders that had multiple and sometimes conflicting agendas (Boyd, 1974; Cuban, 1976).

University preparation programs for superintendents is plentiful as many universities offer superintendent licensure to graduates of Ph.D. or Ed.D. programs in educational administration. However, because responsibilities of the superintendency vary dependent upon

size, location of district, state laws, local school boards, and other complexities, preparation programs are generalized to a great extent (Kowalski, 1999).

In the area of technology for schools, commonality is found amongst school leaders. Almost all schools today are wired and connected to the Internet. Because of Federal funding as well as state and local resources, superintendents will need to be prepared to provide leadership in the technology arena (Mirra, 2004). Superintendents working in concert with local school boards should be informed leaders capable of tapping into technology to strengthen teaching, learning, and school governance (Goodman & Zimmerman, 2000).

Technology preparation for school administrators. Very little study has been done on professional development of superintendents and the factors involving technology. This is partly because many superintendents get their training and skills on the job. University training programs are also poor or slow to develop or recognize that such skills are a necessary and essential component in developing future school leaders. School administrators therefore require on-going training and professional development in the area of leading with technology (Callan & Levinson, 2011).

To prepare superintendents with the above attributes, many superintendents are taking the lead with this goal by developing focus groups in their respective districts to determine the best applications possible (Wehling, 2007). Many educational leaders are modeling and backing 21st century practices and integrating them into the educational system. Administrators must coordinate and model these practices in all situations of their job (Callan and Levinson, 2011).

Responsibility of superintendent for student learning. Expectations of superintendents can be measured through progress reports, which have increased within the past decade. Specifically, the Superintendent Self-Assessment of Progress rubrics identify the expectations of

superintendents. Some of these expectations include appropriately directing resources to supply texts and materials necessary in order to implement aligned, rigorous, high quality curriculum, holding principals accountable for effective implementation of said curriculum, making weekly time in classrooms for monitoring, and utilizing tools such as the Evidence Tracker to systemize, track, and follow up on relevant feedback (Public Schools: State Board of Education, 2014).

With an increase in expectations, the evaluation of superintendents has subsequently undergone significant development. In 2003, the *Superintendent Evaluation Handbook* was released, identifying the unique challenges posed by the evaluation process while offering a descriptive three-tiered model of evaluation. Though an independent work, the evaluation model is anchored in the professional standards for superintendency established by the American Association of School Administrators (AASA), the National School Boards Association (NSBA) Key Work of School Boards, the Interstate School Leaders Licensure Consortium (ISLLC) Standards, and the National Technology Standards for School Administrators (The School Superintendents Association, 2014).

In a recent study, more than 75% of superintendents said they were treated fairly, while others shared concern that their evaluations are conducted through an informal, subjective process (Henderson & Livingston, 2011). However, with the implementation of No Child Left Behind, many schools are utilizing performance data while evaluating the superintendents. New assessments focus on the superintendent's prioritization of school system goals, clarifying the board's expectations of the superintendent, and reviewing the overall effectiveness of the district (The School Superintendents Association, 2013).

Through intensive evaluation and assessment of their expectations, it is clear that superintendents are an invaluable resource to current academia. Extensive evidence highlights a

simple but disheartening perception: The institution of public education is under siege and even the best-resourced and highest-performing school districts are in a fight for economic and political survival (Lytle & Sokoloff, 2013). Superintendents deal with the pressures and anxieties of students, their parents, teachers, principals, and school boards. Additionally, they must recognize how districts are coping with increasing competition and market pressures, while reflecting on one's leadership role, accomplishments, and challenges, both past and future (Lytle & Sokoloff, 2013).

In order to understand the value of superintendents, it is imperative that the complexity of the school system be addressed. Sargut, Gôkçe and McGrath (2011) stipulate that:

> Complex organizations are far more difficult to manage than merely complicated ones. It's harder to predict what will happen, because complex systems interact in unexpected ways. It's harder to make sense of things, because the degree of complexity may lie beyond our cognitive limits. (p. 11)

Though superintendents are bombarded with reminders that the present day school system can be inadequate for preparing students for the world in which they will exist based on information from the U.S. Department of Education, as well as educational research and policy institutes, the superintendents play a fundamental role in the success of an institution through their leadership, character, and energy brought forth in their profession (Farkas, Johnson, Duffett & Foleno, 2001).

A report published by the State Superintendent of Public Instruction indicates that performance to date has not met the required standards (State Superintendent of Public Instruction, 2012). In fact, it states that with little or no investment in capacity, low-performing schools get worse relative to high-performing schools. ...You can’t improve a school’s

performance or the performance of any teacher or student in it, without increasing the investment in teachers' knowledge, pedagogical skills and understanding of students. This work can be influenced by an external accountability system, but it cannot be done by that system (State Superintendent of Public Instruction, 2012, p. 10). This shows that in some circumstances superintendents have not been able to meet expectations or standards that have been mentioned in this review.

Creating, Promoting, and Sustaining a Digital-age Learning Culture

In order to effectively create, promote, and sustain a digital-age learning culture, schools and their leaders are gauging the efficacy of innovative resources, and evaluating the barriers to effective technology usage (American Association of School Administrators, 2007). Many schools and leaders recognize the need for set standards that guide the development and utilization of technology in school. Standards raise awareness about educational goals, the role technology can play and the importance of communication (American Association of School Administrators, 2007).

District leaders are now emphasizing clarity and simplicity of language, which is free from education jargon (Dell, Newton & Petroff, 2011) as key to creating a culture of the modern-day school. Through open and effective communication, the misconception that technology causes more problems than it fixes can be dispelled, and school leaders can begin to harness the advantages of certain technological advances (Dell et al., 2011). Through adhering to technological standards, school leaders and teachers can unite to establish an environment that facilitates learning through embracing our digital age, rather than hiding from it (Dell et al., 2011).

McREL analysis. A study of a superintendent's professional methods was the Mid-continent Research for Education and Learning (McREL) comprehensive analysis of the superintendency, which was released in a report in 2006. In this study, Waters and Marzano (2006) created four major findings. These findings are: (a) District-level leadership matters, (b) Effective superintendents focus their efforts on creating goal-oriented districts, (c) Superintendent tenure is positively correlated with student achievement, and (d) Defined autonomy.

In a recent report published by the State Superintendent of Public Instruction entitled *Greatness by Design: Supporting Outstanding teaching to sustain a Golden State,* a number of recommendations were made (State Superintendent of Public Instruction, 2012). This stipulates how superintendents must prepare and support their administrators. In short, the report details a number of measures across seven chapters.

- Recruiting and retaining top candidates in all teaching fields and for school leadership positions and ensuring that they are available in all of the communities, schools and classrooms where they are needed (Chapter 2);
- Preparing educators to support all of California's diverse students in acquiring the 21st century skills that will make them college- and career-ready (Chapter 3);
- Inducting novice educators – both teachers and administrators – into their challenging work with strong supports and the help of expert veterans (Chapter 4); Developing the knowledge and skills of all educators throughout their careers through readily available, high-quality professional learning opportunities (Chapter 5);

- Evaluating teachers, principals and other educators in ways that provide valid and useful information about effectiveness, support continuing growth and enable timely and accurate personnel decisions (Chapter 6);
- Expanding leadership capacity by creating career development pathways that recruit, develop and deploy mentors, coaches and other leaders in teaching, curriculum, assessment and administration and that create systems for sharing expertise throughout the system (Chapter 7). (State Superintendent of Public Instruction, 2012, p. 13-14)

Each of these is derived from three priorities which as:

> Creating a coherent continuum of learning expectations and opportunities for educators across their entire careers…Developing a learning system in California that supports collaborative learning about effective practices among educators, across schools and districts, between and among school boards and unions and within state agencies. …Developing a consistent revenue base for high-quality professional learning from initial preparation and induction through ongoing career development by creating a category of flexible funding for professional learning" (State Superintendent of Public Instruction, 2012, p. 13).

Through the advent of technologies such as Smartboards, computers, projectors, Skype, iPads, Google Docs, etc, superintendents are able to organize their districts and allocate their resources in an unprecedented manner (American Association of School Administrators, 2007). Surpassing proficiency in core subject matter, students now have the obligation to be media and information literate. Statistically, to be successful students must become globally aware and skilled with modern, updated technological devices (American Association of School Administrators, 2007).

There are committees, conferences, and doctrine dedicated to answering fundamental superintendent questions (American Association of School Administrators, 2007). These questions evaluate how the usage of technology aligns with curriculum and instructional goals, as well as why and how technology can be effectively implemented into the district to benefit administration, teachers, and students alike (American Association of School Administrators, 2007). This evolution was an introduction to the superintendent as instructional leader (Sharp, 1997).The increasing call for accountability that superintendents have to maintain also qualifies the superintendent to be a change agent and instructional leader (Glass, Bjork, & Brynner 2000). When surveyed in 2000, Glass et al. (2000), found that 28.9% of superintendents felt that their role of being a change agent was their primary role. However, bringing about change can cause conflict and apprehension for school boards and other school stakeholders. A similar study by Glass et al. (2000), also found that 25% of superintendents surveyed indicated that their primary role was to be an instructional leader.

Today's contemporary superintendent has more demanding roles. In 2007, superintendents understood their role to include instructional leadership, evaluation of student performance, and providing professional staff development. However, superintendents also expressed frustration because although their roles today have increased none of their roles from previous years have either decreased or abated (Bredeson & Kose, 2007). The 21st century superintendent frequently works with his/her external environments rather than in isolation (Antonucci, 2012).

Technology integration. Much of the research shows that technology integration must be done in small steps for effective integration, according to the Technology Leadership, Management, and Policy Pyramid (Collins, 2009). Schools need to include the following in order

to attain educational excellence in technology: (a) provide organizational integration activities; (b) provide maintenance activities; (c) provide planning activities. Collins (2009) explains that all these steps must be done simultaneously to attain educational excellence in technology. Brooks-Young (2002) explained that administrators must examine what practices are already in place, consider what needs to be done, and what areas need to be developed. Durrant & Holden (2003) explained that there are a number of actions that must be taken in order to sustain the technology infrastructure in our schools and take it to the next level.

Superintendents as business leaders. Forbes' article listing *Top 10 Qualities that Make a Great Leader*, includes self-awareness, honesty, the ability to delegate, communication, commitment, creativity, positive attitude, and an ability to inspire (Prive, 2012). These qualities tend to be apparent in successful superintendents who are indispensable chief school administrators and who have oversight and administrative powers over school districts (Carter & Cunningham, 1997).

Public school superintendents are expected to provide leadership while taking into consideration the input of the Board of Education as well as the individual schools and their constituent parts (Rylander, 2000). Superintendents attend and participate in all school board meetings, advise the Board of Education on the programs, practices and challenges of the district, ensure implementation of school policies and recommend revisions as appropriate (Moore et al., 2012).

Additionally, superintendents prepare data-driven reports, which identify the successes and challenges of the district, while recommending public school district goals, monitoring progress toward goal attainment and supporting long-range planning (Moore et al., 2012). Superintendents have further assumed responsibility for the successful management of the school

district, fulfilling such responsibility by efining the district's budget, providing educational leadership related to the curriculum, ensure personnel are qualified and receive routine supervision, maintaining the quality of district properties and ensuring positive community relations (Rylander, 2000).

Rylander illuminates that superintendents are not just the chief executive officers of their districts, making important administrative decisions, but also the chief financial officers, chief operating officers, etc. The primary role of any superintendent is to develop and maintain a healthy school budget. Because the economy usually dictates how much capital is available for the school district, it is a complicated formula that changes annually, particularly in the distinctive field of public education (Hoyle, 2005).

Given their clear importance, it is evident that superintendents have leadership qualities that mimic small neighborhoods; thus, an exceptional kind of leadership is needed to fulfill these multifaceted and multi-layered duties. Leithwood and Riehl (2003) discusses the importance of building professional communities and engaging external environments. Superintendents are no longer expected to simply work from their offices, but to work in the community and play the role of creating coherence.

McREL has conducted the largest ever meta-analysis of decades of research on the effect of superintendent leadership, concluding that leadership at the highest level can have a positive effect on student achievement (McREL.org, 2014). Their findings illuminate that district-level leadership matters significantly on policy, practice and culture, as there is a significant relationship between district leadership and student achievement (McREL.org, 2014).

As for policy, superintendents are held responsible for writing new district policies and revising or reviewing old ones. This must be an annual endeavor as new issues constantly arise,

thus policies should be developed detailing how these issues will be handled (Garet, Porter, Desimone, Birman, and Yoon, 2011). Superintendents make tough calls as they play key roles in influencing frequency of testing, program development, and instructional assessment – all of which impact their relationship with the Board of Education as they strive to balance the accountability-authority equation (Lashway, 2010).

Concerning testing, recent changes such as the Elementary and Secondary Education Act require testing to be an annual occurrence. However, within the past decade there has been a movement to reduce standardized testing, as successful superintendent Means (2010) notes that:

> "…school chiefs must take the lead and eliminate our obsession with standardized tests… these tests are in no way connected to the eventual success or failure of our kids ten years from now. These assessments do not measure the truly important factors that lead to a student's happiness, such as integrity, decision-making skills, and work ethic" (p. 10).

Though he acknowledges that assessing students is important and he understands the need for schools to chart their progress in student achievement, he wishes that superintendents and teachers alike would not feel the pressure of the exams as a priority over true education and learning (Means, 2010).

Moving forward to reviewing superintendents' impact on academic practice and culture of the school, it is worthwhile to acknowledge that successful superintendents are recognized as leaders who achieve school-based improvement through enabling, challenging, modeling, inspiring, and encouraging (Sweeney, 2000). The aforementioned McREL study concludes that district-level leadership responsibilities are positively related to the academic setting, as there is a statistically significant relationship between district leadership and student achievement

(McREL.org, 2014). Additionally, effective superintendents focus their efforts on creating goal-oriented districts (McREL.org, 2014).

Successful leaders engage in collaborative goal-setting, establish non-negotiable goals for achievement and instruction, ensuring board alignment and support of district goals, monitor goals for achievement and instruction, and utilize resources to support instruction and achievement goals (McREL.org, 2014). Further, the McREL study finds that superintendent tenure is positively correlated with student achievement. That is, the length of superintendent tenure in a district positively correlates to student achievement, and appears to manifest as early as two years into a superintendent's tenure (McREL.org, 2014). Interestingly enough, on the business end of things, if a company has great faith in the staying power of its Chief Executive Officer, the business, too, is statistically more likely to thrive (Hoyle, 2005).

All of these notable findings reinforce the notion that superintendents must act as successful business leaders. As Superintendent Reeves (2006) acknowledges, it is important that his colleagues stand apart by creating moon-shot goals: challenges that are simultaneously inspiring and fantastic. Reeves notes that these goals do not simply come “in the form of five percent improvement rates” (p. 16), but rather include zero equity gaps based on economic status or ethnicity and post-secondary opportunities for 100% of high school students (Reeves, 2013). To reach these goals, as any successful leader would do, superintendents must utilize effective and respectable authority, practical implementation, and the creation/promotion of true visions that their constituents can support (Reeves, 2006).

It is also imperative to show the use of technology can ease many academic burdens for superintendents, teachers, and students alike. Superintendent Reeves (2006) explains that:

> now is the time for superintendents to take advantage of the education marketplace-which is filled with innovative firms and organizations-to vastly increase the range of online courses available to local students, and to shift a growing percentage of academic teaching from traditional classrooms to the Internet (p. 16)

Superintendent Reeves further elaborates that online learning can allow school districts to customize coursework to the individual student, thus allowing children to work at their own pace, receive immediate feedback on progress, obtain instant help in areas of need, and learn through a variety of media (Reeves, 2006). It is important to recognize that students can learn anywhere so long as they have computers, as through the internet they are offered a limitless selection of courses (Reeves, 2006).

Technology breaks down educational barriers, as it doesn't discriminate by race, ethnicity, social class, or gender (Shuldman, 2004). Though there is some backlash from traditionalists, who fear the change of education and tend to be set in their ways, many forward-thinking superintendents recognize that hybrid schools, which effectively blend the traditional and the high tech (with much of the academics handled through online learning) could be the future of education (Shuldman, 2004).

According to Oklahoma City Superintendent Douglas B. Reeves (2009), great superintendents implement change successfully, while world-class superintendents sustain change beyond their tenure. Reeves (2009) also notes that:

> Superintendents can provide their constituents with a better, broader education that is literally customized to their individual needs and interests-and rooted in the most cutting-edge developments the world has to offer. To do these things will take great political courage, because the unions don't want technology to be substituted for labor (p. 66).

Further, this change has really occurred within recent decades with the change of technology. For illustration, the Levels of Technology Implementation (LoTi, 2011) was a tool established two decades ago, in 1994, to help district leadership quantify how teachers were using technology in the classroom. Superintendents are now more willing to explore ways in which technology can be harnessed as a force in instruction and learning. For example, at present, many superintendents are recognizing the multiple ways instructional and communications technology are reshaping the schooling experience, as well as teaching and learning. Though the original LoTi framework provided an empirically validated model for school systems to gauge the effectiveness of technology implementation, the change in technology has updated the LoTi framework immensely.

In detail, the Levels of Technology Implementation is better known now as the Levels of Teaching Innovation, where the newer model emphasizes powerful learning and teaching as well as the use of digital tools and resources in the classroom, as a collaborative effort. The Levels of Teaching Innovation Framework possess six levels, which we shall explore in order to best understand how superintendents can set the standard for technological implementation in the classroom (LoTi, 2011).

The first level, known as 0 or non-use, is the instructional setting in which the use of digital and/or environmental resources does not support or promote purposeful learning aligned to academic standards/expectations (LoTi, 2011). Level 1, awareness, occurs when the instruction focus is exclusively direct instruction. In this level and in Level 2, student learning focuses on lower levels of cognitive processing while digital resources are non-existent or only utilized by the classroom teacher to enhance lectures or presentations.

The third level, infusion, occurs as the instructional focus emphasizes student higher order thinking…and teacher-directed problems (LoTi, 2011). In this phase, the concept attainment, inductive thinking, and scientific inquiry models of teaching are the norm and guide the types of products generated by students. Digital resources are used by students and/or the teacher to execute teacher-directed tasks that emphasize higher levels of student cognitive processing relating to the content under investigation (LoTi, 2011).

The fourth level, integration, is reached when students are fully engaged in exploring real-world issues and solving authentic problems using the available digital and/or environmental resources (LoTi, 2011). In this level, the students' frequent use of digital resources is inherent, and truly motivated by the drive to answer student-generated questions that dictate the content, process, and even the distinct products embedded in the learning experience (LoTi, 2011).

The fifth level, expansion, occurs as student collaborations extend beyond the classroom and are employed for authentic problem solving and issues resolution. This stage emphasizes personal goal setting and self-monitoring, student action, and collaborations with other groups (LoTi, 2011). Student use of digital resources is inherent and motivated by the drive to answer student- generated questions that dictate the content, process, and products embedded in the learning experience (LoTi, 2011). A distinction of this level is that the complexity and sophistication of the digital resources and collaboration tools highlight an inventiveness and spontaneity, as well as sophisticated and complex thinking (LoTi, 2011).

Lastly, level 6, or refinement, occurs when level five has been reached, yet additionally the instructional curriculum is entirely learner-based involving the content, process, and product of instruction (LoTi, 2011). In this phase, the pervasive use of and access to advanced digital

resources provides a seamless medium for information queries, creative problem-solving, student reflection, and/or product development (LoTi, 2011).

The Levels of Teaching Innovation has impacted successful superintendents who lead influential changes in policy, practice, and culture thus far. The best technology leaders are curious, as they exhibit and exude lifelong learning. Superintendents always asking questions, always talking to people, always observing what is happening around them (Thompson, Schmidt, & Davis, 2013). Thompson et al. (2013) reminds superintendents to lead by example through continuous learning, with updated ideas and a curious mind that is willing to entertain and understand unfamiliar concepts.

Technology has also broken down barriers, with the use of iPads and digital literacy tools, to set unprecedented standards for early literacy. Barbara Nemko, Napa County's superintendent, allocates such devices to children as young as preschoolers across her districts to help close the achievement gap (Thompson et al., 2013). Specifically for students who come from homes where English is not the native language, these educational tools allow reading to be fun and accessible for the students, whether by themselves or in a group setting.

In his review of the book *Building Community in Schools* by Thomas J. Sergiovanni, Lynch (2004) writes that Sergiovanni's extensive work led him to the conclusion that the major problem in providing quality education is a loss of a sense of community and that schools cannot fully replace families and neighborhoods, but that they can be a safety net when students need short-term guidance (p. 253-254). Superintendents must be part of these school communities along with students, teachers, and other staff, and they will be instrumental in integrating digital technology into the communities.

One of Sergiovanni's main ideals for schools are that they become communities of learners and communities of leaders; superintendents must be both leaders and learners (Lynch, 2004) in all areas including technology. School systems keep learning about technology changes and in leading the rest of the school staff in creating ways to incorporate that technology into their in a sustainable way. School superintendents serve as examples by using the technology in a visible way.

Sergiovanni (2005) wrote that effective school communities depend upon the virtue of piety to provide a floor of shared values and ideas that tie everyone together, provide security and support, and give the school a special identity that communicates its charter and purposes. Rather than just finding solutions to technology problems, superintendents would be wise to do as Sergiovanni (2005) suggests and help the school staff understand the problems they face and manage these problems and even learn to live with them. The rapid pace of change in technology means that not many leaders will have the competence, time, and information needed at any given time to get the job done which is why leadership and learning together are so important (Sergiovanni, 2005).

According to Turner (2013), the best technology leaders are curious, as they exhibit and exude lifelong learning. Turner (2013) states that superintendents lead by example through continuous learning, with updated ideas and a curious mind that is willing to entertain and understand unfamiliar concepts.

Summary of Literature

This study on how California K-12 public school district superintendents create, promote and sustain a digital-age learning culture for students as well as the challenges they encounter in doing so and what they believe is needed to address their challenges, is anchored on the

framework that the type of leadership superintendents practice in their districts influence student learning (Leithwood & Riel; 2003; Hallinger & Heck, 1996; Leithwood et al., 2004) and that theories of organizational learning is critical in managing a successful district (Argyris & Schon, 1978; Kim, 1993; Senge, 1990; Elliot, 2001).

The digital-age society that started in the 1980s with the stand-alone computer products that were not connected to networks or other systems (Sandoval, 2008) created fear among educators who felt that they would be replaced by computers (Shue, 2009). The digital-age society has now evolved to a network of systems of internet known as the World Wide Web which was introduced in the 1990s where it was widely discussed as a business tool providing services like webpage advertisements with the development of graphics and multimedia tools (Gray, 2011). Computer and Internet use has increased greatly over the past several years and that over 75% of American households have at least one computer as of 2011. According to Technology in Education Consortium (2014), technology has made the workplace and the field of more efficient and collaborative because of softwares that allows for easy access to information, communication and data processing.

The digital learning culture has naturally emerged and children now learn through mobile devices and teachers have also learned to leverage its power to help students acquire knowledge (Garland & Tadeja, 2013; McCoog, 2008; Gearhart, 2011; Moore et al., 2012). These mobile learning devices include social media and Web 2.0 that are all web-based and teachers use them as both accessories and primary tools of instructions (Bower et al., 2010).

Learning in today's digital world include interactive games and activities among students from kindergarten to 12th grades to which MP3 players, iPads, smartphones, table PCs and other devices are used to enhances learning experiences (Shelton & Scoresby, 2010; Schrum & Levin,

2009; Prensky, 2008). In addition, videos are also now used as powerful tools for learning (Flipped Classroom Offers New Learning Path, 2011). These digital tools can jump-start the creativity of each child (Twigg, 2005). In the flipped classroom, learning activities that are considered direct instruction and lower-level critical thinking skills are done at home using video and other multi-media and that classroom time is used for mastery, inquiry-based learning and project based learning (Bergmann & Sams, 2013). Technology has indeed changed the ways students learn because when it is used properly, technology allows students to freely think and express themselves fully, thus making them ready for their future of further technology shifts (Kreuger, 2009; Hoyle, 2014; Kerr, 2011).

There are rules about the proper use of tablets and other gadgets and these rules are referred to as online ethics and digital citizenship whereby schools are educating students and parents about the appropriate use of devices and social media sites for education and learning purposes (Westervelt, 2013; Johnson, 2013).

Both the Interstate School Leaders Licensure Consortium (ISLLC) which was developed in 2008, and the California Professional Standards for Educational Leaders (CPSELS) enumerate standards for education leaders and both do not include specific standards for the use of technology. The International Society for Technology in Education (ISTE), to which its members include teachers and educational leaders, exists to encourage and facilitate collaboration among educators to continually improve learning and teaching. The purpose of ISTE is in line with the National Education Technology Plan goal which is to dramatically improve teaching and learning, personalize instruction and ensure that the education environments we offer to all students keep pace with the 21st century. In 2009, ISTE revised the National Technology Standards for Administrators (NETS.A) to include in its standards visionary leadership, digital-

age learning culture, excellence in professional practice, systematic improvement and digital citizenship, all of which is designed to strengthen the use of technology for all students to learn quickly and efficiently in this modern digital society (Loertscher, Williamson & Redish, 2010). The challenge however in meeting these standards is for students to have adequate access to techonology (Natriello, 2001; Chang, Chin & Hsu, 2008; Muth, 2012).

Today's school superintendents have to be jacks-of-all trades to succeed. Besides being great visionary leaders who can inspire others to work toward their vision and who are up-to-date with the latest technology, superintendents have to be great listeners and willing to keep moving toward their visions despite the many obstacles they encounter, including funding issues and resistance to change on the part of other school leaders and staff. School superintendents have to keep in mind their enormous potential for influence; their decisions and actions directly affect school policies, practices, and culture. Turner (2013) indicated that one of the challenges faced by visionary leaders is that they tend to have dreams that are larger and more difficult than average persons, and thus an extraordinary degree of persistence is required. Superintendents as leaders must also delicately balance the use of power in order to create a healthy culture and productive school (Miller, Salsberry & Devin, 2009). In addition, the challenge of the superintendents' technology leadership includes determining what strategies they should use to influence teachers to integrate information communication technology in their everyday instructional practices (Rivard, 2010; Hoyle, 2005; Patrick, 2014).

Some of the other challenges that superintendents face include lack of opportunities for professional development of staff and resistance to change among school staff and leaders (Nagel, 2013). Such challenges can be surpassed through teamwork and collaboration among all the stakeholders (Galla, 2010; Partnership for 21st Century Skills, 2007). Effective

superintendents also use the three stages of addressing rapid change in their roles as administrators and this include building capacity, implementing change and sustaining independence (LoTi, 2011). They also set realistic goals for the district and the make sure that they carry out regular monitoring of how much progress their school district has made (Waters & Marzano, 2006; McREL.org, 2014). In order to meet the district goals, superintendents must utilize effective and respectable authority, practical implementation and the creation and promotion of true visions that their constituents can support (Reeves, 2006).

The historical trends in technology and the influence that is taken by school district superintendents underscores the need for school leaders and administrators to continuously find ways to create, promote and sustain a digital-age learning culture. Many aspects including ensuring instructional innovation, modeling and providing learner-centered environments as well as participation in an ongoing process to develop, implement, and communicate a shared vision, are elements necessary for the contemporary superintendent to create, promote and sustain a digital-age learning culture. Several aspects of a superintendent's role as well as how they integrate technology can foster an environment that is conducive to creating, promoting and sustaining a digital-age learning culture.

The National Education Technology Plan emphasizes 21st century learning and outlines a call to action for superintendents. The NETS.A standards for advancing digital-age leadership identifies seven components in which superintendents can engage in a dynamic, digital-age learning culture for all students. The Levels of Technology Implementation was established to assist superintendents and district leadership to explore ways in which technology and its power can be harnessed in the classroom as a force for leading and learning. The LoTi has six levels in

which superintendents can draw from to change policy, practice, and culture within a school district.

Superintendents set standards for communication, learning, and a keen perspective on change. By wearing multiple hats (CEO, CFO, COO, etc.), superintendents are an integral part of our education system. Through their business-like leadership, positive attitudes, and perseverance, our educational system is able to grow to become a strong and important establishment that benefits everyone in society.

Chapter 3: Methodology

The purpose of this descriptive survey research study was to explore and describe how California K-12 public school district superintendents created, promoted, and sustained a digital-age learning culture for all students. A second purpose of this study was to identify and describe what these superintendents perceived to be as challenges related to creating, promoting, and sustaining a digital-age learning culture for all students and what they believed was needed to address these challenges. This study was designed to answer the following three central research questions:

- Research Question 1. How do California K-12 public school district superintendents create, promote, and sustain a digital-age learning culture for all students in their districts?
- Research Question 2. What do California K-12 public school district superintendents perceive to be their greatest challenges with regards to creating, promoting, and sustaining a digital-age learning culture for all students in their districts?
- Research Question 3. What do California K-12 public school district superintendents believe they need to address challenges related to creating, promoting, and sustaining a digital-age learning culture for all students in their districts?

Methodology Description

This descriptive survey study proposed to electronically administer a questionnaire (see Appendix C) consisting of 3 participant demographic questions, five structured questions and two open-ended questions to all California K-12 public school district superintendents in order to

learn about strategies they used to create, promote and sustain a digital-age learning culture, their perceived challenges related to leading digital-age learning cultures, and what they believe was needed to address those challenges. According to Leedy and Ormrod (2005), “Survey research involves acquiring information about one or more groups of people—perhaps about their characteristics, opinions, attitudes, or previous experiences—by asking them questions and tabulating responses. The ultimate goal is to learn about a large population by surveying a sample of that population” (p. 189). Fink (2003) identifies four types of survey data collection: questionnaires, interviews, structured record reviews, and structured observations. Surveys may be web-based or internet surveys and administered online.

This study was administered using a web-based survey online to the large population of 1,051 K-12 public school district superintendents in California. There were advantages and disadvantages to administering questionnaires. The advantages were that questionnaires can be administered easily and economically to a large number of people at the same time, participants are provided anonymity and therefore may have been more truthful, and responses can be collected and reported efficiently (Babbie, 1995). The disadvantages were that the majority of persons who receive questionnaires did not return them and survey response are self-report and may not be completely accurate (Creswell, 2002).

The census population in this study was large consisting of 1,051 K-12 public school district superintendents in California. A web-based online survey was the most efficient and economic means of accessing and collecting data from this large and distributed population of educational leaders. The anonymity of participants was protected and therefore the superintendents who responded felt comfortable to be open and honest. A mixture of structured and open-ended questions comprised the questionnaire. It was anticipated that two formats of

questions would help to prompt more substantive responses and that the topic of the survey, the survey length and ease of return would be appealing to superintendents and encouraged participation.

Should there be a low response rate with the web-based survey, the researcher was going to ask the Dean of the College to endorse to the Advisory Committee of the district schools the researcher's letter of request that seeks the superintendents' cooperation in answering the questionnaires. It was mentioned in the letter of request and endorsement letter that the superintendents may have already received and responded to the questionnaire; if they have not yet done so, they were being asked to consider answering the questionnaire. By asking the support of the Advisory Committee through the Dean of the College, the respondents would have been prompted to be more encouraged to answer the survey.

Setting

According to the United States Census Bureau, the state of California has an estimated population of 37,999,878 as of 2012 and that about a quarter (24.3%) of them are persons below 18 years old. Based on the 2008-2012 American Community Survey, California has a total enrolment of 82,291,141 and that 71.9% of them were enrolled from nursery school to high school (United States Census Bureau, 2012).

There are 1,051 public school districts in California: 560 elementary school districts; 88 high school districts; 330 unified school districts; 58 county offices of education; six special state schools; eight State Board of Education charter schools; and the California Education Authority School District ("Fingertip", n.d.).

The State of California is very aggressive in implementing the Common Core State Standards to which technology is one of its core elements through an Assembly Bill that seeks its

second round implementation fund of $1.5 billion. A budget of $1.25 billion was allotted in California in 2013 to support teacher training, textbooks, instructional material and technology upgrades that are needed to address the concerns of the Common Core State Standards (Baron, 2014). All these funding were allotted in order for California to focus more on developing the students' abilities to think critically and to develop analytical skills through hands-on and interactive instructions (Newman, 2000). The Silicon Valley Leadership Group is in support of this bill that prioritizes student's critical thinking skills and the use of technology in their learning as its chief executive officer Carl Guardino said, "With seven out of 10 jobs today requiring proficiency in science, technology, engineering and math, California must remain on the cutting edge of investment in our students, teachers and in-school technologies." (Baron, 2014, p. 2).

Population Sample and Sampling Procedures

California K-12 public school district superintendents. California K-12 public school district superintendents belong to the second largest body of school districts in the nation Study participants will be recruited from the census population of all California K-12 public school district superintendents. In order to recruit study participants, the contact information for all California K-12 public school district superintendents' information was retrieved from the California Department of Education public domain web site. An introduction letter was sent to all of the superintendents electronically. The letter introduced the researcher, provided an overview of the study, described the nature of participation in the study on the part of superintendents, and provided a link to a web site that described informed consent and provide access to the survey.

Study subject participation criteria. In order to be eligible to participate in this study, superintendents must have been listed on the California Department of Education web site, they must have been currently employed, and practicing in a California K-12 public school district at the time this study was implemented.

Human Subject Considerations

The researcher has participated in human subject investigator education and adhered to GPS IRB policies and recommended practices. No permission was needed to contact California K-12 public school district superintendents. Contact information for California K-12 public school district superintendents was available publicly and was obtained from the California Department of Education website. The researcher was following the GPS IRB guidelines for an exempt study in seeking approval to conduct the study. Potential participants were informed that participation in the study was strictly voluntary, giving participants the right to withdraw at any time. Potential participants were also informed that the study would consist of an anonymous online survey on SurveyMonkey.com or Qualtrics. Participants were able to complete the survey at their convenience from any computer that had an Internet connection.

Participants were informed that all information collected for the purpose of this study was kept confidential. The researcher does the names and identities of potential subjects from the pool of qualifying individuals, but the researcher did not know who actually participated. Therefore, this study had waiver of documentation of informed consent so that the researcher would not know the identities of the participants. Participants were given three weeks to consider participating in the study. Since the researcher completed a waiver of documentation of informed consent, the survey included an informed consent page with a box for participants to indicate

consent to participate via the website link. All participants were required to read the informed consent statement and then check the box in order to access the survey questions.

Participants may have also requested the results of the study by noting a link provided at the end of the survey. After completing the survey, participants could have written down the link and visit the site approximately 4-6 weeks at the conclusion of the survey for the results.

The researcher filed an exempt application along with the application for waiver or application and alteration of informed consent. Once the two applications were approved, a copy of the IRB approval letter will be placed in Appendix F.

Security of the Data

The only individual to handle the data was the principal researcher. The principal investigator has put all data under lock and key for five years after the study has taken place. All hand-written notes, as well as all computer files, portable electronic drives, and written inquiries will be kept in a safe in the researcher's home office for a period of five years and destroyed thereafter. Data stored in the researcher's personal computer will be transferred to an external hard drive, which will be kept in the safe as well, and then destroyed in five years. In compliance with IRB, the principal investigator will take the following measures to ensure anonymity:

a) There are no names identified of any of the participants in the study; instead of names, each questionnaire was given a code not associated with a participant name. The consenting documents are not linked by any identifiers to the participants in the study questionnaire;
b) Paper copies of the data files are kept in a safe in the investigator′s home office;
c) Electronic statistical and qualitative data are stored on a hard drive and accessed on the researcher's personal computer which is password protected;

d) IP addresses are not be linked to participant responses;
e) All information collected are backed up on an external jump drive which is stored in the principal investigator's home office safe when not in direct control and possession of the data;
f) Only the principal investigator has access to the research data;
g) The content of the questionnaires were transcribed by a transcription service agency that routinely works with doctoral dissertations and as such has strict policies on confidentiality and data security. All identifiable information was destroyed once the questionnaires was transcribed and delivered to the principal investigator;
h) Sensitive materials is stored according to IRB transcriptions coding sheet and files will be kept in a safe in the principal investigator's home office for five years, and
i) After five years, the principal investigator will shred the information collected in the study and destroy all electronic files using an appropriate magnet to completely erase the files.

Minimizing Potential Risks

Minimal risk is described in the GPS IRB manual as the probable harm that the activities in the research will cause the participant, which should be no greater than when performing normal activities, or when undergoing psychological or physical testing. It was anticipated that any potential risks to participants in this study would be minimal. One potential risk was any fatigue related to completing an extra task. In order to minimize this risk, the length of the survey was limited to 10 questions and it was anticipated that participants would be able to complete the survey in 30 minutes or less. Superintendents were also able to complete the survey at a time and

location of their convenience, since all that was needed was a computer and Internet connection to complete the survey.

One other potential risk might have been sensitivity experienced by superintendents who felt that the way they created, promoted, and sustained a digital-age leaning culture was less than what they desired for themselves. The researcher, however, framed the survey and questions in a positive way intended to have superintendents' describe what they are doing to create, promote, and sustain a digital-age learning culture and not be judged or evaluated. Participants were advised of the nature of participation in the study before they consented to participate and they were advised that their participation was voluntary and that they may have discontinued their participation at any time without any penalty.

Confidentiality

The researcher did know the names and district affiliations of all of the superintendents who were invited to participate in the study. However, by design, the researcher did not know the identities of superintendents who elected participate in the study. Survey respondents were anonymous. There were no names or any other identifying information taken or recorded on the survey questionnaires. Each survey respondent was referred to as Superintendent and assigned a number 1, 2, etc. Electronic statistical and qualitative data was stored on a hard drive and accessed on the primary investigator's personal computer which is password protected. IP addresses were not linked to participant responses.

Instrumentation

The survey was designed and constructed into 3 parts (see Appendix C). Participants first saw the background questions, which allowed the researcher to accurately categorize the responses from the different superintendents participated. There were 3 background questions

asking participants to their school district's total student enrollment, total number of years of experience the participants has a school superintendent, and total number of years of experience the participants has a school superintendent in their current district.

The second part of the survey was comprised of 5 questions that were designed to elicit among the superintendents the strategies they used in creating, promoting, and sustaining a digital-age culture within their school districts. These 5 questions were based on the National Technology Standards for Administrators (NETS-A), the standards used for evaluating the school administrators and leaders' skills and knowledge in supporting digital-age learning, implementing technology and transforming the education landscape. The 5 specific questions are taken from the 5 items under NETS-A component Digital-Age Learning Culture. Respondents are given possible research-based responses related to strategies they may be using in their districts to create, promote and sustain a digital-age learning culture. They are likewise given the option to add to the choices and describe other strategies they may be using in their districts, additional challenges, and other perceived needs.

The survey concluded with part three where participants were asked to respond to three open-ended questions. The questions were qualitative in nature and asked participants about what they did to create, promote, and sustain a digital-age learning culture for all students in their school districts. A question also asked what California public school district superintendents perceived to be their greatest challenges with regards to creating, promoting, and sustaining a digital-age learning culture for all students in their school district and what do they believe they need to address these challenges.

The survey instrument was interfaced electronically through a free, yet secure online service known as Qualtrics. This service has successfully established itself as the Internet's most

popular survey tool, used by individuals and organizations throughout the world. Upon completion of the surveys by the superintendents, data was entered into a database.

Validity. The researcher validated the survey instrument with two experts who have experience and breadth of knowledge in validating the questions being presented to the participants. One expert was a professor in the Pepperdine Graduate School of Education and Psychology while the other was an educational consultant who received her doctoral degree from Pepperdine University. The experts gave their feedback on each specific question and made suggestions on specific wording as well as clarity. Both of their suggestions influenced and changed the instrument to include removing certain words to provide clarity, and providing details on specific background questions.

Table 1 describes the alignment between the guiding questions (column one) and instrument questions (column two) for this study. It also includes a credibility list from sources associated with the questions (column three). The literature sources include research that shows how each of the 3 guiding questions have been cited in recent works. Each of the sources cited directly relate to the guiding questions and the relevancy for each.

Table 1
Guiding Research Questions of the Study

Guiding research questions	Corresponding instrument questions	Literature sources
How do California K-12 public school district superintendents create, promote, and sustain a digital-age learning culture for all students in their districts?	Quantitative Question 1: How do you as a superintendent ensure that instructional innovation in your district is focused on continuous improvement of digital-age learning? Please circle strategies below that you utilize and feel free to add others.	International Society for Technology in Education, 2001

(continued)

Guiding research questions	Corresponding instrument questions	Literature sources
	a. I make sure that our district is providing adequate broadband and wireless access inside and outside of classrooms, guaranteeing at least one Internet-enabled device for every student and educator, and promoting the use of cloud computing.	Russell et al., 2013 Hodgson, 2009
	b. I have put in place a system where continuous monitoring and maintenance of the district's technology hardware (e.g., tablets, laptops, smartphones, etc.); internet access (e.g., school wifi, student cell account) and software infrastructure (e.g., web apps) are implemented to ensure that these technologies are all in good working conditions at all times.	Russell et al., 2013 Gillin, 2006
	c. I make sure that principals, teachers and staff have access to ongoing training that enables them to continuously have access to changes, updates, and the use of different learning and teaching technologies.	Bonk & Graham, 2012 Lingo & O'Callaghan, 2010

(continued)

Guiding research questions	Corresponding instrument questions	Literature sources
	d. I encourage and promote within the district a bring-your-own-device policy regarding smart phones, tablets and other personal laptop computers. e. Other (Please specify) _____.	Walling, 2012
	Quantitative Question 2: In your role of superintendent, how do you model and promote the frequent and effective use of technology for learning in your district? Please circle those practices listed that you utilize and feel free to add others.	International Society for Technology in Education, 2001
	a. I personally and effectively use different technologies (such as emails, twitter, SMS, etc.) to communicate with principals, teachers and staff to stay informed of what is happening in the different schools within the district.	ISTE 2001a; 2001b Lipman, 2014
	b. I encourage principals, teachers and staff to use technology in communicating with one another.	ISTE 2001a; 2001b

(continued)

Guiding research questions	Corresponding instrument questions	Literature sources
	c. I make sure that surveys, meetings, and discussion sessions with principals and teachers are regularly conducted within the district to get their feedback on the successes and challenges they experience in implementing technology in their schools and classrooms.	Mirra, 2004
	d. I implement the established rules about the proper use of tablets and other electronic gadgets in schools.	Westervelt, 2013
	e. Other (Please specify) _____.	
	Quantitative Question 3: As a superintendent, how do you provide learner-centered environments that are equipped with technology and learning resources to meet the individual and diverse needs of all learners? Please circle those practices listed that you utilize and feel free to add others.	NETSA Standard #2c

(continued)

Guiding research questions	Corresponding instrument questions	Literature sources
	a. I make sure that a regular budget is allotted in purchasing software that students can use to develop their creativity and independent work.	Muth, 2012
	b. I make sure that principals and teachers are regularly provided with e-learning materials for teaching and administrative tasks as well as providing various links to different educational forums.	Culp, Honey, and Mandinach, 2005
	c. I encourage principals to challenge their teachers to customize their coursework with students use of technology so that the students are able to work at their own pace, receive immediate feedback on progress, and obtain immediate help in their areas of need.	Reeves, 2003
	d. I encourage principals to challenge their teachers to offer their students access to a variety of media (e.g., internet, smart phones, educational TV shows, etc.) to meet their students' individual needs.	Rivard, 2010 Teddlie & Tashakkori, 2003

(continued)

Guiding research questions	Corresponding instrument questions	Literature sources
	e. Other (Please specify) _____.	
	Quantitative Question 4: As your district's leader, how do you ensure effective practice in the study of technology and its infusion across the curriculum? Please circle those practices listed that you utilize and feel free to add others.	NETSA Standard #2d
	a. I encourage principals to develop hybrid schools where they can effectively blend a traditional and high-tech learning environment.	Shuldman, 2004 Sincero, 2012
	b. I encourage principals and teachers to attend and participate in conferences that address the latest educational technologies to meet the growing needs of students in the use of technology with their learning.	Bonk & Graham, 2012 English, 2011
	c. I encourage principals to challenge their teachers to elicit student-generated questions with the use of technology, and to motivate them to use digital resources in finding the answers.	LoTi, 2011 Rodriguez & Chung, 2012

(continued)

Guiding research questions	Corresponding instrument questions	Literature sources
	d. I encourage principals to conduct regular faculty meetings to which the purpose is to discuss and share educational technologies that they found effective in their respective classes. e. Other (Please specify) _____.	Ray, 2011 Rubie-Davis, 2010
	Quantitative Question 5: How do you lead your district in promoting and participating in local, national and global learning communities to stimulate innovation, creativity and digital-age collaboration? Please circle those practices listed that you utilize and feel free to add others. a. I encourage principals and teachers to be members of online educational communities and organizations, such as, the International Society for Technology in Education (ISTE). b. I make sure that the district utilizes blogs and websites to keep our community stakeholders informed about the operations and well-being of the school district.	NETSA Standard #2e Penn, 2008 Richards & Morse, 2007 ISTE, 2014 Stager, 2007 ISTE 2001a; 2001b Schachter, 2010

(continued)

Guiding research questions	Corresponding instrument questions	Literature sources
	c. I collaborate with major technology companies, such as, Apple, Dell, and Google in adapting within the district emerging educational technologies. d. I make sure that our district is working in collaboration with the county and state offices in promoting the use of innovative technologies. e. Other (Please specify) _____.	Manzo, 2009 Esselman, Lee-Gwin & Rounds, 2012 Manzo, 2009 Esselman, Lee-Gwin & Rounds, 2012
What do California K-12 public school district superintendents perceive to be their greatest challenges with regards to creating, promoting, and sustaining a digital-age learning culture for all students in their districts?	Qualitative Question 1: What do California K-12 public school district superintendents perceive to be their greatest challenges with regards to creating, promoting, and sustaining a digital-age learning culture for all students in their districts?	Tillman & Scheurich, 2013 Iverson, 2012
What do California K-12 public school district superintendents believe they need to address challenges related to creating, promoting, and sustaining a digital-age learning culture for all students in their districts?	Qualitative Question 2: What do California K-12 public school district superintendents believe they need to address challenges related to creating, promoting, and sustaining a digital-age learning culture for all students in their districts?	Huber, 2010 Lavigne & Mouza, 2013

Data Collection Procedures and Data Management

After GSEP IRB approval, the following steps were taken for this research:

1. The researcher created a database of email contact information for all 1,051 California K-12 public school district superintendents who are listed on the California Department of Education web site as currently serving in California K-12 public school districts.
2. A study introduction letter was sent to these superintendents via their superintendent email contact information. The letter introduced the researcher, introduced the study, described the nature of participation in the study and invited potential participants to click on a link which took them to a consent page, then to a background information page, and finally the survey.
3. An email reminder was sent to superintendents after a week to remind them of the survey available. The email included possible benefits to the superintendents in relation to knowing what other superintendents in the state of California are doing and how the results could tie in to the planning of the new Common Core Curriculum.
4. Another reminder was sent a week after asking superintendents to consider taking the survey if they have not already done so outlining the possible benefits to them.
5. A final email reminder was sent the week after the last email asking superintendents to kindly consider taking the survey and notifying them when the survey window would close, which would be at the end of the week from when this final email was sent.
6. Superintendents who were interested in participating and who clicked on the link were provided informed consent information.

7. Superintendents who indicated that they have read consent information and wished to participate was given a check box in order to proceed to the background information page.
8. Superintendents were asked three questions in relation to their district's total student enrollment, how many years they have served as a school superintendent, and how many years they have served as a school superintendents in their current district. These questions were asked in order to accurately categorize the responses from the different superintendents who responded since superintendents come from varying school district backgrounds. After superintendents responded to the background questions, they proceeded to the actual online survey.
9. Superintendents first saw the quantitative questions, which comprised of five questions. Superintendents responded using a Likert-scale to evaluate their efforts in implementing the NETS.A standard. Superintendents then proceeded to the qualitative questions.
10. Superintendents then saw the qualitative questions, which comprised of three questions. The three questions were open ended and asked the superintendents to formulate responses related to what they were doing to create, promote, and sustain a digital-age learning culture for all students in the their school district; what they perceived to be the greatest challenges in regards to creating, promoting, and sustaining a digital-age learning culture for all students in the their school district; and finally, superintendents were asked what they believed was needed to address these challenges in creating, promoting, and sustaining a digital-age learning culture for all students in the their school district.

11. Superintendents who wished to have access to the survey results found a link at the end of the survey in which they were able to view results approximately 4-6 weeks at the conclusion of the study.
12. In the event that a limited or unsatisfactory response was achieved, the researcher would have reached out the Pepperdine University Graduate School of Education Superintendent Advisory Group via the school's dean to ask if those superintendents would be willing to participate in the researcher's study.

Data will be stored on the researcher's computer and access will be locked by a password. All data is secured and all sensitive material is now kept in a safe at the principal investigator's home office for five years. After five years has expired, the principal investigator will shred information collected in this study.

Data Analysis

The researcher utilized the responses from Qualtrics.com to gathered and organized the data for analysis. After gathering the data, the information was reviewed to determine coding topics and themes. The researcher followed the steps listed below to analyze the data.

Subject background data. The researcher categorized the subject background data. The researcher summarized the demographic data of the participants, including the participant's school district total enrollment, number of years the participant has been a school superintendent, and number of years the participant has been a school superintendent of their current district.

Quantitative data. Participants first saw the quantitative questions comprised of five questions. Each of these questions, respondents were given the option of choosing the strategies they used in creating, promoting and sustaining a digital-age learning culture in their districts. They were also given the chance to add to the choices to elaborate the other strategies they might

have implemented in their districts. The data gathered from these questions was reported in tables with a supporting narrative.

Qualitative data. The survey continued with part two where participants were asked to respond to two open-ended questions. The questions were qualitative in nature and asked participants about what they did to create, promote, and sustain a digital-age learning culture for all students in their district. It also asked what do California public school district superintendents perceived to be their greatest challenges with regards to creating, promoting, and sustaining a digital-age learning culture and what do they believed they need to address these challenges.

A coding process was used to develop and recognize common themes. The qualitative data was reported using tables at a supporting narrative. The following steps were taken place for this process:

- Step 1 – Collected data from the SurveyMonkey.com website
- Step 2 – Downloaded data onto an Excel or online spreadsheet
- Step 3 – Distributed Excel spreadsheets to external coders
- Step 4 – Reviewed data
- Step 5 – Coded data
- Step 6 – Determined themes for data
- Step 7 – Wrote exhaustive description for each theme
- Step 8 – Reported findings in Chapter 4

The researcher called upon two experienced coders to also code the open-ended question responses and asked them to follow the same coding procedures as the researcher. The researcher then compared findings. Any discrepancies that existed between the initial findings of the

experienced coders and the researcher was resolved through discussions with the experienced coders and the counsel of the dissertation chairperson.

Researcher Relationship to Study

The researcher has been a teacher in the secondary classroom for the past twelve years. He has also taught at the post-secondary level in the areas of teacher education in local colleges and universities across southern California for the past ten years. The researcher has recently published a book on educational technology and thus the study is significant to him in order to determine the relationship of how the contemporary district administrator implements the use of educational technology at the site or global level.

Chapter 4: Data Analysis and Results

Chapter 4 reports the data analysis and results of this research study, the purpose of which was to explore and describe how California K-12 public school district superintendents create, promote, and sustain a digital-age learning culture for all students. Another purpose of this study was to identify and describe what these superintendents perceive as the challenges in creating, promoting, and sustaining a digital-age learning culture for all students and what they believed was needed to address these challenges.

Specifically, the following three research questions guided this study:

(1) How do California K-12 public school district superintendents create, promote and sustain a digital-age learning culture for all students in their districts, and how do they assess their efforts?;

(2) What do California K-12 public school superintendents perceive to be their greatest challenges concerning creating, promoting and sustaining a digital-age learning culture for all students in their districts?; and

(3) What do California K-12 public school district superintendents believe they need to do to address the challenges related to creating, promoting and sustaining a digital-age learning culture for all students in their districts?

The researcher in this study electronically administered a survey (see Appendix C) to 1,051 California K-12 public school district superintendents in order to learn about strategies they are using to create, promote and sustain a digital-age learning culture, their perceived challenges related to leading digital-age learning cultures, and what they believed was needed to address those challenges. The survey consisted of three background questions, five structured questions, and two open-ended questions. A total of 92 superintendents responded to the survey. The following findings are organized and presented for each of the three guiding research questions.

Findings

Before the respondents were asked to answer the 5 quantitative and 2 qualitative questions, they were first asked about some background information regarding the size of their school districts in terms of student population, their length of service as district superintendents and their total number of years of service in their current districts.

School district size in terms of student population. The respondents of this study comprised of 92 California K-12 public school district superintendents. However, only 65 of the respondents answered the background question regarding the size of their school district in terms of student population. Given this, 22% of the respondents are managing a school district with a student population of 1,000 or less. Another 22% of the respondents are comprised of those California K-12 public school district superintendents whose districts have 10,001 to 50,000 students. Those who are managing school districts with 1,001 to 10,000 students comprise the biggest portion (52%) of the total respondents. The other 3% of the respondents are California K-12 public school district superintendents who handle a total district student population of 50,001 to 100,000 students. Graphical representation of these data is shown in Figure 1.

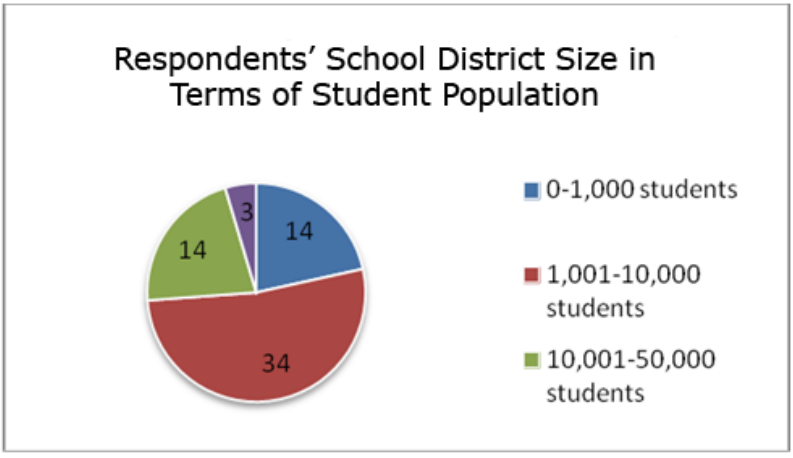

Figure 2. Pie chart of respondents' school district size in terms of overall student population.

Years of experience as district superintendents. Although there were a total of 92 respondents in this study, only 74 California K-12 public school district superintendents answered the background question regarding their total number of years of experience as superintendents. With this, in terms of the length of time that the respondents have served as California K-12 public school district superintendents, 31% of them have 0 to 3 years of experience. Those who have 5 to 10 years of work experience as California K-12 public school district superintendents comprise 35% of the respondents. The rest of the respondents (34%) are those who have been working as District superintendents for more than 10 years. Figure 2 illustrates these data.

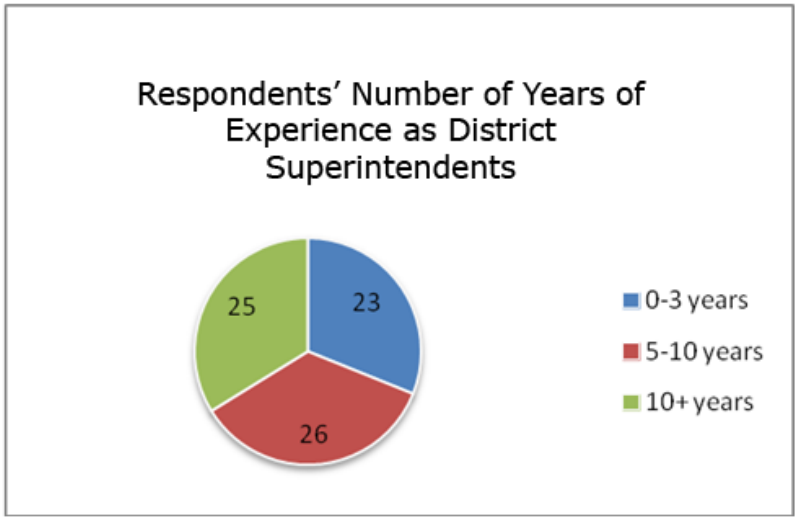

Figure 3. Pie chart of respondents' number of years of overall experience as district superintendent.

Years of experience as superintendent in current district. Out of the total 92 respondents of this study, only 60 answered the background question regarding their total number of years of experience as superintendents of their current school districts. Given this, 57% of the respondents have 0-3 years of service while 33% of them have been serving their current districts for 5 to 10 years. The rest of the respondents (10%) have been in their districts

as Superintendents for more than 10 years. Please see Figure 3 for the graphical representation of these data.

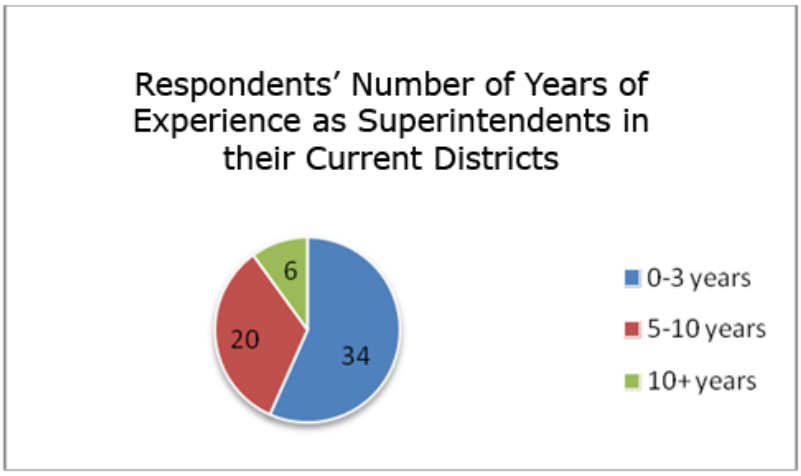

Figure 4. Pie chart of respondents' number of years of experience as superintendents in their current school districts.

Research question one. Research question one asked, *How do California K-12 public school district superintends create, promote and sustain a digital-age learning culture for all students in their districts?* Survey questions one through five, which were quantitative in nature, were specifically designed to answer research question one.

The five quantitative questions were taken from the 5 items under NETS-A (National Educational Technology Standard for Administrators) component Digital-Age Learning Culture which are about the following: (a) ensuring that instructional innovation is focused on continuous improvement of digital-age learning; (b) modeling and promoting the frequent and effective use of technology for learning; (c) providing learner centered environments equipped with technology and learning resources to meet the individual and diverse needs of all learners; (d) ensuring the effective practice in the study of technology and its infusion across the curriculum; and (e) promoting and participating in the local, national and global learning communities that stimulate innovation, creativity and digital-age collaboration. The questions on

these areas are specific to prompt among the respondents the strategies they use to create, promote and sustain a digital-age learning culture within the respective school districts.

In asking the respondents about the strategies they use in creating, promoting and sustaining a digital-age learning culture, they were given possible research-based responses from which to select the strategies they used. Respondents were also given the opportunity to add to those choices if their practices were not among the listed response options.

Focusing instructional innovation on continuous improvement of digital-age learning. Table 2 represents the number of responses and percentage of the total respondents for each of the A-E choices in the survey related to practices that focus instructional innovation on the continuous improvement of digital-age learning. It should be noted that choices A through C, which were related to accessing and monitoring the working condition of technology in schools received the greatest number of responses (56% or greater). Choice D on the other hand, which was about BYOD (Bring Your Own Device) policy, received the lowest response of 26%. This was most likely because a number of districts are just beginning to explore the benefits and advantages of such a policy.

Fourteen of the respondents (15%) provided additional strategies that they use in their districts which include the following six themes: creating strategic plan for using technology in learning among students; emphasizing the bring your own device (BYOD) policy; improving / upgrading / spending for better bandwidth and wireless network; provision of 1:1 devices to all middle school students; hiring a staff to lead and manage the district's technology programs; working as a team at all times, emphasizing the use of *we* instead of *I* in answering the questions.

Table 2
Respondents' Answers to Question 1

How do you as a superintendent ensure that instructional innovation in your district is focused on continuous improvement of digital-age learning? Please circle strategies below that you utilize and feel free to add others.	Number of respondents	Percentage
a. I make sure that our district is providing adequate broadband and wireless access inside and outside of classrooms, guaranteeing at least one Internet-enabled device for every student and educator, and promoting the use of cloud computing.	56	61%
b. I have put in place a system where continuous monitoring and maintenance of the district's technology hardware (e.g., tablets, laptops, smartphones, etc.); internet access (e.g., school wifi, student cell account) and software infrastructure (e.g., web apps) are implemented to ensure that these technologies are all in good working conditions at all times.	65	71%
c. I make sure that principals, teachers and staff have access to ongoing training that enables them to continuously have access to changes, updates, and the use of different learning and teaching technologies.	68	74%
d. I encourage and promote within the district a "bring-your-own-device" policy regarding smart phones, tablets and other personal laptop computers.	26	28%
e. Other (Please specify)	14	15%

Additional strategies respondents use in their districts which include the following six themes: creating strategic plan for using technology in learning among students; emphasizing the "bring your own device" (BYOD) policy; improving / upgrading / spending for better bandwidth and wireless network; provision of 1:1 devices to all middle school students; hiring a staff to lead and manage the district's technology programs; working as a team at all times, emphasizing the use of "we" instead of "I" in answering the questions.

1. *Because I am new to this school district, I began by upgrading our entire infrastructure. Next, I plan to provide at least one Internet-enabled device for every student and educator.*

(continued)

2. *I did not mark the first box as we have moved toward a ratio of device, not 1:1 at all grades. TK-1 will be 4:1, 2-3 2:1 and 4-8 will be 1:1.*

3. *Working on those items not checked but limited by funding and new to my district.*

4. *I model the use of digital tools for my own professional learning through social media and blogging.*

5. *Design and implementation of a comprehensive Technology Master Plan to articulate actions over the next 3 years.*

6. *Our School District has only one school. We are working on improving bandwidth and starting to study BYOD policies.*

7. *Providing 1:1 devices for an entire middle school in addition to 38 classrooms throughout the district in grades 3rd - 12th*

8. *We are working towards BYOD technology.*

9. *Include technology as a tool for learning in the Strategic Plan with "student production" the measurable outcome.*

10. *We are just beginning to restore spending after several years of cuts.*

11. *We are upgrading our wireless network so we can promote some of the aforementioned items.*

12. *I have ensured that there is adequate broadband and wireless access in and outside classrooms. We supply multiple devices to classroom teachers for instructional purposes. This has encouraged a BYOD culture in our district schools. This rural community has intermittent and or zero Internet access and many residents can be seen sitting in their cars or on tables at the District Office or school sites utilizing our wireless access.*

13. *I hire staff (e.g. Technology Director, his subordinate staff, to lead and manage our tech program(s)*

14. *I would not use the word "I" because we have worked as a team on the technology plan in our district.*

Note: n=92

Modeling and promoting the frequent and effective use of technology. Table 3 represents the number of responses and percentage of respondents for each of the four provided response choices related to how superintendents model and promote the frequent and effective

use of technology in their districts. Table 2 also reflects the additional strategies that respondents shared. The top two choices that received the highest number of responses were both related to communication. Seventy four respondents (80%) indicted that they encouraged principals, teachers and staff to use technology in communicating with one another and 72 respondents (78%) shared that they personally and effectively used different technologies (such as email, twitter, SMS, etc.) to communicate with principals, teachers and staff to stay informed of what was happening in the different schools within their respective districts. Four of the respondents provided four additional practices that they use to model and promote the effective use of technology in their districts. These strategies and comments include: featuring successful technology learning practices of teacher leaders and administrators within the district as models to be copied by other schools; provision of growth opportunities, implementing a one-to-one computing in grades 2 to 12, using educational software and e-books; and emphasizing group effort by using we instead of I in answering the question.

Table 3
Respondents' Answers to Question 2

In your role of superintendent, how do you model and promote the frequent and effective use of technology for learning in your district? Please circle those practices listed that you utilize and feel free to add others.	Number of respondents	Percentage
a. I personally and effectively use different technologies (such as email, twitter, SMS, etc.) to communicate with principals, teachers and staff to stay informed of what is happening in the different schools within the district.	72	78%
b. I encourage principals, teachers and staff to use technology in communicating with one another.	74	80%

(continued)

c. I make sure that surveys, meetings, and discussion sessions with principals and teachers are regularly conducted within the district to get their feedback on the successes and challenges they experience in implementing technology in their schools and classrooms.	59	64%
d. I implement the established rules about the proper use of tablets and other electronic gadgets in schools.	52	57%
e. Other (Please specify)	4	4%

Additional practices that respondents use to model and promote the effective use of technology in their districts. These strategies and comments include: featuring successful technology learning practices of teacher leaders and administrators within the district as models to be copied by other schools; provision of growth opportunities, implementing 1 to 1 computing in grades 2 to 12, using educational software and e-books; and emphasizing group effort by using “we” instead of “I” in answering the question.

1. *We the first 1 to 1 District in Riverside County.*
2. *Get our administrators and teacher leaders out to successful models.*
3. *I provide Professional Growth opportunities as we implement 1-to-1 computing in grades 2-12. Currently we use educational software to enhance learning and e-books in social science in grades 6-12.*
4. *Here again..."we".*

Note: n=92

Providing learner centered environments. Table 3 depicts the number of responses and percentage of respondents for each of the four provided response choices related to how superintendents provide learner-centered environments in their districts. For the third question on how superintendents provide learner-centered environments that are equipped with technology and learning resources to meet the individual and diverse needs of all learners, more than half of the respondents (60% to 67%) are using the strategies enumerated in options A to D. This shows that they are doing their best to provide their students a learner-centered environment to provide

for their individual needs through the use of technology. Details of these responses are shown in Table 4 below.

Six respondents gave additional strategies they use in their districts in providing learner-centered environments using technology in schools under them. These strategies include passing a G.O. fund to upgrade technology infrastructure and classroom tools; providing 150 families with 4G LTE wireless internet access through Verizon Wireless; restructuring technology; faculty training and grade level collaboration for technology integration; continually modeling the use of technology and providing electronic copies of agenda; and emphasizing teamwork.

Table 4
Respondents' Answers to Question 3

As a superintendent, how do you provide learner-centered environments that are equipped with technology and learning resources to meet the individual and diverse needs of all learners? Please circle those practices listed that you utilize and feel free to add others.	Number of respondents	Percentage
a. I make sure that a regular budget is allotted in purchasing software that students can use to develop their creativity and independent work.	62	67%
b. I make sure that principals and teachers are regularly provided with e-learning materials for teaching and administrative tasks as well as providing various links to different educational forums.	56	61%
c. I encourage principals to challenge their teachers to customize their coursework with students' use of technology so that the students are able to work at their own pace, receive immediate feedback on progress, and obtain immediate help in their areas of need.	60	65%
d. I encourage principals to challenge their teachers to offer their students access to a variety of media (e.g., internet, smart phones, educational TV shows, etc.) to meet their students' individual needs.	55	60%
e. Other (Please specify)	7	8%

(continued)

Additional strategies respondents use in their districts in providing learner-centered environments using technology in schools under them. These strategies include passing a G.O. fund to upgrade technology infrastructure and classroom tools; providing 150 families with 4G LTE wireless internet access through Verizon Wireless; restructuring technology; faculty training and grade level collaboration for technology integration; continually modeling the use of technology and providing electronic copies of agenda; and emphasizing teamwork.

1. *We passed a G.O. fund last march and part of the funds are allocated for technology - both for infrastructure and for classroom tools.*
2. *We make available to all students and currently provide 150 families with 4G LTE wireless internet access through Verizon Wireless.*
3. *Again all are a goal additionally, restructuring technology to accomplish vision.*
4. *Training and grade level collaboration ensures tech integration. Training and grade level collaboration ensures tech integration.*
5. *Continually model use of technology. Only providing electronic copies of agendas, etc. also help.*
6. *We*

Note: n=92

Study of technology and infusion across the curriculum. Table 5 represents how respondents ensure effective practice in the study of technology and its infusion across the curriculum. On the fourth question on how superintendents ensure the effective practice in the study of technology and its infusion across the curriculum, the biggest number of respondents (77%) uses the strategy of encouraging principals and teachers to attend and participate in conferences on latest educational technologies to meet the technology needs of their students. The strategy in this area that got the lowest response rate is choice which is about encouraging schools to adopt hybrid learning environments where there is a blending of traditional learning environment and high-tech learning environment. The other two choices received response rates of 52% and 54%. Details of these responses are in Table 5 below.

Additional strategies were also given by three respondents as regards ensuring effective practice in the study of technology and its infusion across the curriculum. These strategies include the following: providing coaching to teachers in using technology for instructional purposes; all teachers having smart broadband and netbooks, using online assessment reporting system, having ongoing formative assessment; and provision of Google Chromebooks among grades 2 to 6 students.

Table 5
Respondents' Answers to Question 4

As your district's leader, how do you ensure effective practice in the study of technology and its infusion across the curriculum? Please circle those practices listed that you utilize and feel free to add others.	Number of respondents	Percentage
a. I encourage principals to develop hybrid schools where they can effectively blend a traditional and high-tech learning environment.	40	43%
b. I encourage principals and teachers to attend and participate in conferences that address the latest educational technologies to meet the growing needs of students in the use of technology with their learning.	71	77%
c. I encourage principals to challenge their teachers to elicit student-generated questions with the use of technology, and to motivate them to use digital resources in finding the answers.	52	57%
d. I encourage principals to conduct regular faculty meetings to which the purpose is to discuss and share educational technologies that they found effective in their respective classes.	54	56%
e. Other (Please specify)	3	3%

Additional strategies from respondents in regards to ensuring effective practice in the study of technology and its infusion across the curriculum. These strategies include the following: providing coaching to teachers in using technology for instructional purposes; all teachers having smart broadband and netbooks, using online assessment reporting system, having ongoing formative assessment; and provision of Google Chromebooks among grades 2 to 6 students.

(continued)

1. *Provide coaching to teachers in the use of technology for instructional purposes.*
2. *All teachers have a Smart board and netbooks. The District Has an Online Assessment reporting System to monitor CCSS learning as well as on-going formative assessments.*
3. *We have provided all students in grades 2 - 6 with Google Chromebooks. Our teachers use them interactively with their students continuously. Our students and staff are learning Google Drive to share documents, etc. The Chromebooks are a tool just like pencils and support CCSS and 21st Century Skills well.*

Note: n=92

Stimulating innovation, creativity, and digital-age collaboration. Table 6 represents how respondents lead their respective districts in promoting and participating in local, national and global learning communities to stimulate innovation, creativity and digital-age collaboration For the fifth quantitative question on how superintendents promote and participate in local, national and global learning communities to stimulate innovation, creativity and digital-age collaboration, choices A, B and D got more than 50% response rate from district superintendents. Choice C on the other hand got the lowest rate of response (37%) and this choice is about collaborating with private technology companies for support and assistance. Details of responses in this area are shown in Table 6 below.

Seven additional strategies are shared by 8% of the respondents as regards promoting and participating in local, national and global learning communities. These strategies include: a superintendent who also work as online instructor for a university shares knowledge to her doctoral students using online facilities as a means of collaboration; extending the journey of using technology beyond the district; presenting learning technologies in conferences as a means to collaborate with others; starting and nurturing a group who share technology learning

information among teachers; encouraging the use of open source materials for teaching purposes; and partnering with major technology companies.

Table 6
Respondents' Answers to Question 5

How do you lead your district in promoting and participating in local, national and global learning communities to stimulate innovation, creativity and digital-age collaboration? Please circle those practices listed that you utilize and feel free to add others.	Number of respondents	Percentage
a. I encourage principals and teachers to be members of online educational communities and organizations, such as, the International Society for Technology in Education (ISTE).	47	51%
b. I make sure that the district utilizes blogs and websites to keep our community stakeholders informed about the operations and well-being of the school district.	53	57%
c. I collaborate with major technology companies, such as, Apple, Dell, and Google in adapting within the district emerging educational technologies.	34	37%
d. I make sure that our district is working in collaboration with the county and state offices in promoting the use of innovative technologies.	58	63%
e. Other (Please specify)	7	8%

Additional strategies by respondents in regards to promoting and participating in local, national and global learning communities. These strategies include: a superintendent who also work as online instructor for a university shares knowledge to her doctoral students using online facilities as a means of collaboration; extending the journey of using technology beyond the district; presenting learning technologies in conferences as a means to collaborate with others; starting and nurturing a group of heat seekers who share technology learning information among teachers; encouraging the use of open source materials for teaching purposes; and partnering with major technology companies.

1. *I am an online instructor for a university. I teach doctoral students basic statistics.*

2. *Extend the journey beyond our District out to successful implemented 1:1 environments.*

3. *Technology has been a primary focus of my leadership. My CTO is the president of CETPA and I regularly present at their conferences.*

(continued)

4. *Not able to do this as a small rural district with little extra funding. I rely on Count Office of Education to help with expertise.*

5. *I started with a group of heat seekers with 1-to-1 computing. The pilot group grew to all teachers in two years due to the software that motivated our digital students.*

6. *I encourage the use of open source materials to teach Common Core content*

7. *I am currently working on creating a partnership with major technology companies to provide the needed resources for my staff and stakeholders.*

Note: n=92

Research question two. Research question two asked about public school superintendents' perceived challenges concerning creating, promoting and sustaining a digital-age learning culture for all students in their districts. Respondents of this study were given an open-ended question regarding this matter. Table 7 below shows a summary of the perceived challenges of district superintendents in creating, promoting, and sustaining a digital-age learning culture by the frequency of responses.

Table 7
Summary of the Perceived Challenges of District Superintendents in Creating, Promoting and Sustaining a Digital-age Learning Culture

Perceived challenges	*Frequency of responses*
1. Funding	37
2. Lack of learning materials and access to technology	26
3. Professional development	15
4. Involving stakeholders in the process of change	15
5. Information security	7
6. Constant change in technology	7
7. Implementing student-centered learning	4
8. Educational leadership	4

Out of the 92 total respondents of this study, 71 California K-12 public school district superintendents enumerated what they perceived to be the challenges they face in creating, promoting and sustaining a digital-age learning culture within their respective school districts.

Based on their answers in an open-ended question on this matter, there are eight (8) general themes that the respondents elaborated in their answers. These themes include the challenges on the following: (a) funding; (b) lack of learning materials and access to technology; (c) professional development; (d) involving stakeholders in the process of change; (e) information security; (f) constant change in technology; (g) implementing student-centered learning; and (h) educational leadership. The frequencies of these responses on those are detailed in Table 6. The actual responses of the 71 California K-12 public school district superintendents on the question of what they perceived to be their challenges in creating, promoting and sustaining a digital-age culture learning culture in their school districts can be found at Appendix H. The summaries and compilation of their answers according to the 8 themes mentioned above are discussed in the following sections below.

Funding. Funding is the most frequently mentioned perceived problem among district superintendents. This theme appeared 72 times in the respondents' answers on the open-ended question on what they believe is the greatest challenge they face in creating, promoting a digital-age learning culture within their districts. Their explanations cover the need for funding in purchasing technology devices to training teachers and staff of the district to enable them to effectively teach using different technologies available in the market. Table 8 shows the summary details of the answers from the respondents as compiled under the theme funding problems of school districts in creating, promoting and sustaining a digital-age learning culture for all students in their respective school districts.

Table 8
Respondents' Perceived Challenges in Creating, Promoting and Sustaining a Digital-age Learning Culture – Funding

Funding concerns	*Frequency of responses*
Funding	5
Money	2
Cost	1
Budget	4
Not having funds to stay up to date	1
Adequate funding to update and replace technology	1
The amount of money it will take for the devices	1
Inadequate financial resources for the district	1
Financial constraints and competing demands for the resources	1
The funding is and will continue to be the greatest challenge	1
We still have some catch up to do with regard to properly funding technology	1
Cost and the intrusive privatization charter movement taking grant funds away	1
First, money! I currently have 3,286 netbooks deployed to students and teachers	1
Funding Wireless capacity, Training teachers	1
Separate funding dedicated to tech (infrastructure, software, and staff) that is not subject to negotiations	1
Challenges include: Budgetary concerns with keeping up with the latest software and hardware	1
Funding is still the major road block. Technology is always changing and needs to be replaced a very three years (minimum)	1
Funding! With appropriate funding we can provide needed infrastructure and maintain an appropriate replacement cycle	1
Money for new technology, training for staff members who only use technology to word process, email, and Facebook	1
I find the greatest challenge is getting the funding to implement digital-age learning environment and also the budget to hire professionals	1

(continued)

Funding concerns	*Frequency of responses*
The greatest challenge is always funding. We need additional funding to provide staff development, new devices, upgraded software, increased band-with, etc	1
Being able to financially keep up with the demands of ever-changing technology and providing a plan to continually update and replace with best and most current technology	1
The greatest challenge in regards to creating, promoting, and sustaining a digital-age learning culture would be: 1- lack of financial resources to provide those needs and 2- keeping up with the ever evolving advancements in technology	1
As of now our biggest challenge has been having sufficient funds to implement all technological strategies which my principals and teachers want to in class. We always have to manage and the best with we have	1
Funding is an ongoing issue. Schools need to shift from what I refer to as "bake sale" technology purchasing to "structural" technology purchasing. Rather than funding technology on dollars that are left over, technology costs need to be a percentage of the total budget with predictable funding sources and amounts	1
Remains a serious issue. We are geographically remote without internet access in many of our students' homes. We have a veteran staff, many of whom are reluctant learners of technology. I am new to this district but have reformed two districts previously through technology innovation. I have had the good fortune to be able to hire a new technology director in this district this year and things are getting better quickly!	1
It goes back to funding. With educational funds being cut by 20% from 2007-2012, there needs to be a catch-up time in which school districts can begin to restore the programs and resources that have been cut over those five years or more. For our district, there is no money in the 2013-14 or 2014-15 budget to spend on technology. Thank goodness we passed a bond that is focused on spending those funds to upgrade technology or we would be way behind technologically	1

(continued)

Funding Concerns	*Frequency of Responses*
Right now, everything in education has to do with making certain that we have adequate funding. With all the educational cuts that districts have endured over the last 5-7 years, We cannot guarantee providing or maintain a digital-age learning culture unless funding is there. Education is not getting the funding needed to keep updated technology in the hands of students so that they can be ready for college and careers in the 21st Century	1
I am not a district superintendent. As County Superintendent, I perceive the greatest challenge to be adequate funding to provide student access on a regular basis (individual student computers). Our County Office will have no students next year, since the Local Control Funding Formula has designated the district of residence to receive all ADA funding. The districts are not funded adequately to purchase and/or update the equipment that is necessary for students to benefit fully from the information resources that are available. The question regarding enrollment was answered "pro forma," as the total number of K-12 students in the four districts in the county. Our largest district is less than 1,500 students, and our smallest district is just under 400	1

Lack of learning materials and access to technology. Second to the problem of funding is the problem of the lack of learning materials and access to technology by the students. This is what the respondents believe to be the second most problematic concern of the different school districts as this them appeared 26 times in the open ended question on this matter. Some of their responses on this concern include their challenge in getting and using e-Books, having internet access in school and at home, having stronger bandwidth, having enough technology gadgets, developing effective instructions that support technology use in learning and too much reliance on text books and printed materials. Details of the respondents' answers and explanations of their

perceived problems on the lack of learning materials and students' access to technology are enumerated in Table 9.

Table 9
Respondents' Perceived Challenges in Creating, Promoting and Sustaining a Digital-age Learning Culture – Lack of Learning Materials and Access to Technology

1	Internet capability.
2	Implementing a BYOD (Bring Your Own Device) policy.
3	Upgrading the devices.
4	Providing up-to-date technology devices.
5	Providing and maintaining one-to-one devices.
6	The heavy reliance on textbooks and other printed media.
7	Inadequate internet access for our students in their home environment.
8	Developing effective instruction K-12 that supports student use of technology.
9	I suppose the challenge is sustainable resources for replacement.
10	Replace cost and SBAC has changed the use of technology. Transitioning to e-Books in grades 3-12 will be a challenge. We are preparing students for the 21st Century.
11	Ensuring equity in access to technology tools - during and outside of the school day - for students from all backgrounds.
12	There is a lack of material and/or lesson design that allow for technology integration as part of adult professional development.
13	Finding the adequate programs and adequate curriculum to keep teachers, staff and students motivated and having the hunger to use the most current technological resources.
14	We are a small rural school in the hills of Shasta County. Bandwidth is going to be an ongoing issue for us.
15	Providing additional technology support staff at all school sites as sites acquire more personal technology devices.
16	The availability of bandwidth in our remote area to support innovation with technology in the classroom.
17	Broadband access sufficient to handle 1 to 1 computing and adequate funding for student devices.
18	Making sure that we get the added value digital technology can provide, beyond merely digitalizing established lessons, assignments, newsletters, etc.

(continued)

19	As a district it is difficult to keep up with all the latest technology available.
20	I think the tech companies and publishers could do a better job with providing seamless and wrap around technologies that students find leading to 21st century skills.
21	Solutions for the new SBAC testing is still going through some implementation bumps in California in many districts.
22	finding ways to provide 1:1 devices for low income students to take home or ways to provided internet access for students who do not have internet capability at their home,
23	Technology is a tool to aide in learning, so the challenge is to be sure that learning is the outcome. Having the tools in place is important, but the using the tools to improve student learning is the key.
24	I don't see follow-through with previous state-level initiatives, like e-text books, and the availability of adequate and affordable solutions for the simple implementation that allows more use of technology.
25	ISTE provides a good model for tech implementation. Technology needs to work properly, and be effective at achieving instructional goals, and I'm not sure we are there yet. We have new data/metric requirements emerging under LCAP, so this may take priority also.
26	We are going to begin to see an exacerbation of the challenges that are already persistent as a result of the inequity in resources, facilities, and technology access in our schools. With the SBA platform, these inequities will generate greater challenges in assessing student learning and exposing students to 21st century tools they will need to become more proficient and comfortable with as they transition to college and/or careers.

Professional development. The third most pressing concern of California K-12 public school district superintendents regarding creating, promoting and sustaining a digital-age learning among their students is the challenge of professional development among teachers and staff. This concern appears 15 times in the answers of the respondents in the open-ended question. Their challenges on this matter include finding the time for teachers to attend trainings to upgrade their technology knowledge and skills, provision of adequate and relevant trainings, differentiated learning and provision of on-going training as technology keeps on upgrading and changing over time. Details of their responses on this matter are shown in Table 10 below.

Table 10
Respondents' Perceived Challenges in Creating, Promoting and Sustaining a Digital-age Learning Culture – Professional Development

1	Time for training.
2	Provide up-to-date training.
3	Most teachers are digital immigrants.
4	Effective professional development.
5	Providing release time for professional development.
6	Providing meaningful staff development.
7	Effectively train the staff and teachers and finding the time and money to set up these training sessions.
8	Meaningful and effective 24/7 professional development. Adequate funding for sustainability.
9	It takes great belief that it will make a difference, incredible investment in professional development, and time to make this big transition.
10	It is critical that I provide quality professional learning opportunities and on-going support to teachers in using and integrating digital tools for their own learning and student learning.
11	On-going training is required along with the District leasing the software for the schools. Continuing to provide Online Instruction is also a requirement to meet a variety of options.
12	We are now a District where the students and teachers have the technology they need to be successful. We now have to focus on professional development so that the technology is used to promote the Common Core State Standards.
13	The greatest challenge with regards to creating, promoting, and sustaining a digital-age learning culture for all students in my district is access to high quality professional development for teachers and administrators.
14	Teacher training is key in all areas but is difficult to do in current schedule with common core professional development. They do go hand in hand but for some of our teachers we need to differentiate the learning.
15	Purchasing, integrating, maintaining and training staff and students is very complex and sophisticated. Funding an extra position to address technology curriculum, and another position for the maintenance and sustainability of technology is cost prohibitive.

Involving stakeholders in the process of change. Another thematic challenge that superintendents perceive in creating, promoting and sustaining a digital-age learning for the whole district is making stakeholders get involved in the process of change. This concern appears 15 times among the answers of the respondents in the open-ended question. Adapting technology in the teaching and learning process requires changes in many aspects of teaching and learning on the part of the teachers, staff students, parents and the community at large. These are the stakeholders of the school district and not everybody is ready to embrace technological change. Superintendents are challenged to convince all stakeholders that change in the teaching and learning process is a good thing and something that is not scary. Specifically, the respondents concern ranges from having older teachers who are not willing to move into the technology-age because of their mindset to labor unions who are opposing innovative practices using technology. Details of the respondents' concern on this matter are shown in Table 11.

Table 11
Respondents' Perceived Challenges in Creating, Promoting and Sustaining a Digital-age Learning Culture – Involving Stakeholders in the Process of Change

1	Teacher buy in.
2	Teacher comfort with the technology.
3	Hesitancy of some staff to utilize technology.
4	Labor union opposition to innovative practices.
5	Changing pedagogy systemically throughout the classrooms in our whole district.
6	Getting staff buy-in with implementation and collaborative incorporation of common core standards.
7	Bringing ringing along staff that might not be excited to change to a technology-based delivery system.
8	Older teachers that are in the system who are not able to move into the technology age because of their mindset.
9	People are afraid technology is going to replace people. You still need good people to facilitate the use of technology in education.

(continued)

10	The old guard who don't want to use tech. High tech parents who don't want tech at school A balance with tech.
11	Changing pedagogy in such a way teaching and learning is innovative and powerful learning takes place using technology.
12	The major challenge would be everything is so new and teachers hate to waste time on anything that is not productive so the taking chances is a new trend.
13	One of the other challenges is that the rules with instructional minutes, seat time instructions are antiquated and are hard to make online learning work in a non-charter school environment.
14	The hardest part is changing the culture and idea of what learning is and is not. Involving all stakeholders in the process to ensure a shared vision for student learning in the 21st Century. This can be a daunting task but one that needs to take place in order to ensure the successful implementation of digital learning.
15	Technology is a target for many factions within schools. From unions who do not want to see any funds spent on resources that may detract from salaries, to parents who are not comfortable with the new role of technology in schools, to teachers who are just not comfortable yet, there are loud voices of opposition.

Information security. Respondents of this study also perceive information technology as another challenge in creating, promoting and sustaining a digital-age learning culture for the students of their districts. This concern has appeared in the respondents' answers to open-ended questions seven times. Their responses range from the concern on the security of information in the internet to monitoring age-appropriate contents for students of specific ages and grades. Details of their responses are shown in Table 12.

Table 12
Respondents' Perceived Challenges in Creating, Promoting and Sustaining a Digital-age Learning Culture – Information Security

1	Security.
2	Security of information.
3	Monitoring student access to inappropriate content.
4	Maintaining network security maintaining student safety.

(continued)

5	Monitoring age-appropriate content exposure, and preventing cyber bullying.
6	Blended classrooms are emerging in many districts, and we working to keep up with newly established parameters for student and staff safety regarding internet policies and e-rate.
7	The greatest challenge is keeping up with policies that support learning but at the same time make sure that information is secure and students are using the technology for the intended purpose.

Constant change in technology Table 11 shows the details of the district superintendents' challenge on constant change in technology as one of their challenges in creating, promoting and sustaining a digital-age learning culture within their school districts. This concern appeared seven times in the respondents' answers in the open-ended questions. Details of their answers range from staying current with the changes in technology to public schools lagging behind in technology as compared to entrepreneurs and others in the private sector. Their specific descriptions of their answers to this concern on constant change in technology are shown in Table 13.

Table 13
Respondents' Perceived Challenges in Creating, Promoting and Sustaining a Digital-age Learning Culture – Constant Change in Technology

1	Staying current.
2	Changing technology and evolving.
3	Continually evolving devices and materials.
4	The challenge is the ever changing technology.
5	Schools typically lag behind the pace set by entrepreneurs and others in the private sector.

(continued)

6	The speed of change that overwhelms our teachers and changes the nature of their relationship with pedagogy, students, and content.
7	I believe the biggest challenge to sustaining a digital-age learning culture is the constant change in technology. Being that this is the relatively beginning age of social media and the advancement of technology changes so frequently, it is difficult to finding a stable enough digital platform to use in the educational system. Society is in a constant state of change in this digital era.

Implementing student-centered learning system. A concern on implementing student-centered learning among students in school districts has also been identified by the respondents as one of the challenges they face in creating, promoting and sustaining a digital-age learning culture in school districts. This concern has appeared four times in the open-ended question that was administered among the district superintendents in California. Details of their responses range from students having critical thinking abilities but not being taught well to having students who are digital natives while having teachers who are not necessarily tech savvy. The respondents' specific concerns on the challenge of having student-centered learning are shown in Table 14.

Table 14
Respondents' Perceived Challenges in Creating, Promoting and Sustaining a Digital-age Learning Culture – Implementing Student-Centered Learning System

1	Students have an awesome tool to show critical thought and creativity, unfortunately they're not being taught well.
2	One of my greatest challenges is dealing with the digital divide between teachers, who are not necessarily tech savvy and students who are digital natives.
3	For this generation of teachers to trust their students. Much of what we have promoted in the last ten years was a teacher centered environment. Now we are asking them to transition to a student centered model that is augmented by technology.

(continued)

4	I believe our greatest challenge is assisting educators in their understanding that the technology is a tool not a replacement of paper and pencil activities. We also need to embrace the idea that going paperless isn't the goal, however, allowing teachers and students to utilize their devices as a means of accomplishing learning through a broader lens. Teachers now need to be facilitators, no longer someone who imparts knowledge. This is truly a challenge in that educators don't have total control of the end product or the right answers, that students may know more than their teachers and parents won't be able to do their kids homework at night!

Educational leadership. The last challenge that is perceived by district superintendents in creating, promoting and sustaining a digital-age learning culture in their district is educational leadership. This concern appeared four times in the open-ended questions given to the respondents. Details of their answers range from having bureaucratic requirements in the in the district and school systems that are not aligned with digital-age possibilities to having top management that is too controlling to a point that innovations in schools are impeded. A more detailed description of their concerns on this matter is shown in Table 15.

Table 15
Respondents' Perceived Challenges in Creating, Promoting and Sustaining a Digital-age Learning Culture – Educational Leadership

1	Bureaucratic requirements that do not align with digital-age possibilities (ie seat time, Williams Settlement textbook requirements).
2	Getting school leadership and teachers to develop the vision and capacity to use the powerful tools available to us today to develop and implement lessons that leverage their learning to new and greater opportunities for academic growth.

(continued)

3	California is embarrassingly behind all other states in encouraging districts to be innovative and entrepreneurial with regard to this topic. Our state needs new leadership at all levels to begin the process of recapturing our former spirit of leading the nation.
4	As well, top management tends to be too controlling, which impedes innovation in schools. If we flatten organizational authority and provide more freedom and autonomy, we will stimulate creativity, including the use of technology. The greatest challenge is not money, it is ourselves - superintendents.

To summarize, California K-12 public school superintendents believe that even if they are being very vigilant in creating, promoting and sustaining a digital-age learning culture in their districts, the still face enormous challenges in making sure that their districts are maximizing the benefits of technology use in student learning. Based on their responses in the open-ended question regarding their perceived challenges, they see that funding, lack of learning materials / access to technology and professional development of teachers and staff are the top three hurdles that they need to battle. These top three challenges are followed by five more which include involving stakeholders in the process of change, information security, constant change in technology, implementing student-centered learning and educational leadership.

Research Question 3

Research question three asked about the public school superintendents' perceived solutions on what is needed to be done to address the challenges they face in creating promoting and sustaining a digital-age learning culture for all students in their districts. 68 California K-12 public school district superintendents out of the total 92 respondents of this study, enumerated what they believe are the solutions to the challenges that they face in creating, promoting and sustaining a digital-age learning culture within their respective school districts. Based on their answers in an open-ended question on this matter, there are eight (8) general themes that the

respondents elaborated in their answers. These themes are comprised of the following solutions: (a) provision of sufficient funding; (b) effective implementation of continuing professional development program; (c) visionary leadership; (d) assurance of internet access among students, faculty and staff; (e) provision of appropriate curriculum for technology use in education; (f) collaboration with both private and public sectors; (g) improving instructional technologies; and (h) facilitating creative work environment. The frequencies of responses on the above-mentioned themes are shown in Table 16.

Table 16
Summary of the Solutions in Addressing the Challenges Creating, Promoting and Sustaining a Digital-age Learning Culture as Perceived by District Superintendents

Perceived Solutions	*Frequency of Responses*
1. Provision of sufficient funding	28
2. Effective implementation of continuing professional development program	20
3. Visionary leadership	11
4. Assurance of internet access among students, faculty and staff	8
5. Provision of appropriate curriculum for technology use in education	6
6. Collaboration with both private and public sectors	5
7. Improving instructional technologies	5
8. Facilitating creative work environment	5

There were a couple of comments on the need for time to implement the changes and one respondent commented that their district is already addressing the problems they encounter. The actual responses of the 68 California K-12 public school district superintendents on the question of what they believe are the solutions in addressing the challenges they face in creating, promoting and sustaining a digital-age learning culture in their school districts can be found at Appendix I. The summaries and compilation of their answers according to the 8 themes mentioned above are discussed in the sections below.

Provision of sufficient funding. With the challenges that California K-12 public school district superintendents are facing in creating, promoting and sustaining a digital-age learning culture in their school districts, the number one solution that they are looking at is the provision of adequate funding. This is evident among their responses in the open-ended question regarding this matter as the solution of funding was the most frequent response they gave as 28 times as shown in Table 17. Their responses range from needing the funding to buy and maintain technology devices to funding the needed training of the districts' teachers and support staff.

Table 17
Respondents' Perceived Solutions in Addressing the Challenges in Creating, Promoting and Sustaining a Digital-age Learning Culture – Provision of Sufficient Funding

Areas for the provision of sufficient funding	*Frequency of responses*
Funding.	5
Money.	2
Time and money.	1
Dedicated funding.	1
Resilient state funding.	1
Adequate ongoing funding.	1
Long term commitment to budget.	1
Dedicated funding for technology devices.	1
More money and more resources to locally drive initiatives.	1
You can't create a digital-age learning culture without funding.	1
Budget and funding. Keeping up with the technology development.	1
Funding, infrastructure outside our schools, access for all students in the home.	1
Funding that is adequate or at least the continued development of the public domain.	1
An effective tech plan that included a source of funding State/federal funding support teacher training.	1
Funding is the biggest issue with finding the right person or persons to support technology purchasing, maintenance and training.	1

(continued)

Areas for the provision of sufficient funding	*Frequency of responses*
Districts need a price point for units that will allow replacement of devices affordable. We replace 1,500 units every year in order to maintain effective use.	1
An infusion of dollars that is devote to the digital-age. Rural communities have a difficult time with the lack of wireless, antennas that are within range and the total evolution of the digital age.	1
I believe more funding is needed. Administrators in school districts are very knowledgeable in how to implement a digital-age learning culture for all students but to actually have the opportunity to do takes adequate funding.	1
We need to be able to provide the funding to keep up with the advancements in technology and we need funding to provide the training needed to implement the use of technology.	1
The state needs to increase funding for technology.	1
We need a greater focus on providing specific funding to address infrastructure issues. We do not have sufficient facilities funds to address the needs of our schools...especially the older schools that also typically have difficulty raising funds through their PTAs.	1
I hate to advocate for categorical funding, but a category for technology funding could require that only technology-related items be purchased with the funding source. Absent a requirement by the State, Districts have to assert the need for tech funding, and retain a given level of funding for this purpose each year.	1
There needs to be an augmented amount in educational funding in which technology in school s can be refreshed and updated. Another idea could be where there is a state bond and that is geared totally on technology for all the schools in the state. There are some districts with concentration grant funds of over $X million per year and others with no concentration grant funds at all. How in the world would districts with no concentration grant funds be able to keep any current technology in their districts?	1

Effective implementation of continuing professional development program. The second most frequent solution that the respondents gave in terms of addressing the challenges in creating, promoting and sustaining a digital-age learning culture in school districts is the effective implementation of continuing professional development among the districts' teachers and support staff. The training that they have in mind include those of teachers having coaches, conduct of best practices workshops, and a robust and on-going professional development program. This kind of thinking and solution among the district superintendents is very evident in their responses to the open ended question on this matter as this theme of professional development appeared 20 times among their answers as shown in Table 18.

Table 18
Respondents' Perceived Solutions in Addressing the Challenges in Creating, Promoting and Sustaining a Digital-Age Culture – Effective Implementation of Continuing Professional Development Program

1	Having coaches.
2	More training.
3	Training for staff.
4	Required coding courses.
5	Professional Development
6	Professional learning for staff.
7	Ongoing professional development.
8	A robust professional development program.
9	Time and money for professional development.
10	Return of professional development days within the school year.
11	Continued education and discussion of technological applications for education.
12	Ongoing professional development is critical. Many teachers are not prepared to use digital tools with students.
13	Training for staff on the realities of being a global citizen and the importance of technology in their student's future.
14	More time and opportunities for teachers to gain the skills. A mindset among all members.

(continued)

15	We need to continue to conduct best practices workshops for teachers to integrate technology as a tool to improve instruction and increase student engagement.
16	The right type of sustained training and coaching that will change results in the classroom using technology the right way that is focused on powerful learning for all students.
17	Training and the time to train. The wide technology generation gap among teachers will continue to be a challenge and effective training is the key to address needs of "older" staff.
18	Create and implement a professional development t/coaching model that draws upon experiences and successes from the most innovative teachers in the world that can be easily accessed and reproduced
19	In order to address challenges related to creating, promoting, and sustaining a digital-age learning culture for all students in my district, we need access to high quality professional development for teachers and administrators.
20	Initially we must provide powerful professional development to change the mindset of most educators. We have been stuck in the frenzy to improve test scores that we don't teach critical thinking and problem solving. Once that training has been delivered, we must follow up with coaching to ensure the new learning is practiced in classrooms.

Visionary leadership. Visionary leadership is the third most frequent response of the California K-12 public school district superintendents who participated in this study in terms of their perceived solutions in addressing the problem of creating, promoting and sustaining a digital-age learning culture in school districts. This theme of visionary leadership appeared in the respondents' open-ended question 11 times. Their answers include support from the top management in teachers implementing innovations in using technology in teaching, changing the policies to better facilitate the changes demanded by technology use in the classroom and administrators upgrading their technology skills side by side with the teachers' skills development on technology. Details of the respondents' answers regarding this matter of visionary leadership are enumerated in Table 19.

Table 19
Respondents' Perceived Solutions in Addressing the Challenges in Creating, Promoting and Sustaining a Digital-age Learning Culture – Visionary Leadership

1	Visionary leadership.
2	Consistent expectations.
3	Full support of the Board of Trustees.
4	Vision that meets concerted plans for implementation.
5	We need highly technological ready teachers with the drive to motivate our students.
6	A better state-wide vision State-wide work with technology industry to set more reasonable rate.
7	Courageous leadership. Honoring and supporting our innovators/early adopters and replicating their practices.
8	Permission from the State of California to experiment with the emerging technologies and loosen the rules with face to face meeting. etc.
9	Change charter law to prevent corporate raiding of public funds and to provide public schools a fair opportunity to implement systemic change.
10	Continued support and technology use expectations from district and school admin for teachers to use technology. Technology use expectations for students....infused in regular work not a separate add-on.
11	Our administrators need to be on the same page. We must insist that administrators receive and practice the same level of professional development as their teachers; otherwise, they don't know what to look for and call for in their classrooms.

Assurance of internet access. The solution of assuring that there is reliable internet connection among schools in the district has been mentioned eight times among the respondents of this study. District superintendents believe that this fundamental and powerful technology that is used in creating, promoting and sustaining a digital-age learning culture in school districts is met and properly addressed. The answers of the respondents centered on having available internet access in schools and internet access in the homes of the students so that a seamless and

continuing learning between the school and the homes of the students is present. Details of the respondents' answers on this matter are enumerated in Table 20.

Table 20
Respondents' Perceived Solutions in Addressing the Challenges in Creating, Promoting and Sustaining a Digital-age Learning Culture – Assurance of Internet Access

1	Internet capability.
2	Community wide access to internet.
3	High-speed access, and wireless networks.
4	Our remote county needs broadband access to all.
5	Equal access for all students from school and home.
6	Continued development of CCSS implementation that utilizes many online resources.
7	We need the infrastructure to support the devices. I can afford the devices and software, I can't provide the fiber optics across the miles to reach my district.
8	In a district that has a high level of poverty in home internet connection is a major challenge. Students are like sponges all you need to do is give them the opportunity and they will soak it up!!!!!!!! It's the adult that struggle the most.

Provision of appropriate curriculum for technology use in education. Another perceived solution that the district superintendents are looking into in terms of addressing the challenges they face in creating, promoting and sustaining a digital-age learning culture in their school districts is the provision of appropriate curriculum for technology use in education. This theme appeared in their answers to the open-ended question on this matter six times. Their responses include having better curricular modes that teachers can use, embedding technological skills in the common core standards being implemented in all schools, creating a digital platform and a well-designed curriculum. Details of the respondents' answers are enumerated in Table 21.

Table 21
Respondents' Perceived Solutions in Addressing the Challenges in Creating, Promoting and Sustaining a Digital-age Learning Culture – Provision of Appropriate Curriculum for Technology Use in Education

1	Better models.
2	Well designed and aligned curriculum.
3	I need a scope and sequence that brings teachers along.
4	There is a need to explicitly embed technological skills to our present Common Core Standards.
5	I need a true proven curriculum that addresses said technological resources and the data showing its in nationwide districts and their schools.
6	I believe what is needed to address the challenges related to creating, promoting, and sustaining a digital-age learning culture is to develop a digital platform that is stable enough for learning and building onto the knowledge base, one that is separate from any outside digital influences. A platform that can last for decades and will ensure the students learn as well as our teachers to teach. To develop a system that will sustain itself and not be susceptible and or vulnerable to forced change.

Collaboration with both private and public sectors. The California K-12 public school district superintendents who participated in this study believe that another solution to the problems and challenges they face in creating, promoting and sustaining a digital-age environment is their collaboration with both the private and public sectors. They know that they need help in many ways and given that they have limited funding, collaboration for them would be a key in solving their problems. Their idea is that educational leaders should collaborate and create partnership with local companies, large businesses, the government – state, federal and county levels and different technology companies. This theme on collaboration appeared in the respondents' answers five time in responding to the second open-ended question. More details of their responses on this matter are shown in Table 22.

Table 22
Respondents' Perceived Solutions in Addressing the Challenges in Creating, Promoting and Sustaining a Digital-age Learning Culture – Collaboration with Both Private and Public Sectors

1	Connecting with local companies is a big issue.
2	New connections with local and large businesses.
3	Collaborative discussions with other districts on technology of interest.
4	Support at state, federal, county levels. Collaboration with other government agencies.
5	Partnerships with technology companies and involvement at state and national levels to keep abreast of all innovations.

Improving instructional technologies. District superintendents also see the need in improving instructional technologies if they are to truly create, promote and sustain a digital-age learning culture within their school districts. This theme appeared in their answers to the study's second open-ended question five times. Their responses include having a focus on technology as a learning tool, encouraging the policy of Bring Your Own Device (BYOD) to school, provision of better software and access to digital tools. These answers are enumerated in Table 23.

Table 23
Respondents' Perceived Solutions in Addressing the Challenges in Creating, Promoting and Sustaining a Digital-age Learning Culture – Improving Instructional Technologies

1	A focus on technology as a learning tool.
2	More BYOD (Bring Your Own Device) to schools.
3	Devices for all High quality e-instructional materials.
4	Sufficient resources to provide access to digital tools and devices.
5	I can't afford the five-year refreshing plan we have implemented. To pull off a personalized environment for students, I need better software.

Facilitating creative work environment. The solution of facilitating creative work environment is another strategy that California K-12 public school district superintendents

believe they can use to address the challenges they face in creating, promoting and sustaining a digital-age learning culture among the students, teachers and staff of the school districts. This theme appeared on the respondents' answers five times for the second open-ended question of this study. Their answers include the emphasis on stimulating creativity from both the teachers and students through the use of technology, taking the risk to learn, teach and share new ideas, seeing technology as a very useful tool in delivering instructional programs and having the right people who can use technology for teaching and learning purposes. Details of the respondents' answers regarding this matter are enumerated in Table 24.

Table 24
Respondents' Perceived Solutions in Addressing the Challenges in Creating, Promoting and Sustaining a Digital-age Learning Culture – Facilitating Creative Work Environment

1	We need to develop a work environment that stimulates creative outcomes at the student and teacher levels.
2	Teachers should be allowed and encouraged to take risks, in their classrooms. Young students (primary grades) need opportunities to create work on their computers. Making time in the instructional day to utilize tech, either for research or producing work.
3	On site support for teachers as they try to implement technology.
4	Develop a culture in which a balanced approach to instruction is valued and technology plays an active but transparent role in the instructional program.
5	Another challenge is finding quality people who can move my district forward into the technology age hardware wise.

In general, the California K-12 public school district superintendents are very positive in believing that there realistic and doable solutions to the challenges they face in their districts regarding creating, promoting and sustaining a digital-age learning culture among their students. Based on their responses on an open-ended question regarding this matter, the top three solutions they are looking at in solving their problems include the provision of sufficient funding, effective implementation of continuing professional development program among teachers and staff and

having visionary leadership. These top three solutions are followed by the assurance of internet access among students, teachers and staff, provision of appropriate curriculum for technology use in education, collaboration with both private and public sectors, improving instructional technologies and facilitating creative work environment.

Chapter Summary

The information regarding creating, promoting and sustaining a digital-age learning culture among school districts, was gathered from the responses of 92 California K-12 public school district superintendents. A survey questionnaire composed of five quantitative questions for research question 1 and two qualitative questions for research questions 2 and 3, were electronically distributed among them. The survey questionnaire was specifically designed to elicit from the respondents the strategies they use in creating, promoting and sustaining a digital-age culture in their school districts, what they perceive to be their greatest challenges and what they think are the possible solutions to the problems and challenges they are facing regarding this matter.

Overall, for research question one, California K-12 public school district superintendents are vigilant in creating, promoting, and sustaining a digital-age learning culture for their respective school districts. This has been evident in their responses to the five quantitative questions of this study, as more than half of them are using strategies that encourage students, teachers, principals, and staff members to use different technologies in both the learning process of the students as well as in managing the school systems.

In response to research question two, California K-12 public school superintendents reported that the top three challenges they face in their efforts as superintendents to create, promote and sustain a digital-age learning culture in their districts are insufficient funding, lack

of learning materials or access to technology and professional development of teachers and staff. Five additional challenges shared by superintendents included: challenges involving stakeholders in the process of change, information security, constant change in technology, implementing student-centered learning and educational leadership.

In terms of this study's research question three, the California K-12 public school district superintendents identified the following top three solutions they perceive are needed to address the challenges: the provision of sufficient funding, effective implementation of continuing professional development program among teachers and staff and having visionary leadership. Six additional solutions were also shared and included: the assurance of internet access among students, teachers and staff, provision of appropriate curriculum for technology use in education, collaboration with both private and public sectors, improving instructional technologies and facilitating creative work environment.

Chapter 5: Discussion and Implications

This final chapter discusses the key findings of this study in terms of meaning and relationship to the conceptual framework and literature that framed this study. This chapter also presents and discusses conclusions and recommendations for policy changes, practice changes, and for further study. Finally, this chapter concludes with a chapter summary.

The primary purpose of this survey study was to explore and describe how California K-12 public school district superintendents create, promote, and sustain a digital-age learning culture for all students. In addition, this study also intended to learn the challenges that superintendents encounter in their leadership efforts to achieve a digital-age learning culture and what they believe are needed in addressing those challenges. The following three central research questions guided this study:

(1) What practices do California K-12 public school district superintendents use to create, promote and sustain a digital-age learning culture for all students in their districts?;

(2) What do California K-12 public school superintendents perceive to be their greatest challenges concerning creating, promoting and sustaining a digital-age learning culture for all students in their districts?; and

(3) What do California K-12 public school district superintendents believe they need to do to address the challenges related to creating, promoting and sustaining a digital-age learning culture for all students in their districts? A discussion of the key findings that resulted from an analysis of survey data is presented in the following section in for each guiding research question.

A discussion of the key findings resulting from analysis of the survey data is presented in the following section for each guiding research question.

Discussion of Key Findings

The results concerning practices to create, promote, and sustain a digital-age learning culture in their school districts fell within five primary areas, and the discussion below follows these areas.

Creating, promoting and sustaining a digital-age learning culture. Research question one investigated practices used by California K-12 superintendents to create, promote, and sustain a digital-age learning culture in their school districts. The discussion of findings for this question is organized into the following five sections: (a) ensuring that instructional innovation in the district is focused on continuous improvement of a digital-age learning culture; (b) modeling and promoting frequent and effective use of technology for learning; (c) providing learner-centered environments that are equipped with technology and learning resources to meet the individual and diverse needs of all learners; (d) ensuring effective practice in the study of technology and its infusion across the curriculum; and (e) promoting and participating in local, national and global learning communities to stimulate innovation, creativity and digital-age collaboration.

Continuous improvement. Superintendents were presented with four possible strategies through which to promote the continuous improvement of digital-age instruction and asked to identify which they utilized. These four consisted of (a) providing adequate broadband and wireless access inside and outside of classrooms, guaranteeing at least one Internet-enabled device for every student and educator, and promoting the use of cloud computing; (b) instituting a system where the district's IT hardware, Internet access, and software infrastructure are monitored and maintained to ensure that they are in good working order at all times; (c) ensuring access of principals, teachers, and staff to ongoing training so that they are exposed to changes,

updates, and uses of different learning and teaching technologies; and (d) encouraging a *bring-your-own-device* (BYOD). In addition to these, respondents suggested six additional ones: (a) creating strategic plans for using technology in learning among students; (b) emphasizing a BYOD policy; (c) improving / upgrading / spending for better bandwidth and wireless networks; (d) ensuring availability of one-to-one devices to all middle school students; (e) hiring of staff to lead and manage the district's technology programs; and (f) working as a team at all times, including emphasis of *we* instead of *I* in answering the questions.

Among the four presented to the superintendents, the top three were the following:

- Ensuring access of principals, teachers, and staff to ongoing training so that they are exposed to changes, updates, and uses of different learning and teaching technologies (74%)
- Instituting a system where the district's IT hardware, Internet access, and software infrastructure are monitored and maintained to ensure that they are in good working order at all times (71%)
- Providing adequate broadband and wireless access inside and outside of classrooms, guaranteeing at least one Internet-enabled device for every student and educator, and promoting the use of cloud computing (61%)

Modeling and promoting effective use. Superintendents were presented with four possible strategies through which frequent and effective use of technology for learning could be modeled and promoted and were asked to identify which they utilized. These four consisted of (a) personally and effectively using various technologies to communicate with principals, teachers, and staff to stay informed with respect to the different schools within the district; (b) encouraging principals, staff, and teachers to use technology in communicating with one another;

(c) conducting surveys, meetings, and discussion sessions with principals and teachers regularly so as to solicit their feedback on the their successes and challenges in implementing technology; and (d) implementing established rules about proper use of tablets and other electronic devices in schools. In addition to these, respondents suggested five additional ones: (a) featuring successful technology learning practices of teacher leaders and administrators within the district as models to be copied by other schools; (b) providing growth opportunities; (c) implementing one-to-one computing in grades 2 to 12 (d) employing educational software and e-books; and (e) emphasizing group effort by using *we* instead of *I* in answering questions.

Among the four presented to the superintendents, the top three were the following:

- Encouraging principals, staff, and teachers to use technology in communicating with one another (80%)
- Personally and effectively using various technologies to communicate with principals, teachers, and staff to stay informed with respect to the different schools within the district (78%)
- Conducting surveys, meetings, and discussion sessions with principals and teachers regularly so as to solicit their feedback on the their successes and challenges in implementing technology (64%)

The 80% of the respondents who encouraged principals, teachers and staff to communicate with one another using technology shows that superintendents find this very important are regards modeling purposes to students and the efficiency of communication. This strategy is in agreement with the claims of ISTE (2001a; 2001b) and that it is important to educators to use technologies such as emails, twitter and SMS in communicating with one another. The response of the 78% of the respondents in terms of using technology in

communicating with their principals, teachers and staff shows that superintendents are very good models and show qualities that ideal educational leaders are supposed to have as mentioned in the conceptual framework of this study. This study is grounded on the theory of transformational leadership to which it dictates the responsibility of providing stakeholders with necessary information and coordinating all the activities of the whole district (American Association of School Administrators and National School Boards Association, 1968). Results of this study show that such those responsibilities are being fulfilled by the district superintendents. The relationship and connection that the superintendents develop among their principals, teachers and staff through the use of technology is in agreement with the study of Levy (2010) where he states that relationships among members of the organization is vital in the sustainability of its success and that its opposite, non-connection, is bound to fail or lead to mediocrity. Because of the connection that superintendents build among its principals, teachers and staff, superintendents become effective in mobilizing key individuals in the organization which agrees with the study of Fullan (2005) where such mobilization paves the way for constructive change in the organization.

Learner-centered environments. Superintendents were presented with four possible strategies for providing learner-centered environments and asked to identify which they utilized. These four consisted of (a) allotting a regular budget for purchasing software that students can use to develop their creativity and work independently; (b) regularly providing principals and teachers with e-learning materials for teaching and administrative tasks and links to various educational forums; (c) encouraging principals to challenge teachers to customize their coursework with students' use of technology so that (a) they are able to work at their own pace; (b) can receive immediate feedback; and (c) receive immediate feedback if needed; and (4)

encouraging principals to challenge their teachers to offer students access to a variety of media (e.g., Internet, smart phones, educational TV shows, etc.).

In addition to these, respondents suggested six additional ones: (a) passing a G.O. fund to upgrade technology infrastructure and classroom tools; (b) providing 150 families with 4G LTE wireless Internet access through Verizon Wireless; (c) restructuring technology; (d) faculty training and grade level collaboration for technology integration; (e) continually modeling the use of technology and providing electronic copies of agenda; and (f) emphasizing teamwork.

Among the four presented to the superintendents, the top three were the following:

- Allotting a regular budget for purchasing software that students can use to develop their creativity and work independently (67%)
- Encouraging principals to challenge teachers to customize their coursework with students' use of technology so that (a) they are able to work at their own pace; (b) can receive immediate feedback; and (c) receive immediate feedback if needed (65%)
- Regularly providing principals and teachers with e-learning materials for teaching and administrative tasks and links to various educational forums (61%)

When 67% of the respondents sad that they make sure that a regular budget is allotted in the purchase of software that student needs for their individual and diverse learning needs, the superintendents support the claim of Muth (2012) that funding is a vital component in the success of providing students with the necessary digital-age learning environment that they need. Creating this kind of environment also supports that conceptual framework of this study that is based on transformation leadership to one of the roles of district superintendents is to invest in

the pedagogical skills of the students and in understanding them (State Superintendent of Public Instruction, 2012).

Study of technology and its infusion across the curriculum. Superintendents were presented with four possible strategies through which to promote the study of technology and its infusion across the curriculum. These four consisted of encouraging (a) principals to develop hybrid schools where traditional and high-tech learning environments are blended; (b) principals and teachers to attend and participate in conferences that address the latest educational technologies so as to meet the growing needs of students in use of technology with their learning; (c) principals to challenge their teachers to elicit student-generated questions with the use of technology and to motivate them to use digital resources to find the answers; and (d) principals to conduct regular faculty meetings whose purpose is to discuss and share educational technologies found to be effective in their classrooms.

In addition to these, respondents suggested three additional ones: (a) providing coaching for teachers in use of technology for instructional purposes; (b) providing all teachers with smart broadband and netbooks, employing an online assessment-reporting systems, and having ongoing formative assessment; and (c) providing Google Chromebooks among students in grades 2 through 6.

Among the four presented to the superintendents, the top three were the following:

- Encouraging principals and teachers to attend and participate in conferences that address the latest educational technologies so as to meet the growing needs of students in use of technology with their learning (77%)

- Encouraging principals to challenge their teachers to elicit student-generated questions with the use of technology and to motivate them to use digital resources to find the answers (57%)
- Encouraging principals to conduct regular faculty meetings whose purpose is to discuss and share educational technologies found to be effective in their classrooms (56%)

The 77% of the respondents who claimed that they encourage principals and teachers to participate in conferences on educational technologies supports Bonk and Graham (2012) in their statement that keeping educators updated with the latest trends in educational technology is of utmost importance in the effective practice of technology. Given this updated knowledge and skills of the educators concerned, technologies' infusion across the curriculum becomes less challenging (LoTi, 2011).

As educators improve themselves in the use of technology through better understanding of the latest technology trends as encouraged and supported by district superintendents, the superintendents' transformation leadership role of enabling, challenging, modeling, inspiring and encouraging becomes very relevant and apparent (Sweeney, 2000).

Stimulate innovation, creativity and digital-age collaboration. Superintendents were presented with four possible strategies through which stimulate innovation, creativity, and digital-age collaboration. These four consisted of the following: (a) encouraging principals and teachers to be members of online educational communities and organizations (i.e., ISTE); (b) ensuring use of blogs and websites to inform community stakeholders about operations and well-being of the school district; (c) collaborating with major technology companies (i.e., Apple, Dell, Google) in adapting within the school district emerging educational technologies; and (d)

ensuring that district is collaborating with state and county offices in promoting use of innovative technologies.

In addition to these, respondents suggested five additional ones: (a) employing online facilities as a means to collaborate; (b) extending use of technology beyond the district; (c) presenting learning technologies in conferences as a means of collaborating with others; (d) starting and nurturing a group of heat seekers who share technology learning information among teachers, (e) encouraging use of open source materials for teaching purposes; and (f) partnering with major technology companies.

Among the four presented to the superintendents, the top three were the following:

- Ensuring that district is collaborating with state and county offices in promoting use of innovative technologies (63%)
- Ensuring use of blogs and websites to inform community stakeholders about operations and well-being of the school district (57%)
- Encouraging principals and teachers to be members of online educational communities and organizations (51%)

The number one strategy that superintendents used in ensuring collaboration outside their districts was building a good relationship with the government at the county and state levels showed that superintendents believed that the government was one of the best supporters of school districts in promoting innovative learning strategies. This supports the claim of Manzo's (2009), Esselman, Lee-Gwin and Rounds (2012) that collaboration with the government is necessary in the successful implementation of technology in the teaching and learning process among students.

Additional common strategies that are used by district superintendents. Results of this study revealed that the three additional strategies that the respondents contributed in the creating, promoting and sustaining a digital-age learning environment include the use of Bring Your Own Device (BYOD) strategy, not necessarily having 1:1 ratio of student and computer / internet enabled device use and the provision of coaching strategies among teachers. The BYOD strategy is not widely use because according to one of the respondents, such strategy is fairly new and there are no specific guidelines to it that schools can directly make use of. Since funding has always been a challenge, there are superintendents who maximize budget by having the ratio of TK-1 will be 4:1, 2-3 2:1 and 4-8 will be 1:1 to one district and only having 1:1 ratio for the middle school in another district. In addition to encouraging teachers to attend seminars and workshops on the latest technology trends, some superintendents maximized their resources by putting up a coaching system to assist other educators in the district.

Challenges in creating, promoting, and sustaining a digital-age learning culture. Key findings related to research question two resulted in eight challenges that superintendents perceive to be their greatest challenges in creating, promoting, and sustaining a digital-age learning culture. These challenges included: (a) funding (40%); (b) lack of learning materials and access to technology (28%); (c) professional development (16%); (d) involving stakeholders in the process of change (16%); (e) information security (8%); (f) constant change in technology (8%); (g) implementing student-centered learning (4%); and (h) educational leadership (4%).

Funding. The challenge of funding the educational technology for school district has been the underlying reason for the problems that are encountered by district superintendents. Garland & Tadeja (2013) says that not all teachers, administrators and learners have access to the new social networking tools because districts with limited or lesser funding cannot afford to

acquire enough tools and equipment that a digital-age learning environment requires. According to Natriello (2010), Chan et al. (2008) and Muth (2012), the challenge in learning through the use of technology is the students' access to technology.

Lack of learning materials and access to technology. Since in some districts, full access to internet is a problem, acquiring online materials is difficult for them. The problem of internet access is an obstacle for these districts in having the technology that they need which are mostly available online. Such claim has been confirmed by this study when district superintendents stated that there was a funding problem, lack of learning materials and access to technology among students. This finding also confirms the study of Garland & Tadeja (2013) that not all teachers, administrators and learners have access to the new social networking tools.

Professional development. The respondents' claim that one of their challenges is the professional development of their principals, teachers and staff and thus confirms the statement of Nagel (2013) that there is lack of opportunities for professional development.

Involving stakeholders in the process of change. The challenge of involving stakeholders in the process of change as experienced by the respondents of this study supports the claim of Nagel (2013) who mentioned that there are problems of some school staff and leaders resisting change in the school system where technology has to be infused.

Information security. In line with the problem of information security, as observed by the respondents of this study, Chen et al. (2012) claim that some of the technology problems that students encounter include credibility of information and privacy of information. In addition, Westervelt (2013) and Johnson (2013) say that online ethics and digital citizenship are issues that should be addressed by administrators and educators alike. Ethical issues and concerns arise when there is a weak security of information in the internet and other technology devices.

Constant change in technology. The constant change in technology is another hurdle that district superintendents are looking at in creating a digital-age learning culture. This issue is in connection with the problem of professional development among teachers, principals and staff because when technology changes, the educators must adapt and they would need some training and professional development. This is also connected to the problem of funding because professional development programs have certain budgetary requirements (Westera, 2004).

Implementing student-centered learning. Respondents of this study see that there was a challenge in implementing student-centered learning as these are interrelated to the problems of funding and the professional development among teachers and staff. According to Means (2010) and Harris et al. (2009), facilitating a student-centered learning environment also means attending to students' individual needs and learning styles while utilizing different learning technologies and teaching tools to enhance the learners' ability. Such can be addressed through adequate funding and continuous professional development of school teachers and staff.

Educational leadership. The role of superintendents in leading their district to sustain a digital-age learning culture requires that they develop a comprehensive framework in implementing a doable plan of infusing technology across curriculum (Transforming, 2008). Such task requires a strong leadership will and determination. With a vast amount of different challenges that superintendents face, their ability to tackle and solve these problems is put into test and such is their challenge (Wilkinson, 1999).

Addressing the challenges of creating, promoting and sustaining a digital-age learning culture. The solutions district superintendents enumerated in solving the different district problems and concerns they encountered include the following: (a) provision of sufficient funding (30%); (b) effective implementation of continuing professional development program

(22%); (c) visionary leadership (12%); (d) assurance of internet access among students, faculty and staff (9%); (e) provision of appropriate curriculum for technology use in education (7%); (f) collaboration with both private and public sectors (5%); (g) improving instructional technologies (5%); and (h) facilitating creative work environment (5%).

Provision of sufficient funding. As funding was also the first problem identified by the respondents in creating, promoting and sustaining a digital-age learning culture in school districts, a direct response of providing sufficient funding is what they see as the first solution to their problems and challenges.

Effective implementation of continuing professional development program. When superintendents mentioned that their second biggest challenge is providing their principals, teachers and staff with adequate professional development programs, they naturally emphasize that solving such problem is attending to their professional needs by implementing continuing professional development programs. Through a continuing development program, the necessary skills that teachers would need to adequately teach their students using the latest trends in technology would become possible.

Visionary leadership. To combat interconnected challenges mentioned above, superintendents must be effective in their roles as leaders of the learning community. School superintendents also saw the need of being effective and efficient leaders of their school districts. Such role is elaborated by Miller and Devin (2009) when they say that superintendents must delicately balance the use of power in order to create a healthy culture and productive schools.

Assurance of internet access among students, faculty and staff. Internet access is crucial in a digital-age learning culture and this is what the district superintendents were expressing when they say that a clear solution to their problem is the assurance of internet access among

students, faculty and staff. This solution is in line with the statement from Prensky (2008) that technology can be leveraged to provide personalized learning and to move away from a one-size-fits-all education system and such is a principal component in instituting the successful implementation of technology plans.

Provision of appropriate curriculum for technology use in education. With the use of technology, a different kind of curriculum must be utilized to specifically give way to the tools that technology provides. District superintendents see that such appropriate curriculum has yet to be developed as a response to their challenge of creating the appropriate digital-age learning culture among all students. This resolve is in agreement with Twigg (2005) who said that technology and digital age tools can jump-start creativity in every child.

Collaboration with both private and public sectors. The collaboration with both private and public sectors of district superintendents was what the respondents believed would be a good strategy that can address to the problems they encounter. The collaboration can be made with these entities can be very specific such as funding, provision of technology, professional development, curriculum development and other similar collaborative activities and agreements. This kind of collaboration has been demonstrated by Dell and Verizon when they have provided grants and gifts of technology to many underserved children across America (Schwartz, 2010).

Improving instructional technologies. There were many different technologies that can be used in education but identifying which ones would best fit the needs of the student learning community was what the district superintendents would like to be implemented. The superintendents resolve in taking advantage of technology in assisting students learning supports the claim of Gearhart (2011) who said that technology impacts the technology systems. Technology, according to Kreuger (2009), can catalyze the students' ways of thinking and ways

of expressing themselves which can make them ready for the kind of technology environment they will have in the future.

Facilitating creative work environment. The need to address the unique and individual needs of students requires a lot of creativity and innovation. As such, the respondents of this study believed that the provision and facilitation of a creative work environment would pave the way for a digital-age learning culture within the school districts.

The problems and challenges that are discussed above, as viewed by K-12 California public school district superintendents, are those that they also consider as problems that can be solved and addressed. The solutions they enumerated are those that they think are attainable given their leadership abilities and clear and comprehensive understanding of what needs to be done.

Conclusions

Based on analysis of the data collected, findings from the study support the following conclusions.

Conclusion one. The superintendent's leadership for developing and stewarding a shared vision for technology-supported learning for all students is key to creating, promoting and sustaining a district digital-age learning culture in California school districts. The capacity for which leadership strives is nearly all dependent on how district-level administration accounts for how well they broadcast and share a vision for technology to support learning (Schachter, 2010). Nearly 73% of all superintendents in this study expressed having a visionary leadership as one of the key components in creating, promoting, and sustaining a digital-age learning culture in their respective schools. District superintendents share a responsibility and practice in being active in the distribution of technology and in innovation and this includes sharing a vision for leadership.

Phillips & Phillips (2007) believe any conception of the superintendency must be relationship-centered, focusing on how leaders demonstrate vision and initiative through the involvement of stakeholders, the fostering of teamwork, and the building of strong relationships. The American Association of School Administrators (2007) agrees and adds that the superintendent, like principals, must also demonstrate a keen understanding of teaching, learning and what works for students. Portis and Garcia, (2007) emphasize the efficient use of resources, especially in regards to technology and innovation to support high-achieving student learning.

Conclusion two. Translating a vision for a digital-age learning culture for all students in California school districts requires superintendents to build capacity by: a) prioritizing funding for technology, b) providing administrators, teachers and students with access to current and supported technology, and c) promoting and supporting continuing learning opportunities for school leaders and teachers. This was evident in this study whereas funding became the elemental, and often times primary, reasons in what California K-12 public school superintendents perceived to be their greatest challenges in creating, promoting and sustaining a digital-age learning culture. Supporting teachers with new technologies is not always the easiest way, as funding is a constant challenge for many school districts (Pilgrim et al., 2012). Nearly all aspects of public education considers appropriate and ongoing funding to initiate programs that lead to successful and positive student outcomes (The Council of Chief State School Officers, 2007).

Educators working in nearly all grade levels need increased access to the Internet, as well as more age-appropriate software for their students (Palloff & Pratt, 2010). Overall access ensures that both students and staff receive the training and knowledge to fully implement the use of technology and to improve access to education. 30% of all superintendents in this study

expressed this need as a practice they use and constantly strive. Bennett (2009) further adds that technology training that is systematic and in an on-going manner must be based on effective practice and the latest research to show the outcomes and focus is on student learning.

Superintendents are expected to encourage the use of technology by making it readily available and encouraging communication as well as ongoing training and professional development. Lack of professional development for technology use is one of the most serious obstacles to fully integrating technology into the curriculum (Nickerson & Zodhiates, 2013). Teachers' inadequate access to professional development opportunities means that the challenge of providing a standards-aligned curriculum at the will not be easily met (Sternberg, 2009). Furthermore, the quality of training educators receive before they assume their positions, and the continuing professional development they get once they are hired and throughout their careers, has a lot to do with whether school leaders can meet the increasingly tough expectations of their jobs (Sternberg, 2009). A total of 68 superintendents expressed this same concern using ongoing professional development in this study as another practice they are using to create, promote and sustain a digital-age learning culture in their respective schools.

Conclusion three. Promoting collaboration and regular communication about the use of technology within the district and with the community is another key California superintendent practice for creating, promoting, and sustaining a digital-age learning culture. Superintendents need to be able to use and promote technology themselves whether using it with social media or to simply provide information to parents and the community about their schools or districts. Educational leaders identify, communicate, model, and enforce social, legal, and ethical practices to promote responsible use of technology (Christensen & Horn, 2008). Ertmer and Ottenbreit-Leftwich (2010) agrees and also adds that superintendents who effectively lead integration of

technology promote and model the use of technology to access, analyze, and interpret campus data to focus efforts for improving student learning and productivity. Collaboration and communication with families, businesses, governmental agencies, social service organizations, the media, and higher education institutions are critical to effective schooling (Loertscher et al., 2010). A total of 77% of superintendents in this study stated that they were able to accommodate the growing need and use of regular communication to their different stakeholders as a practice for creating, promoting, and sustaining a digital-age learning culture.

Conclusion four. California superintendents need more funding then currently exists and funding that they can count on over time in order to provide current and reliable technology, access to technology services, and professional development for school leaders and teachers; entities that are essential to creating, promoting and sustaining school district digital-age learning cultures that support high levels of learning for all students. A majority of superintendents and principals say insufficient funding is a more pressing problem for them than lack of parental involvement, ineffective administrators or poor teacher quality (Lashway, 2010). Goens (2009) further adds that many districts have experienced an enormous increase in responsibilities and mandates without getting necessary resources to support them. Farkas et al., (2001) also reports that school leaders say their biggest headaches are funding and the time it takes to comply with a blizzard of local, state and federal mandates. A total of 78% of superintendents in this study stated that funding, or lack thereof, is what they perceived to be their greatest challenge concerning creating, promoting and sustaining a digital-age learning culture. A total of 51% of superintendents in this study also listed funding as they believed they needed in order to support learning in a digital-age learning culture.

Conclusion five. There is a need for a statewide vision and collaboration among state leaders, district leaders, and technology industry leaders in order to enact a more powerful vision for creating, promoting, and sustaining school district and community digital age learning cultures that support high levels of learning for all students. Superintendents in this study believed that making connections to the various stakeholders for their respective districts, as well as outside their districts, was essential in creating, promoting, and sustaining school district and community digital age learning culture. The model superintendent recognizes that effective leadership is shared leadership, one in which teams and ongoing collaborations help define and commit to a common vision, to a culture of respect and openness, and to methods for decision making that ensure every child gets the best possible education (Blankstein, 2004; Weast, 2008). Demonstrating the value of successful communication and collaboration, the impact a superintendent has on a school district, is the direct result of the nature and quality of the relationships he or she develops (Elworthy, 2014; Demski 2014). Haynes (2013) further adds that collaborating with faculty and community members, responding to diverse community interests and needs, and mobilizing community resources for the interest of responding to student achievement is in the best interest of the superintendent. To make a vision a reality will require close collaboration among stakeholders in all areas of California's education system (California Department of Education, 2013). As expressed in this study, 29% of these superintendents stated that they believe this kind of powerful connection was necessary in creating, promoting, and sustaining school district and community digital age learning culture.

Recommendations

Policy and Practice. Five key recommendations are offered in response to the findings and conclusions that resulted from this study:

(1) District superintendents need to develop a clear vision and articulate it constantly to all stakeholders as a direction for their district. Research shows that articulating a vision and a clear direction for the district, ensuring that the mission of each school within his/her district aligns to this vision is both critical and necessary (American Association of School Administrators, 2007; Portis & Garcia, 2007; Waters & Marzano, 2006).

(2) It is recommended that district superintendents place heavy emphasis on professional development. A professional development plan for adult learning that is collaborative, continuous, embedded in daily practice and focused on student achievement affords every educator an opportunity to enrich his/her practice (Domenech, 2009). Professional development opportunities should focus on effective instructional practices using technology and learning the latest technology that promotes high student achievement.

(3) District superintendents must regularly choose to collaborate with his community in regards to technology. The district superintendent must also be aware and use technology themselves.

(4) Funding must take the utmost priority with superintendents. Emphasis in funding includes ensuring that technology programs are sufficiently funded currently and can be funded for the projected long term. Funding for professional development in areas that target successful learning for all students must also be part of a superintendent's plan. Superintendents in this study indicated that funding was neither budgeted for long-term planning in technology or not enough funding was available. Being aware and actively seeking both short-term and long-term

budgeting for technology needs to be part of a superintendent's planand should align with his vision (DiPaola, 2007).

(5) Further collaboration between the superintendent and state leaders, district leaders, and technology industry leaders is another recommendation that must take place on an active and consistent basis. Learning in technology, especially with innovative and constantly changing dynamics requires that superintendents make greater efforts to align their vision with that of the state and those closely connected to ever-growing and changing landscape of educational technology. Nearly every week, a new system or application is being developed for tools to support student learning in educational technology (Bonk & Graham, 2012). Harnessing this power is crucial for superintendents to maximize their efforts in helping students be successful as 21st century digital-age learners. Together, as a team, we prepare students to live, work, and thrive in a highly connected world (California Department of Education., 2013). Furthermore, district superintendents must collaborate with each other in terms of sharing their visions for their respective districts. In this way, they will be able to learn from each other and get the support they need whenever possible. Support from other superintendents will be helpful since they share common problems and effective solutions can be reached if they shared their different administrative experiences in creating, promoting and sustaining a digital-age learning environment for their students. As further supported by Bonk and Graham (2012), the education leader promotes the learning and growth of all students and the success of all staff by cultivating a shared vision that makes powerful teaching and learning the central focus of schooling.

Further research. Two recommendations for further research resulted from this study. The researcher sees a need to do further research in exploring visionary leadership among district superintendents. Their specific vision in their respective districts that have their unique circumstances and challenges can be explored and be compared to each other. Finding commonalities and differences among them could shed light in how public school districts can be managed with a specific purpose of bringing an effective digital-age learning environment to students to help them become effective learners of the 21st century.

Chapter Summary

The purpose of this survey study was to know the successful practices of California K-12 District Superintendents in leading their districts in terms of creating, promoting and sustaining a digital-age learning environment among their students. In addition, this study also intended to learn the challenges that superintendents encounter in their leadership efforts to achieve a digital-age learning culture and what they believe are needed in addressing those challenges.

The top three strategies utilized by the superintendents in terms of ensuring that instructional innovation is the district is focused on continuous improvement of a digital-age learning culture were: (a) making sure that principals, teachers and staff have access to ongoing training that enables them to continuously have access to changes, updates, and the use of different learning and teaching technologies (74%); (b) putting in place a system where continuous monitoring and maintenance of the district's technology hardware (e.g., tablets, laptops, smartphones, etc.); internet access (e.g., school wifi, student cell account) and software infrastructure (e.g., web apps) are implemented to ensure that these technologies are all in good working conditions at all times (71%); and (c) making sure that our district is providing adequate broadband and wireless access inside and outside of classrooms, guaranteeing at least one

Internet-enabled device for every student and educator, and promoting the use of cloud computing (61%).

In the area of modeling and promoting frequent and effective use of technology for learning this study revealed that the superintendents' top three strategies were: (a) encouraging principals, teachers and staff to use technology in communicating with one another (80%); (b) personally and effectively using different technologies (such as emails, twitter, SMS, etc.) to communicate with principals, teachers and staff to stay informed of what is happening in the different schools within the district (78%); and (c) making sure that surveys, meetings, and discussion sessions with principals and teachers are regularly conducted within the district to get their feedback on the successes and challenges they experience in implementing technology in their schools and classrooms (64%).

The strategy of providing learner-centered environments that are equipped with technology and learning resources to meet the individual and diverse needs of all learners was also used by district superintendents. Their top three most utilized specific strategies were: (a) making sure that a regular budget is allotted in purchasing software that students can use to develop their creativity and independent work (67%); (b) encouraging principals to challenge their teachers to customize their coursework with students' use of technology so that the students are able to work at their own pace, receive immediate feedback on progress, and obtain immediate help in their areas of need(65%); and (c) making sure that principals and teachers are regularly provided with e-learning materials for teaching and administrative tasks as well as providing various links to different educational forums.

In the area of ensuring effective practice in the study of technology and its infusion across the curriculum, respondents of this study revealed that their mostly used strategies were:

(a) encouraging principals and teachers to attend and participate in conferences that address the latest educational technologies to meet the growing needs of students in the use of technology with their learning (77%); (b) encouraging principals to challenge their teachers to elicit student-generated questions with the use of technology, and to motivate them to use digital resources in finding the answers (57%); and (c) encouraging principals to conduct regular faculty meetings to which the purpose is to discuss and share educational technologies that they found effective in their respective classes.

In the area of promoting and participating in local, national and global learning communities to stimulate innovation, creativity and digital-age collaboration respondents of this study revealed that their top three strategies were: (a) making sure that their district is working in collaboration with the county and state offices in promoting the use of innovative technologies (63%); (b) making sure that the district utilizes blogs and websites to keep their community stakeholders informed about the operations and well-being of the school district (57%); and (c) encouraging principals and teachers to be members of online educational communities and organizations, such as, the International Society for Technology in Education (ISTE).

The additional common strategies that were used by district superintendents included the use of Bring Your Own Device (BYOD) strategy, not necessarily having 1:1 ratio of student and computer or internet enabled device use and the provision of coaching strategies among teachers. The BYOD strategy is not widely used because according to one of the respondents, such strategy is fairly new and there are no specific guidelines to it that schools can directly make use of. Since funding has always been a challenge, there are superintendents who maximize budget by having the ratio of *TK-1* will be 4:1, 2-3 2:1 and 4-8 will be 1:1 to one district and only having 1:1 ratio for the middle school in another district. In addition to encouraging teachers to

attend seminars and workshops on the latest technology trends, some superintendents maximize their resources by putting up a coaching system to assist other educators in the district. In other contexts of adoption of IT in public schools, a similar strategy that addresses issues related to the BYOD has been explored. Some factors in this strategy were (a) policy (Green, 2007), (b) security (Henderson & Livingston, 2011), (c) user education (Markelj & Bernick, 2012), and (d) mobile learning (An & Reigeluth, 2011). Contrary to the trends in other contexts, such novel policy received the lowest response of 26% in California K-12 public schools.

This study revealed that the challenges that district superintendents face in creating, promoting, and sustaining a digital-age learning culture included: (a) funding (40%); (b) lack of learning materials and access to technology (28%); (c) professional development (16%); (d) involving stakeholders in the process of change (16%); (e) information security (8%); (f) constant change in technology (8%); (g) implementing student-centered learning (4%); and (h) educational leadership (4%).

With the given challenges, respondents of this study also shared what they believe are necessary to do in order to addressing the challenges of creating, promoting and sustaining a digital-age learning culture. The solutions they enumerated were the following: (a) provision of sufficient funding (30%); (b) effective implementation of continuing professional development program (22%); (c) visionary leadership (12%); (d) assurance of internet access among students, faculty and staff (9%); (e) provision of appropriate curriculum for technology use in education (7%); (f) collaboration with both private and public sectors (5%); (g) improving instructional technologies (5%); and (h) facilitating creative work environment (5%).

Given all the information that was gathered by this study, the following can therefore be concluded:

(6) The superintendent's leadership for developing and stewarding a shared vision for technology-supported learning for all students is key to creating, promoting and sustaining a district digital-age learning culture in California school districts.

(7) Translating a vision for a digital-age learning culture for all students in California school districts requires superintendents to build capacity by: a) prioritizing funding for technology, b) providing administrators, teachers and students with access to current and supported technology, and c) promoting and supporting continuing learning opportunities for school leaders and teachers.

(8) Promoting collaboration and regular communication about the use of technology within the district and with the community is another key California superintendent practice for creating, promoting, and sustaining a digital-age learning culture.

(9) California superintendents need more funding then currently exists and funding that they can count on over time in order to provide current and reliable technology, access to technology services, and professional development for school leaders and teachers; entities that are essential to creating, promoting and sustaining school district digital-age learning cultures that support high levels of learning for all students; and,

(10) There is a need for a statewide vision and collaboration among state leaders, district leaders, and technology industry leaders in order to enact a more powerful vision for creating, promoting, and sustaining school district and community digital age learning cultures that support high levels of learning for all students.

With the conclusions discussed above this study recommends the following:

(1) District superintendents need to develop a clear vision and articulate it constantly to all stakeholders as a direction for their district. Research shows that articulating a vision and a clear direction for the district, ensuring that the mission of each school within his/her district aligns to this vision is both critical and necessary (American Association of School Administrators, 2007; Portis & Garcia, 2007; Waters & Marzano, 2006).

(2) It is recommended that district superintendents place heavy emphasis on professional development. A professional development plan for adult learning that is collaborative, continuous, embedded in daily practice and focused on student achievement affords every educator an opportunity to enrich his/her practice (Domenech, 2009). Professional development opportunities should focus on effective instructional practices using technology and learning the latest technology that promotes high student achievement.

(3) District superintendents must regularly choose to collaborate with his community in regards to technology. The district superintendent must also be aware and use technology themselves.

(4) Funding must take the utmost priority with superintendents. Emphasis in funding includes ensuring that technology programs are sufficiently funded currently and can be funded for the projected long term. Funding for professional development in areas that target successful learning for all students must also be part of a superintendent's plan. Superintendents in this study indicated that funding was neither budgeted for long-term planning in technology or not enough funding was available. Being aware

and actively seeking both short-term and long-term budgeting for technology needs to be part of a superintendent's planand should align with his vision (DiPaola, 2007).

(5) Further collaboration between the superintendent and state leaders, district leaders, and technology industry leaders is another recommendation that must take place on an active and consistent basis. Learning in technology, especially with innovative and constantly changing dynamics requires that superintendents make greater efforts to align their vision with that of the state and those closely connected to ever-growing and changing landscape of educational technology. Nearly every week, a new system or application is being developed for tools to support student learning in educational technology (Bonk & Graham, 2012). Harnessing this power is crucial for superintendents to maximize their efforts in helping students be successful as 21st century digital-age learners. Together, as a team, we prepare students to live, work, and thrive in a highly connected world (California Department of Education., 2013). Furthermore, district superintendents must collaborate with each other in terms of sharing their visions for their respective districts. In this way, they will be able to learn from each other and get the support they need whenever possible. Support from other superintendents will be helpful since they share common problems and effective solutions can be reached if they shared their different administrative experiences in creating, promoting and sustaining a digital-age learning environment for their students. As further supported by Bonk and Graham (2012), the education leader promotes the learning and growth of all students and the success of all staff by cultivating a shared vision that makes powerful teaching and learning the central focus of schooling.

In terms of suggested future research in line with the findings of this study, the researcher sees a need to do further research on exploring visionary leadership among district superintendents. Their specific visions in their respective districts that have their unique circumstances and challenges can be explored and be compared to each other. Finding commonalities and differences among them could shed light in how public school districts can be managed with a specific purpose of bringing an effective digital-age learning environment to students to help them become effective learners of the 21st century.

This study described the different practices that district superintendents were using to meet the digital-age learning needs that are set forth for the students. Likewise, their perceptions on the problems that are prevailing along with their efforts of reaching their district goals were also explored in this study. Solutions to those problems were also elicited by this study among the survey participants. As such, a comprehensive description of what was happening in K-12 California public school districts has been illustrated in this study. Likewise, the management and leadership directions that district superintendents plan to take in addressing their challenges were described and illustrated in this study.

The California K-12 public school district superintendents are remarkable leaders who take on the challenge of creating, promoting and sustaining a digital-age learning culture among their 21st century learners. They have their limitations but they never stop in finding solutions to their challenges, limitations and problems. They recognize their visionary leadership is a key in the solutions to the problems they face on a day-to-day basis.

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APPENDIX A
Participant Recruitment Invitation with E-mail

Date:

Dear Superintendent:

You are cordially invited to participate in a research study conducted by Mr. Chester Tadeja, a doctoral candidate at Pepperdine University. This study is being conducted in partial fulfillment of the requirements for a dissertation. You may be particularly interested in the results of this study as it relates to the technology leadership of other superintendents in the state of California as well as how this could influence and impact the new Common Core Curriculum.

Working Title of the Study
"An Enquiry Into California School District Superintendents: Their Role in Creating, Promoting, and Sustaining A Learning Culture In The Digital Age"

Purpose of the Study
The purpose of this survey research study is to explore how California K-12 public school district superintendents create, promote and sustain a digital-age learning culture for all students. A second purpose of this study is to identify and describe what these superintendents perceive as the challenges related to creating, promoting and sustaining a digital-age learning culture for all students and what they believe is needed to address these challenges.

Potential Risks and Discomforts
The risks to participants include discomfort with answering questions about yourself and/or your experiences. You may feel pressure to answer questions in a socially desirable way. You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights, or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, you may contact the researcher, Chester Tadeja or Dr. Linda Purrington, chair, lpurring@pepperdine.edu or 949.223.2568 or you may contact Dr. Thema Bryant-Davis, Chairperson of the Pepperdine University Graduate and Professional Schools IRB, at thema.bryant@pepperdine.edu or (818) 501-1632.

If you decide to participate, you will be required to take an online survey that consists of five questions using a Likert-scale rating and three open-ended questions. Go to https://+++TBD+++ from any computer or electronic device that has access to the Internet. The survey will take approximately 20-30 minutes. Your informed consent is required to participate in this study. You must read the informed consent statement on the survey welcome page. In order to gain access to the survey questions, you must check the informed consent box. All survey responses will be kept anonymous. You may refuse to answer any question that you do not want to answer and still remain in the study. No information that can identify you will be published in the results of this study. Participation is strictly voluntary. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. Participation or non-participation will not affect your job status or any personal consideration or rights you usually expect. If you would like to receive the study results, you may follow the link provided at the end of the survey; results will

be available approximately 4-6 weeks after the conclusion of the study. If you have any questions, you may contact me at [LEFT INTENTIONALLY BLANK].

Respectfully,
Chester Tadeja

APPENDIX B
Informed Consent

Dear Superintendent:

My name is Chester Tadeja and I am a doctoral candidate in the Organizational Leadership program at Pepperdine University, Graduate School of Education and Psychology. I am currently in the process of recruiting individuals for my study entitled, “An Enquiry Into California School District Superintendents: Their Role in Creating, Promoting, and Sustaining A Learning Culture In The Digital Age”. The professor supervising my work is Dr. Linda Purrington. The study is designed to investigate how California K-12 public school district superintendents create, promote and sustain a digital-age learning culture for all students. A second purpose of this study is to identify and describe what these superintendents perceive as the challenges related to creating, promoting and sustaining a digital-age learning culture for all students and what they believe is needed to address these challenges. So I am inviting individuals California public school superintendents to participate in my study. Please understand that your participation in my study is strictly voluntary. The following is a description of what your study participation entails, the terms for participating in the study, and a discussion of your rights as a study participant. Please read this information carefully before deciding whether or not you wish to participate.

If you should decide to participate in the study, you will be asked to respond to 3 background questions, 5 quantitative questions, and 2 open-ended qualitative questions. It should take approximately 30 minutes to complete the survey. Please complete the survey alone in a single setting.

Although minimal, there are potential risks that you should consider before deciding to participate in this study. These risks include the possible imposition on the participant’s time. Another potential risk is that participants may feel fatigue as it relates to completing an extra task. In the event you do experience an imposition on your time or in completing an extra task, you may withdraw from the participation of the survey at any time.

The potential benefits to you for participating in the study are you may be interested in the results of this study in light of the new Common Core State Standards and how it might implicate the use of technology in the classroom. You may also be interested in learning how other California state public school superintendents are creating, promoting, and sustaining and digital-age learning culture.

If you should decide to participate and find you are not interested in completing the survey in its entirely, you have the right to discontinue at any point without being questioned about your decision. You also do not have to answer any of the questions on the survey that you prefer not to answer--just leave such items blank.

After 2 weeks, a reminder note will be sent to you to complete and return the survey. Since this note will go out to everyone, I apologize ahead of time for sending you these reminders if you have complied with the deadline.

If the findings of the study are presented to professional audiences or published, no information that identifies you personally will be released. The data will be kept in a secure manner for at least 5 years at which time the data will be destroyed.

If you have any questions regarding the information that I have provided above, please do not hesitate to contact me at the address and phone number provided below. If you have further questions or do not feel I have adequately addressed your concerns, please contact my dissertation chairperson, Dr. Linda Purrington at linda.purrington@pepperdine.edu. If you have questions about your rights as a research participant, contact Dr. Theme Bryant at thema.bryant@pepperdine.edu, Chairperson of the IRB at Pepperdine University.

By completing the survey and clicking the 'continue button, you are acknowledging that you have read and understand what your study participation entails, and are consenting to participate in the study.

Thank you for taking the time to read this information, and I hope you decide to complete the survey. You are welcome to a brief summary of the study findings in about 1 year. If you decide you are interested in receiving the summary, please visit the website listed at the end of this survey.

Sincerely,
Chester Tadeja
Doctoral Candidate
[Address Left Intentionally Blank]
[Address Left Intentionally Blank]

○ I fully understand and give my informed consent to participate in this study

APPENDIX C
Survey Questions

In order to accurately categorize the responses from the different superintendents who will participate in this study, please consider answering the following questions. None of this information will be used to identify you and the responses will only be used to categorize participants' backgrounds.

1. Which of the following best describes your school district's total student enrollment?

- ○ **0-1,000 students**
- ○ **1,001-5,000 students**
- ○ **5,001-10,000 students**
- ○ **10,001-20,000 students**
- ○ **20,001-50,000 students**
- ○ **50,001-100,000 students**
- ○ **100,001-1,000,000 students**
- ○ **1,000,001+ students**

2. How many years of experience do you have as a school superintendent?

- ○ **0-3 years**
- ○ **3-5 years**
- ○ **5-10 years**
- ○ **10+ years**

3. How many years of experience do you have as a school superintendent in your current district?

- ○ **0-3 years**
- ○ **3-5 years**
- ○ **5-10 years**
- ○ **10+ years**

QUANTITATIVE SURVEY QUESTIONS

15. How do you as a superintendent ensure that instructional innovation in your district is focused on continuous improvement of digital-age learning? Please select the response below that you utilize and feel free to add others. You may select all responses that apply.

    a. I make sure that our district is providing adequate broadband and wireless access inside and outside of classrooms, guaranteeing at least one Internet-enabled device for every student and educator, and promoting the use of cloud computing.

    b. I have put in place a system where continuous monitoring and maintenance of the district's technology hardware (e.g., tablets, laptops, smartphones, etc.); internet access (e.g., school wifi, student cell account) and software infrastructure (e.g., web apps) are implemented to ensure that these technologies are all in good working conditions at all times.

    c. I make sure that principals, teachers and staff have access to ongoing training that enables them to continuously have access to changes, updates, and the use of different learning and teaching technologies.

    d. I encourage and promote within the district a "bring-your-own-device" policy regarding smart phones, tablets and other personal laptop computers.

    e. Other (Please specify) _____.

16. In your role of superintendent, how do you model and promote the frequent and effective use of technology for learning in your district? Please select those practices listed that you utilize and feel free to add others. You may select all responses that apply.

    a. I personally and effectively use different technologies (such as emails, twitter, sms, etc.) to communicate with principals, teachers and staff to stay informed of what is happening in the different schools within the district.

    b. I encourage principals, teachers and staff to use technology in communicating with one another.

    c. I make sure that surveys, meetings, and discussion sessions with principals and teachers are regularly conducted within the district to get their feedback on the successes and challenges they experience in implementing technology in their schools and classrooms.

d. I implement the established rules about the proper use of tablets and other electronic gadgets in schools.

e. Other (Please specify) _____.

17. As a superintendent, how do you provide learner-centered environments that are equipped with technology and learning resources to meet the individual and diverse needs of all learners? Please select those practices listed that you utilize and feel free to add others. You may select all responses that apply.

a. I make sure that a regular budget is allotted in purchasing software that students can use to develop their creativity and independent work.

b. I make sure that principals and teachers are regularly provided with e-learning materials for teaching and administrative tasks as well as providing various links to different educational forums.

c. I encourage principals to challenge their teachers to customize their coursework with students use of technology so that the students are able to work at their own pace, receive immediate feedback on progress, and obtain immediate help in their areas of need.

d. I encourage principals to challenge their teachers to offer their students access to a variety of media (e.g., internet, smart phones, educational TV shows, etc.) to meet their students' individual needs.

e. Other (Please specify) _____.

18. As your district's leader, how do you ensure effective practice in the study of technology and its infusion across the curriculum? Please select those practices listed that you utilize and feel free to add others. You may select all responses that apply.

a. I encourage principals to develop hybrid schools where they can effectively blend a traditional and high-tech learning environment.

b. I encourage principals and teachers to attend and participate in conferences that address the latest educational technologies to meet the growing needs of students in the use of technology with their learning.

c. I encourage principals to challenge their teachers to elicit student-generated questions with the use of technology, and to motivate them to use digital resources in finding the answers.

d. I encourage principals to conduct regular faculty meetings to which the purpose is to discuss and share educational technologies that they found effective in their respective classes.

e. Other (Please specify) _____.

19. How do you lead your district in promoting and participating in local, national and global learning communities to stimulate innovation, creativity and digital-age collaboration? Please select those practices listed that you utilize and feel free to add others. You may select all responses that apply.

a. I encourage principals and teachers to be members of online educational communities and organizations, such as, the International Society for Technology in Education (ISTE).

b. I make sure that the district utilizes blogs and websites to keep our community stakeholders informed about the operations and well-being of the school district.

c. I collaborate with major technology companies, such as, Apple, Dell, and Google in adapting within the district emerging educational technologies.

d. I make sure that our district is working in collaboration with the county and state offices in promoting the use of innovative technologies.

e. Other (Please specify) _____.

Questions are based on National Technology Standards for Administrators (NETSA) #2 a-e.

QUALITATIVE SURVEY QUESTIONS

1. What do you, as a California K-12 public school district superintendent, perceive to be the greatest challenges with regards to creating, promoting, and sustaining a digital-age learning culture for all students in your district?

2. What do you, as a California K-12 public school district superintendent, believe is needed to address challenges related to creating, promoting, and sustaining a digital-age learning culture for all students in your district?

REQUEST FOR STUDY RESULTS

This concludes the survey portion of this study. If you would like to receive the results of this study, please follow this link. The results will appear approximately 4-6 weeks after the conclusion of this study. Thank you again for your invaluable participation.

APPENDIX D
E-mail Reminders for Participants

Dear Superintendent:

This is a friendly reminder to participate in the study entitled "An Enquiry Into California School District Superintendents: Their Role in Creating, Promoting, and Sustaining A Learning Culture In The Digital Age" that was sent to you last week. The results of this study may be of interest to you in light of the new Common Core and how technology is being used to promote student learning. I've included a link for you to participate. I know that you likely busy, but the survey contains only 9 questions with the first 6 as a quick multiple choice selection. I hope you will consider completing this study. If you have any questions, please contact Dr. Linda Purrington, chair of the study at 949.223.2568 or at lpurring@pepperdine.edu.

Respectfully,
Chester Tadeja
Doctoral Student
Pepperdine University

APPENDIX E
E-mail from Dean Weber

Dear Pepperdine Superintendent Advisory Group:

You have likely received an invitation form from one of our dissertation students, Chester Tadeja, who is working on his dissertation study focusing in on how California school district superintendents create, promote, and sustain a digital-age learning culture for all students. If you haven't been finished it already, you are encouraged to do so. In light of the new Common Core and how technology is being used to promote student learning, you may find the results of this study of profound interest to you. I've included a link for you to participate. I know that you likely busy, but the survey contains only 9 questions with the first 6 as a quick multiple choice selection. I hope all is well with you otherwise and that you will once again seriously consider completing this study. Please let me know if you have any questions.

Respectfully,
Dr. Margaret Weber
Dean GSEP
Pepperdine University

APPENDIX F
Pepperdine IRB
Application for a Claim of Exemption

Date: 4/22/14 IRB Application/Protocol #:

Principal Investigator: Chester Tadeja

School/Unit: ☐ Faculty ☐ Staff ☐ Student ☐ Other
☐ GSBM ☒ GSEP ☐ Seaver ☐ SOL ☐ SPP
☐ Administration ☐ Other:

Street Address: [Left Intentionally Blank]
City: [Left Intentionally Blank] State: CA Zip Code: 91709
Telephone (work): (000) 000-0000 Telephone (home): (000) 000-0000
Email Address: @

Faculty Supervisor: **Linda Purrington, Ed. D.** *(if applicable)*
School/Unit: ☐ GSBM ☒ GSEP ☐ Seaver ☐ SOL ☐ SPP
☐ Administration ☐ Other:
Telephone (work): (949) 573-3320
Email Address: linda.purrington@pepperdine.edu

Project Title: An Enquiry of California School District Superintendents: Role in Creating, Promoting, and Sustaining and Digital-Age Learning Culture

Type of Project (Check all that apply):
☒ Dissertation ☐ Thesis
☐ Undergraduate Research ☐ Independent Study
☐ Classroom Project ☐ Faculty Research
☐ Other:

Is the Faculty Supervisor Review Form attached? ☒Yes ☐No ☐N/A

Has the investigator(s) completed education on research with human subjects? ☒ Yes ☐ No
Please attach certification form(s) to this application.

Investigators are reminded that Exemptions will NOT be granted for research involving prisoners, fetuses, pregnant women, or human in vitro fertilization. Also, the exemption at 45 CFR 46.101(b)(2), for research involving survey or interview procedures or observations of public behavior, does not apply to research with children (Subpart D), except for research involving observations of public behavior when the investigator(s) do not participate in the activities being observed.

1. Briefly summarize your proposed research project, and describe your research goals/objectives.

The purpose of this survey research study is to explore and describe how California K-12 public school district superintendents create, promote, and sustain a digital-age learning culture for all students. A second purpose of this study is to identify and describe what these superintendents perceive to be as challenges related to creating, promoting, and sustaining a digital-age learning culture for all students and what they believe is needed to address these challenges. California K-12 public school district superintendents will be invited to participate in an online electronic survey consisting of 3 background questions, 5 quantitative questions and 3 qualitative questions (see Appendix C).

Research Question 1: How do California K-12 public school district superintendents create, promote, and sustain a digital-age learning culture for all students in their districts. What do California K-12 public school district superintendents perceive to be their greatest challenges concerning creating, promoting, and sustaining a digital-age learning culture for all students in their districts?

Research Question 2: How do California K-12 public school district superintendents believe they need to address challenges related to creating, promoting, and sustaining a digital-age learning culture for all students in their districts?

Research Question 3: What do California K-12 public school district superintendents believe they need to address challenges related to creating, promoting, and sustaining a digital-age learning culture for all students in their districts?

2. Using the categories found in Appendix B of the Investigator Manual, list the category of research activity that you believe applies to your proposed study.

The exemption at 45 CFR 46.101(b)(2), for research involving survey or interview procedures or observations of public behavior, does not apply to research with children, Subpart D, except for research involving observations of public behavior when the investigator(s) do not participate in the activities being observed.

Category 3: Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior that is not exempt under paragraph (b)(2) of this section, if: the human subjects are elected or appointed public officials or candidates for public office.

3. Briefly describe the nature of the involvement of the human subjects (observation of student behavior in the classroom, personal interview, mailed questionnaire, telephone questionnaire, observation, chart review, etc):

i. California K-12 public school district superintendents will be invited to participate in an online electronic survey consisting of 3 background questions, 5 multiple choice questions related to digital-age learning culture leadership practices, and 3 open-ended questions related to technology leadership practices, challenges, and perceived needs (see Appendix C).
ii. Superintendents will initially receive an invitation email providing an overview of study. Email will provide a link to informed consent and survey.

4. Explain why you think this protocol should be considered exempt. Be sure to address all known or potential risks to subjects/participants.

This study meets the requirements for exempt status under the federal regulation's (45CFR46): (A) Research activities that: (1) Present no more than potential risk to human subjects. (2) Involve only procedures listed in one or more of the following categories, may be reviewed by the IRB through the expedited review procedure authorized by 45 CFR 46.110 & 21 CFR 56.110 Research activities that govern the protection of human Subjects. (3) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. The potential risk that each interview involves is the possible imposition on the participant's time. Another potential risk is that participants may feel fatigue as it relates to completing an extra task. In order to minimize this risk, the length of the survey has been limited to 10 questions and it is anticipated that participants would be able to complete the survey in 30 minutes or less. Superintendents will also be able to complete the survey at a time and location of their convenience, since all that is needed is a computer and Internet connection to complete the survey. Additionally, the following steps will be taken in order to minimize any risks: (a) Participants' identity will be not be known to the researcher and will not be used in this study; (b) No specific identifying information will be used or reported in any way; (c) Participants will be made aware that their participation in this study is completely voluntary. The participants will have the option to discontinue this survey at any time without penalty. Lastly, participants will be made aware of their rights and receive contact information for Dr. Linda Purrington, Dissertation Chairperson, and Dr. Thema Bryant, IRB Chairperson.

5. Explain how records will be kept.

The only individual to handle the data will be the principal researcher. The principal investigator will put all data under lock and key for 5 years after the

study is done, and written inquiries will be kept in a safe in the researcher's home office for a period of 5 years and destroyed thereafter. Data stored in the researcher's personal computer will be transferred to an external hard drive, which will be kept in the safe as well, and then destroyed in 5 years.

6. ☐ Yes ☒ No Are the data recorded in such a manner that subjects can be identified by a name or code? If yes:
   - Who has access to this data and how is it being stored? The data files will only be handled by the principal investigator.
   - If you are using a health or mental health assessment tool or procedure, what is your procedure for referring the participant for follow-up if his/her scores or results should significant illness or risk? Please describe. N/A
   - Will the list of names and codes be destroyed at the end of the study? Explain your procedures. The only individual to handle the data will be the principal researcher. The principal investigator will put all data under lock and key for five years after the study has taken place. All hand-written notes, as well as all computer files, portable electronic drives, and written inquiries will be kept in a safe in the researcher's home office for a period of five years and destroyed thereafter. Data stored in the researcher's personal computer will be transferred to an external hard drive, which will be kept in the safe as well, and then destroyed in five years.

7. Attach a copy of all data collection tools (e.g., questionnaires, interview questions or scripts, data collection sheets, database formats) to this form. Be sure to include in such forms/scripts the following information:
   - a statement that the project is research being conducted in partial fulfillment of the requirements for a course, master's thesis, dissertation, etc. (if applicable)
   - purpose of study
   - a statement that subjects' responses will be kept anonymous or confidential (explain extent of confidentiality if subjects' names are requested)
   - if audiotaping or videotaping, a statement that subject is being taped (explain how tapes will be stored or disposed of during and after the study)
   - a statement that subjects do not have to answer every question
   - a statement that subject's class standing, grades, or job status (or status on an athletic team, if applicable) will not be affected by refusal to participate or by withdrawal from the study (if applicable)
   - a statement that participation is voluntary

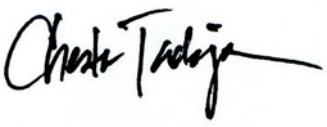
   Please note that your IRB may also require you to submit a consent form or an **Application for Waiver or Alteration of Informed Consent Procedures form.** Please contact your IRB Chairperson and/or see the IRB website for more information.

8. Attach a copy of permission forms from individuals and/or organizations that have granted you access to the subjects.

9. ☐Yes ☒No Does your study fall under HIPAA? Explain below. This study will not gather protected health information (PHI) nor will it obtain any identifiable/personal information from parent participants. This research is only aimed at gathering how California K-12 public school district superintendents create, promote, and sustain a digital-age learning culture for all students.

9.1 If HIPAA applies to your study, attach a copy of the certification that the investigator(s) has completed the HIPAA educational component. Describe your procedures for obtaining Authorization from participants. Attach a copy of the Covered Entity's HIPAA Authorization and Revocation of Authorization forms to be used in your study (see Section XI. of the Investigator Manual for forms to use if the CE does not provide such forms). If you are seeking to use or disclose PHI without Authorization, please attach the **Application for Use or Disclosure of PHI Without Authorization** form (see Section XI). Review the HIPAA procedures in Section X. of the Investigator Manual. N/A

I hereby certify that I am familiar with federal and professional standards for conducting research with human subjects and that I will comply with these standards. The above information is correct to the best of my knowledge, and I shall adhere to the procedure as described. If a change in procedures becomes necessary I shall submit an amended application to the IRB and await approval prior to implementing any new procedures. If any problems involving human subjects occur, I shall immediately notify the IRB Chairperson.



4/22/14

_____ _____

Principal Investigator's Signature *Date*

_____ _____

Faculty Supervisor's Signature (if applicable) Date

Appendices/Supplemental Material

Use the space below (or additional pages and/or files) to attach appendices or any supplemental materials to this application.

-Investigator Education Certificate

-Supervisor Review Form

-Superintendent Survey Invitation Letter

-Informed Consent

-Waiver of Documentation of Informed Consent

-Superintendent Survey

-Survey Reminders

-Dean Weber's Message

-Dissertation Chapters 1-3

APPENDIX G
Pepperdine IRB
Application for Waiver or Alteration of Informed Consent Procedures

Date: 4/22/14 IRB Application/Protocol #:

Principal Investigator: CHESTER TADEJA_____

☐ Faculty ☐ Staff ☒ Student ☐ Other
School/Unit: ☐ GSBM ☐ GSEP ☐ Seaver ☐ SOL ☐ SPP
☐ Administration ☐ Other:

Street Address: [Left Intentionally Blank]
City: [Left Intentionally Blank] State: CA Zip Code: 91709
Telephone (work): (909) 000-0000 Telephone (home): (000) 000-0000
Email Address:

Faculty Supervisor: **DR. LINDA PURRINGTON** *(if applicable)*
School/Unit: ☐ GSBM ☒ GSEP ☐ Seaver ☐ SOL ☐ SPP
☐ Administration ☐ Other:
Telephone (work): (949) 573-3320
Email Address: linda.purrington@pepperdine.edu
Is the Faculty Supervisor Review Form Attached? ☒ Yes ☐ No ☐ N/A

Project Title: AN ENQUIRY INTO CALIFORNIA SCHOOL DISTRICT SUPERINTENDENTS:

Type of Project (Check all that apply):

☒ Dissertation ☐ Thesis
☐ Undergraduate Research ☐ Independent Study
☐ Classroom Project ☐ Faculty Research
☐ Other:

Has the investigator completed education on research with human subjects?

☒ Yes ☐ No ☐ N/A

If applicable, attach certification forms to this application.

Informed consent of the subject is one of the fundamental principles of ethical research for human subjects. Informed consent also is mandated by Federal regulations (45 CFR 46) and University policy for research with human subjects. An investigator should seek a waiver of written or verbal informed consent, or required elements thereof, only under compelling circumstances.

SECTION A

Check the appropriate boxes regarding your application for waiver or alteration of informed consent procedures.

☐ Requesting Waiver or Alteration of the Informed Consent Process
☒ Requesting Waiver of Documentation of Informed Consent

If you are requesting a waiver or alteration of the informed consent process, complete Section B of the application.

If you are requesting a waiver of documentation of informed consent, complete Section C of the application.

SECTION B

Request for Waiver or Alteration of the Informed Consent Process - 45 CFR 46.116(c) & 45 CFR 46.111(d)

Under certain circumstances, the IRB may approve a consent procedure which does not include, or which alters, some or all of the elements of informed consent, or the IRB may waive the requirements to obtain informed consent. The following questions are designed to guide the decision making of the investigator and the IRB. Check your answer to each question.

☐ YES ☐ NO B.1. Will the proposed research or demonstration project be conducted by or subject to the approval of state or local government officials. ***{45 CFR 46.116(c)(1)}***
Comments:
If you answered no to question B.1, skip to question B.3.

☐ YES ☐ NO B.2. Is the proposed project designed to study, evaluate, or otherwise examine:
(i) public benefit or service programs;
(ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs ***{45 CFR 46.116(c)(1)}***
Comments:
If you answered yes to questions B.1 and B.2, skip to question B.6.

☐ YES ☐ NO B.3. Will the proposed research involve greater than minimal risk? *(Minimal risk is defined as the probability and magnitude of harm or discomfort anticipated in the research which are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.)*
{45 CFR 46.116(d)(1)}
Comments:

☐ YES ☐ NO B.4. Will waiving or altering the informed consent process adversely affect the rights and welfare of the subjects?***{45 CFR 46.116(d)(2)}***
Comments:

☐ YES ☐ NO B.5. Will pertinent information regarding the research be provided to the subjects later, if appropriate?***{45 CFR 46.116(d)(4)}***
Comments:

☐ YES ☐ NO B.6. Is it practicable to conduct the research without the waiver or alteration?
("Practicable" is not an inconvenience or increase in time or expense to the investigator or investigation, rather it is for instances in which the additional cost would make the research prohibitively expensive or where the identification and contact of thousands of potential subjects, while not impossible, may not be feasible for the anticipated results of the study.) ***{45 CFR 46.116(d)(3)}***
Comments:

Waiver or alteration of the informed consent process is only allowable if:

- ***The answer to questions B.1 and B.2 are yes and the answer to question B.6 is no, OR***
- ***The answers to question B.1 is no, B.3 is no, B.4 is no, B.5 is yes, and B.6 is no.***

If your application meets the conditions for waiver or alteration of the informed consent process, provide the following information for IRB review.

- A brief explanation of your experimental protocol in support of your answers to questions B.1 - B.6.
- Identify which elements of consent will be altered or omitted, and provide justification for the alteration.
- The risks involved in the proposed research and why the research presents no more than minimal risk to the subject.
- Describe how the waiver or alteration of consent will not adversely affect the rights, including the privacy rights, and the welfare of the individual.
- Define the plan, where appropriate, to provide individuals with additional pertinent information after participation.
- Explain why the research could not practicably be conducted without the waiver or alteration.
- Other information, as required, in support of your answers to questions B.1 - B.6.

SECTION C

Request for Waiver of Documentation of Informed Consent - 45 CFR 46.117(c)

An IRB may waive the requirement for the investigator to obtain a signed consent form for some or all of the subjects. The following questions are designed to guide the decision making of the investigator and the IRB regarding this topic. Circle your answer to each question.

☐ YES ☒ NO C.1. Was informed consent waived in Section B of this application? If yes, skip Section C, documentation of informed consent if not applicable.

☐ YES ☒ NO C.2. Does the proposed research project qualify for alteration of the informed consent process under Section B of this application?
Comments:

☒ YES ☐ NO C.3. The consent document is the only record linking the subject and the research, and the principal risk is potential harm resulting from a breach of confidentiality. ***{45 CFR 46.117(c)(1)}***

Comments: There is no benefit in knowing the names of participants to the study and the only link to survey and participant is the informed consent form. The participant will still need to agree to informed consent but only by checking the box in the online survey that stats that the participant agrees to terms without giving name or other detail that will link participant to survey.

☒ YES ☐ NO C.4. The research presents no more than minimal risk of harm to subjects and involves no procedures for which written consent is normally required outside the research context. ***{45 CFR 46.117(c)(2)}*** *(Minimal risk is defined as the probability and magnitude of harm or discomfort anticipated in the research which are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.)*

Comments: The principal risk to the participant is any potential harm as a result of a breach of confidentiality. Participation in this study will be associated with no more than minimal risks and/or discomfort. Minimal risk is described in the GPS IRB manual as the probable harm that the activities in the research will cause the participant, which should be no greater than when performing normal activities, or when undergoing psychological or physical testing.
The 'minimal' risk that each participant involves is that other people may discover they participated in the study even though their identity is anonymous. However, all survey responses will be kept anonymous, so this risk is very low. Another potential minimal risk is the possible burden on the participant's time or fatigue in completing an extra task.

Risks will be minimized in the following ways: (a) participant's identity and company they own will not be needed for the study and will not be asked for by investigator (b) no specific identifying information will be used or reported in any way, (c) if the participant experiences exhaustion, fatigue, or irritability while completing the survey; the participant could stop or leave participation in the study. Participants will be clearly made aware that their participation in this study was completely voluntary. The participants will have the option to discontinue the survey at any time without penalty. The research will secure an informed consent from all participants which will explain that the participants can have the right to withdraw at any time, understand the participation will be strictly voluntary, agree to the confidentiality measures that will be taken, and will be able to review the results of the study for accuracy after it has been published on Pepperdine's dissertation database. Lastly, participants will be made aware of their rights and can contact the Dissertation Chairperson Dr. Linda Purrington at

linda.purrington@pepperdine.edu as well as the IRB Chairperson Dr. Theme Bryant at thema.bryant@pepperdine.edu.

Waiver of documentation of the informed consent is only allowable if:

- ***The answer to question C.1 is yes, OR***
- ***The answer to questions C.1 is no <u>and</u> the answer to either question C.3 or C.4 is yes.***

If your application meets the conditions for waiver of documentation of informed consent, provide the following additional information, supplementing the material provided in Part C of this application, for IRB review.

- How the consent document is the only record linking the subject to the research.

There is no benefit in knowing the names of participants to the study and the only link to survey and participant is the informed consent form. The participant will still need to agree to informed consent but only by checking the box in the online survey that stats that the participant agrees to terms without giving name or other detail that will link participant to survey.

- How the principal risk to the subject is the potential harm from a breach of confidentiality.

The principal risk to the participant is any potential harm as a result of a breach of anonymity. Participation in this study will be associated with no more than minimal risks and/or discomfort. Minimal risk is described in the GPS IRB manual as the probable harm that the activities in the research will cause the participant, which should be no greater than when performing normal activities, or when undergoing psychological or physical testing.

The 'minimal' risk that each participant involves is that other people may discover they participated in the study even though their identity is anonymous. However, all survey responses will be anonymous, so this risk is very low. Another potential minimal risk is the possible burden on the participant's time.

Risks will be minimized in the following ways: (a) participant's identity and company they own will not be needed for the study and will not be asked for by investigator (b) no specific identifying information will be used or reported in any way, (c) if the participant experiences exhaustion, fatigue, or irritability while completing the survey; the participant could stop or leave participation in the study. Participants will be clearly made aware that their participation in this study was completely voluntary. The participants will have the option to discontinue the survey at any time without penalty. The research will secure an informed consent from all participants which will explain that the participants can have the right to withdraw at any time, understand the participation will be strictly voluntary, agree to the confidentiality measures that will be taken, and will be able to review the results of the study for accuracy after it has been published on Pepperdine's dissertation database. Lastly, participants will be made aware of their rights and were provided with the Dissertation Chairperson Dr. Linda Purrington at linda.purrington@pepperdine.edu as well as the IRB Chairperson Dr. Theme Bryant at thema.bryant@pepperdine.edu.

- Why, if performed outside the research context, written consent is not normally required for the proposed experimental procedures.

The survey is designed to get the participant opinion about creating, promoting, and sustaining a digital-age learning culture and does not ask or require any personal information that would link participant to survey answers. The survey is voluntary to complete and does not require participants to give out their name or personal information. If the participant would be asked to sign their full name, the participant may have fears that their confidentiality would be breached. Even though their signature would not be linked to the survey (i.e., a separate piece of paper as informed consent), the signature could cause anxiety over loss of anonymity.

<u>If the IRB approves a Waiver of Documentation of Informed Consent, the investigator must:</u>

- Ask each participant if he or she wants documentation linking the participant with the research (i.e., wishes to complete an informed consent form). The participant's wishes will govern whether informed consent is documented. ***{45 CFR 46.117(c)(1)}***

AND

- At the direction of the IRB, provide participants with a written statement regarding the research.

{45 CFR 46.117(c)}

APPENDIX H
Responses to Qualitative Survey Question Number 1

What do you, as a California K-12 public school district superintendent, perceive to be the greatest challenges with regards to creating, promoting, and sustaining a digital-age learning culture for all students in your district?

1. Changing pedagogy systemically throughout the classrooms in our whole district. Getting school leadership and teachers to develop the vision and capacity to use the powerful tools available to us today to develop and implement lessons that leverage their learning to new and greater opportunities for academic growth.

2. Funding Wireless capacity Training teachers Teacher skills. Continually evolving devices and materials.

3. It goes back to funding. With educational funds being cut by 20% from 2007-2012, there needs to be a catch-up time in which school districts can begin to restore the programs and resources that have been cut over those five years or more. For our district, there is no money in the 2013-14 or 2014-15 budget to spend on technology. Thank goodness we passed a bond that is focused on spending those funds to upgrade technology or we would be way behind technologically.

4. There is a lack of material and/or lesson design that allow for technology integration as part of adult professional development.

5. We are now a district where the students and teachers have the technology they need to be successful. We now have to focus on professional development so that the technology is used to promote the Common Core State Standards.

6. The hardest part is changing the culture and idea of what learning is and is not. Involving all stakeholders in the process to ensure a shared vision for student learning in the 21st Century. This can be a daunting task but one that needs to take place in order to ensure the successful implementation of digital learning.

7. Schools typically lag behind the pace set by entrepreneurs and others in the private sector. As well, top management tends to be too controlling, which impedes innovation in schools. If we flatten organizational authority and provide more freedom and autonomy, we will stimulate creativity, including the use of technology. The greatest challenge is not money, it is ourselves - superintendents.

8. The speed of change that overwhelms our teachers and changes the nature of their relationship with pedagogy, students, and content.

9. The heavy reliance on textbooks and other printed media.

10. Funding. The old guard who don't want to use tech High tech parents who don't want tech at school A balance with tech.

11. Funding is still the major road block. Technology is always changing and needs to be replaced a very three years (minimum).

12. For this generation of teachers to trust their students. Much of what we have promoted in the last ten years was a teacher centered environment. Now we are asking them to transition to a student centered model that is augmented by technology.

13. Internet capability.

14. The greatest challenge with regards to creating, promoting, and sustaining a digital-age learning culture for all students in my district is access to high quality professional development for teachers and administrators.

15. Funding! With appropriate funding we can provide needed infrastructure and maintain an appropriate replacement cycle.

16. Staying current and funding.

17. One of my greatest challenges is dealing with the digital divide between teachers, who are not necessarily tech savvy and students who are digital natives. It is critical that I provide quality professional learning opportunities and on-going support to teachers in using and integrating digital tools for their own learning and student learning. In addition,

18. We are going to begin to see an exacerbation of the challenges that are already persistent as a result of the inequity in resources, facilities, and technology access in our schools. With the SBA platform, these inequities will generate greater challenges in assessing student learning and exposing students to 21st century tools they will need to become more proficient and comfortable with as they transition to college and/or careers.

19. Funding is an ongoing issue. Schools need to shift from what I refer to as "bake sale" technology purchasing to "structural" technology purchasing. Rather than funding technology on dollars that are left over, technology costs need to be a percentage of the total budget with predictable funding sources and amounts.

20. Funding remains a serious issue. We are geographically remote without internet access in many of our students homes. We have a veteran staff, many of whom are reluctant learners of technology. I am new to this district but have reformed two districts previously through technology innovation. I have had the

good fortune to be able to hire a new technology director in this district this year and things are getting better quickly!

21. I find the greatest challenge is getting the funding to implement digital-age learning environment and also the budget to hire professionals to effectively train the staff and teachers and finding the time and money to set up these training sessions.

22. The greatest challenge in regards to creating, promoting, and sustaining a digital- age learning culture would be: 1- lack of financial resources to provide those needs and 2- keeping up with the ever evolving advancements in technology.

23. The greatest challenge is always funding. We need additional funding to provide staff development, new devices, upgraded software, increased band-with, etc.

24. Money for new technology, training for staff members who only use technology to word process, email, and Facebook.

25. As of now our biggest challenge has been having sufficient funds to implement all technological strategies which my principals and teachers want to in class. We always have to manage and the best with we have

26. I believe the biggest challenge to sustaining a digital-age learning culture is the constant change in technology. Being that this is the relatively beginning age of social media and the advancement of technology changes so frequently, it is difficult to finding a stable enough digital platform to use in the educational system. Society is in a constant state of change in this digital era.

27. First, money! I currently have 3,286 netbooks deployed to students and teachers. On-going training is required along with the District leasing the software for the schools. Continuing to provide Online Instruction is also a requirement to meet a variety of options for students. Replace cost and SBAC has changed the use of technology. Transitioning to e-books in grades 3-12 will be a challenge. We are preparing students for the 21st Century.

28. I believe our greatest challenge is assisting educators in their understanding that the technology is a tool not a replacement of paper and pencil activities. We also need to embrace the idea that going paperless isn't the goal, however, allowing teachers and students to utilize their devices as a means of accomplishing learning through a broader lens. Teachers now need to be facilitators, no longer someone who imparts knowledge. This is truly a challenge in that educators don't have total control of the end product or the right answers, that students may know more than their teachers and parents won't be able to do their kids homework at night!

29. Ensuring equity in access to technology tools - during and outside of the school day - for students from all backgrounds. Meaningful and effective 24/7 professional development. Adequate funding for sustainability.

30. Cost and the intrusive privatization charter movement taking grant funds away

31. We are a small rural school in the hills of Shasta County. Band width is going to be an ongoing issue for us.

32. Limited funding. Most teachers are digital immigrants.

33. Providing and maintaining one-to-one devices. Developing effective instruction K-12 that supports student use of technology. Students have an awesome tool to show critical thought and creativity, unfortunately they're not being taught well.

34. Finding the adequate programs and adequate curriculum to keep teachers, staff and students motivated and having the hunger to use the most current technological resources.

35. Money.

36. Adequate budget and security; effective professional development.

37. Purchasing, integrating, maintaining and training staff and students is very complex and sophisticated. Funding an extra position to address technology curriculum, and another position for the maintenance and sustainability of technology is cost prohibitive.

38. Funding, providing release time for professional development, providing additional technology support staff at all school sites as sites acquire more personal technology devices, implementing a BYOD policy and monitoring student access to inappropriate content, finding ways to provide 1:1 devices for low income students to take home or ways to provided internet access for students who do not have internet capability at their home.

39. The greatest challenge is keeping up with policies that support learning but at the same time make sure that information is secure and students are using the technology for the intended purpose. Teacher training is key in all areas but is difficult to do in current schedule with common core professional development. They do go hand in hand but for some of our teachers we need to differentiate the learning.

40. Technology is a tool to aide in learning, so the challenge is to be sure that learning is the outcome. Having the tools in place is important, but the using the tools to improve student learning is the key.

41. We still have some catch up to do with regard to properly funding technology. Solutions for the new SBAC testing is still going through some implementation bumps in California in many districts. Blended classrooms are emerging in many districts, and we working to keep up with newly established parameters for student and staff safety regarding internet policies and e-rate. I think the tech companies and publishers could do a better job with providing seamless and wrap around technologies that students find leading to 21st century skills. ISTE provides a good model for tech implementation. Technology needs to work properly, and be effective at achieving instructional goals, and I'm not sure we are there yet. We have new data/metric requirements emerging under LCAP, so this may take priority also. I don't see follow-through with previous state-level initiatives, like e-text books, and the availability of adequate and affordable solutions for the simple implementation that allows more use of technology.

42. Inadequate financial resources for the district and inadequate internet access for our students in their home environment.

43. Changing technology and upgrading the devices.

44. Changing pedagogy in such a way teaching and learning is innovative and powerful learning takes place using technology.

45. The challenge is the ever changing technology. As a district it is difficult to keep up with all the latest technology available.

46. Teacher comfort with the technology. Security of information.

47. Money, time for training, and hesitancy of some staff to utilize technology.

48. Adequate funding to update and replace technology and provide up-to-date training.

49. The amount of money it will take for the devices.

50. Providing meaningful staff development. Providing up-to-date technology devices Maintaining network security maintaining student safety.

51. The availability of band-width in our remote area to support innovation with technology in the classroom.

52. Broadband access sufficient to handle 1 to 1 computing and adequate funding for student devices.

53. Not having the funds to stay up to date.

54. Separate funding dedicated to tech (infrastructure, software, and staff) that is not subject to negotiations.

55. Technology is a target for many factions within schools. From unions who do not want to see any funds spent on resources that may detract from salaries, to parents who are not comfortable with the new role of technology in schools, to teachers who are just not comfortable yet, there are loud voices of opposition. It takes great belief that it will make a difference, incredible investment in professional development, and time to make this big transition.

56. Making sure that we get the added value digital technology can provide, beyond merely digitalizing established lessons, assignments, newsletters, etc.

57. The funding is and will continue to be the greatest challenge.

58. Being able to financially keep up with the demands of ever-changing technology and providing a plan to continually update and replace with best and most current technology. Secondly, bringing along staff that might not be excited to change to a technology-based delivery system.

59. I am not a district superintendent. As County Superintendent, I perceive the greatest challenge to be adequate funding to provide student access on a regular basis (individual student computers). Our County Office will have no students next year, since the Local Control Funding Formula has designated the district of residence to receive all ADA funding. The districts are not funded adequately to purchase and/or update the equipment that is necessary for students to benefit fully from the information resources that are available. The question regarding enrollment was answered "pro forma," as the total number of K-12 students in the four districts in the county. Our largest district is less than 1500 students, and our smallest district is just under 400.

60. Right now, everything in education has to do with making certain that we have adequate funding. With all the educational cuts that districts have endured over the last 5-7 years. We cannot guarantee providing or maintain a digital-age learning culture unless funding is there. Education is not getting the funding needed to keep updated technology in the hands of students so that they can be ready for college and careers in the 21st Century.

61. Maintaining budget constraints.

62. Financial constraints and competing demands for the resources; labor union opposition to innovative practices; bureaucratic requirements that do not align with digital-age possibilities (ie seat time, Williams Settlement textbook requirements).

63. California is embarrassingly behind all other states in encouraging districts to be innovative and entrepreneurial with regard to this topic. Our state needs new leadership at all levels to begin the process of recapturing our former spirit of leading the nation.

64. Challenges include: Budgetary concerns with keeping up with the latest software and hardware, getting staff buy-in with implementation and collaborative incorporation of common core standards, monitoring age-appropriate content exposure, and preventing cyber bullying.

65. Older teachers that are in the system who are not able to move into the technology age because of their mindset.

66. Budget.

67. Teacher buy in plus budget issues restrain this process.

68. Cost.

69. People are afraid technology is going to replace people. You still need good people to facilitate the use of technology in education. One of the other challenges is that the rules with instructional minutes, seat time instructions are antiquated and are hard to make online learning work in a non-charter school environment.

70. Nothing; moving forward. I suppose the challenge is sustainable resources for replacement.

71. The major challenge would be everything is so new and teachers hate to waste time on anything that is not productive so the taking chances is a new trend.

APPENDIX I
Responses to Qualitative Survey Question Number 2

What do you, as a California K-12 public school district superintendent, believe is needed to address challenges related to creating, promoting, and sustaining a digital-age learning culture for all students in your district?

1. Create and implement a professional development t/coaching model that draws upon experiences and successes from the most innovative teachers in the world that can be easily accessed and reproduced.

2. Dedicated funding. Required coding courses. Devices for all High quality e-instructional materials.

3. There needs to be an augmented amount in educational funding in which technology in school s can be refreshed and updated. Another idea could be where there is a state bond and that is geared totally on technology for all the schools in the state. We do not have enough in the base grant budget to pay for technology especially if you are a school without any concentration grant funds. There are some districts with concentration grant funds of over $^million per year and others with no concentration grant funds at all. How in the world would districts with no concentration grant funds be able to keep any current technology in their districts?

4. There is a need to explicitly embed technological skills to our present Common Core Standards.

5. We need to continue to conduct best practices workshops for teachers to integrate technology as a tool to improve instruction and increase student engagement.

6. We are already there. We have a full 1:1 learning environment for all students in grades K-8. We provide all students with digital devices and 150 families with wireless 4G LTE services when the students are not at school.

7. We need to develop a work environment that stimulates creative outcomes at the student and teacher levels.

8. More time and opportunities for teachers to gain the skills. A mindset among all members about the importance of constant improvement, etc.

9. Increased promotion and demonstration of instructional technologies to decision makers and changing current education codes that pay schools for seat time, not mastery.

10. Consistent expectations An effective tech plan that included a source of funding State/federal funding support Teacher training.

11. The state needs to increase funding for technology.

12. I can't afford the five year refreshing plan we have implemented. To pull off a personalized environment for students, I need better software and a scope and sequence that brings teachers along.

13. Internet capability.

14. In order to address challenges related to creating, promoting, and sustaining a digital-age learning culture for all students in my district, we need access to high quality professional development for teachers and administrators.

15. Support at state, federal, county levels. Collaboration with other government agencies and money.

16. A focus on technology as a learning tool.

17. Sufficient resources to provide access to digital tools and devices and professional learning for staff.

18. We need a greater focus on providing specific funding to address infrastructure issues. We do not have sufficient facilities funds to address the needs of our schools... especially the older schools that also typically have difficulty raising funds through their PTAs.

19. I hate to advocate for categorical funding, but a category for technology funding could require that only technology-related items be purchased with the funding source. Absent a requirement by the State, Districts have to assert the need for tech funding, and retain a given level of funding for this purpose each year.

20. Our remote county needs broadband access to all.

21. I feel we need to stress the importance digital-age learning by showing the benefits of it and how it is useful everywhere as needed.

22. We need to be able to provide the funding to keep up with the advancements in technology and we need funding to provide the training needed to implement the use of technology.

23. We need funding and visionary leadership.

24. Training for staff on the realities of being a global citizen and the importance of technology in their student's future.

25. We need highly technological ready teachers with the drive to motivate our students.

26. I believe what is needed to address the challenges related to creating, promoting, and sustaining a digital-age learning culture is to develop a digital platform that is stable enough for learning and building onto the knowledge base, one that is separate from any outside digital influences. A platform that can last for decades and will ensure the students learn as well as our teachers to teach. To develop a system that will sustain itself and not be susceptible and or vulnerable to forced change.

27. Districts need a price point for units that will allow replacement of devices affordable. We replace 1,500 units every year in order to maintain effective use.

28. Initially we must provide powerful professional development to change the mindset of most educators. We have been stuck in the frenzy to improve test scores that we don't teach critical thinking and problem solving. Once that training has been delivered, we must follow up with coaching to ensure the new learning is practiced in classrooms. We also need to educate our parents as to the changes in education. Many students now hear their parents tell them they are "doing it wrong" because it isn't the way they were taught. This creates a frustrating homework time. Finally, our administrators need to be on the same page. We must insist that administrators receive and practice the same level of professional development as their teachers, otherwise, they don't know what to look for and call for in their classrooms.

29. Courageous leadership. Honoring and supporting our innovators/early adopters and replicating their practices. Resilient state funding.

30. Change charter law to prevent corporate raiding of public funds and to provide public schools a fair opportunity to implement systemic change.

31. Equal access for all students from school and home.

32. More funding. Continued support and technology use expectations from district and school admin for teachers to use technology. Technology use expectations for students....infused in regular work not a separate add-on.

33. Teachers should be allowed and encouraged to take risks, in their classrooms. Young students (primary grades) need opportunities to create work on their computers. Making time in the instructional day to utilize tech, either for research or producing work.

34. I need a true proven curriculum that addresses said technological resources and the data showing it's in nationwide districts and their schools.

35. Funding.

36. Adequate ongoing funding and well designed and aligned curriculum.

37. Funding is the biggest issue with finding the right person or persons to support technology purchasing, maintenance and training.

38. Dedicated funding for technology devices, return of professional development days within the school year, community wide access to internet.

39. More time, money and coaches.

40. Ongoing professional development is critical. Many teachers are not prepared to use digital tools with students.

41. Vision that meets concerted plans for implementation. Funding that is adequate, or at least the continued development of the public domain. Continued development of CCSS implementation that utilizes many online resources.

42. More funding.

43. Partnerships with technology companies and involvement at state and national levels to keep abreast of all innovations.

44. The right type of sustained training and coaching that will change results in the classroom using technology the right way that is focused on powerful learning for all students.

45. An infusion of dollars that is devote to the digital-age. Rural communities have a difficult time with the lack of wireless, antennas that are within range and the total evolution of the digital age.

46. Time.

47. Funding, high-speed access, and wireless networks, plus time and money for professional development.

48. Training and the time to train. The wide technology generation gap among teachers will continue to be a challenge and effective training is the key to address needs of "older" staff.

49. More BYOD to schools.

50. Professional Development.

51. We need the infrastructure to support the devices. I can afford the devices and software, I can't provide the fiber optics across the miles to reach my district.

52. Develop a culture in which a balanced approach to instruction is valued and technology plays an active but transparent role in the instructional program.

53. See response to number 9.

54. A better state-wide vision State-wide work with technology industry to set more reasonable rates. More training better models.

55. Full support of the Board of Trustees, constant communication with parents and teachers, onsite support for teachers as they try to implement technology, and a robust professional development program.

56. Funding, infrastructure outside our schools, access for all students in the home.

57. Budget and funding. Keeping up with the technology development.

58. Time and money.

59. You can't create a digital-age learning culture without funding.

60. I believe more funding is needed. Administrators in school districts are very knowledgeable in how to implement a digital-age learning culture for all students but to actually have the opportunity to do takes adequate funding.

61. More money and more resources to locally drive initiatives.

62. Continued education and discussion of technological applications for education, collaborative discussions with other districts on technology of interest, and training for staff.

63. Teachers not willing to get trained because of their insecurities with technology. Another challenge is finding quality people who can move my district forward into the technology age hardware wise.

64. Connecting with local companies is a big issue.

65. New connections with local and large businesses as well as long term commitment to budget.

66. Permission from the State of California to experiment with the emerging technologies and loosen the rules with face to face meeting. etc.

67. Ongoing professional development.

68. In a district that has a high level of poverty in home internet connection is a major challenge. Students are like sponges all you need to do is give them the opportunity and they will soak it up!!!!!!!! It's the adult that struggle the most.