Fall March 2016

Educational Technology: Leadership and Implementation

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Fall October 2009

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LOYOLA MARYMOUNT UNIVERSITY

Educational Technology:

Leadership and Implementation

by

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A dissertation presented to the Faculty of the School of Education,

Loyola Marymount University,

in partial satisfaction of the requirements for the degree

Doctor of Education

2010

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ACKNOWLEDGEMENTS

I am forever grateful to the many individuals who have provided invaluable guidance and support throughout this process.

To my committee chair, Dr. Edmundo Litton, who is that special teacher in my life who encouraged me to find my path and dedicate myself to the field of education. You inspire me with your talent, passion, incredible work ethic, and wonderful disposition.

To Dr. Franca Dell'Olio, who taught me the importance of leading with a sense of soul.

To Dr. Mary McCullough, who taught me what it truly means to set the bar and then set it higher.

To the educators who let me into their workplace to conduct this study, I am in awe of your dedication and commitment to your craft.

To my coworkers and colleagues who provided invaluable encouragement and support.

To my wonderful family and friends who always showed complete support and understanding of the many birthdays, holidays, and Sunday gatherings that I had to miss during the years that it took to complete this process.

To my loving parents, who always believed in me and provided me with the means to pursue my goals.

To my wife, who sacrificed with me every step of the way, and who always reminded me of the gift that I was giving to my family and to myself.

DEDICATION

To my wife, Gina Marie Galla

And my children

Isabella Maria and Anthony James Galla

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ABSTRACT

Educational Technology:

Leadership and Implementation

By

Anthony J. Galla

The purpose of this study was to evaluate two important aspects of educational technology: leadership and implementation. The research conducted in this study aimed to assess three aspects of leadership as it relates to educational technology: leadership that supports the technology implementation process, leadership that supports the change associated implementing technology, and leadership that supports a culture that embraces technology. An additional purpose of this study was to evaluate the process, procedures, and actions of implementing educational technology at three Catholic elementary schools in ways that foster a culture that promotes a supportive disposition towards educational technology.

The data from the interviews, document reviews, and site observations revealed that leadership styles and practices that support the adaptation to change and a culture that can embrace technology are vital to the educational technology implementation process. This study confirmed literature that contends that partnership, collaboration, and

ownership from all stakeholders are essential conditions in being able to cultivate change and sustain a culture that embraces technology. In addition, this study identified and discusses the significance of effective educational technology leaders, professional development, the establishment of a vision, mission, and plan, proper technology maintenance, and the idea that technology is a resource that is meant to enhance rather than replace teaching and instruction.

CHAPTER I

BACKGROUND OF THE STUDY

Introduction

Computer based technology has the potential to profoundly shape and influence the future and evolution of education in a plethora of ways (Gordon, 2000; Scheffler & Logan, 1999). Computer based technology can change the many ways in which educators teach and organize lessons, assess and monitor student success, administer daily practices in schools, communicate with students and parents, and collaborate and reform schooling for the purpose of improving student achievement. Computer based technologies can lead to considerable change in the way educators think about and approach many educational practices. Chalk and chalkboards are being replaced by smart boards and computers that are connected to digital projectors showing presentations using a variety of audio and video media. Word processors have made an impact on the learning process of reading and writing for students as much as they have for teachers. Grades, attendance, and other record keeping are now streamlined with computer based technologies, all with the intent to support more effective educational practices and overall improved student achievement.

Efficient implementation of computer based technology can be subjective, with differing criteria offered by numerous users. Matzen and Edmunds (2007) defined one major aspect of efficient computer based technology in education in terms of teacher preparation and beliefs about technology and professional development. The authors

stated that a constructivist based ideology and use of technology in classrooms leads to more effective student centered instructional practices.

A critical domain of efficient computer based educational technology is seen in the administrative use of electronics to enhance instruction for student achievement, such as the use of data systems to track student progress across districts and states. No Child Left Behind sounded a clarion call for educational systems to implement statewide data management and tracking systems in an effort to afford the educational system a bigger vision and capacity to improve student achievement (US Department of Education, 2004b). Until recently, the educational system in America has had great difficulty in applying an accurate and helpful mechanism of measuring student achievement because such digital data systems were sorely lacking (Guthrie, 2007). NCLB has led to the initiation of programs such as the California School Information Services (CSIS) California Longitudinal Pupil Achievement Data System (CALPADS). CALPADS offers schools in California the opportunity and means to organize student data and share that data among the many different educational systems throughout the state. Funded by over three million dollars, CALPADS aims to use technology to standardize the data exchange process so that educators will be able to utilize valuable research and evaluation (Perez, Shambaugh, & Parrish, 2008).

Other examples of technologies that improve student achievement include the use of Pod casts, wireless high speed internet connections, and student use of media presentations (Li, 2007; O'Bannon & Judge, 2004). Effective computer based educational technology is also defined by how budgets are spent and how computer based hardware is

creatively utilized in classrooms and computer labs (Liu & Huang, 2005). When considering the multitude of specific computer based technologies and strategies that can improve student achievement, it is imperative that policy makers, administrators, and teachers ensure that these technologies are accessible to all students. In doing so, it is important that educational leaders appropriately define the notion of accessibility. Providing all students with access to educational technology requires more than simply equipping a school classroom with 35 computer systems. Proper accessibility means providing all students with the ability to become literate in the use of computers and to create and interpret pertinent information when learning with computer based educational technologies (Hawkins, 2005).

Leadership and implementation of computer based educational technology is in part measured by how well that technology bridges the digital divide. The digital divide is defined by the alarming gap and disparity between the haves, the dominant groups of society who have abundant access to and knowledge of computer based technology, and the have-nots, minority groups and the underprivileged who have little to no exposure to computer based technology (Hawkins, 2005). Thus, it is imperative to consider the social justice notion of the digital divide when implementing computer based educational technology.

Computer based technology has the potential to lead the field of education to its outermost frontier and to head in the same direction as many of the major educational movements such as democracy, progressive education, and standards (Cuban, 1986; Selwyn, 1999). Due to the lack of consistency in utilization, implementation, leadership,

and access, the field has yet to see a profound technological revolution that can completely alter and redefine the field of education (Cuban, 2001; Selwyn, 1999). If we consider the potential of computer based technology and its role as such a significant and profound dynamic in the evolution of education, how then do educational leaders address these inconsistencies? How should computer based technologies be implemented in today's schools? Furthermore, how do educational leaders provide effective leadership to support the implementation of revolutionary technology and how will they ensure that all students and members of the educational community have access?

It is quite common to find in educational literature the disposition that technology is one of the single most important factors that will have an effect on the future of education. If educational leaders are to take the ideal that technology is a significant catalyst for change and make it tangible, real, and measureable in educational systems through implementation and leadership, it is important to question where this ideal comes from and the reasoning behind this belief. Although the use of electronic technologies as revolutionary educational practices can be seen throughout the 20th century in American classrooms with the use of radio, television, and film, the spark that ignited this popular disposition about computer based technologies was lit by educational policy (Cuban, 1986). In 1983 T.H. Bell, the Secretary of Education under President Ronald Reagan, released *A Nation at Risk*, a report that illuminated for the country the broken American educational system that was in dire need of reform (Culp, Honey, & Mandinach, 2003). The significant piece from this report that relates to technology is that for the first time in

educational policy computer science was mentioned as a basic high school graduation requirement.

A Nation at Risk told the country that American students were behind other nations of the world and that in order to catch up, American students needed to learn how to be technologically savvy and "understand the computer as an information, computation and communication device, use the computer in the study of English, mathematics, science, and social studies, for personal and work related purposes, and understand the world of computers, electronics, and related technologies" (National Commission on Excellence in Education, 1983, p. 86). This report had a monumental effect on future educational policy and law that in turn led to the growth and development of educational technology. Thus, computer based technology today is considered a medium that will transform educational practices, instruction, teaching, learning, and student achievement in unique and dynamic ways that cannot be achieved with any other mechanism (Cuban, 2001). The responsibility of today's educational leaders is to identify, design, and implement appropriate paradigms that are capable of using this mechanism to bring the vision established in *A Nation at Risk* to fruition.

As the No Child Left Behind Act of 2001 continues to challenge our nation's schools to meet demanding requirements in order to bridge the achievement gap, schools continue to look for the most efficient strategies to help them achieve these goals. The integration and implementation of computer based technology in today's schools is a powerful mechanism in utilizing such strategies and reaching the requirements of NCLB, which specifically calls for school systems to integrate data systems so that sound

educational decisions can be made using the most useful and organized data (Wayman, 2005).

Cuban (2001) stated that technology in education today is not the same as it was in the 1920's, 1960's, and 1980's. The exponential speed in which electronic technology develops today is comparable to the rate in which some educators have become exponentially unfamiliar with technology. Technology represents a rare aspect of education whereby many teachers do not necessarily have familiarity or schema with it while their students are extremely experienced. This perpetuates difficulty and confusion when educators are expected to lead and act as role models within a domain that is foreign to them: suddenly it is the students who are the masters and the students who are making the rules and establishing the practices and cultures associated with educational technology. It is time for educators to commit themselves to a more extensive and thorough understanding of technology's role in education. Technology has the power to change all that educators know and are comfortable with, and all that educators experience in the field of education. Educational leaders must be prepared to meet the challenges of utilizing and implementing technology in today's schools.

A significant motivating factor in conducting this study is my desire to see that educational leaders are prepared for the technological future and for whatever role technology might play in the progress of the field. In the initial stages of thinking about this study, too much attention was placed in my misguided approach of wanting to create a document that could benefit the field by illuminating 101 ways in which technology could be efficiently used in education to improve student achievement. If educators spend

all of their time focusing on any number of unique computer based technologies and their use in education, what happens when those technologies become outdated, obsolete, or replaced? How can the system, institution, leader, or educator be better prepared to lose one technology and replace it with another?

A significant amount of research highlights specific computer based technologies and their role in education (Clark, 2006; Judson, 2006; Ribble & Bailey, 2004; Stein, 2003). The study of specific computer based technologies is extremely important. However, this study focuses on leadership and the implementation process rather than on a specific computer based technology that is being implemented. The specific computer based technologies that impress and inspire educators (for example, television, laptops, smart boards, document cameras, Power Point, etc.) are certain to change quickly and often. Therefore, it is imperative that educators learn how to implement and utilize any computer based technology in education, regardless of any significant technological innovation currently in favor and practice.

The most recent implementation of computer based technology in education, from teacher preparation to student learning to administrative organization, is profoundly focused on the use of online information systems that utilize the internet and web-based resources (Resta & Laferriere, 2007). As current trends in education continue to depend on and develop through internet access, educators are faced with a unique set of challenges associated with on-line connectivity, including issues of plagiarism, free speech, cyber-citizenship, and child predators. When considering implementation and leadership of computer based technology in education, perhaps the most concerning issue

is that of online safety and the pressing need to protect children from inappropriate and harmful content. It is imperative that educational leaders consider laws and policies that are in place to guide administrators in making appropriate decisions to protect children. Title II, Part D of NCLB (2001), entitled *Enhancing Education Through Technology*, provides sound guidance for the implementation of computer based technologies in education when considering such factors. Subpart 2 discusses the design of appropriate technology activities that foster an academic and productive utilization of technology, while Subpart 4 discusses internet safety and mandates that schools protect children from obscene and pornographic material (US Department of Education, 2001).

In 2001 the Children's Internet Protection Act (CIPA) mandated that in order to receive federal funding, public schools and libraries must install filtering software to prevent computers from receiving inappropriate material such as pornography or other data deemed unsuitable or harmful (Kemerer, Sansom, & Kemerer, 2005). Although it is obviously in the best interest of schools to prevent students from accessing pornography, the blocking and filtering of information blurs the line between "safeguarding the free exchange of ideas and protecting children from harmful materials via the internet" (McCarthy, 2004). The difficulties in applying censorship to education can be seen where one school or administrator might consider a piece of information to be inappropriate where another might consider that same information to be protected speech that is an allowable political, social, or student expression. Ironically, the entity that currently makes the decision of what gets blocked is neither the federal government nor school systems but the makers of software filtering programs (McCarthy, 2004).

In 2004, the US Department of Education released their National Education Technology Plan entitled *Toward a New Golden Age in American Education: How the Internet, the Law, and Today's Students are Revolutionizing Expectations.* This policy outlined seven major action steps and recommendations for American schools which included improving the implementation of technology and the call for schools to integrate data systems. The report defines this recommendation as the need to implement a means to digitally organize school data and student records and that "integrated, interoperable data systems are the key to better allocation of resources, greater management efficiency, and online and technology-based assessments of student performance that empower educators to transform teaching and personalize instruction" (US Department of Education, 2004). Although such systems will streamline data that will ultimately be used to improve student achievement, the implementation must consider the students' personal information that it be stored, shared, and transmitted with privacy and sensitivity.

Enacted in 1974, The Family Educational Rights and Privacy Act (FERPA) is the mechanism in place to regulate the processing of this information. "The intent of FERPA is to protect the confidentiality of student records by preventing disclosure of personally identifiable information to outsiders without prior consent. The act gives parents or legal guardians the right to inspect their child's confidential files and challenge information found in the files that they believe to be inaccurate or misleading" (Essex, 2004, p. 111). The effect of computer based technology on the information age directly impacts FERPA in terms of the issue of confidentiality of student educational records. Although the federal government has a law in place to protect the privacy of student records, many

administrators and school officials do not have an understanding of FERPA and how the law applies to students (Toglia, 2007).

Copyright law becomes an issue in the implementation and leadership of computer based technology on many different levels. Educators are faced with the conundrum of what is acceptable in using and copying books and workbooks as well as digital media such as DVD's and computer software. In terms of leadership, it is important to note that "if a teacher is charged with copyright violation, it is likely that the principal will be charged as well" (Shaughnessy, 2005, p. 151). Teachers and students can in fact use copyrighted material legally, if it falls under Section 107 of the Copyright Act of 1976, which stipulates a fair use policy (Kemerer, Sansom, & Kemerer, 2005). The difficulty is in how to interpret the meaning of fair use, specifically when utilizing the complexity of computer based technology. In 1998 the Digital Millennium Act was proposed and work began to establish a set of guidelines for educators to assist them in determining the fair use of digital materials. Although many groups were involved in the project, consensus could not be reached and there are still many discrepancies in deciphering issues of fair use (Langran, Langram, & Bull, 2005). As fair use becomes more and more difficult to decipher, computer based technology makes it easier and easier to copy items illegally. It is the responsibility of educators to respect copyright laws and model this disposition for their students and colleagues (Langran, Langram, & Bull, 2005).

Statement of the Problem

In 1997 a community of faculty, staff, and parents of a Catholic K-8 school in Los Angeles convened with excitement and enthusiasm. A major school fundraiser combined with many generous community donations collected approximately $50,000 for the purpose of implementing and integrating technology into the administrative and educational practices of the school. The faculty and office staff prior to this effort did not have computers to assist them in administrating, planning, and teaching. The school had no computers for student use nor did it have a computer lab. The funds collected changed these circumstances and the goal of this meeting was to formulate a plan for how to spend the funds and lead the school into the 21st century.

The situation described above brings up several important questions when considering the implementation of technology in today's schools. Once money is obtained, either through grants, donations, fundraisers, or any other source, how is that money spent, who makes key decisions, and how do those decisions affect the culture of the school? How efficient and effective are those decisions, specifically on the implementation and integration of technology and technological practices within the school? Furthermore, what administrative leadership fosters effective implementation of technology and how prepared is the school to face the significant change associated with the implementation and integration of technology?

In 1997, this Catholic school had little guidance in formulating a technology plan. Many of the nearby Catholic schools were without computer based technology and few if any institutions provided accessible information on the successes and failures of the

implementation of educational technology. Over the next four years the school made many mistakes and errors in the approach to spending funds and implementing technology until the administration and staff faced the realization that they had a computer lab with outdated machines, inadequate teacher training, aging and incompatible software that was not grade level appropriate, and a school culture and leadership that viewed technology as a complicated and resource consuming problem that hindered rather than helped.

This cautionary tale serves as a reminder for why there is such a profound need to research, document, and prepare schools for the process of implementing technology and for the leadership that is required to foster that implementation. Because of the autonomous leadership of Catholic schools and because of the lack of organized and mandated policies and guidelines for implementing technology, school communities must look at how technology is being implemented. Evaluating the technology implementation process allows educators to identify the various behaviors and practices that lead to the need for effective leadership and implementation of technology for teaching and learning.

The amount of time, energy, and financial dollars spent on the integration, implementation, and leadership of computer based educational technology is immense, it is imperative that educational leaders question, monitor, and assess the return. This issue is by no means exclusive to Catholic elementary schools. All levels of education, both public and private, are in desperate need of computer based technology implementation studies that investigate this return. In working to meet the requirements of NCLB, the U.S. Department of Education's Enhancing Technology Through education program

(EETT) released a report entitled *State Strategies and Practices for Educational Technology: Volume 1 – Examining the Enhancing Education through Technology Program* (2007). A strong caveat of this report is that there is a great need for the investigation of technology implementation and evaluation of technology standards, professional development, and the appropriate allocation of grants and funding for educational technology (US Department of Education, 2007). The report states that the United States increasingly receives considerable funds and grants for educational technology and professional development, thus establishing a great need for leadership, direction, and guidance on spending those funds and appropriately implementing educational technology.

Purpose of the Study

The purpose of this qualitative research study is to investigate leadership that supports educational technology implementation and the change processes involved in fostering a culture that embraces technology. A second purpose of this study is to investigate the educational technology implementation process at three Catholic elementary schools to identify ways that promote a supportive disposition and culture towards educational technology.

The setting in this study includes three Catholic elementary schools in the Los Angeles area that each claim to embrace and utilize technology in many areas of operation in the school. The data collected in this study documents the practices of the participants using interviews, observations, and document reviews. The results from this

study will contribute to the field of education information and guidelines that can be used by educational leaders to identify and adopt technology leadership and implementation that is better suited to foster a technological culture.

Interviews, site observations, and document reviews were conducted at each of the three Catholic schools. The interviews were conducted with the principal and the individual in charge of technology at each school in an effort to learn about current implementation and leadership practices that are associated with educational technology. Documents were reviewed to analyze technology plans as well as budgets for educational technology implementation at each school. Site observations at each school surveyed educational technology in practice and the degree to which leadership supports and fosters a technological culture.

Significance of the Study

This study is significant because it aims to contribute to the field of education data on computer based educational technology implementations as it is linked to leadership processes that foster those implementations. It is important that school leaders have a set of guidelines and documentation that will inform them about the significant variables that school leaders must be aware of when implementing technology and allocating funds towards technology integration. This study aims to educate administrators and other stakeholders about how to implement technology and how to be prepared to change with the many new technologies that have yet to be put into practice. Administrators, faculty and staff, students, and parents will benefit from the knowledge of these implementation

and leadership practices as they are ultimately designed to improve student achievement. This study aims to present school teachers and leaders with information that can help them avoid practices and mistakes that lead to an inefficient implementation of technology that mishandles and underutilizes funds and technology itself. In terms of social justice, this study is connected to the digital divide and this notion is explored more in Chapter 2. This study also illuminates the unequal and unbalanced allocation and access to technology in schools by demonstrating how the digital divide is clearly evident in education and how specific implementations can make computer based technologies more accessible to the underprivileged.

Theoretical Framework

An appropriate theoretical framework for this study must address the leadership of educational technology implementation, the implementation of computer based technology, and leadership and implementation that emphasizes social justice and considers the inequalities of the digital divide. One of the more prevalent frameworks associated with educational technology and an appropriate framework when discussing the implementation of computer based technology in education is constructivist theory. Jonassen (2000) defines the relationship between the constructivist perspective and technology by stating that:

> The ways in which we use technologies in schools should change from their traditional roles of technology-as-teacher to technology-as-partner in the learning process. Students do not learn from technology, technologies support meaning making by students. Students learn with technologies when computers support knowledge construction and learning by doing. (p. 8)

Jonassen, Peck, and Wilson (1999) further defined the relationship of constructivism to educational technology by stating, "Teaching is a process of helping learners to construct their own meaning from the experiences they have by providing those experiences and guiding the meaning-making process" (p. 3). Thus, technology is a tool and a resource and its implementation must be seen as such by educational leaders.

Although constructivism represents the appropriate vehicle that drives this implementation and leadership study of educational technology, Jonassen's "mindtools for conceptual change" represents the direction of this investigation. David Jonassen's mindtools can be defined as a framework that always focuses on problem solving and supporting meaningful learning rather than focusing on specific technologies and the way in which they work (Jonassen, 2006). Mindtools, also referred to as modeling tools, are specific ways to use educational technologies to aid students in constructing learning. Examples of such Mindtools include building databases, visualization tools, concept mapping, and spreadsheets to construct models that "facilitate intense cognitive and social activities that result in conceptual change" (Jonassen, 2006, p. 23).

Additionally, the framework of this inquiry must also address the leadership that is required to cultivate, foster, and sustain computer based technology practices in education. Such leadership can thrive within the structure of a professional learning community (PLC). Technology is often introduced to communities in the form of new policy, practice, and change. The ideology of a PLC is an appropriate philosophy for educational technology leadership because a significant goal of a PLC is to prepare for such change using the constructivist notion of learning by doing. DuFour, DuFour, Eaker,

and Many (2006) stated that learning by doing "develops a deeper and more profound knowledge and greater commitment than learning by reading, planning, or thinking" (p. 4). Learning by doing ensures that each member of the community takes ownership in adapting to change. DuFour et al. (2006) also stated that another significant goal of a PLC is to "create conditions for perpetual learning – an environment in which innovation and experimentation are viewed not as tasks to be accomplished but as ways of conducting day-to-day business forever" (p. 5). Fostering a technological culture requires "learning by doing" by providing the community with the tools necessary to accept technological change with a greater commitment.

Research Questions

The research questions driving this study are as follows:

1. How do educational leaders provide leadership that supports the implementation of technology, the change associated with new technologies, and a culture that embraces technology?
2. How are computer based technology initiatives implemented in three Catholic schools in ways that foster a culture that promotes a supportive disposition towards educational technology?

Definitions of Key Terms

Computer based technology: refers to the use of any electronic technology that is connected with the use of computers. Examples of computer based technologies include the use of laptop and desktop computers, smartphones, PDA's and other text devices, a plethora of software programs that can be used by students, teachers, and administrators, digital projectors, high speed internet connections and applications, streamlined audio and video, pod casting, voice recognition, touch screens, Web quests, smart boards, and a variety of other electronic devices. Any reference to computer based technology in education in this study refers to the use of electronics that either directly work with or compliment the use of computers in some way.

Digital divide: refers to the disparity between those who have access to digital technology and those who do not have such resources (Hawkins, 2005). The term digital divide in this study is deeply rooted in social justice and refers to actions and variables that must be practiced to reduce this gap in accessibility.

CHAPTER II

REVIEW OF LITERATURE

Introduction

School leaders must learn how to better prepare, implement, and utilize computer based technology in education, regardless of the specific technological marvel that represents the most current, common, and popular trend in education. Research questions posed in this study aim to investigate how educators think about the role of computer based technology in Catholic elementary schools. Today's educators must continue to shift their focus from thinking about implementing a specific technology to thinking about implementing any technology. Understanding the theoretical approach to integrating and implementing technology in education is paramount to the long term success of that implementation, for the benefit of student achievement. Current literature that addresses issues on the implementation of computer based technologies offer a plethora of discourses that articulate three distinct themes within educational technology pertinent to this study: 1) sound leadership ideologies and practices that support technology implementation and integration and foster a technological culture, 2) the implementation of computer based technology, and 3) the role of the digital divide as it relates to leadership and the implementation of educational technology.

Constructivism and Educational Technology

Constructivist theory serves as an appropriate theoretical framework when investigating the implementation and leadership of computer based technology in

education. In the same way that educators use chalk, pencils, and textbooks, the implementation and leadership of computer based technology into educational systems is effective when viewed as a tool and resource that can assist learners to construct meaning and ultimately improve student achievement (Jonassen, Peck, & Wilson, 1999).

In applying constructivist theory as the framework for computer based technology implementation and leadership in education, Jonassen (2006) made the distinction that technology is a great tool to learn with rather than technology is a great way to teach. When technology is implemented and utilized as a tool that aides instruction rather than as a replacement or substitute for instruction, it benefits the entire educational system. Technology as a constructivist tool provides a means for individuals to construct meaning and applies to teachers who instruct, students who learn, administrators who run schools, superintendents who run districts, and so forth throughout the entire education system.

A conundrum presented by computer based technology in education is that it is so volatile, dynamic, and progressive, it has the propensity to change incredibly fast, which makes it quite difficult to manage. Quite often in education, once a new computer based technology is implemented, learned, and a protocol is established for its place in the school setting, it changes. How then do educational leaders overcome the difficulties of implementing something that is so cutting edge, changing, dynamic, and that costs so much in terms of resources such as time, money, and training? It is imperative that educators implement technology as a tool to engage students to learn by thinking in meaningful ways (Jonassen, 2006).

Jonassen (2006) defined his mindtools approach in the following way:

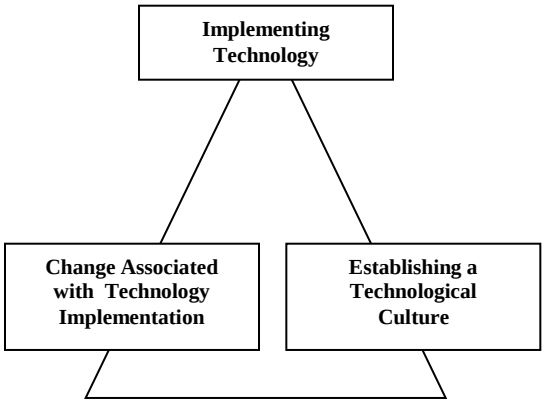
> Mindtools represent a constructivist approach toward using computers to engage learners in representing, manipulating, and reflecting on what they know, not reproducing what someone tells them. When a mindtool is being used, knowledge is constructed by the learner not provided by the teacher. Mindtools are just that: tools for engaging the mind. (p. 14)

It is important to view mindtools as a means of constructing models of learning. In this way, students can use computer based technologies to construct models of the curriculum being taught that allow the learners to see concepts in new and alternative ways.

Leadership: Styles, Practices, and Ideologies and the Implementation of Computer Based Technology in Education

The implementation of computer based technologies in education requires leadership styles and methods that are capable of supporting the implementation of technology, the change associated with that implementation, and the fostering of a culture that embraces and incorporates technology throughout school communities and systems (refer to Table 1).

Table 1. *Sustainable Leadership of Educational Technology*



Sustainable leadership of educational technology encompasses three important notions:

1) implementation of the technology,
2) change associated with that implementation,
3) establishing a technological culture.

Educational leaders must be prepared for the technological future and for whatever role technology might play. If educators spend all of their time focusing on any number of unique computer based technologies and their use in education, what happens when those technologies become outdated, obsolete, or replaced? How can the system, institution, leader, or educator be better prepared to lose one technology and replace it with another? The answer lies in sustainable leadership and the ability to not overtly focus on performance or rushing without caution into educational investments and decisions that promise immediate results and fall short of expectations.

Hargreaves and Fink (2006) presented practices that can lead to changing the way technology is implemented in education in stating that deep change does not occur overnight (p. 53). Argyris (1990) defined this notion with his proposition to develop the organization's capacity to produce double loop learning. Argyris proposed that in order to initiate change and get from here to there, you must "empower the organization with the capacity to learn by mapping out how the organization presently deals with the problem" (p. 95). One example of this can be seen when schools work together in order to get a hands-on opportunity to draw from other technology leaders a means to extrapolate the problems associated with current methods of implementing technology. The next step in Argyris's (1990) plan was to establish the double loop process by increasing the institution's capacity to learn. This can be accomplished by fostering behaviors that offer contributions and productivity over behaviors that reward stagnancy. By incorporating the implementation of technology into a school's vision, that school can be more prepared to adapt as various technologies evolve from commonplace to obsolete. The

third step in this process is to "reeducate educators by moving from espoused theory to theory in use", or in other words, going from talking the talk to walking the walk (Argyris, 1990, p. 95). This is not accomplished quickly and requires a great deal of practice, trial and error, and patience with plenty of focus on evaluating the practice. In terms of education technology, this entails implementing technology for the right reason: student achievement. Once this step is accomplished, the fourth step is to apply what the school has practiced to new technologies when it is time for implementation. New technologies will be utilized for more appropriate uses and in more efficient and just ways. Perhaps a fifth step could aim to elaborate the learning process to the greater educational community by collaborating with neighboring schools or districts with communications that depict and celebrate successful implementation so that it might serve as a catalyst to continue that success. The success of this step has the potential to be measured at district meetings where educational leaders can update each other on progress, obstacles, and solutions.

Sustainable Leadership and the Implementation of Computer Based Technology

Hargreaves and Fink (2006) argued that change is the one aspect of school reform that is perhaps the most difficult to sustain noting that, "if the first challenge of change is to ensure that it is desirable and the second challenge is to make it doable, then the biggest challenge of all is to make it durable and sustainable" (p. 2). Current research indicates that computer based technology represents a significant catalyst for change in the ongoing evolution of education specifically in the way in which educators teach and

students learn. Apple Classrooms of Tomorrow (ACOT), a research initiative between Apple Computers and over one hundred educational institutions, conducted a study from 1985 through 1998 and recognized in their formal Ten Year Report that technology is indeed a catalyst for change. The study found that when teachers utilize technology and are supported with the right leadership, they "also change their approach to teaching and learning from curriculum-centered to learner-centered, from individual tasks to collaborative work, and from passive learning to active learning" (p. 15).

Sustainable leadership is necessary when considering the change that exists between the level of mastery in technological knowledge between teacher and student. Cuban (2001) stated that technology in education today is not the same as it was in the 1920's, 1960's, and 1980's. The exponential speed in which electronic technology develops today is comparable to the rate in which some educators have become exponentially unfamiliar with technology. Marc Prensky (2001) referred to this as the difference between digital natives and digital immigrants. Digital natives are those who have grown up with technology and possess a schema of technological know-how and understanding. Digital immigrants are those who did know grow up learning computer based technology and thus have to learn such skills as adults. Technology represents a rare aspect of education whereby many teachers do not have familiarity or schema with technology while their students are extremely experienced. This perpetuates difficulty and confusion when educators are expected to lead and act as role models within a domain that is foreign to them: suddenly it is the students who are the masters and the students who are making the rules and establishing the practices and cultures associated

with educational technology. It is time for educators to commit themselves to a more extensive and thorough understanding of technology's role in education. Technology has the power to change all that we know, all that we are comfortable with, and all that we have experience with in the field of education. Educational leaders must be prepared to meet the challenges of utilizing and implementing technology in today's schools.

How do educational systems embrace sustainable leadership that adapts to such changes in education? One efficient approach to meeting this challenge is to develop a cycle of inquiry and action and to begin thinking in new directions for a paradigm shift that addresses these concerns. Educators must think about why they are implementing technology and that implementation must go beyond the desire to see immediate results in measuring student achievement. Sustainable leadership goes beyond planning and action, it also evaluates. Coghlan and Brannick (2001) established a theme of action research and a meta cycle of inquiry in which educational problems can be analyzed by planning action, taking action, and evaluating that action to measure its effectiveness (p. 18). DuFour et al. (2006) presented a very similar paradigm that focused on the central importance of a results orientation, which can "continuously improve the collective capacity of a group to achieve intended results, which cannot be achieved by engaging in elements of the process and ignoring results" (p. 152). Using Edward Deming's four step feedback loop, new paradigms are born with the realization and awareness that the issue is being approached with the cycle of "plan, do, check, act and adjust" rather than with the cycle of "plan, do, do, do" (p. 153). When implementing technology in education, we plan, do, do, do, do when we constantly purchase new technological gadgets without

thinking about factors such as training personnel, compatibility, and long-term use. Hargreaves and Fink (2006) offered a theme for which to approach the issue of education technology and leadership: focus on sustainable leadership when implementing technology, not on the specific technology that is being implemented.

Leadership for Change and Culture Associated with the Implementation of Computer Based Technology

Leadership practices that support change and that foster culture are related in that they often share similar characteristics (Senge, 2000). Collaboration, partnership, constructivism, and the structure of a professional learning community (PLC) are all examples of leadership styles and practices that strengthen transformation, transition, and followership (Evans, 1996). The process of implementing new initiatives that replace old ways of doing things can benefit from a type of leadership that involves and incorporates input from all stakeholders so that change is viewed as a necessary and rewarding endeavor. As change begins to overcome feelings of challenge, resistance, and loss, a shift towards the desired culture that sustains such change can then occur (Bridges, 2003).

Establishing a professional learning community requires collaboration and accountability from educators and leaders. Sustainable leadership can thrive within the structure of a PLC. Technology is often introduced to communities in the form of new policy, practice, and change. The ideology of a PLC is an appropriate philosophy for educational technology leadership because a significant goal of a PLC is to prepare for

such change using the constructivist notion of learning by doing. DuFour et al. (2006) stated that learning by doing "develops a deeper and more profound knowledge and greater commitment than learning by reading, planning, or thinking" (p. 4). Learning by doing ensures that each member of the community takes ownership in adapting to change. DuFour et al. also stated that another significant goal of a PLC is to "create conditions for perpetual learning – an environment in which innovation and experimentation are viewed not as tasks to be accomplished but as ways of conducting day-to-day business forever" (p. 5). Fostering a technological culture requires learning by doing by providing the community with the tools necessary to accept technological change with a greater commitment

Wayman and Stringfield (2006) discussed the importance of administrative support in fostering technology in education and the importance of involving not only the entire faculty, but the entire educational system in the process of utilizing technology for the purpose of improving student achievement:

> The implementation of technology systems greatly increases school capacity to use data and involve all faculty. Our study indicates that supports provided by the district, and the principal in particular, were helpful in promoting faculty involvement. Teachers believed that aspects of their own practices were improving. They reported using student histories and assessment data to gain a better overall picture of student needs. Many teachers reported believing themselves to be more efficient. They also viewed themselves as implementing better pedagogical techniques such as effective differentiation and learning through collaboration. (p. 566)

The implementation of technology is not the sole responsibility of the state or district, nor is it the sole responsibility of teachers or principals; it must be embraced by each and

every facet of the educational system. DuFour et al. (2006) often cited a powerful assertion in their discussion of PLC's and the importance of collaboration:

> No program, no textbook, no curriculum, no technology will be sufficient to meet educational challenges. Educators will remain the most important resource in the battle to provide every child with a quality education, and thus leaders must commit to creating the conditions in which those educators can continue to grow and learn as professionals. (p. 185)

This notion serves to remind educational leaders that technology in of itself is not a savior for the educational problems of today. With sustainable leadership, the implementation of technology creates more resources for student achievement and must be a collaborative effort that requires participation from all educational positions.

Sanders (2006) called for a more clearly defined structure for education technology leadership and proposed leadership initiatives that aim to develop more fully a culture that fosters and embraces the implementation of technology. Among the more significant initiatives is one that he refers to as "purposeful design and inquiry pedagogy" whereby the application of technology and its place across the curriculum needs to be rethought with a focus on desired outcomes. Sanders stated that, "too often, we fail to identify the desired learning outcomes we hope to achieve with technology," an assertion that can be addressed by applying the double loop learning process to the way in which schools put technology into practice (p. 35). Bain and McNaught (2006) investigated the beliefs and practices of teachers who utilize technology in their teaching. The relationship between a teacher's beliefs and their practices often reveals a reluctance to change and a hesitation to embrace the new processes, routines, and practices that are involved with the implementation of technology. A fundamental necessity in the successful nurturing and

fostering of technology in education is a style of leadership that promotes empowerment and encourages educators to challenge themselves to grow and expand within their professional domains.

Another method of fostering a technological culture can be seen in the work of Argyris (1990) as mentioned earlier and his discussion of single versus double loop learning. Argyris explained that single loop learning "solves the presenting problem" but does not "solve the more basic problem of why the problem existed in the first place" (p. 92). How then do organizations discover, isolate, and determine why such problems exist? Argyris suggests that reflecting on goals, beliefs, strategies, and values is imperative if an organization aims to prevent problems associated with ineffective roles and policies, or in this setting, for schools to increase student achievement (p. 94). Technology is seen as a single loop process when it is implemented as a solution or fix for an educational problem rather than as a tool for improving overall student achievement. The implementation of technology must be seen as a double loop process: not a focus on the acquisition of specific technologies, but on the theory of how any technology is implemented. The implementation of technology becomes a double loop process when a leader facilitates a vision, goals, and values that are kept at the forefront of decision making and not taken for granted.

Implementing Computer Based Technology in Education

History of Technology Implementation in Education

As computer based technology continues to play a key role in the progression of education, an investigation of its implementation begins with a look at the history of the use of electronic technology in schools. The philosophies and dispositions held by today's educators about computer based technologies are largely influenced and defined by their experiences with the ways in which electronic technologies have been utilized in education in the past. Typically, these experiences are with electronic technologies that aimed to enhance audio and video. The genesis, development, and progress of computer based technologies are directly related to the history of electronic audio and visual technologies from the 1920's through the 1980's: namely radio, television, film, and early use of the first personal computers (Cuban, 1986). A thorough investigation of the implementation of computer based technologies in education must include an inquiry about how educators approached the implementation of these earlier forms of electronic technology.

Larry Cuban, an educator who is considered by many to be an expert in the field of educational technology, has written extensively on the issue whereby his works illuminate two distinct notions about the implementation of electronic technology. First, aside from the most recent decade, electronic technologies that can be considered benchmark innovations (radio, television and film, and computers) have largely and consistently been unveiled and embraced by the public, teachers and administrators, and school boards and systems as messiah-like saviors to curriculum and instruction filled

with the promise to make a significant impact on bridging the learning gap and make learning more accessible and effective to all types of learners (Cuban, 1986). Second, these benchmark innovations have largely and consistently been underutilized, have ultimately had far less impact on student achievement than first anticipated, and have undershot the mark they aimed to hit in influencing and improving education (Cuban, 2001).

Implementation, Change, and Culture

The implementation of any initiative within a given organization is a process that is directly related to aspects of change and culture (Bridges, 2003). Evans (1996) defined the implementation process as a series of transitions that begin with the need to convince the staff that change is necessary and that the implementation of a given initiative is beneficial, meaningful, and essential to their practice. Once the staff is ready and willing to embrace change the implementation process continues with what Evans (1996) defined as "moving from loss to commitment, from old competence to new competence, from confusion to coherence, and from conflict to consensus" (p. 55). The process described above is an appropriate outline for the implementation of computer based educational technology in that the utilization of educational technology often requires significant modifications to educational practices.

Bridges (2003) presented a similar approach to the implementation process and proposed that there is a distinct difference between starting an implementation schedule and beginning a transition:

> Even though there is a new situation in place and they have started to grapple with it, people are still in the neutral zone feeling lost, confused, and uncertain. The beginning will take place only after they have come through the wilderness and are ready to make the emotional commitment to do things the new way and see themselves as new people. Starts involve new situations. Beginnings involve new understandings, new values, new attitudes, and most of all new identities. (p. 58)

Leadership and implementation of educational technology must embrace change that focuses on nurturing beginnings.

Terms such as values, attitudes, and identities as mentioned in the discussion above regarding change are typically associated with the definition of culture, thus linking a connection between implementation, change, and culture. Senge (2000) defined culture as being "deeply rooted in people. It is embodied in their attitudes, values, and skills, which in turn stem from their personal backgrounds, from their life experiences, and from the communities that they belong to" (p. 325). In order for culture to be influenced and transformed, the implementation and change process must continually promote collaboration and purpose.

Clarity and purpose are essential components to both change and culture (Bridges, 2003; Evans, 1996). Bridges (2003) pointed out that "it is the purpose, not the objectives, that is the heartbeat of the organization" (p. 41). When implementing educational technology educational leaders benefit from a clear focus on the end result, which is using technology to enhance rather than replace curriculum and instruction, rather than risking confusion or conflict by adhering rigidly to an objective that is counter-productive to the overall purpose.

Teacher Training and Technology Professional Development

If technology is such a powerful resource and tool, what is stopping it from being a truly effective catalyst for change in the field of education? Although the answer to this question is as complicated as the specific schematics of how some computer based technologies actually work, a part of this answer is directly related to the professional development, teacher preparation, and training of computer based technologies in education.

When considering the training of teachers and computer based technologies in education, one purpose of this inquiry is to investigate what currently exists so that we can consider how to arrive at what could be. Let us consider then three factors that currently define technology training in education: the historical patterns of technology training, technology training in teacher preparation programs, and professional development through schools, districts, and dioceses. First, the historical pattern of teacher use of electronic technologies has shown that professional development and the systems in place that have promoted the utilization and implementation of electronic technologies in education have failed to significantly change the way that teachers teach (Cuban, 2001). Second, teacher preparation at the university level is greatly responsible for familiarizing educators not only with technical computer skills that are required to work with computer based technologies, but also with the ideologies necessary to significantly change instructional practices (Matzen & Edmunds, 2007). Third, professional development opportunities at the school site, district, or archdiocesan level

must work to repair the disconnect between teacher beliefs and practices and the computer based technology skills that are being taught (Brinkerhoff, 2006).

Although some might think of computer based technologies such as laptops for every student as groundbreaking resources that will change instruction, it is important to remember that many new technologies have been introduced to the field of education over the years in the same ways with the same overzealous expectations.

Today's inception of laptops with wireless broadband connections for every student is yesterday's inception of film, radio, and instructional television that aimed to bring about the same systemic change (Cuban, 1986). These technologies were implemented with similar flaws in teacher preparation and professional development. Film, radio, and television each failed to materialize the way in which they were intended. Teachers were not prepared to utilize these technologies appropriately and the systems in place that were meant to assist teachers in integrating these technologies into their lessons were inefficient. Films failed because of teacher's lack of skills in using equipment and film and one of the reasons why radio failed is because teachers were not interested (Cuban, 1986). Instructional television failed due to lack of teacher preparation in how to use television to compliment instruction (Cuban, 1986). Today's use of computer based technologies in education is meeting the same fate. Selwyn (1999) stated that "the computer's limited integration into schools is merely a replication of the catalogue of previous technologies which have failed to make an impact in the classroom" (p. 78). Brinkerhoff (2006) stated that "barriers impacting technology integration may be grouped into four main categories: resources, institutional and

administrative support, training and experience, and attitudinal or personality factors" (p. 22).

Educational leaders must work towards breaking this cycle. Matzen and Edmunds (2007) pointed out a promising direction in their claim that "technology can be used both in ways that are consistent with teacher's existing practices and in ways that shift their practices, a difference dependent upon the type of technology professional development received" (p. 417).

Perhaps the most significant flaw in formal teacher preparation programs is the overemphasis on teaching specific computing skills and not enough emphasis on how to use technology in ways that change instructional practice towards a more student-centered, constructivist methodology (Brinkerhoff, 2006). Matzen and Edmunds (2007) supported this claim and link professional development with teachers' instructional use of technology by pointing out that "when teachers are provided with technology professional development focusing primarily on technical skills, they may fall back on technology uses consistent with their existing instructional practices simply because they have not been provided with an alternative vision for the use of technology" (p. 418). Teacher preparation is more successful when it challenges teachers to use technology in ways that change their practice rather than using it in ways that keep their practice uninfluenced.

One major aspect of teacher preparation and the efficient implementation of computer based technology in education is the significance of teacher attitudes and beliefs about technology and professional development (Liu & Huang, 2005).

Brinkerhoff (2006) refered to this aspect as “attitudinal barriers” which include anxiety about a lack of knowledge in using technology and about current technological trends, concerns about keeping pace with technologically talented students, and “teachers’ perceptions of their computer competency and the adequacy of their technology preparation” (p. 24). An additional role of teacher preparation programs is to work towards alleviating such concerns by placing a stronger focus on familiarizing educators with technology beyond fundamental computing skills.

Brinkerhoff (2006) defined significant concerns with professional development at the school site, district, or diocese level and found in his research:

> Training is offered at inconvenient times for teachers not specific to their needs. Rather than asking teachers what needed to be covered in the training, professional development was driven by the trainers hired by the school and was offered after school hours with the expectation that teachers would attend the training on their own time. A lack of support following professional development represents another training relater barrier to a teacher’s use of technology in instruction. (p. 23)

Educational leaders must stop and think about being on the receiving end of such training. What positive motivation and enculturation can result from such training? If acquiring the intended professional development is that much of a chore for the faculty and staff, the actual ownership and importance of that knowledge will be minimal and perhaps a waste of valuable time, energy, and resources.

MacDonald (2008) discussed another concern that the concept of professional development at the local level can sometimes be perceived as a one day workshop or occasional focus rather than as an ongoing aspect of the culture of the site. He points out that “one-day workshops often remain the norm even though they are inadequate since

they do not provide for ongoing collegial interaction" (p. 430). Perhaps the most appropriate way to address this concern is with consistent and continuous follow up with the teachers and staff. Similar to teaching math, the lesson learned on the first day of school is an imperative and integral piece in being able to understand and learn the lesson taught on the last day of school.

A successful professional development program is one that fosters collaboration and a shared ownership of the value of what is being taught. Yamagata-Lynch (2003) studied the effects of a professional development program on teachers whereby a significant finding was that "actions taken by individuals are most meaningful within the community that shares a common experience and understanding" (p. 103). It is imperative that educational leaders promote professional development as a positive and necessary endeavor that will have perceived immediate, practical, and tangible influence on teacher practice.

When considering the history of technology training, formal training and teacher preparation programs, and the role that local sites play in technology professional development, the fact that we realize the concerns described above indicate that we are thinking towards solutions and improving the overall training and preparation process of technology education. In terms of a vision, educational technology training will be far more effective when there is less disparity between formal teacher training at the university level and the professional development offered at the local level.

This inquiry can benefit by elaborating on several other factors that might influence the educational technology training process. In terms of policy, the No Child

Left Behind Act (2001) called for the distinct need to train highly qualified teachers. Educational technology training will continue to evolve as schools and systems become more and more proficient at defining and meeting the criteria set forth by NCLB. Another factor worth investigating is the impact of budgeting and spending on technology and the financial influence technology training may have on the profession. Peslak (2005) cautioned that technology funding in the last decade has exponentially increased well into the billions of dollars while little research has investigated the effect of those expenditures in education. Finally, it is paramount that educational technology training has a proven and tangible effect on pedagogy and that all of this has a positive influence on student achievement.

The Digital Divide

Leadership and implementation of computer based technology in education is in part defined by the equitable use of that technology and the digital divide. Digital divide is a fairly new term for a concept that has existed throughout the ages. The concept of the digital divide is based on the principle of equality: historically, those in possession have a distinct and unfair advantage over those who are not in possession. In today's world, technology is commonly associated with the progression and evolution of electronic power and even newer cutting edge energy applications such as hydrogen power and fuel cells. It is important to remember that every age since the beginning of time has advanced and developed their own inventions and technologies and that every age has consisted of those that have had access to those technologies and those that did not. Even the

Neanderthals, who lived side by side with Cro-Magnons, eventually died out because they did not have access to the same sophisticated tools and technologies as their early human counterparts.

The term digital divide originated during the 1990's when it was used by the Clinton Administration and one of Clinton's advisor, Larry Irving, in a series of surveys and reports for the United States National Telecommunications and Information Administration (NTIA) (Hawkins, 2005; Compaine, 2001). In July of 1995, the NTIA released the first in a series of reports called *Falling Through the Net: A Survey of the "Have-Nots" in Rural and Urban America*, which called into question for the first time the idea of access to information and communication technologies (ICT) (NTIA, 1995). This report identified a social, geographic, and economic gap that existed between those who had significant access to ICT and those whose access was limited or nonexistent. A popular claim made in the report states that "while a standard telephone line can be an individual's pathway to the riches of the Information Age, a personal computer and modem are rapidly becoming the keys to the vault" (NTIA, 1995, p. 2). This statement shows that the report focused specifically on the idea of physical access to the internet and physical ownership of computer hardware rather than on the idea of possessing actual information obtained from that access and ownership (Hawkins, 2005). Throughout the early and mid 1990's, the digital divide was strictly defined by an individual's physical access to ICT.

Since that report, the term digital divide has become increasingly more complex and it continues to be influenced by a plethora of factors that go far beyond the issues of

physical access and ownership between the haves and have-nots. Today the digital divide is further defined by individual skill sets and usage of ICT, by issues of race, and by issues of gender. Furthermore, the digital divide has distinctly different implications when viewed globally, nationally, and at the local level. A central purpose of this paper is to investigate the importance of inculcating the ideology of the digital divide when integrating technology in education. The importance of doing so is to ensure that the implementation and leadership practices associated with that integration are socially just. Thus, this literature review will also examine how the digital divide effects implementation and leadership and what it means for educational leaders to work to bridge the digital divide.

The Digital Divide, Individual Skill Sets, and Usage

Literature now commonly defines the digital divide as the differences between the haves and have-nots as they pertain not only to physical access to ICT and the internet but also to the consistency of use and skill level and mastery of such technologies (Hargittai, 2002). The significance of skill set and usage is based on the premise that physical access to ICT alone does not sufficiently solve the problem of the digital divide. Hypothetically, if all of the have-nots were given a reliable computer system with high speed internet access, they still do not necessarily know how to efficiently use that system without proper training (Servon, 2002). Ultimately, it is the potential information that is obtained from ICT and knowing how to use that information that will ultimately bridge the learning gap between the haves and the have-nots (Thomas, 2008).

The true advantage that the haves possess in terms of obtaining and using information is significant. Information by itself has limited value, however, once an individual or group learns how to take information and interpret, produce, facilitate, and deem the information important, they are then truly in a position of personal, social, economic, or political power (Wresch, 1996). The process of supplying and connecting ICT to the substantial number of have-nots in the world is an arduous undertaking, but the true challenge in bridging the digital divide is the process of giving those have-nots the means to make that information useful, productive, and empowering.

The Digital Divide and Race

From the inception of the use of the term in the early 1990's, perhaps the most common dynamic of the digital divide is that of race. The NTIA's *Falling Through the Net: A Survey of the "Have-Nots" in Rural and Urban America* illuminated the degree of unequal access to ICT of the marginalized in the United States. The report identified the significance of race and the digital divide when it cited that "a child in a low-income White family is *three times* as likely to have Internet access as a child in a comparable Black family, and *four times* as likely to have access as children in a comparable Hispanic household" (NTIA, 1995, p. 4).

Since then some research over the last decade investigating the racial disparity of access to ITC at home has found that the access gap between Whites and Blacks, Hispanics, and other minorities is indeed shrinking (Hoffman, Novak, & Schlosser, 2001). Although the notion of access to computers at home based on demographics and

geography is significant, the digital divide is also defined by access to the internet, access at school and work, and the degree to which teachers are prepared to promote and instruct technology use to their students (Gorski & Clark, 2001). Paramount to this study, however, is the notion of racial disparity as it pertains to issues of access and usage germane to education. Educational leaders must continue to address the concerns of how the racial digital divide impacts student achievement "in terms of content, pedagogy, evaluation and assessment, and school culture" (Gorski & Clark, 2001, p. 15). What are the dominant concerns that educational leaders must contemplate when implementing and leading educational technology in schools and school systems? The design and implementation of education technology programs must be available and usable by all races, must be as available and consistently implemented in poor areas populated by the marginalized as much as they are in wealthy, White areas and they must offer teacher and student training that produces individuals that are capable of creating and influencing useful information (Hess & Leal, 2001).

The Digital Divide and Gender

Research shows that gender plays a significant role in defining the digital divide. In short, when it comes to issues of access and usage of computer based technologies, women are often disadvantaged. When compared to men, fewer women are encouraged in computer use and mathematics in primary and secondary education, fewer women own and use computer based technologies, and fewer women complete their careers in higher education with computer based technology degrees and positions in the information and

technology (IT) field (Clark & Gorski, 2002; Cooper, 2006). Furthermore, anxiety about using computers, reluctance to using computers, and the notion that computers and software are geared towards men are additional issues in addressing the digital divide that are uniquely faced by women (Cooper, 2006). Prior to the first decade of the 21st century, there existed a prominent gap in internet access between men and women and between boys and girls (Clark & Gorski, 2002).

A popular gender stereotype is that men have a higher degree of interest in computers and math and that men are more proficient users of computer based technologies compared to women. A male dominated technology stereotype is perpetuated by a cycle whereby men are encouraged more in school, therefore men study computer engineering and technology more in college, and thus men take more careers in computer based technologies and IT companies (Cooper, 2006). The idea that computers and software are geared towards men is a notion that is supported by empirical research (Clark & Gorski, 2002). Consider for example the idea that males primarily spend hours upon hours playing video games made mostly by fellow males that feature content and media that perpetuates the male dominated technology stereotype (Cooper, 2006). What does this imply when considering the implementation and leadership of technology in education? The stereotypes exemplified in the content of popular culture and the mainstream media such as the video game and computer software industries inevitably suggest that "girls may be at a technical disadvantage long before they ever graduate from high school and enter the job market" (Bolt & Crawford, 2000, p. 75). Technology implementation in education must consider the importance of empowering the female

identity by utilizing software that is free of such stereotypes and by teaching technology skills to women that lead to a greater interest in the IT field for the future. Technology implementation and leadership must consider this need for change because "inequitable practices in education are preparing tech-savvy, tech-valuing, and tech-confident men to fit into high level, high paying technology industry jobs while women are discouraged from seeing related fields and occupations as accessible, desirable, or attainable" (Clark & Gorski, 2002, p. 30).

The Digital Divide: Global versus National versus Local

The digital divide is unique in that it is a phenomenon that has different implications when considered globally, nationally, or at the local level. In his discussion of these uniquely different implications, Tiene (2002) stated that globally, many nations have insignificant utilization of ICT compared to larger industrialized nations such as America and throughout Europe. Although the United States does not represent the technologically marginalized at the global level, disparity does exist between race, gender, and affluence within our national borders. At the local level, there are often great inconsistencies between access and utilization of ICT between adjacent school systems and even between schools in the same neighborhoods. Perhaps this idea is a humbling notion for educators in charge of implementing and leading educational technology and can guide decision making when implementing technology into schools and systems. Norris (2001) demonstrated that regardless of whether the digital divide is viewed as a global, social, or democratic phenomenon, "reducing the cost of information and

communication minimizes some, although not all, of the significant barriers to effective political participation at an individual level" (p. 23). At its core, this is what needs to be addressed when implementing and leading a technological culture in our schools.

The Digital Divide and Sustainable Leadership

When considering sustainable leadership and a technological culture, the role that technology plays in closing the achievement gap is profoundly connected to the notion of the digital divide. First and Hart (2002) defined the significance of the digital divide as "the lack of opportunity to access to technology and the lack of opportunity to learn the skills to make use of the technological portal to the world, which is the reality for large numbers of the poor and the educationally underserved" (p. 385). Current methods that focus on utilizing technology as a quick educational fix seem incapable of addressing the more complex issues of social justice. The more technology is implemented without thinking about equity and equality, the more problems it creates in balancing the distribution of that technology and opportunities for quality education for all. Bolt and Crawford (2000) further defined the notion of the digital divide by stating that:

> The last twenty years have seen a tremendous leap forward in the use of technology in classrooms, creating a different kind of educational experience for some students – but not, by any means, for all. Access to this technology is becoming based, is not equally available to all students, is not handled equally well by all educators, and is not equally useful to everyone in education as it is presently structured. (p. 25)

In their discussion of justice, Hargreaves and Fink (2006) presented a principle that "sustainable leadership does no harm to and actively improves the surrounding environment by finding ways to share knowledge and resources with neighboring schools

and the local community" (p. 142). In this way, social justice is at the very heart of sustainable leadership in that it is in our vested interest as educators to see to it that all students have equal and equitable access to technology and all other resources because what we do in our school ultimately effects the teachers and students in all schools. An intriguing idea presented by Hargreaves and Fink (2006) is the notion of networked districts of schools whereby schools known for being exemplary and advanced in specific specialties in various curricula are interconnected and offer "access to all the varied learning resources of concentrated expertise across the district, developed in collaboration and complementary ways to enhance the learning power of all students and of all the institutions that can support them" (p. 155). In terms of implementing computer based educational technology, this idea forces schools to think beyond the implementation in their own community and more towards the global community. The application of sustainable leadership to addressing the digital divide illuminates the unequal and unbalanced allocation and access to technology in today's schools by demonstrating how the digital divide is clearly evident in education and how specific implementations can make computer based technologies more accessible to the underprivileged and underserved.

Bridging the Digital Divide

NTIA's report in 1995 has influenced over a decade of critical thought, evaluation, investigation and research about the various disparities in access and usage of ICT and the digital divide. The good news is that one of their more recent reports entitled

A Nation On-line: How Americans are Expanding their Use of the Internet (NTIA, 2002) indicates that there is an increase in the equal and equitable use of ICT and that we are moving in the right direction in bridging the digital divide. The problem is not fixed, and there is potential for the digital divide to face new challenges based on the progress and evolution of today's ever complex technologies, but our awareness and inclination to address the digital divide are growing and smarter and more informed decisions are being made by today's educational leaders.

Research that supports the NTIA points out that while statistics may indicate that more of the underserved and marginalized may have physical access to hardware and internet connections, the opportunity use and mastery ICT still shows a considerable gap that may be increasing (Van Dijk & Hacker, 2003). The digital divide will never completely close until policy and systemic change works beyond the ideal of simply purchasing computers for all and towards addressing the more important social issues of inequitable learning opportunities in schools (Valadez & Duran, 2007).

The literature presented here in Chapter II discusses leadership, implementation, and the digital divide as it pertains to the use and integration of educational technology. In the next chapter, I will present the methodology and structure of this research investigation and discuss the data collection process.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this qualitative study is to research how leadership supports the implementation of educational technology and to investigate the educational technology implementation process in three Catholic schools. The setting, design, and results of this study aim to illuminate sound practices in utilizing educational technology by visiting schools to observe the technology implementation process. The research questions of this inquiry are answered by observing classroom and administrative uses of technology in schools, by interviewing administrators and technology personnel about the successes and challenges of integrating technology in education, and by reviewing documents related to the integration of educational technology at these three Catholic schools. All names of participants and school sites described in this study are pseudonyms. The setting of this study is three Catholic elementary schools in the Los Angeles area that each claim to embrace and utilize technology in various ways in the school and exhibit a supportive disposition towards educational technology. The results of this study present information and guidelines that can be used by educational leaders to compare these findings to their institutions in an attempt to identify and adopt technology implementation leadership and practices that foster a technological culture.

Research Questions

The current digital generation of learners uses technology in unique ways to make sense of the world around them. The questions asked in this study aim to investigate whether or not the implementation and leadership of computer based technology in schools supports that style of learning. This study proposes to answer the following research questions:

1. How do educational leaders provide leadership that supports the implementation of technology, the change associated with new technologies, and a culture that embraces technology?
2. How are computer based technology initiatives implemented in three Catholic schools in ways that foster a culture that promotes a supportive disposition towards educational technology?

The first question is addressed primarily by interviewing principals and technology personnel to gain insight into how prepared the schools are to meet the demands for technological change. Technology leadership can be observed in how technology is utilized throughout the school and can be seen in classroom lesson plans as much as it can be seen in the way that records are maintained in the school office. This study aims to observe how well prepared the schools are to provide sustainable leadership for technology implementation, which will allow schools to continue to adapt to the new and unforeseen changes brought by educational technology.

The second question is answered by examining how technology is currently being implemented in three Catholic elementary schools and by gaining insight through interviews into the attitudes, beliefs, and concerns that educators have about computer based technology and leadership in education. Observations include instruction in computer labs and instruction in technology rich classrooms. A review of documents illuminates how effectively policies and protocols foster a technological culture. A primary purpose of this study is to observe firsthand what the implementation of educational technology currently looks like in the three schools.

Setting

The setting of this study is three Catholic elementary schools in the Los Angeles area. These three schools are referred to in this study as St. Anthony's School, St. Mary's School, and St. Peter's School. The schools were chosen for their reputation as schools that embrace and utilize technology in various ways in the school and for the administrator's positive and productive disposition towards the role of technology in education. The positive reputation for successful educational technology at each school was identified via the recommendations, suggestions, and colloquial opinions of pastors, principals, and school supervisors. The primary rationale for choosing these three sites is that they represent a low, middle, and high socio-economic status. Additionally, these three sites represent a variety of racial and ethnic populations as described below. Reliability and validity in this study are significantly dependent on having access to technology in practice at schools of varying socio-economic status and ethnicity that have

at a minimum a moderate amount of resources and funding and leadership for their technology programs.

St. Anthony's School

St. Anthony's School is located in an affluent region of Los Angeles and, according to the school's 2008 census report it has a school population of both students and teachers that are predominantly white. Families at the school are categorized as middle to high socio-economic status. The high socio-economic status of the community allows the school to maintain a comfortable budget for technology throughout the school and curriculum. Currently the school's enrollment is at full capacity with 315 students.

St. Anthony's school was founded in 1965. Already a relatively newer school compared to most Catholic elementary schools in Los Angeles that were founded between the 1920's and the 1950's, it benefitted from significant renovations and upgrades as a result of a Los Angeles area earthquake in 1994. When faced with repairing the school facility after the quake, a building committee had the foresight to seek the expertise of an educational consultant to assist them in planning the future growth of the campus. The remodeling and building that resulted from the earthquake renovations gave the school facility an opportunity to plan for technology by installing proper electric and internet wiring throughout the campus, making room for proper storage, and designing two rooms specifically for multimedia presentations and computer workstations. Preliminary observation of the school site and conversations with the current principal reveal that the facility is new, modern, clean, and spacious. Computers are new and

maintained, the software being used is licensed and relevant, such as Microsoft Office 2007, and the students are encouraged to use technology in ways that promote creative thinking. The facility is as neat, organized, and efficient as the actual quality hardware that is being used.

According to the principal, staff, and the school handbook, computer literacy is a significant aspect of the curriculum at the school. In terms of technological strengths, St. Anthony's benefits not only from the financial resources of the community but also from properly trained technology personnel and technology leadership supported from the administration and throughout the faculty. St. Anthony's staff utilizes a wide range of technologies in their school including two multimedia computer labs, wireless high speed internet connections, and three mobile laptop carts (each containing 18 computers) that travel between classrooms.

In addition to the excellent facility and quality hardware that distinguishes St. Anthony's as a technologically proficient school, the school is also distinguished because of its one mobile laptop carts that are used to convert the classrooms into computer labs. The school principal states that although the computer lab has its place in preparing the students for today's technological world, the future of educational technology and instruction is not in a computer lab but in the classrooms where the curriculum is being taught. The principal claims that the ideal for her school is that every classroom is used as a computer lab so that computer based technology could be used as a tool to instruct far more than fundamental typing and office skills. In an effort to meet this goal, the school

purchased 54 laptop computers that are stored on three rolling and locking carts that can float to all of the classrooms.

St. Mary's School

St. Mary's School is populated by a low to middle socio-economic status community in a low to middle socio economic region of Los Angeles. According to the school's 2008 census report, the student population of 246 is much more diverse than St. Anthony's. The majority population is Latino, followed by Filipino with fewer numbers of Asians and Blacks and less than ten Whites. The faculty population is equally diverse and consists of Latinos, Filipinos, Asians, and Whites. The principal at St. Mary's explains that the school has a long established tradition of expansion and growth as evidenced by the addition of three buildings, sixteen classrooms, a kindergarten, a preschool, a computer lab, and a multi-media center.

St. Mary's was founded in 1928 and currently serves students from preschool through the eighth grade. A distinguishing characteristic about the school is its development of three academy programs that were first implemented in 2006, two of which actively and creatively implement and integrate educational technology as a means to improve student achievement. The Primary Learning Academy includes grades kindergarten, first, and second and highlights their Reading First curriculum with a strong focus on literacy and language skills. The Intermediate Preparatory Academy introduces students in grades three, four and five to fundamental technology skills and the ideology of digital citizenship. The school principal describes this academy as having a pedagogy

that focuses on the ethical use of technology and on becoming proficient in basic productivity applications including typing and word processing. The Junior High Information Technology and Preparatory Academy for grades six through eight places a greater emphasis on using technology across the curriculum as a tool to improve critical thinking. The curriculum of this academy is geared towards teaching students how to create, analyze, and decipher information and use that information to solve real world problems.

In terms of technological strengths, St. Mary's benefits from dynamic technology leadership and from trained technology personnel more than they do from significant financial resources. The principal at St. Mary's proclaims to have creatively integrated substantial technology into their school with limited funding and financial resources. Several specific technologies are being used at St. Mary's school that warrant observation and investigation. Each homeroom teacher at the school has been issued a laptop computer and multimedia projectors are available for use in the classrooms. The school has two computers labs, one that consists of fourteen desktop computers that is used exclusively for grades one through five and an additional computer lab that consists of thirty five desktop computers for grades six, seven, and eight. In addition, each of the three junior high classrooms are equipped with five desktop computers. A wireless, high speed internet connection is accessible throughout the school by teachers, staff, and students. Grading is managed and organized using an web-based grading program. This program also allows student and families to review lessons given each day and check the status of homework, tests, and other aspects of each teacher's lesson plans and

curriculum. The grading program also allows parents to have individualized access to their child's grades and progress. Another distinguishing factor about St. Mary's school is their philosophy on being proponents for free and open software. Rather than putting large amounts of money into software packages that require hefty licensing fees that eventually have to be renewed, St. Mary's implements software and programs that are free and open internet-based applications.

St. Peter's School

St. Peter's School is populated by a low to middle socio economic community in a low socio-economic region of Los Angeles. Census data from the 2008 report states that this minority school community of 186 students is approximately 60% Hispanic, 35% Filipino, 4% Asian and Black, and 1% White. St. Peter's school has undergone a great deal of change in its 57 year history. Although the school began with 220 students, it reached its enrollment peak in the mid 1960's with an unprecedented 1,150 students. Enrollment of that magnitude is rare in the history of Catholic elementary schools in the Los Angeles area. During the 1970's, the area experienced a considerable economic decline and the school reverted back to an enrollment number similar to the school's beginnings. Since then, the school has not seen an increase in enrollment and remains a lower socio-economic community.

In terms of technological strengths, St. Peter's benefits more from technology leadership than it does from trained technology personnel or abundant technology hardware and resources. Although St. Peter's has fewer specific technologies integrated

into the school, the principal states that the technology that they have is utilized quite efficiently. The school currently supplies each homeroom teacher with their own laptop computer. In addition, the school possesses two multimedia projectors that float between classrooms and teachers as needed. St. Peter's can access the internet via a wireless high speed connection that is accessible throughout the school's campus. A recently created school website now gives the community a more efficient means to communicate and share important information. Each homeroom teacher maintains a class page on the website to facilitate homework assignments, notes, projects, and correspondence between the teachers and their students and parents.

According to conversation with faculty members, a distinguishing factor for St. Peter's school is the new principal's dynamic leadership and highly qualified experience with computer based technology. Due to budgeting constraints and a difficult economy, St. Peter's school does not employ a specialty teacher for computer classes, nor do they employ an individual to maintain the computer systems or network. Instead, those responsibilities fall on the new principal. According to conversation with the principal, this individual feels well qualified for the task and sees it as an opportunity to differentiate St. Peter's as a technology rich school and increase enrollment. The principal is responsible for creating, launching, and maintaining the school's new website, has installed hardware throughout the school including the routers for the wireless high speed internet connections, and has built the schools computer network. An important aspect of the principal's leadership is his ability to network with local universities and computer companies. In particular, the principal has created a unique

partnership with the computer engineering and technology department at a local state university as well as with Apple in which 40 desktop PC and 25 Mac computers where recently donated to the school. The principal states that his greatest challenge in implementing and leading technology at St. Peter's has to do with software. He claims that getting hardware is the easy part and that there are plenty of opportunities for his low SES school to benefit from the donations and charity of business and communities to get efficient computers in his classrooms. Instead, the challenge lies in getting software packages, and more importantly, licensing for that software that does not expire or require annual renewal fees. In response to this challenge, the principal has creatively utilized a number of free applications for word processing, spreadsheets, multimedia presentations, and grade management, many of which are web-based applications.

Participants

A total of five educators serve as formal participants in this study. St. Anthony's and St. Mary's are each represented by two participants, the principal and the individual in charge of technology at the school. St. Peter's school is represented by the principal, as there is no specific technology personnel employed at the school. Instead, the principal at St. Peter's is in charge of the administration and leadership as well as technology maintenance and implementation. It should be noted that the technology personnel at St. Anthony's and St. Mary's have different job titles. The individual in charge of technology at St. Anthony's is referred to as the network administrator. The individual at St. Mary's is referred to as the technology coordinator. Although the titles are different,

the role of each position is the same at each site; to facilitate, maintain, coordinate, and implement technology at the school. All of the participants were made aware of the processes of this research study as written in a consent form. Students were not directly monitored or interviewed in this study.

The first participant of this study is the principal at St. Anthony's school, a Caucasian female in her fifties, Mrs. Land. Mrs. Land has 24 years teaching experience in elementary education, 11 of those in administration. She possesses a California professional clear teaching credential as well as a Master's degree in Education. Although she is a first year principal at St. Anthony's, she had been the vice principal there for the last eight years. Mrs. Land states that educational technology is important to the culture of St. Anthony's school and is proud of how their use of technology marks them as a distinguished Catholic elementary school in Los Angeles.

The second participant of this study is the network administrator at St. Anthony's, a Caucasian female in her sixties named Mrs. Borris. Mrs. Borris has 22 years experience working in elementary schools and teaching grades K-8 in computer class. As network administrator, Mrs. Borris not only teaches computer classes to the school but also assists with the computer systems and network maintenance, provides technology assistance to students and staff, and assists with the budget and technology plan created by the school.

The third participant in this study is the principal at St. Mary's school, a Caucasian female in her fifties, Mrs. Noble. Mrs. Noble is an experienced educator and administrator of 18 years. She is currently in her twelfth year as principal of St. Mary's and has taught both at the primary and junior high level of elementary education. Mrs.

Noble has a Master's degree and is very active in researching and investigating issues of educational technology as evidenced in her on-line technology blogs and affiliation with an on-line newsletter where she has shared many insights about educational technology.

The fourth participant in this study is the technology coordinator at St. Mary's, an African- American male in his forties, Mr. Robles. According to the principal, Mr. Robles is primarily in charge of facilitating the computer infrastructure, maintaining the network, supporting the faculty and staff, and implementing computer based technology at the school. Although he is not the school's official computer teacher for all grade levels, he does in fact teach an advanced computer class to the junior high as well as a fundamental computer class for any interested intermediate and junior high students during summer school. The junior high class is advanced in that the curriculum goes beyond basic computer skills such as typing and word processing and includes elements of creative media, video and sound, and web design. Mr. Robles has three years experience working in the field of education. His background includes experience as an information technology (IT) professional who was responsible for repairing, maintaining, and supporting computer hardware for a large corporation here in Los Angeles.

The fifth participant of this study is the principal at St. Peter's school, a Caucasian male in his thirties, Mr. Sherlock. Mr. Sherlock has been teaching for nine years and has been an administrator for two years. He holds a California professional clear teaching credential as well as an administrative credential. In addition, he has Master's degrees in both education and administration. He is currently in his first year as a principal at St. Peter's and states that he is eager to re-structure technology implementation at the school

in an effort to increase school enrollment and to change negative perceptions within the community about the school being poor and lacking resources. Table 2 summarizes the breakdown of the participants in this study.

Table 2. *Participant Summary*

Name	**Title / Position**	**Gender**	**Ethnicity**	**Age**	**Years Experience in Education**	**Years Experience as an Administrator**
Mrs. Borris	Computer Teacher	F	Caucasian	60's	22	0
Mrs. Land	Principal	F	Caucasian	50's	24	1
Mrs. Noble	Principal	F	Caucasian	50's	18	9
Mr. Robles	Technology Coordinator	M	African - American	40's	3	0
Mr. Sherlock	Principal	M	Caucasian	30's	9	1

Data Collection

The research questions in this study are answered through qualitative methods composed of observations, interviews, and a review of documents related to technology implementation. The methods used in this study are summarized in Table 3.

Table 3. *Methodology Summary*

Research Question	Methods
1. How do educational leaders provide leadership that supports the implementation of technology, the change associated with new technologies, and a culture that embraces technology?	• interviews with principals and technology personnel • observation of instruction in computer labs and technology rich classrooms • review of documents that pertain to technology implementation and leadership
2. How is computer based technology implemented in three Catholic schools in ways that foster a culture that promotes a supportive disposition towards educational technology?	• interviews with principals and technology personnel • observation of instruction in computer labs and technology rich classrooms • review of documents that pertain to technology implementation and leadership

Observation

Observation is a data collection method that is appropriate in this study because it directly shows how technology is specifically being used throughout the three schools. An observation tool and protocol was designed for this study and suggests examination of several areas and uses of technology at each school including primary, intermediate, and junior high computer labs, classroom lessons that utilize educational technology as a resource tool, technology committee meetings and a tour of the school. The observation protocol is included in Appendix B. Educational technology implementation and leadership within the three Catholic elementary schools is evaluated and assessed via observation of computer labs and computer use in classrooms and administrative offices by educators and principals. Davidson and Olson (2003) have provided a model of research on technology integration based on the observation of classroom technology instructors, interviews with school leaders, and analysis of focus groups with parents and

community members. Such qualitative techniques are capable of providing a wealth of data "that can provide a unique window into the development of technology implementation" (p. 267). Anderson and Dexter (2005) also provided a model for specifically investigating school technology leadership that also focuses on gaining insight about educational practices and opinions through observation and interviews. Using the National Educational Technology Standards for Administrators (NETS-A), which was developed by the International Society for Technology in Education (ISTE), observation and interviews allowed the researchers to identify leadership characteristics and decision making skills that were conducive to fostering a technological culture.

In addition, there are other specific observations made at each school site. At St. Anthony's, the utilization of three mobile laptop carts equipped with 18 computers is observed for efficiency of use and instruction. This includes observation of access and setup of the laptop cart, distribution of the laptops to students, the lesson plan and classroom use of the computers, collection of the machines from the students, and finally closure and storage of the machines. At St. Mary's, one day was spent with the technology coordinator to observe a typical day for scheduled maintenance of the network and computer hardware and providing various hardware and software support for faculty and staff. Observation of the support process illuminates the degree to which staff members are proficient in the use of educational technology as well as how well they are prepared for the use of technology in education. At St. Peter's school, time was spent with the principal, who also has the responsibility of maintaining the school's

computer network, on a typical day designated to address technology issues at the school while also balancing the day's administrative tasks.

Data collection for this study occurred over the course of nine weeks. This time frame included three weeks of observation, followed by three weeks of interviews, followed by three weeks of document reviews. The timeframe for the data collection is outlined in Table 4.

Table 4. *Data Collection Timeframe*

Data Collection	Site	Week
Observation	St. Anthony	week 1
Observation	St. Mary	week 2
Observation	St. Peter	week 3
Interviews	St. Anthony	week 4
Interviews	St. Mary	week 5
Interviews	St. Peter	week 6
document review	St. Anthony	week 7
document review	St. Mary	week 8
document review	St. Peter	week 9

Interviews

The school principal and the technology personnel are interviewed at each of the three schools for a total of three interviews. Specifically, open-ended interviews are used to illicit information from the participants. Silverman (2006) defined open ended interviews as interviews that maintain flexibility and rapport with the interviews by listening actively (p. 110). Open interviews are used so that interviewees are given more

opportunity to speak freely and perhaps more candidly and honestly. Interviews are an important and justified means of collecting data in this study because candid and honest answers illuminate leadership dispositions and philosophies on promoting, cultivating, and encouraging a technological culture. In addition, interviews give insight into teacher attitudes towards the utilization of technology.

The structure of each interview is to question the two individuals at each site together in the same meeting. The same questions are asked of all five participants and are designed to draw out thoughtful and meaningful answers that can reveal how each school knows that what they are doing is either successful or in need of growth when it comes to computer based technology implementation. The questions intend to extract information and responses that are "on target, that elicit depth, detail, vividness, nuance, and richness by creating three kinds of questions: main, follow-up, and probes" (Rubin & Rubin, 2005). A mixture of main, follow-up, and probing questions ensures that the responses give insight into the reasons why initiatives are adopted and why specific decisions are made.

The interview questions that are asked of each of the participants are included in Appendix A. The questions were specifically designed to gain insight on possible answers to the two research questions for this study. There same interview questions are asked of all five participants. The Observation Protocol is included in Appendix B. The Document Review Protocol is shown in appendix C. A written consent form is included in Appendix D. Complete transcriptions of the interviews from this study can be found in Appendices E, F, and G.

Document Reviews

Another appropriate means of collecting data for this study is the review of documents that pertain to educational technology. A document review protocol was designed for this study and suggests reviewing the following records at each school: WCEA / WASC Document, technology plans, technology budgets, professional development descriptions, technology job descriptions, and technology committee meeting minutes. A review of such documents illuminates the goals, plans, actions, and assessments that each school puts into practice in order to implement educational technology.

The Western Association of Schools and Colleges / Western Catholic Educational Association (WASC / WCEA) accreditation narrative is a key document to be reviewed at each school site. The WASC / WCEA document describes in great detail the philosophy, culture, and educational process unique to each school. This narrative often includes an explanation of a school's technology implementation process as it pertains to strengths and areas for improvement, goals, and a technology action plan. The WASC document also includes teacher, parent, and student surveys that illuminate explicit wants, needs, and dispositions towards the current state of educational technology at each school site.

Separate from the WASC document is each school's five to ten year technology plan. A technology committee is typically made up of teachers and staff members that have created a technology plan to account for specific technology hardware, software,

and training needs of the school. Included in this plan are specific steps and strategies for rolling out computer based technologies unique to each school.

An investigation of the implementation of technology in education includes a review of budgets and financial resources that support the technology programs in schools. Technology budgets and expenditure spread sheets can reveal efficiency in spending, distribution of technology access within the school, and honest accounts of which technologies are used or perhaps underutilized. Furthermore, evaluation of these funds reveals how certain technological implementations are developed and why specific leadership styles are embraced or avoided.

Other documents reviewed are verifications of specific technology professional development opportunities given to faculty and staff. An accurate evaluation of technology integration at the school must consider proper training in the use and application of computer based technology. The decisions for specific professional development and training choices are directly related to the proficiency and effectiveness of educational technology integration at the school.

Other useful documents include detailed job descriptions for the various technology positions held at each school. In addition to a computer teacher, there is a need to employ an individual to monitor and maintain technology systems. In addition, it is imperative that teachers and staff have proper technical support and assistance for the use of technology in both teacher management and instruction.

Finally, this study investigates a review of records and minutes from technology committee meetings at each school site. The technology committee is largely responsible

for determining and assessing the what, how, and why of technology implementation by interpreting the needs of each school community and advising the administration accordingly. It is just as important to inquire the decisions being made by these technology committees as it is to inquire about what informs and influences those decisions.

Data Analysis

Data collected in this study from observations, interviews, and document reviews was compared in an attempt to find data relevant to the questions posed in this study. Interview transcription data was coded to look for pertinent themes regarding issues of educational technology leadership, implementation, and the digital divide. The site observations and document reviews were used to identify pertinent themes as well as to corroborate the findings from the interviews. The next chapter presents these themes and the results and findings of the data.

CHAPTER IV

RESULTS AND MAIN FINDINGS

Introduction

This qualitative research study investigated two main aspects of educational technology at three Catholic elementary schools. First, this investigation was designed to study aspects of leadership that support educational technology. Second, this investigation was designed to study the implementation of computer based educational technology in ways that support a technological culture. The interviews, document reviews, and site observations all contributed to the findings of both research questions. The data, results, and findings discussed in this chapter articulate the evidence that the research methods identified in answering the two research questions proposed in this study:

1. How do educational leaders provide leadership that supports the implementation of technology, the change associated with new technologies, and a culture that embraces technology?
2. How is computer based technology implemented in three Catholic schools in ways that foster a culture that promotes a supportive disposition towards educational technology?

Research Question 1: Educational Technology Leadership

The answer to the first research question, "How do educational leaders provide leadership that supports the implementation of technology, the change associated with new technologies, and a culture that embraces technology?" is discussed here by presenting data that is organized around the various themes that were found in the research methodologies. A summary of the consistent themes that arose from the interviews, document reviews, and site observations as related to research question one is presented in Table 5. The answer to the first research question includes a discussion about the digital divide as it relates to the data collected regarding educational technology leadership.

Data that answers the first research question are organized into the following five themes. *The Relationship between Implementation, Culture, and Change* discusses the notion that these three concepts are interconnected and closely related to one another. *Qualities of Effective Technology Leaders* are presented and discussed as they relate to ways in which leaders can support educational technology. *Professional Development* is explored as an imperative aspect of preparing stakeholders for their role in adapting to change and establishing a technological culture. *Recognizing the Role of Technology* is a necessary aspect in ensuring continuity with the use of technology and in using and allocating technology resources appropriately. Finally, *the Digital Divide and Educational Technology Leadership* discusses the social justice responsibilities of educational leaders in making decisions that lead to a greater digital equity among the students in our schools.

Table 5. *Summary of Themes that Answer Research Question 1: Educational Technology Leadership*

	Educational Technology Leadership			
	Theme	**Interviews**	**Document Review**	**Site Observation**
Leadership that supports the: Implementation of Technology, the Change Associated with New Technology, and a Culture that Embraces Technology	**The Relationship and Between Implementation, Change, and Culture** • interconnected and closely related	x	x	x
	Qualities of Effective Technology Leaders • ability to model the use of technology skills and lead by example • providing appropriate support to staff • positivity towards technology	x		x
	Professional Development • providing PD opportunities • sharing a vision • types of educational technology professional development	x	x	
	Recognizing the Role of Technology • generational differences in using technology • providing appropriate technology resources	x	x	
	The Digital Divide and Educational Technology Leadership • digital equity and open source software • providing access to software as well as hardware • administrative decision making	x	x	x

The Relationship between Implementation, Change, and Culture

The process of implementing educational technology, adapting to change, and fostering a technological culture are all very closely related and interconnected. Data that applies to an aspect of the implementation of educational technology often also applies to fostering a technological culture, adapting to change, and so on. This notion is discussed in greater detail after a complete presentation of data is articulated here in Chapter 4. However, the following dialogue supports this notion and illuminates how it can present unique challenges for educational leaders. According to Ms. Noble and Mr. Robles from St. Mary's School, one of these challenges has to do with the significant time it can take to establish collaboration and partnership required to foster a technological culture while taking into consideration the expeditious pace of technological change. Ms. Noble comments on her responsibility as a principal to "stay on top of change" so that she can educate the teachers and provide leadership that informs and guides them towards educational technologies that are most appropriate for the infrastructure of the school. In addition, the dialogue comes full circle from the discussion of fostering a technological culture and embracing change back to the implementation of educational technology. Ms. Noble stipulates her philosophy that the implementation of educational technology has to be founded on the concrete educational value that technology can provide directly to the students in the classroom:

> **Interviewer:** How would you describe, you alluded to this a little bit, but on number six here, how would you describe the technology culture here? Is it positive? Is it a work in progress? Is it challenging to continue to support this?
> **Ms. Noble:** Is there an "All of the above?"

Mr. Robles: My gosh, it's challenging. And it's challenging in that it's new to everyone. I mean it's not like they did this five years, ten years ago. The technology is new to everybody and it changes everyday. Everyday we're always coming across new websites, new hardware. Think of the iPod. Five years ago there wasn't an iPod. Three years ago there was the iPod1. Now there's the iPod7 or something? It's always changing and you have to stay on top of that change.
Ms. Noble: That's kind of where Mr. Robles and I come around. Is that we stay on top of the change to help educate the teachers. We are always bringing things to each other's attention. One of the things that we're looking at right now, this is kind of our new cutting edge thing, is that we're having a challenge in providing funding for our music teacher. And so we're looking at WiiMusic. Which is the new—
Interviewer: Yes, I've seen that.
Ms. Noble: Well and they also, it was created in conjunction with the National Music Teachers. They are touting it now as having a real value in the classroom. So Jan and I—
Mr. Robles: Evaluating it over this last week or two.
Interviewer: The kids would love that, that's for sure!
Ms. Noble: Oh, I'm sure they would! But before we put it out to the kids we have to make sure that there's an educational value to it. And not just an entertainment value.

Ms. Noble also concurs that leadership must support the implementation of technology, the change associated with new technologies, and a culture that embraces technology. The following interview transcriptions explain her philosophy and approach to educational technology leadership, which includes a three step process that coincides with these three aspects of educational technology represented in the first research question. In order to provide leadership that supports the implementation of educational technology, she establishes a means to find and provide opportunities that allow the teachers and staff to integrate technology into their classrooms and workspaces. In order to acclimate to the change associated with new technology, she immersed herself in the process of investigating and understanding educational technology. In order to support a culture that embraces technology she joined and consistently participates with a

professional educational technology organization called the International Society for Technology in Education Institute (ISTE).

According to Ms. Noble, leadership that supports the implementation of educational technology provides opportunities that allow the teachers and staff to integrate technology into their classrooms and workspaces. She cautions that when providing such opportunity it is important not to place too heavy a load of responsibility on the teacher at the expense of the technology being implemented. In this sense, daily lessons are enhanced by the technology rather than replaced by the technology:

> **Ms. Noble:** As an administrator, you cannot add technology on top of what you already do. You have to replace something that you're doing with technology. And so I looked for, and you'll read about this in my blog, I look for every opportunity I can to remove things from the teacher's plate in order for them to embrace the learning curve that they need in order to integrate technology into their classroom.
> **Interviewer:** That's really good.
> **Ms. Noble:** Because what happens too often is they try to do a technology project on top of what they are already teaching.
> **Interviewer:** Instead of making it one and the same?
> **Ms. Noble:** Instead of saying, "Okay, which of these things can I pull back on the traditional way and integrate technology?" You can't just keep stacking them.

In order to acclimate to the change associated with new technology, Ms. Noble immersed herself into the process of investigating and understanding educational technology. This allowed her to build her own personal learning network and prepared her to provide the type of leadership that would support such change:

> **Interviewer:** So you're someone who's a big proponent of technology. What would you say as a principal you're very cognizant of in terms of being the kind of leader that makes educational technology successful at your school?
> **Ms. Noble:** The very first thing I did was immerse myself. I began to write blogs and read blogs so I built my own personal learning network.

Ms. Noble's states that, "You have to be exposed to the ideas before you can make any kind of change." She credits her participation with ISTE with providing some of the knowledge, means, and resources to be able to lead such change:

> **Interviewer:** That's just so great that you were cognizant of this kind of three step plan to in fact initiate technology leadership.
> **Ms. Noble:** Well I do credit ITSE a lot for their support and participating in the ISTE Institute where we have three days to at least talk to a small group of people about you know, what are the technology standards? Why are they important? And we follow that up by attending the National Education Computing Conference. Now I was a little more informed because I had already begun blogging and I had already begun to build a personal learning network with international educators. But you have to start somewhere. You have to be exposed to the ideas before you can make any kind of change.

Site observations of the school enforce the notion that the relationship between implementation, change, and culture are interconnected and closely related. This is largely seen in the way in which they promote their school as a technology learning academy and in the way in which the use of technology is consistent throughout each grade level. Photo stories, pen-pal e-mails, and copies of student created e-books highlighting student works are displayed throughout the campus.

In addition, the staff uses technology to reinforce the idea that technology integration is an interconnected process in the way in which minutes are recorded during meetings. Teachers take turns writing down minutes which are then posted on an on-line blog. The result is that faculty can go back to the blog and continue to have conversations about issues, concerns, and ideas that are explored at the meetings. An example of one blog discusses a meeting in which an outside educator visited the staff to demonstrate a Title 1 funded on-line reading program aimed at helping the students improve phonics, vocabulary and reading comprehension. The discussion of the demonstration was cut

short to allow for the remaining items on the agenda, but several staff members took advantage of posting further comments on the blog to assess whether or not they wanted to take advantage of the program.

Qualities of Effective Technology Leaders

According to interviewees, one of the more significant qualities that an effective technology leader can demonstrate is their ability to model the use of technology skills to others and lead by example. The following dialogue from Ms. Noble, principal of St. Mary's School, reveals her disposition about the importance of being a role model for technology leadership:

> **Ms. Noble:** Well, number one, you have to lead by example. You have to be willing to embrace the learning curve and take on new technologies. If you're not willing to how can you expect your teachers to be willing to? You have to be willing to be in the trenches because, well, let me just give you an example of what I mean by that. Because I'm willing to learn technology, and because I participate in professional development around technology that sometimes my teachers don't have the time to do, because they're so busy with their day-to-day operation, then I can go into the classroom and they can say, "I want to do this, I want to blog or I want to use voice thread." And then I can go and teach the lesson and say, "Sit back with your kids, learn how to do this along with your kids. I'll teach the initial lesson and then you can do it after that."

Ms. Noble defines the ability to model the use of technology skills in two significant ways. The first is that educational leaders must be "willing to embrace the learning curve and take on new technologies." This comment suggests that leadership styles, practices, and principles that support and propagate educational technology in education are not strictly measured by a leader's specific technological talents, proficiency, or knowledge. This can instead be measured by that leader's motivation, willingness, and capacity to embrace technology. The second way in which Ms. Noble defines the ability to model

technology skills is in a leader's ability to provide faculty and staff with the means and opportunity to learn and experience educational technology. Aside from allowing these skills to be taught through professional development, faculty and staff also require "playtime" to experiment and truly have possession of their newly acquired educational technology skills.

Ms. Noble further elaborated on the notion of "playtime" and explained that a leader's responsibility does not only entail allocating and distributing the technological resource. She states that leaders must also provide the necessary time needed to experiment with that resource and learn how to make that tool an effective part of an educator's repertoire:

> **Interviewer:** Okay, that is exactly what I wanted to ask you. My first question under leadership is, and I'll preface this by saying that my vision of writing this paper, I was going to say that the type of leader that is going to really be successful implementing and leading technology is going to be the one that does "this." And so that's a really great example. But are there other specific leadership practices? Like that you can think of in terms of your repertoire, your toolbox of being a leader? Little quirks that would be supportive of technology? That would be another example of what you just shared? Certain things that you do to help the teachers embrace technology?
> **Ms. Noble:** Well, I shared the one in the beginning. About being willing to go in and model in the classroom. Absolutely essential. I provide playground time. We have our curriculum meeting every week and at least once a month I provide, I might introduce a technology tool, but then I provide a time for them to use that tool, to look for ways to use it in their lesson, to try it out, to explore things.
> **Interviewer:** That's good that you're not expecting them to do it on their own.
> **Ms. Noble:** Because many of them are not—I mean let's face it, I need to get a life! I'm a geek! – They're not going to go home and spend time on their computers.

On a visit to the school, I observed Ms. Noble provide coverage for a teacher that wanted to go to the computer lab to learn how to utilize a web-based reading program for her class. Ms. Noble interrupted our visit so that she could substitute teach and provide

this faculty member with about 30 minutes to learn the program from another teacher who was working in the lab.

The above assertion that an effective technology leader must be able to provide appropriate support to faculty and staff in their understanding and use of educational technology is further acknowledged in the interview with Mr. Sherlock. He also concurs that it is often more important and empowering for a leader to provide such support than it is for them to have advanced technology skills and knowledge:

> **Mr. Sherlock:** To be honest with you, I don't think that the leader has to have the working knowledge of all the technology. It's really good if they do, but the leader has to be able to give that freedom to the teachers. And give the support to the teachers to try new things. To experiment with different ideas of technologies. If the leader is close minded about what is to be used then I don't think the teacher will have an opportunity to pick what works best in that classroom. For example, smart boards. I worked with smart boards at my old school. They were highly effective for my third grade class. But there were teachers where they just weren't comfortable using that --- but using a document camera was like winning the lottery! Because they were able to put a picture book underneath there and be able to do their kindergarten work. They were able to put a paper under there and fold it for the students to understand how to fold paper or cut along a line. And so giving the teachers the opportunity to experiment and see what they need and not being so strict about what is to be used. There are certain things like Grade Link or things that need to be used across the school. But as far as in each classroom, it depends on the teacher and giving the teacher that freedom. The leader needs to support the teacher.

The idea of a leader's responsibility to provide appropriate staff support for educational technology is also something that was immediately and predominantly present in the interview with Mrs. Land. Mrs. Land's philosophy on leadership qualities for educational technology is to

"support the teachers in their individual endeavors to incorporate technology into the curriculum."

Educational leaders can establish a culture that embraces technology by promoting a sense of positivity and empowerment regarding technology with faculty and staff. The following example highlights the experience of a seventy year old teacher who at first struggled with the change and transformation associated with educational technology to an individual and then became very supportive and a strong proponent of the use of educational technology. This was accomplished in no small part because of the leader's capacity to provide a clear vision as well as the positive means for that vision to be shared by the staff:

> **Interviewer:** How easy is it for teachers to feel really positive about all the technology that's being –how easy is it for teachers to feel positive about it at school?
> **Ms. Noble:** Well, first thing that comes to mind is [a teacher of here at St. Mary's]. You know a digital immigrant three years ago. Four years ago? Knew absolutely nothing about it, now she can't live without it!
> **Mr. Robles:** She's seventy years old!
> **Ms. Noble:** Our oldest teacher here. And she was kicking and screaming at the beginning, but now she knows—because what it does, once you get a good handle on it—it makes your job easier. It eliminates a lot of your old paperwork. You know, your grading, the posting of a grade. All of that becomes a lot easier once the technology is in place.
> **Mr. Robles:** I'm going to teach the teachers today how to use Google forms to create a self-grading quiz.
> **Ms. Noble:** And once they see it, they're going to be like, "Whoa!"
> **Interviewer:** That's so cool!
> **Ms. Noble:** Especially for the what we call dip stick assessment. We moved to using curriculum mapping and understanding by design for IN because it really lends itself to the idea of moving away from being textbook dependent and also to technology integration. Because it's that kind of backwards design notion where you identify your standards and then you think about it. And we've also moved into performance-based assessment. All of this, I consider that to be part of our technology piece.
> **Mr. Robles:** Yeah, it is. It very much is.
> **Ms. Noble:** People miss that. They think that using technology is drill and kill or purchase software that the kids are sitting and using and that is not what our school is about!

Professional Development

In the same way that Ms. Noble described her philosophy that she has an obligation to get into the classroom to provide the teacher with appropriate support, Mr. Sherlock also asserts that providing opportunities for professional development is a crucial component in leading educational technology:

> **Mr. Sherlock:** I think they need support. Giving that teacher that needs a little bit more help the opportunity for, let's say, professional development. Giving them a sub for the day or having myself go in. This is what I do, I had my sixth grade, or my seventh grade teacher, who may not be great with technology. Two periods I went in and covered for him. He went into the eighth grade class, she's great with technology, and he watched her. So giving, in a small school like mine, time for these teachers to go observe other teachers using technology and seeing this is how I can use it. This is what they mean by using the projector with the computer and pulling things online and seeing how easy it is. Because unless they know how they can use it, they won't want to. Because you tell them, "We'll get you a smart board, we'll get you a projector."

In addition to providing support, the interview with the principal and computer teacher at St. Anthony's School suggests that faculty and staff also require a variety of types of professional development in the form of purposeful and structured guidance and instruction on how to use technology as a resource:

> **Mrs. Land:** I don't think that the teachers know all that is out there to lead them further. How are we going to use it? How are you going to tie it in to this lesson? Say like you're teaching Social Studies. What's out there to tie in this lesson? To enhance this lesson? To get projects going? So, in other words, it stops at just the technical part of it. And looking stuff up on the internet. It seems to have halted [things]. In other words, we really need to see what other schools are doing as far as collaboration, and the teachers with [our computer teacher]and with one another. To see how they can expand and go over that and get beyond just looking up stuff on the internet to write a paper. What's out there? How are other schools going to really broaden their scope of using the technology that's there?

Ms. Noble points out that a leader's approach to supporting professional development on educational technology is often dependent on how much that leader is willing to develop their own growth and advancement of technological skills.

> **Ms. Noble:** I am always involved in, constantly involved in, professional development for my own technology learning. I attend as many conferences as I can. I take advantage of online opportunities like webinars and archive technology talks.

Ms. Noble also suggests the importance of seeking unique professional development opportunities for the faculty and staff that have a direct benefit for the students. Here she describes an opportunity that allowed the faculty and staff to learn about how to implement a specific software application from a qualified and specialized expert:

> **Ms. Noble:** I have seminars here at our school for our teachers where I Skype in presenters from around the world. Our students were taught how to do Photostory by David Jenks who is a district level technology person in the public schools in Chicago. Skyped in and taught our students and the students in Canada together at the same time on the same day, and it cost me zero dollars.
> **Interviewer:** That's awesome!
> **Ms. Noble:** We set up our projector. Our LCD projector and projected it up on the walls or on our whiteboards.

Recognizing the Role of Technology

When looking at one's use of technology through a generational lens, Ms. Noble comments on the distinction between teachers that did not grow up with technology and those who have. These two groups may have a different outlook on the significance of seeing technology as a resource and a tool and understanding the role of technology in education. The following transcription references the article *Digital Natives, Digital Immigrants*, which uses the terms in its title to define "students today that are native

speakers of the digital language" and "those of us who were not born into the digital world but have, at some later point in our lives, become fascinated by and adopted many or most aspects of the new technology" (Prensky, 2001, p.1). Ms. Noble observes the potential for disparity in education when the students in our classrooms who have grown up with technology are being taught by teachers that have had to learn technology as adults. The caveat offered by Ms. Noble is that although a digital native has a unique understanding and schema of the use of technology, they still need to learn the value of technology as an educational resource and as a tool in a professional educational setting:

> **Ms. Noble:** They're not—there are problems with the digital immigrant, digital native metaphor, but –are you familiar with that metaphor?
> **Interviewer:** I'm not so sure.
> **Ms. Noble:** okay. There's a very famous article, I think it was written by Marc Prensky. It was called *"Digital Natives, Digital Immigrants."* And it's been in the blogging world, it's become an over-used metaphor. And it does break down, like all metaphors, at some point. But the main point is that, the concept is that our students have never grown up in a time when they didn't have the internet. Most of our teachers are digital immigrants. And so they approach technology completely differently—
> **Interviewer:** They just don't have that schema.
> **Ms. Noble:** They don't have that schema. And I find, that even with my young teachers, they may use technology, but they've never been taught that technology is a learning tool.
> **Interviewer:** And not the be all end all!
> **Ms. Noble:** Well it's not that. It's like they might use Facebook or MySpace, or they might use IM as a social thing, but they don't understand technology in a professional educational environment.
> **Interviewer:** That's a really interesting comment because I'm well aware of that metaphor in a different context. It comes up a lot in research. But what the research tends to point to is this concept of the teacher not having the schema of technology is dwindling away. And perhaps even in 10 years isn't even going to be a factor for the new teacher coming into the work place. But what an observant comment that the new teacher coming into the workplace may have grown up with technology, but they may not necessarily know of it as a learning and instructional tool and a resource. Versus this social thing.

> **Ms. Noble:** Although hopefully in ten years the teacher educational programs will have morphed enough that they will understand the power of the tool. We're in kind of a funny in between time.

In considering the above assertion that technology is an educational resource that must be used appropriately as such, Ms. Noble points out that educational leaders must be aware of the existing challenges and difficulty level of integrating certain technological tools into the curriculum faced by the teachers. She suggests that leaders must be able to provide appropriate support, which can be accomplished by having reasonable expectations of the amount of technology being implemented by the faculty, the time needed to understand and master that technology, and ensuring that the technological tools offered by the administration have correlation and connectivity to the mission, vision, and technology plan of the school.

> **Ms. Noble:** Yes, you weren't –you asked about specific strategies and specific things that I do. I think the other thing and this is a mix between a specific strategy and a leadership style, but technology is not—we do not do technology for technology's sake. Technology is a tool and it is integrated within the curriculum. It is not taught on it's own. The whole purpose of using technology is to enhance the learning and the education of the students. Not to teach them how to use Excel or Word or go to a computer lab and do a cute little project. Along with that, the other thing that I am very cognizant of is it's not—even though I explore the newest gadget—it's not imperative that my teachers jump on the bandwagon with every new gadget. I'm very concerned to choose tools that I introduce them to based on the learning curve. It has to have a short learning curve, and if it works for what we do, I'm not going to jump to the new latest tool and say, "Oh well, why don't you try this one now." For example we use Google and iGoogle. Every faculty member has an iGoogle page. I chose that because they could learn one application and it could bring in a lot of the technology that I want them to use. They can have RSS feeds on their Google page. We use the Google calendar for our master calendar for school. For calendaring facilities and it's all on one page.
> **Interviewer:** That's a great idea!

Ms. Noble: So we use Google Notebook to take notes. And so I'm very cognizant of that. You want to package something for the teachers that they are going to be able to deal with.

The Digital Divide and Educational Technology Leadership

The educational leaders at the three Catholic elementary schools in this study have experienced several challenges having to do with the digital divide. The first challenge discussed here is presented by Ms. Noble who comments on digital equity and the responsibility for leaders to make decisions that allow students to develop fundamental technology skills. She notes that today's school leaders must be accountable in providing children with a fundamental skill set that surpasses that of reading, writing, and arithmetic and teaches students "digital literacy, global collaboration, digital citizenship, and effective communication in the digital age—not just written communication:

Interviewer: Let's talk about the digital divide a little bit. You had hinted at some of the things—you had hinted at, your notion of the way it looked in your school was keeping things compatible and consistent with each other. Tell me about what you feel are some equity issues in your knowledge of technology here at school? What are some of those issues about? Is it more within your own school community? Is it more what you see between other Catholic schools or beyond that?
Ms. Noble: Well, part of it you'll read about in our self-study. One of the things when we finish here, if we could put on a thumb drive our self-study for him?
Mr. Robles: Okay.
Ms. Noble: We talk pretty strongly about digital equity. And first of all, let me talk about the big picture. 63% of my kids are on free and reduced price lunch. If I don't take the initiative to provide a technology enriched curriculum that teaches digital literacy, global collaboration, digital citizenship, effective communication in the digital age—not just written communication—my students will be at an economic disadvantage. And I want to make sure that they're not at an economic disadvantage for their future. So I feel pretty strongly about what I call digital equity. That we have a moral and ethical obligation. And Mr. Robles, you feel pretty strongly about this too.

Mr. Robles: Yes.
Interviewer: You're talking about fair opportunities after school and beyond.

The WASC document at St. Mary's school includes four "critical issues" identified by the school as areas in which they see the greatest need for improvement. The first critical issue of the four is titled "Ubiquitous Access to Technology: 1:1 Computer Initiative for K-8." The rationale for this improvement is articulated in the document as follows:

> "Digital equity*: Based on our school community profile (with 63% of our students on free or reduced price lunch) we have wish to ensure all of our students will have access to the information, knowledge, skills and tools that will secure a level playing field for them in the future and afford them access to economic opportunities. We are seeking equal opportunities for all of our students regardless of socio-economic status."

Furthermore, the document defines this critical issue as being composed of the following three factors:

- To ensure digital equity
- To provide a vehicle for developing information fluency, digital citizenship, global connections and support creativity and innovation encouraging critical thinking , knowledge application , and effective communication and content creation
- To build student capacity for creativity and innovation- To support critical thinking, the ability to apply academic knowledge to real life situations, creative problem solving, and the ability to create content and unique applications

St. Mary's School clearly articulates their assertion that digital equity is paramount to the vision and mission of the school. Digital literacy and the ability to use information intelligently are fundamental like skills that are firmly embraced and taught at each grade level.

One of the more common concerns that surfaced at the inception of the digital divide was the notion of equitable access to computers (NTIA, 1995). According to Ms. Nobel and Mr. Robles, a leader's ability to provide a fundamental technology skill set is contingent not only on the physical hardware and actual computers available to the school and its students, but the software and the licensing required to be able to utilize relevant computer programs and applications. Ms. Noble suggests that educational leaders must work towards establishing a level playing field so that all students have an equal opportunity to learn the same relevant technology skills that are needed in the world in which we live. Her answer and approach to this dilemma is to utilize open source software as appropriately and as often as she can. Open source software is defined as any program that is freely accessible and openly distributed to the public. Ms. Noble brings up the creation of text based documents and the need for students to develop word processing skills as an example. Microsoft Office and its Word, PowerPoint, and Excel applications are among the world's most commonly found programs for editing and creating text based documents. She points out that there are several open source word processing programs such as Open Office that are capable of teaching students these same necessary skills:

> **Ms. Noble:** And the other thing, well, I'll get to this in the digital equity digital divide issue but I think that we need to use more internet based resources and more open source resources. And one of the reasons, besides digital equity which we can talk about, is also it ensures that everybody is on a level playing field. If I've got Office 2007 at home and Office 2003 at school, I use a Mac and you use a PC, you know all of those things can mitigate against the immigration of technology because people get frustrated. You have to do what you can to undercut the frustration level by providing common platforms.
> **Interviewer:** I'm so glad to hear you say that because so often, and we will get to that digital divide, but too often that is just so generic and bland into like a race

issue or a gender issue. And more to the point with the digital divide, it's far more complicated
Ms. Noble: Right. I think one of the biggest changes we made was Microsoft Office for instance.
Interviewer: What was that change?
Ms. Noble: We instituted Open Office as opposed to Microsoft Office. And one of the reasons was Microsoft Office has a big expense dollar to it. Because we're 63% lower income families, they couldn't afford this. So now when they get home they don't have it. So across the board we went to Open Office. And Open Office is free.

Another important point made by Ms. Noble and Mr. Robles is that educational leaders must consider the cost of the software application which also includes licensing fees and the ability to install that program on multiple computers at the school. It is the high cost of licensing fees that forces Ms. Noble to make use open source software applications. However, for her this is an effective decision because it frees up funds to be allocated to other areas of educational technology:

Interviewer: So forgive me, I don't mean to sound ignorant, so it's not so much about your school being able to pull the resources to install it, it's about what the kids have access to when they leave?
Ms. Noble: It's about both. The licensing is extremely expensive.
Mr. Robles: And for the school to stand for it also was a problem.
Ms. Noble: Why should I pour money into licensing that I can pour into providing technology resources for those kids? Licensing money is basically money that you're throwing away!
Mr. Robles: We had enough site licenses probably to put it on most of the school computers. Not all of them.
Ms. Noble: Not any more. That has to be renewed. That's why I—the renewal was going to kill us. But it's also for the kids. It's also because a lot of the world does use open source software. The United States has bought into Microsoft's culture, but if you do your research you'll find that there are a lot of big, multinational corporations who are moving more towards open source. So I think that the kids need to have the flexibility to work in more than one platform. They can't just be Microsoft centric.
Interviewer: No kidding.
Ms. Noble: I'm passionate for Catholic schools about open source because I think it's a social justice issue. There is almost, I have a book this thick, there is almost

every single application that you could buy, there is an open source equivalent for it.
Interviewer: Really?
Ms. Noble: For Photoshop, Open Source Photoshop. I can't think of an application that doesn't have an Open Source. So that should not be a barrier for Catholic schools to move into technology that, "I can't afford to buy the software."
Interviewer: I have been reading on this for two years and I have not once come up with that plan. It's such a powerful point. Everything about the equity and the social justice issue is always about race or it's about gender. It's much more global and what does it really look like for us?

Summary for Research Question 1

The first research question inquires about leadership that supports the implementation of technology, the change associated with new technologies, and a culture that embraces technology. The three notions of implementation, change, and culture are very closely related and interconnected to the point where it is difficult to separate them into three distinct principles. Therefore, the data that answers the question applies to all three: educational technology implementation, change associated with that technology, and a technological culture.

Only one of the leaders studied in this investigation revealed a significant amount of data pertaining to the first research question. Mrs. Noble, an educator with nine years of experience as a principal, revealed substantial data, particularly in the interviews. The other two principals in this study, each in their first year in the position, did not provide significant data regarding leadership that supports the implementation, change, and culture associated with educational technology.

Educational technology leadership is very much contingent on the qualities of effective leaders, specifically with a leader's ability to inspire enthusiasm, provide support, and lead by example. A leader's ability to provide appropriate professional development for the use of educational technology is an imperative part of the implementation process. A leader must have a keen and practical understanding of their employees' capacity to value and use technology so that resources can be appropriately provided and effectively utilized. Finally, educational technology leaders must take into consideration the justice and equity issues of the digital divide when making decisions about the implementation of technology in education.

Research Question 2: Implementation of Educational Technology

The answer to the second research question, "How are computer based technology initiatives implemented in three Catholic schools in ways that foster a culture that promotes a supportive disposition towards educational technology?" is discussed here by presenting data that is organized around the various themes that were found in the research methodologies. A summary of the themes that arose from the interviews, document reviews, and site observations as related to research question two is presented in Table 6. The answer to the second research question also includes a discussion about the digital divide as it relates to the data collected regarding the implementation of educational technology.

Data that answers the second research question is organized into the following five themes. *Vision, Mission, and Planning* discusses the need for a shared vision and

plan as well as a defined decision making process regarding the implementation of educational technology. *Assessing Obstacles of Educational Technology Implementation* highlights the challenges faced by the three schools in this study in the educational technology implementation process. *Fostering a Technological Culture and Embracing Change* discusses the significance of using educational technology to enhance pedagogy and curriculum rather than replace it. *Managing and Maintaining the Implementation of Technology* presents data regarding the monitoring and upkeep of educational technology. Finally, *The Digital Divide and the Implementation of Educational Technology* presents issues of access to computer hardware and software and disparities between the haves and have-nots of the three schools investigated in this study.

Table 6. *Summary of Themes that Answer Research Question 2:Implementation of Educational Technology*

Implementing Computer Based Technology in Ways the Foster a Culture that Promotes a Supportive Disposition Towards Educational Technology:	The Implementation of Educational Technology			
	Theme	**Interviews**	**Document Review**	**Site Observation**
	Vision, Mission, and Planning • forming and following a Technology Plan • WCEA / WASC Documentation • the technology decision making process	x	x	
	Assessing Obstacles of Educational Technology Implementation • St. Anthony's • St. Mary's • St. Peter's	x	x	x
	Fostering a Technological Culture • adapting to change • collaborating with faculty and staff • focus on the pedagogy • using technology to enhance curriculum rather than replace it	x	x	x
	Managing and Maintaining the Implementation of Technology • maintenance of computer systems • significance of the role of systems maintenance	x	x	
	The Digital Divide and the Implementation of Educational Technology • high speed internet access • access to computers at home • haves and have nots	x	x	x

Vision, Mission, and Planning

In discussing the implementation of educational technology, the primary and most consistent theme that comes from the data collection is the notion of a Technology Plan that can be used to develop a leader's vision, the community's mission statement, and a detailed action plan for how to integrate educational technology into the culture of the school. In Catholic education one of the first places to look for such a plan is in a school's accreditation documentation. Catholic schools are accredited through a partnership of the Western Catholic Education Association and the Western Association of Schools and Colleges (WCEA / WASC). As such, schools are required to maintain a written document that outlines the school's plans, procedures, and processes for every course of action and aspect of pedagogy, curriculum, and the educational process. This documentation is commonly referred to as the "WASC document" by many Catholic schools and is submitted to WCEA / WASC anywhere from every one to six years, depending on the accreditation term granted to the school. A Catholic school's WASC document is a very appropriate place to find written clarification of a school's vision, mission, and plan for anything that is put into practice at the school and for everything that the school says that it does. A strong caveat in looking at a WASC document as a means of data collection is that the processes outlined in the document are not always the same as the processes being implemented at the school. In other words, just because something may be written in a WASC document does not necessarily mean that it is followed or that it has come to fruition at the school. Here, Mr. Sherlock shares about the lack of a consistent technology plan in his WASC document:

> **Mr. Sherlock:** Well there is something in our WASC document about technology. It's never been followed. So what I'm struggling with is that the very basic outline from our WASC document really is, when I came in, was really kind of not what the direction the school is going in. So we're going to have a problem our next WASC where the things that are in our document really aren't applicable to the direction the school is currently going in. So we have to start over. And the school is in such a low position technologically that it needs to come up with a five year plan.

Data collected from all three sites indicates that the development of a consistent technology plan requires collaboration of all stakeholders within the community. More, it requires that stakeholders are excited, interested, and willing to participate in the following through with the actions set forth by that plan. Faced with the challenge of establishing this collaborative effort without a vice principal or an individual on staff in charge of technology, Mr. Sherlock created a leadership team to assist him with the administrative decision making process:

> **Mr. Sherlock:** Because, asking people who don't want to use technology to come up with a tech plan? It's going to be a useless document. I put into place a leadership team. Three teachers on my staff who are always here, dedicated and have agreed to this. And I put it out there for everybody. I said, "I want a leadership team. If you're interested, come to my office after the faculty meeting." Three people show up, three people are on my leadership team! And you know what? If I'd had all 10 teachers there, then all 10 teachers would have been on it. Of course that would mean that things would be a lot more delegated, but it just means that people would have a higher stake in what they're doing. But these are the three teachers. Two out of the three are technologically inclined. One is not and that's fine. So I usually take these two teachers as my lead for my tech plan. So the three of us really work together with what we want, what we can do, where we're going. And they are the ones that are the most excited. So they're the ones that I have my other teachers go and watch. So I have an elementary teacher saying, "I think I want to do what she's doing." Go watch her, I'll cover your class. Go watch, see how she does it. And if you want it, I will find a way to get it for you.

When asked about the existence of a specific decision making process in the form of a written plan or technology committee at St. Anthony's school, the response indicated that it was an area in which the school was lacking:

> **Interviewer:** Can you talk to me a little bit about technology planning? Or the way that technology decisions are made? If you're going to invest money in something else, if you're going to upgrade? Who makes those suggestions? Do you have a committee? Do you have a process?
> **Mrs. Land:** Well, we used to have a technology committee, but that went by the way side. Honestly, now honestly the dads did all the work for me. But then it got to the point where, they were wonderful, they really were, and I shouldn't ---I'm not complaining—but a computer would go down and [we are at appoint where they aren't able to meet out demands to maintain the systems]. Now we have [a professional company that we pay to maintain our systems.] And they're wonderful. I can pick up the phone and say, "This is wrong." They can fix it from their office sometimes. Just walk me through it if I'm really having a big problem.

Further discussion about the decision making process at St. Anthony's supports Mrs. Land's assertion that her school needs to develop a sound technology plan and committee to assist with the process. This notion is represented in the following transcription:

> **Interviewer:** So when you are asked to purchase technology resources from your staff, how do those situations get evaluated?
> **Mrs. Land:** Well you know, basically, Ida the math teacher—I had to buy four new laptops this year. Ida, who is our math teacher, has been using hers for six years. And she's our technology expert, honestly. And she's over in the other building. That woman is incredible. She said, "I need a new laptop." And I knew that we had some monies but since I was new and just had to work on the budget— I just said, "Okay." She uses it daily. All my teachers have laptops they're up and running daily. And so I bought Ida a new one and then somebody needed a new one in their classroom, because they have the classroom – computers in the lower grades. So I just went ahead and bought them. I figured it was—we ordered them through Dell. And then basically the one crashed here in the office and that one was so old that I ordered a new one.
> **Interviewer:** Do you have a computer in every classroom?
> **Mrs. Land:** We have a teacher's computer in every classroom. And there are computers, banks, six computers in 1st grade, in third grade—,they're in 1st and 4th and 5th, 6th, 7th and 8th have [access to] the mobile carts.

Interviewer: And 1st and 4th, how many are in there?
Mrs. Land: There's six in each.
Interviewer: And are the teacher's computers laptops or desktops?
Mrs. Land: They're laptops

Mrs. Land discussed the need for technology leaders to develop a shared vision for educational technology among all stakeholders through collaboration and sharing of resources. Mr. Sherlock similarly commented on his perception of how a leader can develop a technology plan and equitably distribute ownership of that plan to the faculty and staff:

> **Mr. Sherlock:** We were one step behind where [a prominent school was using technology.] We had a good relationship with them so our teachers, we all took a day, and we went over to [that school] to see what they do. We had just bought smart boards, they had smart boards for a year. So we said, "Let's go see how they're doing." Our principal had a good vision at that point, of knowing what to do, and how to implement her tech plan. Because she just said, "Let's not reinvent the wheel. Let's go see how they're doing it." And I took that approach here.

Mr. Sherlock further explains that a leader's responsibility does not end with simply providing opportunity for educational technology use, but that a leader must also find creative ways to share their vision so that faculty and staff can genuinely see the possibilities that educational technology can offer as a resource. The interview with Mrs. Land also revealed that a vision can be accomplished by encouraging professional development in educational technology and by gathering the appropriate resources to implement educational technology.

> **Mr. Sherlock:** But they don't want it because they don't know how to use it. If they can see it in action and say, "Oh, this is what I can do." Then you have success. And then of course after that comes training. Getting them used to that. So I would think that teachers that really aren't comfortable with that or need that

extra push, need to see it in action in order for them to actually visualize what they are going to do.

Ms. Noble explains the importance of involving the entire community in the development of the mission. She credits her involvement with ISTE with giving her the insight to understand that building a common vision starts with the involvement of the staff but that it must eventually include all of the stakeholders in the community:

> **Ms. Noble:** I took a core group of my staff and we participated in the ISTE Institute—are you familiar with ISTE?
> **Interviewer:** I am, yes.
> **Ms. Noble:** Okay and it was in connection with the National Education Computing Conference when it was in San Diego. And the whole purpose of doing that was to build a common vision. ISTE puts out their essential conditions for technology integration, which you should probably look at if you haven't looked at them.
> **Interviewer:** I don't believe I have. They're common conditions?
> **Ms. Noble:** They're called Essential Conditions. Now they are in the process of changing them because they morphed into a document that's 14 things and nobody can do all 14 things! And so they are trying to rework those. But I think the key element that I took from the ISTE Institute besides the support and a lot of other things, was that you have to have a common vision within your community if you want to move forward.
> **Interviewer:** A common vision?
> **Ms. Noble:** I mean you have to build a common vision within your community. It starts with your staff. It has to include later, all of your stakeholders if you want to move forward. And the way I built a common vision – in our previous WASC study when we wrote our mission statement, we revisited our mission statement and we wrote our mission statement. And it was right after the turn of the century, so we wrote in our mission statement, because it sounded so good, that we educate children for the 21st century. So the way we started about building a common vision was about three or four years ago I asked my staff the question. "We say we educate children for the 21st century, what is the difference between educating children for the 21st century and for the 20th century? And so we spent a lot of time exploring that concept. We may not have had the technology skills to do what we needed to do, but the first things that we needed to know was that we had to be convinced that we needed to change something.

Interviews also suggest that the establishment, communication, and implementation of a proper vision, mission, and planning mechanism is not solely the

responsibility of the school. This is also the responsibility of districts, the archdiocese, the state, and the federal government:

> **Mrs. Borris:** Part of the problem I think too is there are no guidelines from the archdiocese. And I feel that, I really believe that technology is here to stay. I mean let's face reality. And I don't feel that were moving forward with it, because the archdiocese—they used to have some guidelines and I probably have them somewhere from 1970 or something. But there's no one out there. And I kind of feel that no one thinks technology is important and other things are more important and yet our kids are going out into the world. They're going on to high school, and I always had pride our kids here would go and they'd go to the advanced computer classes. I can't say that today because they haven't had the same things the other kids have had. And I always tell our principal, "Don't tell them who taught them! I'm embarrassed by what they don't know!", "Don't tell anyone that I teach computers!" Because I don't want them thinking, "Oh, well those kids didn't learn anything!" But my hands are tied, her hands are tied, we have no way of getting this out. And with no guidelines from the archdiocese, no minutes allowed, you know. That's more important, to me, more important than PE. I know kids have to exercise but I'd say that because technology is so important – and it is important.

Assessing Obstacles of Educational Technology Implementation

Data collected from each of the three schools suggests that unique challenges were faced in assessing potential obstacles to implementing educational technology, regardless of their ranking as a high, medium, or low socio-economic status school. St. Anthony's, the school with a high SES, faced valid and difficult challenges that revolved around managing the resources that they in fact already had. St. Mary's, the middle SES school, found that their challenges revolved around embracing a technological infrastructure that was already in place and having to learn how to find and utilize resources that would allow them to build upon that infrastructure. St. Peter's, the low SES school evaluated in this study, faced challenges in having to implement electronic,

computer based technology quite literally from the ground up.

St. Anthony's. Mrs. Land started her position as principal of St. Anthony's School at the beginning of the 2008 – 2009 school year. The challenges and obstacles faced by Mrs. Land and the St. Anthony's community in implementing educational technology were not found in acquiring computer based educational technology or in finding appropriate resources or funding. Instead, the challenges were found in providing a shared vision for a collaborative educational technology plan and in providing the necessary professional development required for the teachers to be able to appropriately utilize the many educational technology resources that they already had. Documentation of the technology curriculum at the school indicates that quite a bit of technology was being explored in each grade level without much of a plan for how to find the instructional minutes required to cover all that was desired. The interview with Mrs. Land and Mrs. Borris, the computer teacher, provided key insight into facing these challenges. The following dialogue describes the difficulties associated with their initial implementation of a mobile computer lab with 18 computers:

> **Mrs. Land:** With the junior high, [there is] kind of a problematic situation that we inherited with regard to taking the junior high out of the lab and giving them mobile labs and turning the whole technology program over to the teachers.
> **Interviewer:** That sounds like an extensive process.
> **Mrs. Land:** It was an extensive process, and part of the problem was there was no back up for the teachers. Or technology training or in service training, or any kind of professional development to go with this. They were just told, "Use these labs now, in your room. This is your computer."
> **Interviewer:** Tell me what you mean by, "pulling the junior high out of the lab" – tell me about this whole process if you would.
> **Mrs. Borris:** Okay, she decided, the former principal decided, that she did not want me teaching the junior high, that she wanted the teachers to do it. So she

decided that I would no longer give grades. And the teachers would do the teaching. What she didn't plan on was the teachers didn't know. And when she bought the computers she put Office 2007 on them and no one knew how to use it! And so, I went in to try and teach them to use Office 2007, Word and Excel. I gave them 30 minutes a week .And even the kids would come and say, "Why can't we come to your lab?" And I'd say, "Because I don't have any room for you! I don't have enough time!"
Interviewer: In your future, do you see the teachers being more of the facilitators of those mobile labs or do you see this being a function of a specific computer lab?
Mrs. Land: I'm seeing that the teachers have to teach, and when are they going to have time to do that? The minutes are horrendous for these teachers. To teach literature and religion and history. When are they supposed to fit this computer and technology time in?
Mrs. Borris: There was no planning or implementation. The labs were just put into the classrooms. So it's been kind of a year where, even last year, where they were just kind of, "Use the labs!" So they were kind of trying to find things by going on the internet and looking up things. Because there was no, there was absolutely no—the vision may have been there. But the implementation for this vision was not given. So that's kind of one of the obstacles that they're facing.

St. Mary's. In the 1990's, St. Mary's school had an established technological infrastructure in place, which was partly defined as having computers accessible to the students in many of their classrooms. When Ms. Noble began her tenure as principal, the school began to install the appropriate means to connect those computers to the internet. The administration quickly learned that their infrastructure was flawed by the fact that they did not have a plan in place for how to adapt to new technology, in this case wired internet connectivity. As a result, they found that their technology program became dormant and their computers became old and obsolete:

Interviewer: When you have implemented either software, as you're suggesting with Google, or actual hardware, what have been some of the obstacles and challenges that you have faced here or anywhere else? That have been just, things that have come up, that have been challenging.
Ms. Noble: Well, certainly wiring a school is challenging. Our school did not have--we were kind of cutting edge with technology. We had computers in the

> classroom for a long time and that's probably why my name came up with technology. I presented at NCEA probably ten years ago on the use of computers in the classroom. So that's another reason that I have that reputation. But what happened was that they put internet in a couple of classrooms and then they said, "Oh, well we want internet in more classrooms." And so it was a mess. An absolute mess! In fact I had to hire a company to come in and trace all of the cables to see how things were going. So if you have the luxury of starting from scratch you got to have a plan. The other thing that happens with technology that we've experienced here is you really do have to think five years down the road. You can't think, "Well this computer is pretty good. It's good enough." Because it's not going to be good enough!
> **Interviewer:** Yeah, in a certain amount of time.
> **Ms. Noble:** Yeah, in a very short amount of time! Shorter than you would guess. We were at a standstill with technology integration at one point primarily because the equipment didn't work! It was too old, it wouldn't access things correctly. It was too slow.
> **Interviewer:** And this was after you had already established some kind of technological rapport, culture here at school?
> **Ms. Noble:** Well, no. This is prior to the big shift. But see, we had technology in the classroom but it wasn't being used. It wasn't being used because the infrastructure wasn't adequate and the teachers were frustrated by it so they just ignored it. Obstacles in implementing technology…

Ms. Noble comments that "teachers are not going to use technology if every time they turn something on it doesn't work." With that philosophy in mind her response to an inadequate infrastructure and ignored computers in the school was to create a Technology Coordinator position on the staff that would be responsible for maintaining the computers and ensuring that the systems work properly. She also recognizes an additional challenge regarding the implementation of educational technology in that accepting donated computer based equipment is in some ways counter-productive. Such donations are often obsolete, commenting that "if it's not good enough for you at home, chances are it's not good enough for the kids here:"

> **Ms. Noble:** We've spent very little money on technology. Very little. Industry cast offs in our computer lab. We do buy refurbished computers because they're

> cost effective. We use open sourced software. But you really do need somebody – I have a technology coordinator who, hopefully you will get to meet! He is not a technology teacher, he is not my computer lab person, his job is infrastructure. And you really do need someone who has the knowledge—I mean the basic things I can do. I can go plug the cable back in when a kid trips over the cable and it goes off. But you do need somebody to maintain things. Because teachers are not going to use technology if every time they turn something on it doesn't work. And so I would say that is the biggest stumbling block. We started practically all over again. At one point we had 100 computers in this school, but so many of them didn't work. And some were such dinosaurs! And I know this sounds silly, but we rarely accept donations from parents because what happens is, they want to give you their dinosaurs! And if it's not good enough for you at home, chances are it's not good enough for the kids here! So we have to look at solutions. Clients is one solution. Linux programs is another solution. But I think those are the kinds things you need to think about for the hardware implementation.

St. Peter's. Similarly to Mrs. Land at St. Anthony's, Mr. Sherlock started his position as principal of St. Peter's School at the beginning of the 2008 – 2009 school year. Upon his arrival, he found that the school had very little computer based technology, that the facility did not provide for adequate electricity and wiring for technology integration, and that the implementation and planning of educational technology had been virtually dormant and untouched for five years or more.

The site observation at St. Peter's school revealed that the primary challenge in implementing educational technology lay in setting up and building a space for a computer lab. Mr. Sherlock had to call upon favors, donations, and parent volunteers to set up an unused classroom with the proper electric and wiring to accommodate a set of working computers. He spent much of his time over the summer establishing what was needed, acquiring donated computer software and hardware, and setting up the machines at the school. His dual role as both administrator and technology coordinator forced him to physically set up the lab as well as install a wireless network at the school and create

and launch a new website for the school community. Mr. Sherlock comments on the experience:

> **Mr. Sherlock:** It was stagnant for five years - it's just kind of the way that the school was five years ago. And so, with more of a non-techie person in charge, that idea wasn't pushed forward too much. So for five years really nothing changed. And in five years technology has gone from floppy disks to thumb drives! And much more! I've seen in that time technology change and it changes monthly, daily. And so for something to stay put for five years— is a really long time for nothing to change. For the same programs to be on the same computers. With no updates! When you don't update a computer—when I went through the old computers that were there, they shut off the automatic updates. So these computers have never been updated since 2000. That was the last update. Because you can go to the control panel or the programs and you can see when the last update was and they were all in 2000. So you know, I said, "Okay." And you hear the computers running, like a (makes humming noise) like something's not right. The culture was stagnant. That's what I can define it as. It has not changed for five years so there's a huge need.

One positive factor was that the previous principal had utilized a monetary donation allocated for technology and purchased a laptop computer for each homeroom teacher. Using these laptops as a starting point Mr. Sherlock speaks about one of his first challenges, establishing an internet connection at the school so that the staff could take advantage of the mobility of their laptops:

> **Mr. Sherlock:** The first obstacle is updating to current technology which is wireless. These teachers had laptops, but they had to leave them at their desk. So for me it wasn't really a feasible option to really have a wired school when these teachers have laptops. They can't move them from their desk. They can't take them to the faculty room, they can't take them to the library, they can't even put them on a cart and attach them to a projector. So that was number one for me.

In addition to providing adequate internet connections at the school for the faculty to be able to use their laptops, St. Peter's was also faced with the challenge of getting the teachers involved and active in utilizing their laptops both as tools for instruction and for organization and planning. The principal's preference was to generate a sense of

excitement and interest in the implementation of educational technology by first introducing the staff to these tools and then allowing them to be part of the process of purchasing them for the school. However, since the laptops were already there when he arrived, he had to get the staff interested in utilizing what they already had without previous guidance, direction, or vision as to how the laptops could be used:

> **Mr. Sherlock:** Because there are so many tools, and there are tools out there on the web for learning. And textbooks are becoming more and more aligned with technology. There's websites and things in the textbooks now. If you have a newer textbook you have online support, you use that. That was number one and then number two was, the computers that were here in the school were absolutely inappropriate. It was just unacceptable. So that was my next step, to get the hardware in place. Once I got the hardware into the school my step now is to get the teachers onboard and get the teachers educated on using it all. I was going to take it the other way, to get them excited and then get the technology. I had to take what I can when I could get it. But I think it worked out nicely because they see all this new stuff coming in and they get excited.

Included in Mr. Sherlock's philosophy is the idea that it is important to first show the faculty and staff what the implementation of educational technology looks like according to a vision and plan before that technology is given to the staff and integrated into the culture of the school. The logic behind this philosophy is twofold. First, to prevent wasted physical space in terms of setting up classrooms and a computer lab with equipment that can be potentially underutilized. Second, to be very mindful and appropriate with the spending of funds to ensure that the implementation of educational technology is placed where it is needed most and where it will get the most use for the benefit of the children.

The site observation of educational technology at St. Peter's School revealed some of the challenges they face in having limited availability of teacher led instruction

with the use of computers. According to the principal, the school had to overcome the loss of a computer teacher in the middle of the 2008 – 2009 school year due to budget restraints. In response to this dilemma, the administration made the decision to allow the students at the school, particularly in the junior high, to setup and run the computer lab. These responsibilities included arriving to school as early as 7:00 a.m. to turn on the machines, run system updates, and prepare the lab for daily use. In addition, these older students were given the responsibility of instructing certain fundamental computer skills to the younger children. The eighth graders teach the first graders how to access programs, navigate through basic software, and even give instruction on basic keyboarding and interface skills. In addition, some of the more technologically savvy students are even allowed time to share their knowledge with the teachers for the benefit of their training as well. Although this process is still supervised and facilitated by the homeroom teachers at the school, the students, teachers, and parents have come to view the decision to give the junior high students such responsibility as a genuine reward and a valuable learning opportunity.

Fostering a Technological Culture and Embracing Change

The research methodologies consistently found that one of the most significant aspects of implementing educational technology is the need to foster a technological culture. The leader's responsibility of fostering a technological culture and embracing change requires sensitivity and understanding as the members of the community do away with the familiar in order to eventually gain something that they can come to see as more

valuable. Establishing a culture that promotes a supportive disposition towards educational technology requires the community to face the fears associated with change. Mr. Sherlock explains his experience in establishing such a culture as a new principal to the school. He learned that even asking something that he thought was so fundamental, a request of the teachers to e-mail him weekly lesson plans, was clearly a case of culture shock for his new faculty:

> **Interviewer:** Are they afraid of it?
> **Mr. Sherlock:** Most of our teachers are on the fence. They are comfortable with the hand written progress reports because that's what they've always done. They're comfortable with their grade books with the graph paper because that's what they've always done. They're comfortable with the way things are. When I came in I gave them a template for lesson plans on the computer. I said, "Every Monday morning just email me your lesson plans." And that really was the first thing that sent them over! And I didn't think I was asking for a whole lot. I came from a different culture. So I said, "Email me your lesson plans so that I can have them on my computer every week."
> **Interviewer:** And that was a challenge.
> **Mr. Sherlock:** That was a huge challenge! And I have one teacher who just can't do it. So, a lot of my teachers are kind of on the fringe. A lot of them are on board completely and some of them are going to stay put. So I'm really working with that middle group. I want to get them on board. Then those people automatically transfer over because, "Oh, well everybody else is doing it." It's like a psychology experiment almost with this, you know? You have digital immigrants and technology natives. So I'm dealing with those immigrants right now.

Mr. Sherlock also commented on the lack of direction regarding the implementation of educational technology in the most recent WASC document for the school which was written in 2006. Upon review of this report the document has few references to technology. A significant reason why a technological culture is not vividly present at the school is because it is not written into the school's vision and plan. The WASC document does in fact call upon the school to create a technology committee for the purpose of "promoting computer access and literacy for faculty, staff, and students."

However, Mr. Sherlock confirmed that no such committee had been formed prior to his arrival in 2009. His comments suggest that the creation of a technological culture must begin with the vision so that it can be reflected on, referenced, recognized in the daily life of the school.

Another example of fostering a technological culture and embracing change can be seen in the approach taken by the administration of St. Mary's in restructuring the school into "Learning Academies." By collaborating with the teachers and working in partnership on the decision making process, the entire faculty and staff had ownership in building and fostering the new technological culture of the school. Ms. Noble states that as an educational leader she "drives the decision making, but does not impose the decision making." The administration's ability to cultivate this ownership empowered the faculty and staff to be able to embrace the change associated with their new technology inspired learning academy. As a result, the teachers began to request more computers and more student time with those computers:

> **Interviewer:** Explain the cost of how technology planning – you talked about a plan – how does St. Mary's move forward with decisions that are primarily principal driven? Do you bounce ideas off this individual that you—what was his position title again?
> **Ms. Noble:** We're calling him the Technology Coordinator.
> **Interviewer:** Okay, is it just the two of you? You're so well versed in knowing this. Does it primarily just come from you?
> **Ms. Noble:** No, yes and no. Part of building a common vision -- one of the things we did after we had this meeting and we start talking about this, was I put a blank map of the school and I said, "Okay. We know that we want to change things and build collegiality, we know that technology is going to be really important. And as a group we decided that we were going to start with the junior high. That's where we're going to start our technology push and then we're going to figure out how it's going to go down into the other grades. So one of the things we did was put up a blank map of the school. I said, "How would you arrange the school?" Every classroom moved! We set up school academies. We have a Primary

> Academy, K,1 and 2. The Intermediate Academy, 3,4 and 5. Junior High Information Technology Prep Academy 6, 7 and 8. They kind of came up with their own identities. And we said that if the junior high was going to be a technology academy then they need ubiquitous access to technology. So we moved all of them over into the old school building, where the computer lab was. So do I drive the decision making? Yes, but I don't impose the decision making.

The following transcription suggests that a key factor in being able to foster a technological culture is the idea of having a stronger focus on the pedagogy rather than on the technology. Ms. Noble describes this concept as "trying to change teachers' outlook that it's about the application of knowledge" rather than the application of technology. The rationalization here is that curriculum and instruction is founded in standards and pedagogy regardless of the means of instruction, whether that means is in the form of a textbook, a SmartBoard, or any other educational resource or tool. This strong focus on learning rather than on the specific technological tool that is used to teach the lesson yields consistency in the learning process.

> **Ms. Noble:** The other thing though in terms of technology culture and whether it's challenging or a work in progress. And this is absolutely essential to who we are, it is challenging and a work in progress because it's really not about the technology it's about the pedagogy. It means that the teachers have to completely change their whole mindset of what teaching is. The whole thing about web 2.0, teachers are no longer the purveyors of facts. The educational institute is no longer the only place to go to receive knowledge. And so trying to change teachers' outlook that it's about the application of knowledge. It's about what the kids do with knowledge that is really what education is about today. So it's absolutely a work in progress because most teachers teach the way they were taught! It means looking at textbooks—and I'm not anti textbook—however, I believe for the teachers to truly change, I have to take the textbooks out of their hands. Because it's too easy to do what we're comfortable with which is teach page one to page 100 or 500 whatever it is. So right now, our 6th, 7th and 8th grade social studies and religion is being taught textbook free.
> **Interviewer:** Wow!
> **Ms. Noble:** We have textbooks, they're resources, but our curriculum is based on the standards and this pedagogy that it's not enough for the kids to memorize

information. It's much more about what they do with the information and also on digital literacy.
Interviewer: Yes, exactly.
Ms. Noble: Well, and it's how parents traditionally measure education which goes back to that piece of vision. Remember it starts with the teachers but then it has to involve all of the stakeholders. I think we have to be more visual with our standards. I really believe that we have to go to a standards based report card so that the parents know exactly what material is being covered. Because the only way that parents have, the traditional way of knowing is, "Did you cover the book?"

The above assertion of using technology to enhance the curriculum rather than to replace the curriculum is further explored below. The following transcription discusses how technology that enhances curriculum supports a technological culture. A particularly illuminating comment comes from Ms. Noble who stipulates that there is no specific "technology curriculum" because "the idea is that the technology should be transparent". Technology that enhances the curriculum supports a technology culture because the use of technology is integrated into the learning process:

Ms. Noble: No, but I think it's a hard concept for people though. I think when they think "technology" – we had another school who I won't name, who came out to visit us, last week? Two weeks ago? Their initial question, although by the end of the day we were in a different point, but their initial question was, "What should our technology curriculum be?" And that's not even a question that we ask. I don't teach Word in second grade and Excel in third. It's all integrated within the curriculum. Do we give a lesson in how to use PowerPoint? Or how to use presentation software? Absolutely. But it's like one lesson and then the kids are using it for their learning not—
Interviewer: So the technology curriculum is more fundamentals and not cross-curricular? Is that what you mean by that?
Ms. Noble: Yes. They're saying, "Well, what should they learn in this grade?" They need to learn those things that allow them to do what they need to do to learn. Now, putting that aside I do have stated in my curriculum that I want the kids to learn keyboarding in the intermediate grades. That's the only thing that I push, keyboarding. Keyboarding skills. The more comfortable you are with the keyboard, the easier you're going to have—
Interviewer: We don't even use the term typing anymore! Because a keyboard does a lot more than that! With the controls—

> **Mr. Robles:** Because there's keys on the computer keyboard that a typewriter doesn't have. You need to know those keys also. What they do, what they're for.
> **Ms. Noble:** The idea is that the technology should be transparent. So teaching keyboarding is one of—there's very little anymore that you have to memorize. But teaching keyboarding is an essential skill because then you're not worried about the technical aspect of it. So that is something that we try to instruct.

Despite facing challenges associated with limited computer hardware, software, and personnel, site observation at St. Peter's School indicates that daily instruction is very much enhanced by the use of educational technology. The junior high math teacher instructs the students for a minimum of one hour a week in the computer lab where the students work on math and logic problems via free web-based programs. In addition, after school groups such as the Academic Decathlon team use the computer lab for logic problems as much as 45 minutes each day. The philosophy here is that everyone teaches and everyone learns at their own pace in regards to one's capacity to use technology.

The significance of using technology as a resource and tool to enhance rather than replace pedagogy can be seen in the process of using mobile laptop carts at St. Anthony's School. Observation of this process shows that the firm establishment of a systematic procedure is an effective means of fostering a technological culture and embracing change. The following description of the process of unpacking the mobile cart, distributing the laptop computers to students, moving forward with a daily lesson, and returning the computers to the cart is one that allows the class to focus on teaching and learning more than on the significance of the laptop as the instructional tool.

The following observation took place in a junior high math class at St. Anthony's. Upon arriving in the classroom, students walked over to a mobile cart and acquired a laptop computer without being prompted from the teacher. Each student powered on their

laptop as part of their beginning of class activity as they took out other supplies and prepared themselves for class. Each student logged into a Math software program that was purchased by the school and worked at their own pace as the teacher checked in the previous night's homework. It took students approximately 2 – 4 minutes to get their laptop up and running. As the lesson commenced, some noticeable observations indicated that student learning was genuinely enhanced through the use of the laptop computers. First, the students solely asked questions about the algebraic word problems that they were working on within the computer program; they did not ask technical questions about how to use the computers. Second, the teacher was able to successfully give multiple directives to the students that were fairly complex. Students were asked to take an on-line math quiz, to submit it electronically to the teacher, and then run and check a report about their progress on the quiz. When the students were finished, they powered down the laptops and returned them to the mobile cart in less than five minutes. Although the laptops were a significant presence in the lesson, the learning had to do with the math and not with the use of the computers.

Managing and Maintaining the Implementation of Technology

Planning and processes must be put into place not only for the implementation of computer based educational technology but also to keep it maintained and managed on a daily basis. The efforts required to implement educational technology do not stop once the technology is acquired and integrated. The challenges associated with this are dependent on a variety of factors including available personnel and budget. At a lower

SES school such as St. Peter's, Mr. Sherlock is forced to take on the role of principal and that of network administrator and information technology specialist (IT). That means that he is in charge of fixing hardware, patching software, updating systems, and handling the day to day minutiae of problem solving a computer network:

> **Mr. Sherlock:** It's hard because things don't get done in a timely manner. It's up to me to do it. I have parents who say, "Is there anything that you need?" And I say, "Yes!" I always say, "Yes." And that's the thing. People ask me for help and I say, "Yes." And that's it. And then I take what I can get. I can't be picky right now because I don't have the resources in place to be picky. But I'm the only one here full time. These parents are giving freely. So I say, "Do what you can. Here's what I want done, do what you can." When something goes wrong I have a couple of parents who are good with computers. So when something goes wrong I say, "Talk to so and so's dad and see if they can come in after school one day and help you out." That's really my maintenance plan. Otherwise I'm down there and I'm fixing it.

In addition to always accepting help from the parents and other community members, Mr. Sherlock also looks for ways to combine staff positions and responsibilities to get the faculty more involved in the technology maintenance and managing process:

> **Mr. Sherlock:** That's me, I call and I do all of that. So things don't get done in a timely manner. I am relying on volunteers, and I am relying on other people to take it upon themselves to see if they can fix what they can. So if a computer goes down, it may be a week before it gets back up. The thing is, the way I'm looking at it – for now—it's better than what we had. So I'm looking at it, it's progress. If I can get something better into place in the future, great. If I can consolidate a couple of the positions on the staff. [Combining two positions] into one, different job? That's what I'm looking to do. I need to reclassify my staff and really think about, well, how effective is a library with no computer in it? That's not really a trend that we want to go towards. We want a library that has a bank of computers in it.

St. Anthony's also faces challenges with the operation and process of keeping their mobile computers running smoothly. Unlike Mr. Sherlock, Mrs. Land is able to afford an outside company to come in every other week to maintain their systems. St.

Anthony's pays several thousands of dollars a year for this maintenance contract. However, they are not able to prevent every problem and there are often fixes that are required at the time of instruction. Spending more time on troubleshooting and getting the class started with each student having access to a working marching often leads to further challenges with dwindling instructional time:

> **Mrs. Borris:** With the wireless, because they're all trying to log on at the same time, and it takes 10 minutes to get it going, so we've lost so much time before we can begin a lesson. I only have them for an hour a week.
> **Interviewer:** You have them in the computer lab or in a different location on campus?
> **Mrs. Borris:** …with me in the lab. And there they would use the Word processor and they got vocabulary. They got tested. They had more of a learning situation so they would know about technology. Not just that, "Oh I can get to the internet. I can do this. I can do that." Well, how do you know that's a reputable site? Things like that. Well, they don't get that anymore. And it's nothing bad to say about the teachers, they just don't know it. And so, I tried giving a test, and I was told, "Well, you don't give a grade, so what does it matter?" And the kids have picked that up they're very astute. And I just feel that I'm being cheated in teaching them. And I feel the kids are being cheated in this way. And there's no way for me to correct that now. I mean, [in this interview we] will talk about that, but it's hard. It's hard for me to go in there and not have the laptops working. Because I'm trying to teach and I'm working on the connections and we have a 30-minute frame. It's not very much time.

When asked to clarify their concerns regarding managing and maintaining the computer systems, St. Anthony's elaborated on the learning curve required to effectively use their mobile laptop cart:

> **Mrs. Borris:** I think the biggest problem is getting them to start up! I mean, just getting them logged on. They all have to log on. In our 7th grade we've got two wireless routers to the cart. And then, it's only 30 minutes so if the children don't come in until 1:00 or five to one, I'm there at 1:00. They're still pulling laptops out. Yesterday was 8th grade [where] we have one cart with 18 laptops. They pulled the cart from 7th grade in [to their classroom]. We've got to pull the cart in, plug it in. By the time all that is finished, it's already after 1:00. Before they came right to the lab, the work was done. If the teacher had something she wanted to do, it was done in the lab. By going to the classroom I have to hook up the

machine. Because it was already hooked up in my room I could start. The minute they walked in I could start. I can't do that. So the time frame is not there. And I feel like I'm just getting started and it's time to go. Sorry guys, I'm leaving.

Ms. Noble explains the significance of having an individual in charge of systems maintenance whose role is much more focused on troubleshooting than on curriculum and instruction. Her caveat is that if the teachers face an obstacle or challenge with whether or not a specific computer based technology is set up or working properly they become discouraged and the educational process is hindered. The transcription below highlights the significance of the role of the Technology Coordinator at St. Mary's and the value of having a position on staff that ensures the maintenance of educational technology. The end of this transcription suggests another advantage in having such a position on staff, the ability to monitor the security, safety, and citizenship of the student's activity on the computers and network:

Ms. Noble: Because I'm going to repeat. One of the essential conditions of a technology program is not a teacher for the tech lab. It's being a troubleshooter.
Mr. Robles: Yes! Yes!
Ms. Noble: You need that more than anything else because if the teachers are frustrated, they are not going to do it. Your job is absolutely critical.
Mr. Robles: And I deal with them all the time. You know? Whoa! These last few days have been kind of trying for us. I think I've got a handle on it now. Because we had a server issue, but I still got one monitor that I have to do upstairs. That one that went down and took off a bank of six.
Ms. Noble: Right. One monitor went down and took out six of our computers with it! So he does all that kind of stuff. He also rebuilds the teacher's laptops if the laptop goes south.
Mr. Robles: It happens.
Interviewer: So you're maintaining the systems and the network?
Mr. Robles: Yes, maintain.
Ms. Noble: And he also took a class in forensics.
Interviewer: Oh really?
Ms. Noble: So that we can follow up on our kids.
Interviewer: Oh wow! That's very interesting. That's a really good thing to—
Mr. Robles: I like that forensic class that was very, very interesting.

> **Interviewer:** I never thought that you'd even have to be prepared with something like that, but you're right. That's another whole angle---you're worried about your physical plant and then for your teachers to be able to use it. And there's the whole digital citizenship kind of a thing.

The WASC document from St. Mary's School includes a section that identifies ways in which the school has taken steps to improve from their previous accreditation visit, specifically having to do with their interest in improving the "effective integration of technology across the curriculum." The explanation of specific actions that were taken in order to reach this goal began with "Added a technology consultant to the staff to support our technology efforts." The administration and staff at St. Mary's school has clearly justified the need for such a position and has placed great emphasis on the role of this staff member.

The Digital Divide and the Implementation of Educational Technology

Evidence of the digital divide was clearly seen at the middle and low SES schools in this study. In one of the more illuminating examples, the principal at St. Peter's School was told by a major telecommunications company that high speed internet access was not available in his school's neighborhood because the low SES demographic in the area:

> **Interviewer:** The most startling thing you mentioned was the story about Verizon and you being informed that it wasn't necessarily a priority because of the demographic of the neighborhood.
> **Mr. Sherlock:**The guy I was talking to just now. He was from Verizon. I called two months ago when I put this lab in place, and I got the computer lab set up. The dad who helped me do it said, "You need fiber optics." So I said, "If it's worth [me paying for] Verizon, I'll call." When I called Verizon they said, "You're not a high priority area. You are a very low-income area. It is not worth it to us to put it in your area." Once again, we are being penalized for being poor. So our kids won't have a decent internet speed because of the location that we're in. That was an eye opening experience. Because it finally struck a chord with me. I

> always worked in higher end schools and for them to tell me in so many words that, "You're a low income area, you're a low priority."

When asked about other issues of equitable access, Mr. Sherlock brought up the notion that many families in his community were at the disadvantage of not owning a computer or having access to one at home. In response to this, he provided computers to a select number of school families:

> **Mr. Sherlock:** I updated everything and I ended up having 45 computers. And I said, "I don't have room for 45 computers." I knew of a lot of my families didn't have computers. So I gave about 10 computers to the families that didn't have one. Most of them were the desktops that we unloaded but the fact is you can get Internet, you can upgrade the computers, and they worked. So for me it's progress. It's not the ideal situation but now almost every one of our families has a computer. I have to make sure all of our families have a computer and Internet access.

When looking at the high SES school in this study, there is a clear distinction evident between the haves of St. Anthony's and the have-nots of St. Mary's and St. Peter's. Below is an excerpt from the St. Anthony's interview that discusses the overwhelming access to technology on the part of the community. It can be seen in the school's policy of distributing information electronically and in the description of the technological items owned by the students:

> **Interviewer:** Is it safe to assume that the majority of your parents and families have access to computers and technology?
> **Mrs. Land:** Oh yeah.
> **Mrs. Borris:** Yes. Everything.
> **Mrs. Land:** Definitely, because we've gone now to emailing instead of sending out papers. We've just gone to emailing things to the entire school. That type of thing.
> **Interviewer:** Do you see in your children that they have an advantage in having other technologies? Laptops, smart phones? Do you see a lot of that?
> **Mrs. Land:** A lot of it. I mean, with our policy, cell phones are allowed but they have to be in the backpacks, they have to ask permission after school to use them.
> **Mrs. Land:** Some of them have two of three things!

> **Mrs. Borris:** Well, some of them have more than one cell phone!
> **Mrs. Land:** Yes! Exactly! So, technologically, they have probably everything out there that's new and innovative. And they know how to use them. Like I picked up one and I had to go to the child and say, "Turn this off for me." I mean, how's that look! So, we have that expanse at this end where they're very technologically savvy. I think we teach the basic skills. But [we see a need at our school for us to begin] implementing projects that go beyond basic skills, [to begin] collaborating with one another and solving problems. And using creative abilities. That's where I think we need to go. And I think we're very limited because of time constraints. So we need to do something to adjust that.

St. Anthony's has documentation of the technology that is used in the classroom according to grade and subject. Each grade level and class subject has a lengthy list of uses of education technology from reading and writing programs in the primary grades that are used several times a week to complex math programs that are used on a daily basis on the junior high. Compared to data from the other two schools in this study, St. Anthony's has access to a significantly larger pool of technology resources for their student body.

Further evidence of this notion of the digital divide was observed at St. Peter's School in terms of the quality of computers and software available to the students. The main computer lab at the school has 32 used computers that can be described as in working condition with limited productivity. The average age of the computers is 6 to 8 years old and although they are up and running, their processing power is limited for some of the demanding minimum requirements needed to run today's software application. In addition, the principal at St. Peter's states that the concern of computer access also extends to the home. He shared that as much as 20% of his junior high students do not have a working computer at home nor do they have a high speed internet connection. The main challenge here is the idea of the children being able to develop

digital literacy skills without having a means to practice outside of the school. The principal works to equitably distribute computers to families in need as her receives donations and machines to the school.

In comparison, the computer lab at St. Anthony's School reflects the high socio-economic status of the community and leads to a more efficient use of educational technology. St. Anthony's uses three mobile carts that can be used in any classroom at the school. Each cart is equipped with nineteen high end laptop computers that connect to the internet wirelessly. The newer construction of the campus at St. Anthony's after an earthquake in 1994 provides classrooms that are spacious that include central air conditioning, new covered shelving, and plenty of desk space for the students. The description earlier in this chapter of a fairly efficient lesson plan enhanced through the use of technology earlier is due in part to the physical setup of the plant.

Summary for Research Question 2

The second research question inquires about the implementation of computer based technology in three Catholic elementary schools in ways that foster a culture that promotes a supportive disposition towards educational technology. The implementation process must begin with a clearly established and communicated vision, mission, and plan. Furthermore, that vision must have continuity throughout the implementation process. It is imperative for educators to research and assess potential obstacles in the technology implementation process. Investigating the implementation process at others schools allows educators to learn from the mistakes and successes of others. Fostering a

technological culture requires the community to adapt to change. This in turn requires collaboration among all stakeholders within the community and necessitates that pedagogy and student achievement are most prominently at the heart of decision making, not the technology itself. Educational technology requires a systematic procedure for the monitoring, maintenance, and upkeep of computers and networks. This is more successful in schools that have a dedicated position on the staff rather than those that assign these responsibilities to an administrator or community volunteer. Finally, it is imperative that the accessibility issues of the digital divide are present in the decisions that drive the implementation process. Awareness of such issues go a long way towards ensuring fair, just, and equitable distribution of computer access to educational technology and the promotion of digital literacy.

The data collected in this study has confirmed the significant theme in this investigation that the leadership and implementation of educational technology must focus on pedagogy. Technology in education must focus on the enhancement of curriculum and instruction rather than on implementing and using technology for technology's sake. This important role of technology in education will be discussed in the final chapter where I will present the implications, conclusions, and recommendations of my study.

CHAPTER V

DISCUSSION AND IMPLICATIONS

Introduction

This research study investigated two main areas of educational technology: leadership that supports educational technology and the implementation of computer based educational technology in ways that support a technological culture. Qualitative data were collected at three Catholic elementary schools using interviews, document reviews, and site observations. Data from these three research methodologies were organized into a total of ten themes, five for each of the two research questions. This chapter provides a discussion of the results of this study as well as conclusions, implications, and recommendations for additional research.

Discussion

The results of the study are discussed according to the two research questions. The following section is organized into a discussion of the themes that are related to each question.

Research Question 1

How do educational leaders provide leadership that supports the implementation of technology, the change associated with new technologies, and a culture that embraces technology? This question focuses specifically on leadership and the practices and styles that educational leaders must be cognizant of when integrating technology into school and systems. Change and culture are two concepts that are port of the implementation process and as such require equal consideration.

The Relationship between Implementation, Change, and Culture. The implementation of educational technology, the change associated with that implementation, and the establishing of a technological culture that can allow technology implementation to cultivate and thrive are three concepts that are interconnected and very closely related. Initially, the intention of this study was to differentiate between these three notions and identify data and results that were specific to each. The presumption was that educational leaders could provide unique and specific leadership styles and practices to each of the three concepts articulated in the first research question. Instead, this study found that leadership practices that support and promote the implementation of educational technology are the same practices that sustain change and establish culture.

The implementation of a new technology has a distinct impact on a community's capacity to adapt to change simply because the new technology requires in some way shape or form adaptation to new processes or procedures. The concept of a technological culture is related to implementation and change in that the processes and procedures must be supported, agreed upon, empowering, and shared in ownership in order for the implementation and change to be successful. Consider as an example the data collected from the interview with Ms. Noble, principal at St. Mary's. Ms. Noble put into practice a three step plan for integrating educational technology at her school. As explained in Chapter 4, this three step plan is unique in that it is aligned with the three aspects of educational technology expressed in the first research question of this study.

The first part of her plan had to do with educational technology implementation. Step one was to empower the staff by acting in partnership in the decision making

process of discerning what technology would be integrated into the school and classrooms. Such collaboration ensures that both the administration and staff share ownership of their philosophy that the technology would enhance rather than replace teaching and instruction. This partnership is indicative of the structure a professional learning community. The collaborative structure and inclusive philosophy of a PLC provides the staff with the necessary tools to try out and experiment with educational technology (DuFour et al., 2006). In this case, Ms. Noble applied the ideology of a PLC as a mechanism to introduce and implement new uses of educational technology. Using professional learning communities as an approach not only enriched the experience of technology implementation, but the collaboration, partnership, and ownership also set the stage for the community to begin to adapt and sustain the change associated with that new use of technology.

The correlation between implementation, change, and culture can also be seen in the second step of Ms. Noble's plan to integrate technology into the school. She met the responsibility of sustaining the change associated with technology by immersing herself in acquiring knowledge about educational technology information. Being informed and empowered with knowledge is an essential condition in being able to lead and sustain change, particularly when considering that knowledge about technology is incredibly volatile as new and unique technologies are introduced so frequently and commonly in society. Ms. Noble's immersion into education technology information directly affected the development of the implementation strategy and ultimately strengthened the technological culture at the school. Ms. Noble immersed herself in significant ways: by

creating and moderating blogs on websites, by attending technology conferences throughout the nation, and by establishing membership with various professional technology institutions such as ISTE. The philosophical approach to immersing herself with information was based on the ideal that all stakeholders must be exposed to ideas before considering and initiating any kind of change. Exposure to ideas that are discussed, endorsed, and presented in blogs, seminars, and professional groups bring a sense of authority, validity, and comfort to stakeholders in making decisions that require change.

The third step in Ms. Noble's plan also supports the notion that implementation, change, and culture are interrelated. Ms. Noble proposed the following philosophical question as the foundation of the school's technology implementation process: What are the desired outcomes regarding curriculum and instruction and our use of educational technology here at our school? This question continues to be vividly present throughout the school. In hindsight, she recognized that in order for the staff to truly answer the question, she must lead the development of a culture that can embrace technology and one that can support the changes that are associated with technology.

Qualities of Effective Technology Leaders. Evaluation of the data collected in this study regarding effective technology leaders warrants two key points of discussion. First, it is important to question whether certain leadership qualities and practices can be specifically effective in supporting technology implementation. Second, it is important to consider the distinction between a leader who is technologically savvy and proficient

versus a leader who is not technologically inclined and the impact that this distinction may have on one's ability to provide effective technology leadership.

Another presumption of this study was that there would be clear and obvious examples of leadership styles and practices that are specifically effective in supporting technology implementation. Effective leadership qualities are generally applicable to a significant number of administrative and managerial undertakings and are not necessarily unique to educational technology. The leadership practices identified in this study were appropriate for supporting the implementation, change, and culture associated with educational technology. Leaders can be particularly effective with the implementation, change, and culture associated with educational technology by utilizing styles and practices that provide the faculty and staff with the means to research, evaluate, and experiment with new computer based educational technologies. DuFour et al. (2006) presented a similar model for such thinking when discussing the need for a group to take a hands-on, constructivist approach to defining purpose and intended results. Ms. Noble referred to this notion as providing faculty with an appropriate amount of playtime and the use of such practices was also endorsed by the other two principals interviewed in this study. An integral aspect of providing appropriate support to faculty and staff is to allow them time to experiment with the new technologies in question. Based on the reaction of the staff, leaders must recognize when to push the implementation of technologies that are endorsed by the staff and when to let go of those that impede progress. It is imperative that the staff feels supported and prepared rather than as though the technology is being forced upon them. Technology cannot be viewed by the staff as

another task that placed upon an already overbearing sense of responsibility of day to day teaching.

This study evaluated leaders who possess an elaborate schema, skill set, and talent in the use of computer based technology as well as leaders who lack advanced technological skills and who are easily categorized as digital immigrants. One of the presumptions that I had before collecting data for this study was that the greater an individual's computer based technology skill set, the greater their capacity and ability to be an efficient technology leader. Upon completion of this study, I cannot say that I have found a definitive corroboration of this notion. However, I can say that this assertion is far less true than I had presumed. Although not all leaders have the ability to be an exemplary role model in their use of educational technology, they can still be an extraordinarily efficient technology leader through their passion, ability to collaborate, their willingness to embrace the learning curve, and by being open to new ideas. Consider as an example two of the principals from this study, Ms. Noble at St. Mary's who is extremely talented and knowledgeable with computer based technology, and Mrs. Land at St. Anthony's who is far less experienced with technology. Both clearly exhibit qualities of efficient technology leaders and both schools have implemented technology with evidenced success. A school that has a technologically skilled leader is not necessarily advantaged over a school that does not. A technologically skilled leader is likely to possess critical knowledge about what is cutting edge in technology, how to use technology in education, and about issues and current trends that are influential to the field. Such skills, talents, and knowledge absolutely have an immediate, tangible, and

positive impact on that leader's capacity to succeed with the implementation of educational technology. However, a leader with that technological knowledge can still find the same success and acquire and present these same important ideals in other ways, particularly through other capable hired staff. As long as such ideals are embraced and supported by the leader, successful technology integration can be achieved.

Professional Development. Professional development is an imperative aspect of the educational technology integration and implementation process. The caveat offered by the educational leaders studied in this investigation is that without professional development the precious time, money, and energy spent on educational technology implementation is likely to be misused and ineffective. Specifically, a noteworthy concern regarding the lack of professional development is the potential for too much time to be spent focusing on acquiring specific technologies while not spending enough time focusing on properly training teachers and educators on how to use that technology as a resource that can directly benefit students in the classroom. The importance of professional development that focuses on using technology as a resource to directly benefit students is discussed in this section.

Professional development exists in the form of training in teacher preparation programs at the college and university level as well as the professional development that is offered through districts, dioceses, and individual schools. Although higher education plays an integral role in preparing teachers with educational technology training, some research indicates the existence of certain flaws that may be present in such programs

such as an over-emphasis on teaching technical computer skills at the expense of teaching how to use educational technology as an instructional tool (Brinkerhoff, 2006; Matzen & Edmunds, 2007). It is important that educational leaders are cognizant of this notion so that they can work towards providing professional development opportunities that appropriately hone in on specific areas in which the staff is most in need and in areas that enhance curriculum and instruction with a focus on pedagogy.

Recognizing the Role of Technology. One of the more significant, big picture notions identified in this study is that educational leaders must recognize the appropriate role of technology in education. The results from this study consistently present evidence to support the notion that the appropriate role of technology is that it is used as a resource and tool and is not something that replaces instruction. The rationale for implementing technology in education must be grounded in pedagogy. This ideal is closely related to the theoretical framework of this study and the assertion that constructivism is an appropriate lens by which to view the implementation of educational technology. Jonassen (2000) describes this by explaining the importance of educators moving from a "technology-as-teacher to technology-as-partner" mentality (p. 8). Jonassen's (2006) Mindtools philosophy is dedicated to providing educators with specific examples of how computer technology, specifically with software programs, can be used in ways that enhance teaching and instruction

Our capacity as educators to understand this role and thus apply it to the technology implementation process is contingent on our personal experiences with

technology. As pointed out by the principals in this study, those who have grown up and have an established schema with the use of technology may have an innate talent and knack for understanding how to use new technologies, but that does not necessarily mean that they understand the value of technology as an educational resource and as a tool in a professional educational setting. Educational leaders must be aware of when this is the case and act accordingly in their approach to mentoring and leadership.

Prensky's (2001) notion of the digital native versus the digital immigrant is one that has an impact on teaching and instruction. The potential for disparity is present when teachers who are digital immigrants and have had to learn technology as adults are instructing students who are digital natives who may possess more technical knowledge and a greater technological skill set than their teachers. Leadership, professional development, and teacher preparation can address these concerns by challenging teachers to improve by using technology in ways that shift their existing practice into one that utilizes technology in ways that enhance instruction (Matzen & Edmunds, 2007). Alternatively, my observation is that progress in addressing this concern is somewhat slowed and perhaps even skewed in that it is a problem that is slowly diminishing in classrooms as more digital immigrants retire and leave the field while more digital natives enter the profession.

The Digital Divide and Educational Technology Leadership. The ideology of the digital divide has an impact on educational technology leadership, specifically when considering factors that may influence the decision making that is involved in the

technology implementation process. The impact of the digital divide as it relates to the first research question and the role of leadership is that decisions must consider digital equity and the responsibility of leaders to work towards providing students with more than fundamental typing and user skills. Digital equity demands that educational leaders plan for technology implementation that design programs that teach students how to research and disseminate information as well as how to use data and information in ways that will being them opportunity and advantage. As explained by Mr. Robles in Chapter 4, meeting this responsibility begins with addressing the ideal of digital equity and the digital divide in a school's mission, vision, and plan so that it can be present and influential in the decision making of the technology implementation process. The staff at St. Mary's took this approach and were cognizant of digital equity throughout their junior high's transition to becoming a technology academy. As a result, decision making supported the adoption of open source software so that students could utilize critical software programs needed to enhance their skills both at school and at home without being hindered by cost.

Research Question 2

How are computer based technology initiatives implemented in three Catholic schools in ways that foster a culture that promotes a supportive disposition towards educational technology? This question focuses specifically on the implementation process in three Catholic elementary schools and on the evaluation of planning, processes, and actions taken with technology integration at the schools.

Vision, Mission, and Planning. The investigation of the three Catholic elementary schools in this study revealed that the first and most important step towards implementing technology in ways that foster a technological culture is the need to establish a suitable vision, mission, and plan. The establishment of a proper vision, mission, and plan serves as the starting point of the educational technology implementation process and becomes the main mechanism that allows educational leaders to promote a supportive disposition towards educational technology. Evaluation of the establishment of the mission, vision, and plan at the three schools offers a unique point of discussion for each.

St. Anthony's school has a high socio-economic status and the community generally possesses a significant amount of resources compared with the other two schools in this study. The availability of considerable financial resources allowed the administration of the school (prior to the principal interviewed in this study who was new to the position at the school at the time of the interview) to purchase three mobile laptop carts each housing 18 computers. Because the money was available and because the community had a strong interest in integrating technology into the school, the acquisition and implementation of these carts happened quickly and certainly without a formal written plan or review by a technology committee. My assessment of this process is that this approach was counter-productive and that it worked against the school. This is because the current administration voiced frustration about the lack of consistent use of the carts as well as a lack of agreement or direction on the part of the staff in how to use the carts. What worked against the school was that their financial resources allowed them to acquire the technology without forcing them to think it through. On the contrary, in

schools where the finances need to be acquired before the hardware, a plan is almost inevitable. Consider the following example of how this process was inefficient. When approached with questions about vision, mission, planning, and a technology committee during the interview, the principal and computer teacher almost immediately began to speak about how to fix problems that already exist rather than discussing how their plan came to fruition. This example is very closely related to the notion of double loop learning and learning by doing as proposed in Chapter 2 (Argyris, 1990; DuFour et. al, 2006). Double loop learning, or the ability to solve the source of a problem versus applying a band-aid to a recurring obstacle, cannot be accomplished without establishing a vision, mission, and plan for desired outcomes.

St. Mary's school was truly an exemplary model of how to efficiently lead and implement technology in education as evidenced throughout the data collection process. The entire community took ownership of establishing a vision, mission, and plan and they saw to it that all of the stakeholders were seen as partners. Compared with the other schools in this study, St. Mary's school was the most successful in terms of establishing a technological culture that was supported by the entire community. Thus, it was not surprising that the only school that had an established mission, vision, and plan regarding educational technology implementation had established by far the most successfully supported technological culture.

In contrast to the success seen at St. Mary's, the absence of any kind of vision, mission, or plan at St. Peter's is indicative of their lack of technology prior to the arrival of the school's most recent principal. When the new administration of the school was first

contacted and asked about participating in this study, Mr. Sherlock was confident in being able to provide evidence of the school's vision, mission, and plan. Unfortunately, he quickly discovered that evidence of a formal plan having to do with technology was missing from any relevant documentation. Even the mention of technology in the school's most recent WASC report was shallow, generic, and difficult to use as a stepping stone from which to build upon the school's implementation progress.

Assessing Obstacles of Educational Technology Implementation. Any school that undergoes the educational technology implementation process will certainly face challenges and obstacles that are unique to their community. Schools can learn invaluable lessons from evaluating the challenges and obstacles faced by others in an effort to be better prepared for integrating educational technology. Evaluation of the results from Chapter 4 contend that there is a keen difference between preparing for predictable challenges and obstacles of which the community is already aware and those that are unforeseen and unanticipated.

The obstacles faced at St. Anthony's indicate that the school was challenged by learning how use the educational technology that was already acquired and set in place at the school. The administration that was in place prior to the school year in which this study was conducted had acquired mobile laptop carts but neglected to define the use and purpose of these mobile computer labs within the school's vision, mission, and plan. In addition, that administration failed to provide professional development, teacher training, or any clear direction or guidance as to how the mobile labs should be used to benefit

teaching and instruction. Instead, the directive to use the mobile carts was perceived by the faculty and staff as an added responsibility that was not connected to their current instruction. They felt as though the mobile laptop carts needed to be utilized simply for the sake of not wasting valuable use of such an impressive resource. Key faculty members were in fact able to make use of the labs in ways benefited teaching and instruction, however, there was no cohesion or consistency with those uses in each and every grade level.

The administration at St. Mary's school was diligent in formulating a vision, mission, and plan that thoughtfully considered the use and purpose of educational technology in the school. The challenge that they faced was in acquiring the resources to replace the existing dormant technology and putting that new, more relevant technology into place. The principal commented that, "We had technology in the classroom but it wasn't being used. It wasn't being used because the infrastructure wasn't adequate and the teachers were frustrated by it so they just ignored it." Not only did they need to acquire resources for technology, they also needed to break down the existing negative culture associated with the presence of dormant and unused educational technology. St. Mary's is certainly not the only school to experience such a plight and I contend that this is perhaps one of the more common experiences of schools that are reassessing the need to implement educational technology into their school. As indicated by Liu and Huang (2005), teacher attitudes and beliefs about the use of educational technology often present significant barriers to progress. Such is a clear sign and indicator that culture needs to be

addressed at the school in order to promote a supportive disposition towards educational technology.

The new principal at St. Peter's school is faced with the mammoth task of designing an implementation program for educational technology from the ground up. A key consideration is that the school's status as a low SES community, enrollment concerns, and financial challenges prevent the technology implementation process from making the top of the priority list. The principal does however recognize that the school's success is in some way measured by their ability to utilize educational technology to teaching and instruction. His efforts to bring in computers and rebuild the computer lab, to install wireless internet access points throughout the school, and to begin to cultivate a technological culture are important steps in the implementation process. Unfortunately, research shows that such an approach of do now, plan later is counter-productive to fostering a technological culture that is self sustaining (Argyris, 1990; Coghlan & Brannick, 2001). As described in Chapter 2, neither planning nor doing are effective without the checking, acting, and adjusting (DuFour et al., 2006).

Fostering a Technological Culture. A key aspect in fostering a technological culture that promotes a supportive disposition towards educational technology is the idea that technology implementation needs to be perceived as having tangible value. The results from Chapter 4 contend that parents will support the culture when they know that technological resources are being used in ways that will directly benefit their children. Teachers and faculty will support the culture when they know that the effort, energy, and

time placed into learning and utilizing technological resources are worth their while and that they compliment curriculum and pedagogy. The mechanisms that hold these cultural aspects together are a common and consistent vision, collaboration, and partnership with all stakeholders (DuFour et. al., 2006; Sanders, 2006; Wayman & Stringfield, 2006).

Another imperative aspect of establishing a technological culture is seen in the transformation process in going from doing to being. Transformative leadership can nurture this perception and reality among all stakeholders through a strong focus on purpose and followership (Evans, 1996). Culture becomes actualized when an institution shifts from the perception that individuals will embrace a technological culture to the reality that the individuals in that institution are in fact thriving within a technological culture.

Data collected in this study confirms the notion that a leader's ability to foster a new culture is significantly related to a grass roots leadership style that is personal, easily accessible, and adaptable (Hargreaves & Fink, 2006). The implementation, integration, and use of new educational technology initiatives are accompanied with an often challenging learning curve for administrators and leaders. Hargreaves and Fink stated that "technology that ignores the human factor and that disregards the natural principals of emergent design diverts precious energy away from the business of teaching and learning" (p. 264). This human factor requires leaders to be cognizant of sensitivity, collaboration, ownership, and empowerment when implementing and integrating new technology systems in education.

Finally, educational leaders can measure the success of a technological culture by how well the individuals within that institution can adapt to forever being in the midst of technological change. This is accomplished when leaders focus on preparing teachers, parents, and students for using any technology as a tool and resource rather than as a replacement for education and instruction. The opposite occurs when leaders prepare teachers, parents, and students to use a specific technology, which often results in failure when that technology eventually becomes obsolete.

Managing and Maintaining the Implementation of Technology. The ability to provide proper maintenance and upkeep of computer systems, networks, and computer based hardware and software is an absolute non-negotiable in being able to sustain educational technology in a school. Observation and evaluation of the maintenance and upkeep process at the three schools in this study revealed that having a paid position on staff to handle these responsibilities, whether in the form of a school employee or an outside company, is much more efficient that assigning these responsibilities to a community volunteer or than adding them on top of the already overwhelming responsibilities of a principal. Interestingly, it appears that the administration's ability to provide such maintenance is directly related to the socio-economic status of each school. St. Anthony's school, which has the highest SES in this study, has the financial resources to hire an outside company to handle all technology maintenance, upgrades, and upkeep. The services of this outside company are in addition to having a computer teacher who also acts as a technology coordinator at the school. Review of an invoice revealed that

several thousands of dollars are spent each year in having the systems maintained by this outside company. St. Mary's, the middle SES school in this study, has a paid position on the staff titled as a network administrator. Mr. Robles is not a computer teacher and his responsibilities solely revolve around maintaining computer based technology at the school. St. Peter's, the school with the lowest SES in this study, does not have a formal position to handle upkeep of educational technology at the school. As a result, the principal does what he can when he can with the occasional help of parents or community volunteers when they have the knowledge and skill to lend a hand.

The Digital Divide and the Implementation of Educational Technology. Not surprisingly, this study revealed a great disparity of access to computer based technology between the communities of St. Anthony's, St. Mary's, and St. Peter's. Some students at St. Anthony's were reported to have more than one cell phone and pocket electronic device while some families at St. Peter's had no computer and thus no internet access in their home. My perception of St. Anthony's from the site observations was that even the layout, space for storage, work space, and amenities of the classrooms spoke of how the community was privileged. In contrast, the computers, space, and amenities of the other two schools were much more humble. Other evidence of the digital divide was seen in the quality of the computers being used in each of the three schools. St. Anthony's had new, high powered laptop computers, St. Mary's had mid-powered desktop machines that were several years old, and St. Peter's had very low powered desktop computers, some of which were over a decade old.

As indicated in Chapter 2, the review of literature discussing the digital divide first defined the concept as issues of access to computer based technology. As awareness and consideration of the digital divide became more and more popularized in the 1990's and 2000's, this discussion was broadened to include more social justice issues of race, gender, and global considerations (Bolt & Crawford, 2000; Hoffman, Novak, & Schlosser, 2001; Norris, 2001). Today the discussion of the digital divide is much less about access to computer hardware and much more about access to information and about how to empower students with the knowledge of how to use that information to one's advantage in today's world (Thomas, 2008). Evaluation of the results from Chapter 4 concur that today's educational leaders have the responsibility of ensuring that decision making in the educational technology implementation process goes beyond simply acquiring computer hardware. It is imperative that the implementation of educational technology ultimately assists students with learning how to acquire and make use of meaningful information. The distinction between defining the digital divide as access to hardware versus ability to use information to one's advantage has significant implications for student achievement. Future studies investigating the leadership and implementation of educational technology may benefit from studying and measuring student access and ability to use and disseminate meaningful information and its effect on student performance.

Conclusions

The purpose of this study was to evaluate two important aspects of educational technology: leadership and implementation. The research conducted in this study aimed to assess three aspects of leadership as it relates to educational technology: leadership that supports the technology implementation process, leadership that supports the change associated implementing technology, and leadership that supports a culture that embraces technology. In addition, the purpose of this study was to evaluate the process, procedures, and actions of implementing educational technology at three Catholic elementary schools in ways that foster a culture that promotes a supportive disposition towards educational technology.

Several conclusions can be made from the discussion of results of the research methodologies of this study. Foremost, leadership styles and practices that support the adaptation to change and a culture that can embrace technology are vital to the educational technology implementation process. This study confirms research from prior studies that contend that partnership, collaboration, and ownership from all stakeholders are essential conditions in being able to cultivate change and sustain a culture that embraces technology. Evidence of this notion was present in the interviews, document reviews, and site observations at each school.

Qualities of effective educational technology leaders can be identified and clearly defined. The interviews and site observations confirmed that role-modeling and leading by example, providing support to staff, and exhibiting positivity in the face of change are all categories of leadership practices identified in this study that compliment educational

technology implementation. The leaders in this study achieved measurable success in the implementation of technology at their schools because of their willingness to embrace the learning curve where they did not have the necessary technology skills or knowledge to move forward. Although a leader who possesses strong technological knowledge and skills may have a stronger ability to be able to lead educational technology in a school, a leader without such technological talents can utilize the aforementioned leadership practices with similar success and results. Evidence of the above notion was seen in the interviews and site observations at each of the three schools.

Professional development is an integral aspect of the technology implementation process and is vital to sustaining change and a technological culture in a school. Professional development must be purposeful, structured, and must not be limited to a single afternoon activity that is not revisited or followed up on consistently. Because of the fact that educators come into the profession with varying technological knowledge and varying skills learned in different teacher preparation programs at the university level, educational leaders must plan professional development that is most needed for both the staff and the specific applications of technology integration in the school.

The idea that technology is a resource that is meant to enhance rather than replace teaching and instruction is perhaps the most critical piece of data taken from this study. This study clearly confirms this ideal brought forth in previous research (Cuban, 2001; Jonassen, 2006; Jonassen, Peck, & Wilson, 1999). Interviews and document reviews revealed that this philosophy was ardently present and made aware in the schools evaluated in this study.

The establishment of a vision, mission, and plan is another nonnegotiable, essential condition of the educational technology implementation process. Evans (1996) described the importance of clarity and vision and the ideal that "a shared vision is crucial to innovation, because it helps make organizational membership and work itself meaningful and thus inspires followership" (p. 207). Two of the three schools in this study did not have an established vision, mission, or plan for education technology and the efforts to integrate technology at those schools were met with progress stopping challenges and obstacles. The one school that did have a clear vision, mission, and plan is exemplary in the ways in which technology has been integrated and in which a technological culture has been fostered and cultivated at the school.

This study confirmed that the implementation process fosters a technological culture in ways that promote a supportive disposition to technology when the vision, mission, and plan begin to come to fruition. A supportive disposition towards technology was evident at the three schools in this study through interviews, document reviews, and site observations. This was seen as each community exhibited evidence of adapting to change, collaborating with all stakeholders, and using technology to strengthen pedagogy.

Without properly managing and maintaining technology, it is very likely that the computers, hardware, and software at the school will slowly gravitate towards neglect, obsolescence, and disregard which equate to wasted dollars, time, effort and energy. Site observations and interviews reveal that the two schools in this study that more rigorously integrate and utilize technology have an established means of maintaining technology at

the school. The school that does not have an established means of maintaining technology showed evidence of a more significant amount of setbacks and challenges in the technology implementation process.

The data from the interviews, document reviews, and site observations reveal that the ideology of the digital divide is profusely present in each of the three schools evaluated in this study. The data from this study confirms previous research that today's concerns regarding the digital divide are less focused on access to hardware and more focused on teaching students how to make use of information in ways that lead to advancement and advantage in today's society. This social justice issue represents a significant responsibility of educational leaders to consider such concerns in planning, carrying out, and making decisions throughout the technology implementation process.

Implications

The results of this study confirm that the implementation of educational technology is significantly impacted by a leader's ability to support change and foster a technological culture. The process of implementing educational technology into schools is one that requires a vision, mission, and plan. In addition to planning, the change and culture associated with new educational technology at a school must be supported with professional development and proper maintenance of technology and computer systems.

This study contributes to the field of education a description of effective leadership qualities that support the implementation process. It also contributes information that can assist educators and administrators in preparing for challenges and

obstacles with the integration of technology as well as information that can assist with avoiding mistakes and missteps. This study also contributes examples of efficiency regarding planning, professional development, adapting to change, fostering a technological culture, maintaining computer systems, and considering the impact of the digital divide.

In terms of computer and network maintenance, the implication for educational leaders is that as educational technology becomes more and more integrated into schools and classrooms, administrators and principals must consider the notion of hiring a technology position that can take on the responsibilities of network administrator and technology coordinator. An aspect of this notion that was not considered in this study is the degree to which principals and administrators are prepared and trained to be able to fill such positions. If an administrator does not possess a strong technological skill set they may be challenged with knowing how to choose an individual to be able to maintain technology in the school. Guidance and direction from further research or the diocese may be needed to fulfill this need in schools.

The study also confirmed presumptions of the digital divide in that an unequal and unbalanced allocation of financial recourses and access to technology was clearly evident in the three schools. Educational leaders would benefit from putting into practice a record keeping system, similar to the CALPADS data system that was described in Chapter 1, that documents updated statistics regarding technology access, acquisition, and usage in schools so that these resources can be more equally distributed and perhaps even shared within a diocese or district. Another implication regarding the digital divide

relates to maintenance and upkeep of educational technology in that the high cost of the maintenance process prohibits schools with a lower SES from acquiring such a position on the staff. It is suggested that schools, dioceses, and districts consider this social injustice and investigate a system by which several schools could share the cost of this resource while at the same time provide this benefit not only to their school but to other schools as well. Sharing the cost of the contract or services for an individual or company to maintain technology at a school is an example of how this issue can be addressed.

The US Department of Education's National Technology Plan and NCLB call for the implementation of data systems so that educators can streamline decision making in closing the achievement gap. Although higher socio-economic schools have a considerable head start on lower socio-economic schools in initiating this process, federal programs are becoming more proficient in assisting those in need and making funds available to integrate technology in school systems (Guthrie, 2007). The potential result of this objective is clear. If all schools at every educational level kept organized tracking records of student data, and if that data was implemented in a system that could be shared among the many different public and private educational systems from preschool to graduate school, that information would be the equivalent of the education holy grail. The information would be invaluable in terms of how it could guide educational leaders in making significant strides in the educational process of American schools. As school systems continue to improve upon the integration of educational data systems, it is imperative that a set of procedural guidelines be developed and endorsed and that these systems foster continuity and assimilation so that student records can be as useable as

possible. Discussion of a student data record keeping system is pertinent to this study in that schools must have the technological implementation and culture in place to be able to benefit from and utilize such a system.

Recommendations

Analysis of the data from this study leads to several recommendations for further research. First, the research methodology used in this study would have been enhanced through the use of an instrument that could quantify teacher attitudes and beliefs about educational technology. It would have been interesting to see the results from a survey questionnaire designed to measure teacher attitudes and beliefs and evaluate whether or not those results concur with the effectiveness of leadership styles and practices described in this study. In addition, a questionnaire could include a measurement of attitudes and beliefs about teacher preparation received both in university programs and through schools. This information could be used to evaluate the development and choice of professional development opportunities designed for ways in which educational technology can strengthen pedagogy.

Future researchers who conduct a similar study may want to consider interviews with teachers and faculty in addition to those with administrators and those in charge of technology at the schools. Information gathered directly from speaking to teachers and faculty about their use of educational technology could enhance the data collected in this study regarding adapting to change and fostering a technological culture. Such data could be instrumental in a leader's ability to adopt participatory leadership in promoting

collaboration and ownership in the process of cultivating change and culture in a school (Evans, 1996).

Future research can also include investigation of more school sites and consider broadening the scope of this study to include public schools. A primary reason for this consideration is to evaluate data collected regarding the digital divide and to gain a more accurate measurement of distinguishing between haves and have-nots as it pertains to access to both computer hardware and information. Knowledge of student access to technology and use of technology at the home could enhance a teacher's and administrator's ability to compensate and better utilize technology for curriculum and instruction in the classroom.

It would be interesting to discern any difference in the results of this study if it were conducted at the high school level. Previous research indicates that the use of educational technology in secondary education differs from that of elementary education in that it is used in more specific applications (Cuban, 2001; Jonassen, 2006). A similar study conducted at high schools may reveal further unique factors regarding the implementation, change, and culture associated with educational technology and whether or not the educational technology implementation process is more or less complex in secondary education.

Future research may want to focus on the investigation of university teacher preparation programs, leadership preparation programs, and the degree to which educators are prepared to embrace, utilize, and implement technology. The California Professional Standards for Educational Leaders (CPSEL) is a document released by the

Association of California School Administrators and serves as an appropriate lens through which university programs can be evaluated. The CPSEL's reference a leader's ability to initiate change, transform culture, and collaborate with all stakeholders, each of which are aspects that are integral to this study.

Another area for future research is that of educational technology and policy making. Educational technology continues to present new and unique challenges for educators in the areas of budgets, digital ethics and citizenship, academic honesty and copyright law, and the facilitation and management of private student records. Educators will depend on the continuing development of policy that guides and protects students, parents, teachers, and administrators as we continue to face such challenges.

It is suggested that a similar study be applied to the design of a longitudinal study to be able to evaluate the entire educational technology implementation process. This study conducted research during and after the educational technology implementation process and reviewed factors such as leadership, change, and culture after they were experienced at the school. It would be interesting to evaluate a longitudinal study that monitors the entire implementation process from the very beginning. It may take several years to examine the following: the establishment of a vision, mission, and plan, the acquisition of funds, the acquisition of computer based technology and hardware, the process of preparing the physical school site and installing computer based technology and hardware, the design and implementation of professional development, the maintenance of computer systems, and the ability to monitor for a minimum of one year

the outcomes of educational technology implementation as they relate to the dynamics of change and technological culture at the school.

Ultimately, more research needs to investigate the plans and procedures that are being utilized in leading and implementing computer based technology in American schools. There is room for improvement at the federal, state, and diocesan level in endorsing a document that can provide assistance to educational leaders in the form of guidelines for integrating technology into schools. Such a document can improve upon outlining and recommending specific strategies, steps, obstacles, and caveats of misappropriating funds, hardware, software, people, and procedures. School leaders must continue to strive for equality and justice in their leadership and implementation practices regarding computer based technology initiatives in education.

APPENDICES

Appendix A: Interview Questionnaire

Leadership for Educational Technology

1. Can you describe for me specific leadership principles and practices that you use to endorse educational technology with your staff, teaching and learning, and the daily operations of the school?
2. Why do you believe these practices are effective?
3. What are the qualities of effective technology leaders? How are these qualities exhibited in your school?

Computer Based Technology Implementation

4. Explain in detail the process for how technology planning and decisions are put into practice in your school community.
5. Can you describe for me some of the obstacles that you have perceived in implementing technology in your school?

Technological Culture

6. Describe the technology culture in your school. How was this culture developed?
7. How do teachers use technology for teaching and learning?
8. Describe for me any policies and practices at your school that foster a culture that supports and embraces educational technology?

Leadership and Change Associated with Technology Implementation

9. Describe for me any policies and practices that promote a supportive disposition towards the change associated with educational technology.

Digital Divide

10. How do you ensure that computer based technology is distributed fairly and equitably throughout your school?
11. What role do you believe does technology play in promoting equity in society?
12. How does your school ensure that your students are prepared to use technology in ways that would better their lives?

Appendix B: Observation Protocol

Research Question Themes	Observed									
	Computer Lab			Classroom Lesson that Utilizes Educational Technology as a Resource Tool			Technology Committee Meeting	Tour of School
	Primary	Intermediate	Junior High	Primary	Intermediate	Junior High		
Leadership for Educational Technology								
Computer Based Technology Implementation								
Technological Culture								
Leadership and Change Associated with Technology Implementation								
Digital Divide								

Appendix C: Document Review Protocol

	Documents Reviewed						
Research Question Themes	WASC Narrative	Technology Plan	Technology Budget	Professional Development	Technology Job Description	Technology Committee Meeting Minutes
Leadership for Educational Technology						
Computer Based Technology Implementation						
Technological Culture						
Leadership and Change Associated with Technology Implementation						
Digital Divide						

Appendix D: IRB Consent Form

Loyola Marymount University
Educational Technology: Leadership and Implementation

1) I hereby authorize Anthony J. Galla, M.A. to include me in the following research study: Educational Technology: Leadership and Implementation.

2) I have been asked to participate in a research project which is designed to investigate educational technology leadership and implementation practices and which will last for approximately six months.

3) It has been explained to me that the reason for my inclusion in this project is because I am a Catholic school principal or technology administrator responsible in some way for educational technology leadership and implementation at my school.

4) I understand that if I am a subject, I will participate by answering interview questions, I will be observed in my role and position at the school, and I will assist in gathering specific educational technology documents at the school to be reviewed for the study.

   The investigator will observe me in one or more of the following:

   1. one primary, one intermediate, and one junior high level computer class in the computer lab (the educational objective will cover fundamental computing skills)
   2. one primary, one intermediate, and one junior high class in a homeroom that utilizes educational technology as a prominent tool for instruction (the educational objective will cover core curriculum in one of the main subject areas)
   3. one technology committee meeting
   4. one tour of the school from the administration and office staff to view the various uses of computer based technology in the management of the school, recording keeping, and facilities maintenance.

   The investigator will also conduct interviews and will analyze and review the following documents: accreditation narratives, technology plans, technology budgets, professional development records for educational technology, technology position job descriptions, and technology committee meeting records and minutes.

   These procedures have been explained to me by Anthony J. Galla, M.A.

5) I understand that I will be videotaped, audiotaped and/or photographed in the process of these research procedures. It has been explained to me that these tapes will be used for teaching and/or research purposes only and that my identity will not be disclosed. I understand that I have the right to review the tapes made as part of the study to determine whether they should be edited or erased in whole or in part. I agree that the tapes shall be retained for research and/or teaching purposes for an indefinite time.

6) I understand that the study described above may involve the following risks and/or discomforts: the research may illuminate educational technology leadership and implementation practices that can be improved upon by myself or my school.

7) I also understand that the possible benefits of the study are to assist in creating a set of guidelines that can illuminate sound educational technology leadership and implementation practices that can be shared within the field of education.

8) I understand that Anthony J. Galla, who can be reached at (818) 203-7351 or tgalla@stfrancisds.org, will answer any questions I may have at any time concerning details of the procedures performed as part of this study.

9) If the study design or the use of the information is to be changed, I will be so informed and my consent reobtained.

10) I understand that I have the right to refuse to participate in, or to withdraw from this research at any time without prejudice of any kind.

11) I understand that circumstances may arise which might cause the investigator to terminate my participation before the completion of the study.

12) I understand that no information that identifies me will be released without my separate consent except as specifically required by law.

13) I understand that I have the right to refuse to answer any question that I may not wish to answer.

14) Some of the information with which I will be provided may be ambiguous, or inaccurate. However, I will be informed of any inaccuracies following my participation in this study.

15) I understand that in the event of research related injury, compensation and medical treatment are not provided by Loyola Marymount University.

16) I understand that if I have any further questions, comments, or concerns about the study or the informed consent process, I may contact John Carfora, Ed.D. Chair, Institutional Review Board, 1 LMU Drive, Suite 3000, Loyola Marymount University, Los Angeles CA 90045-2659 (310) 338-4599, John.Carfora@lmu.edu.

17) In signing this consent form, I acknowledge receipt of a copy of this form.

18) Subject's Signature_____ Date _____

Date_____
Witness_____

Appendix E: St. Anthony's Interview

Principal: Mrs. Land
Computer Teacher: Ms. Borris

00:00:00 …all be edited notes. And I'll give you a copy of it so that you know.

00:00:04 Okay.

00:00:05 But thank you. And so you, you took the questions and you wrote something out, you're amazing!

00:00:09 Well, you know I did because, at first I said, "I didn't quite understand the leadership aspect of it." Because basically [Mrs. Borris] is the computer person and she's in charge of the lab. And I thought, I mean, I kind of said, all right, there's encouragement. I worked with [Mrs. Borris] last year. Basically, we really got the program for early literacy lab. And I was in the lab most mornings. In the lab last year, realizing the importance of that. But I guess it's along supporting the teachers. Encouraging them. Basically, [Mrs. Borris'] job is working with the early literacy lab and then working with the junior high, in kind of a problematic situation that we inherited with regard to taking the junior high out of the lab. And giving them mobile labs and turning the whole technology program over to the teachers. And so—

00:00:11 That sounds like an extensive process.

00:00:13 It was an extensive process, and part of the problem was, Tony, there was no back up for the teachers. Or technology training or in service training, or any kind of professional development to go with this. They were just told, "Use these labs now, in your room. This is your computer."

00:01:29 Can we start there? Can you tell us—?

00:01:30 Sure.

00:01:31 –a little bit about, what you mean by, "Pulling the junior high out of the lab and creating" – tell me about this whole process if you would.

00:01:38 Okay, she decided, the former principal decided, that she did not want me teaching the junior high, that she wanted the teachers to do it. So she decided that I would no longer give grades. And the teachers would do the teaching. What she didn't plan on was the teachers didn't know. And when she bought the computers she put Office 2007 on them and no one knew how to use it! And I was to have nothing to do with it. And she came back and said, "Well, do you know how to do it?" And I said, "Well, yeah. It's kind of my job to know this stuff!" Right? And so, I went in to try and teach them to use

Office 2007, Word and Excel. I gave them 30 minutes a week thinking, kept thinking nothing. And even the kids would come and say, "Oh, [Mrs. Smith] Why can't we come to your lab?" And I'd say, "Because I don't have any room for you! I don't have enough time!" And so—

00:02:27 By the way, the 30 minutes a week, is it a specific computer allocation? Or is it part of language arts? Or part of a –

00:02:32 I don't know. I think it goes to language arts.

00:02:35 It goes to language arts in the homeroom.

00:02:37 Okay, so in their schedule, it's their homeroom hour?

00:02:40 It's their homeroom hour.

00:02:42 It's going for thirty minutes so by the time we get the laptops out and bring in the second cart I'm lucky if I get the thirty minutes, and get them to work by the way! With the wireless.

00:02:53 And I wrote all that down.

00:02:55 The wireless is like [talking over each other] …with the wireless, because they're all trying to log on at the same time, and it takes 10 minutes to get it going, so we've lost –

00:03:03 So where were they before? Do you indicate—?

00:03:05 I have them an hour a week.

00:03:08 In a different location on campus?

00:03:09 In the lab—

00:03:10 In the lab.

00:03:11 …with me. And there they would use the Word processor and they got vocabulary. They got tested. They had more of a learning situation so they would know about technology. Not just that, "Oh I can get to the internet. I can do this. I can do that." Well, how do you know that's a reputable site? Things like that. Well, they don't get that anymore. And it's nothing bad to say about the teachers, they just don't know it. And so, I tried giving a test, and I was told, "Well, you don't give a grade, so what does it matter?" And the kids have picked that up they're very astute.

00:03:43 Sure.

00:03:44 “Well, I don’t have to do this.” You’re like, okay.

00:03:45 Right.

00:03:46 And I just feel that I’m being cheated in teaching them. And I feel the kids are being cheated in this way. And there’s no way for me to correct that now. I mean, [Mrs. Land] and I will talk about that, but it’s hard. It’s hard for me to go in there and not have the laptops working. Because I’m trying to teach and we have a 30-minute frame. It’s not very much time.

00:04:08 Well, is, in your future, do you see the teachers being more of the facilitators of those mobile labs?

00:04:16 I’m seeing that the teachers have to teach, and when are they going to have time to do that? And there’s so many, the minutes are horrendous for these teachers. To teach literature and religion and history. When are they supposed to fit this into their schedule? You know?

00:04:30 And I think Tony that you might see is that I had each teacher fill out a sheet. I wrote a note telling them that you were coming and asked them to say how actually they were incorporating any technology in their classroom, or if they were just using the lab. And each teacher did that. You’re going to see that there are some teachers, for example our 6th grade teacher, that they use the mobile labs in their classrooms for instruction. And they itemized what they do, that’s in the back. So they have tried, and some of them do work with [Mrs. Borris]. For example, they work on reports together. So there is some kind of collaboration. It’s just that it wasn’t really planned, you know what I’m saying?

00:05:11 Okay.

00:05:12 There was no planning or implementation. The labs were just put into the classrooms. So it’s been kind of a year where, even last year, where they were just kind of, “Use the labs!” So they were kind of trying to find things by going on the internet and looking up things. Because there was no, there was absolutely no—the vision may have been there. But the implementation for this vision was not given. So that’s kind of one of the obstacles that they’re facing. But they have, in some way, come up with certain things that they are doing, you know, 5th, 6th, 7th and 8th. Basically, I would say for 7th and 8th it’s basically [Mrs. Borris’] instruction. And them saying that, like the 7th grade doing PowerPoint.

00:05:59 Well, I just did what they –all 6th, 7th and 8th have a science fair coming up and they have to know how to use the MLA format. So I just made, I was told, a cheat sheet. I shouldn’t use that word! “Well here’s a cheat sheet. This is how we’re going to do it and

we'll practice doing it so get your heading paragraph." And that's what I did, I gave them step by step how to do that. Because a lot of the children don't have 2007 at home. They have 2003 and they don't know how to do it.

00:06:26 Yeah, that ribbon on the top is a little—

00:06:30 And so the kids they say to me, "Well I only have 2003." "Well, okay, I'll do one for you too."

00:06:37 Is it safe to assume that the majority of your parents and families have computers [there is talking over each other a couple of words are inaudible]

00:06:45 Oh yeah.

00:06:45 Yes. Everything.

00:06:46 But definitely. Because we've gone now to emailing instead of sending out papers. We've just gone to emailing things to the entire school. That type of thing.

00:06:57 So that's your primary means of communication?

00:06:59 Yes. Well, we still do the family envelopes. But between [Mrs. Borris] and another person in the lab for the Early Literacy, they input it all in the emails. So we're emailing the parents everything now.

00:07:10 Do you see in your children that they have the advantage of having other technological toys? Laptops, smart phones? Do you see a lot of that?

00:07:19 A lot of it. I mean, with our policy, cell phones are allowed but they have to be in the backpacks, they have to ask permission after school to use them—

00:07:29 Same policy?

00:07:30 Same –in the presence of an adult. Well, if not, the parents have to come and get them or the teachers take them. Well, they have other stuff if we take that away from them.

00:07:38 Interesting.

00:07:39 They—some of them have two of three things!

00:07:42 Well, some of them have more than one cell phone! Like hello!

00:07:44 Yes! Exactly! So, technologically, they have probably everything out there that's new and innovative. And they probably know how to use them. Like I picked up one and I had to go to the child and say, "Turn this off for me." I mean, how's that look! So, we have that expanse at this end where they're very technologically savvy. And then what we would like to do and what I can see, I think we teach the basic skills. But bringing in that into the new horizons of local society, and I wrote down some of the things we would like to do. You know, implementing projects that go beyond basic skills, and they're collaborating with one another and solving problems. And they're using creative abilities. That's where I think we need to go. And I think we're very limited because of time constraints. I think I put that down.

00:08:44 Yes.

00:08:45 So we need to do something to adjust that.

00:08:48 Well. I'll share with you, just for your information. I do usually teach at a high school during the summer to make a little extra income. And I do a computer course, various computer courses. And what I'm finding is that it's very common for schools, when they're making the decision about spending the money and either investing in a computer lab versus the classroom of the future being in the actual classroom. The concept of going to the computer lab is kind of going by the way side. Which poses very interesting ramifications for the computer instructor. They seem to be becoming more of a network administrator than an actual teaching instructor. And so I see a lot of evidence of that at a lot of different schools. And so what you're commenting on, at least in the research that I'm doing is right in line. Some schools are just moving forward without thinking of things like professional development and without thinking of the logistics of the layout. And the time constraints and the proper training and things like that. So, just to recap, can you summarize for me what the specific challenges were about not being able to just go use that? What's stopping you from using that cart like this really great educational way where you're all logging on to the site? Or you're all synched together? What's stopping you from just immediately taking the laptop off the cart and just, boom. Lesson –

00:10:13 I think the biggest problem is getting them to start up! I mean, just getting them logged on. They all have to log on. In our 7th grade we've got two wireless to the cart. And then, it's only 30 minutes so if the children don't come in until 1:00 or five to one, I'm there at 1:00. They're still pulling laptops out.

00:10:35 Where are they going when they "go there?" You mean they're not in their own classroom but they go to another place?

00:10:40 No, no. They're in their own classroom.
[Everyone talks over each other for a sentence or two.]

00:10:41 Oh, just meaning—

00:10:42 What happens is—

00:10:43 Yesterday was 8th grade. 11th to 8th grade we have one cart with 18 laptops. They pulled the cart from 7th grade in. We've got to pull the cart in, plug it in. By the time all that is finished, it's already after 1:00. Before they came right to the lab, the work was done. If the teacher had something she wanted to do, it was done in the lab. By going to the classroom I have to hook up the machine. Because it was already hooked up in my room I could start. The minute they walked in I could start. I can't do that. So the time frame is not there. And I feel like I'm just getting started and it's time to go. Sorry guys, I'm leaving.

00:11:23 My take on that question Tony is that I don't think that the teachers know all that is out there to lead them further. To using—how are we going to use it? How are you going to tie it in to this lesson? Say like you're teaching Social Studies. What's out there to tie in this lesson? To enhance this lesson? To get projects going? So, in other words, it stops at just the technical part of it. And looking stuff up on the internet. It seems to have halted with pushing it over and saying—in other words, we really need to see what other schools are doing as far as collaboration, and the teachers with Janet and with one another. To see how they can expand and go over that and get beyond just looking up stuff on the internet to write a paper. You know? What's out there? How are other schools going to really broaden their scope of using the technology that's there? And bringing it in, putting regards to using it?

00:12:31 Well, see that's what we do with 4th grade.

00:12:34 How so?

00:12:35 Well [Mrs. Smith] is the only teacher I could go to and say, "You know, I want to try something with your class. Do you care if I do this?" Well the children now have, in the last two years – I mean four, five years ago I would never have said, "Let's take the 4th graders and teach them PowerPoint." But yet I have these little babies coming in there that could give you a PowerPoint presentation that would really knock your socks off! They're pretty good! And they grasp it right away because they're young and their minds are like little sponges. So we do that. Lots of graphing. Different things given to graph. I was able to do all that with the 4th grade. And it makes me feel good because I'm teaching them something. And it makes the teacher feel good because she doesn't have to mess with that because she knows that I'm going to do that with them. So with [Mrs. Smith] it's worked well, really well.

00:13:22 Tony, I guess I'm saying, what's available out there that I could educate my teachers or have them take a class or take some kind of seminar? Or that we could all go to, just to see how things are being used at other schools, to get past just the basic skills?

00:13:42 Well I would tell you I would strongly recommend investigating [a specific teacher training program]. And it's a program that your staff will be certified in doing certain things. And it's done at different levels. And it begins with the very, very basic—your, I mean this in the right way—your perhaps, a little bit older teacher, who has no experience in keeping grades in a grading program or anything like that, really getting them used to using the computer. And then it goes to the next step to where you're using the computer for specific organization and administrative tasks as a teacher. Organizing your grades, organizing your lessons, and then implementing it where it would be the student use. It will teach you about blogging. It will make your teachers create a site and start blogging. It will give an example and walk it through. And it really does a great job step by step. And then it will certify your teachers. We have done it, a lot of schools have done it and had great success. It's an excellent tool and I would highly recommend checking it out.

00:14:48 Thanks.

00:14:49 I can send you some information on it as well.

00:14:50 Would you? I know that, I think [Mrs. Doe] got, our math teacher, I think she got, she's technology certified. And she uses a similar program.

00:15:02 Oh right, I noticed them in the—

00:15:03 Yes. And every teacher uses [a web based grading program]. We've had it, what is it? Are we in our second or third year?

00:15:09 Do you have parent access available yet?

00:15:11 Oh yes. Parents are accessed, yes.

00:15:13 Can you talk to me a little bit about the process involved in the teachers being comfortable to update it enough or frequently enough so that the parents could in fact look at accurate records?

00:15:26 Well, they do all that all the time.

00:15:28 Is there a mandate how often they have to do it?

00:15:30 They're putting grades in weekly. And basically the only time we shut it down is when we go into the grading period. We shut it down for the period of a week until the report cards come out.

00:15:39 Now does that mandate come from you? How do you know that the teachers are updating the grades?

00:15:44 Basically I go give me your progress report and I know right away. I go on, I have an administrative access to it. I go on just to check. They're putting in grades sometimes daily.

00:15:58 They're doing that to because the parents are looking at it.

00:16:01 The parents are looking at it. The parents are looking at it all the time. [Talking over each other]

00:16:03 Put a grade it—

00:16:04 The pressure comes—

00:16:05 And we have things on now, parents put certain things on now where if a child goes below a C they get a red alert right away when they go on. And we encourage the teachers to check it because the teachers, they are so good about it. I will say that. Every teacher is using it. Kindergarten went on to [this web based grading program] this time for their report card. That is one thing that—

00:16:25 That's a big step.

00:16:26 That's a big step.

00:16:27 It was quite a challenge for us as well. This is the first year for us, in Kindergarten. And first year using [the web based grading program] and my trouble is that the teachers aren't entering the grades frequently enough to where if I started the parents now, they wouldn't have accurate grades. Some of them don't upkeep it enough.

00:16:42 Well, we were going to just do it—we ended up doing it after the first trimester last year. And –

00:16:52 No, it was her last year, my first year.

00:16:53 So yeah, it's our second year. But honestly, that works great and the parents like it. They put alerts on after this thing drops down, just to see. **[00:17:01]Goes from a C to a B.**

00:17:02 I think it's worked out better than doing—before we had a very old program that we had for years.

00:17:07 What was that program?

00:17:08 [a software grading program]

00:17:09 Yes.

00:17:10 Okay, which I'm still using to keep track because I refuse to use a pencil and paper. So I know who's done what assignment, who hasn't –because they're not being graded. But I think it's because, and I think when they had [a web based grading program] I don't think it was as frequent. I could remember teachers saying, "Oh, I have a stack of papers to put into [a web based grading program]." Well, now they can't do that because the parents are going to be looking and the parents don't want to know that you haven't put grades in for three weeks! They don't care what else you got going.

00:17:37 Interesting that the parent is the actual catalyst!

00:17:40 Exactly!

00:17:41 Actually they are**.** Once this started, they know their child has a test, and they were calling. "Is that grade going to be on today?" I mean, these parents are so – and all this was explained Back to School Night. Every teacher explained the process. But I will say this, these teachers, and they are so good about emailing parents. I mean I can't even begin to tell you. The emails are out—

00:18:05 Well, also now, each teacher has their class list, or whatever class they teach. Like [Mrs. Doe] teaches English—

00:18:17 6^{th}, 7^{th} and 8^{th}.

00:18:18 6^{th}, 7^{th} and 8^{th} grade, so she has all those email addresses. So if she needs to send out something to the 6^{th} grade parents she just puts it in and she sends it.

00:18:26 That's great. Are you kind of the facilitator on staff monitoring [this web based grading program]?

00:18:30 Yes.

00:18:31 Yes, she's—

00:18:31 Well not [that grading program].

00:18:32 Oh, not [that grading program]?

00:18:33 I can, but [Mrs. Land] does that—

00:18:34 And honestly—

00:18:35 In terms of working with them – or is there really no contact? And it's all up and running?

00:18:39 They know how to do it.

00:18:40 They just know how to do it! And you know, basically, we talked about the frequency of using it. I have a junior high meeting every Tuesday with all the junior high teachers, and I'll say, "Right now, progress reports on –" they'll have a progress report right there for me. Every teacher, and they are so up to date. Like they do—Math, she puts it in daily. [A math teacher] they're putting grades in weekly and the parents are – and sometimes if the parents are happy – because the minute it's graded it goes right into [the program]. Because they know the parents—or they'll get an email, "Have you"— Because what happens if a child hasn't taken the test yet, they have to correct it so that it won't appear as a zero or whatever. But they're phenomenal. I mean Tony we've got by the end of the trimester, we have pages –

00:19:34 And the nice part about it is that you're just sitting down making the progress report. I mean we could do it in the other thing we had, [another software grading program], we could print out progress reports also. But this is just a piece of cake to them.

00:19:51 It's second nature to them now. We do attendance by [our current program]. Everything is in the office by 8:15, they just sit down and—

00:19:56 See, all of that is very progressive and not a lot of schools can say that they are that successful at using a web based grading program that's accessible to parents. I'm going to stop.

FIRST SEGMENT ENDS.

00:00:00 I want to respect your time. So I want to move forward with maybe a different concept here. Can you talk to me a little bit about the planning? Or the way that technology decisions are made? If you're going to invest money in something else, if you're going to upgrade? Who makes those suggestions? Do you have a committee? Do you have a process? What do you think?

00:00:20 Well, we used to have a technology committee, but that went by the way side. Although I still, and the dads would come in, honestly the dads did all the work for me.

But then it got to the point where, they were wonderful, they really were, and I shouldn't ---I'm not complaining—but a computer would go down and [a father], would leave work all the time, God bless him, because he worked close by. Well, finally they got wind of it and they made him check in and out. So he couldn't come whenever. If a server went down, or whatever. Now we have [a professional computer maintenance company]**.** And they're wonderful. I can pick up the phone and say, "This is wrong." They can fix it from their office sometimes. Just walk me through it if I'm really having a big problem. Or I accidentally, on the server, threw the printer in the trash!

00:01:04 Oh right, stuff like that will happen.

00:01:06 And [an IT professional] comes what—?

00:01:07 He comes once a week and he's here about 8:15 to 12:30 or 1:00.

00:01:12 Very discreetly, may I ask you a ballpark figure of what you might spend –

00:01:16 Are these your **pens** on here?

00:01:17 Yes, thank you. I brought extra?

00:01:19 Just checking

00:01:22 I'm just curious how much you would spend a month for an outside group to do that.

00:01:25 Yes, let me go over— [Inaudible talking over each other]

00:01:28 Everything they do is so—the dads put all the connections in – and you should have seen the wiring! I wanted to cry it was such a mess. It was so, and they did their best. So it wasn't what I wanted because I have a neat thing. And this guy came in, took a picture of it, and said, "Here's a before and after for you." I took one look and was like, "Wow!" And I said, "Look guys, it was nothing against you." And we have to ask for the parents that are really, really –

00:01:52 She's going to pull it for you.

00:01:53 Thank you. [Talking over each other]

00:01:54 They really work with us and they will do anything for us.

00:01:59 So you rely on some of the parent input and involvement?

00:02:01 [Talking over each other] for [the IT professional] to come.

00:02:03 And who is that individual?

00:02:04 He is a worker. He works with [the professional computer maintenance company].

00:02:06 Okay, understood.

00:02:08 And he just comes in and it was so funny because when I first decided that we were going to the **[00:02:14] XXXX** the owner of the company said, "Oh you can't do it that way." And I said, "Oh yes, I can." And he said, "He says you can't do that." And I said, **[00:02:22]" XXXXX** and he was wrong!" So it's worked out really well.

00:02:27 What type of internet connection do you have here at school, do you know?

00:02:31 Versus what?

00:02:32 Do you have a, I'm assuming you have a high-speed connection, but do you have a T1 line? Do you have—?

00:02:37 We can ask him.

00:02:38 Yes, he's here. You know what? I'll get him.

00:02:44 We're also hooked up with the parish so the whole plan is hooked up.

00:02:48 I see, do you share that bill with the parish? Or does the school pay their own?

00:02:51 No, we have our own school thing, but there is an archdiocese discount. Because I see it on the bills every now and then. We pay, I think we pay every other month that's why I had to pull it.

00:03:03 Thank you very much—

00:03:04 …wanted to give you a copy—

00:03:05 So when, so do you get hit up saying, "Hey, we need a new laptop for this teacher." Or, and so—

00:03:12 I did this year.

00:03:13 How do those situations get evaluated?

00:03:15 Well you know, basically, the math teacher—I had to buy four new laptops this year. Our math teacher, has been using hers for six years.

00:03:26 Wow.

00:03:27 And she's our technology expert, honestly.

00:03:29 What grade level is she at?

00:03:30 She teaches 6th, 7th and 8th grade level math only.

00:03:32 Okay, all right.

00:03:33 And she's over in the other building. That woman is incredible. She said, "I need a new laptop." And I knew that we had some monies but since I was new and just had to work on the budget—

00:03:45 Sure.

00:03:46 I just said, "Okay." She uses it daily. All my teachers have laptops they're up and running daily. They've got them on their thing and they're doing all kinds of things. So, all my junior high teachers have individual laptops. And so I bought [the math teacher] a new one and then somebody needed a new one in their classroom, because they have the classroom –

00:04:06 Okay

00:04:07 –computers in the lower grades. So I just went ahead and bought them. I figured it was—we ordered them.

00:04:14 It's definitely a wise investment!

00:04:18 And then basically the one crashed here in the office and that one was so old that I ordered a new one.

00:04:24 We can't seem to find [the IT professional].

00:04:25 That's okay.

00:04:27 Well, he's coming. I just called.

00:04:28 I just wanted to ask him about the type of connection. Do you have a computer in every classroom?

00:04:33 We have a teacher's computer in every classroom. And there are computers, banks, six computers in 1st grade, in Third grade—

00:04:42 No 4th.

00:04:43 Oh, pardon me—

00:04:44 There's two now.

00:04:45 Oh, there are two now? 1st, I'm sorry. They're in 1st, 4th, 5th doesn't have them they took them out, and 5th, 6th, 7th and 8th have the—

00:04:53 The mobile carts.

00:04:54 Have the mobile carts.

00:04:55 And 1st and 4th, how many are in there?

00:04:57 I think there's six in each.

00:04:59 And are the teacher's computers laptops or desktops?

00:05:01 They're laptops in 6th, well no, 6th has both because [a teacher] has her own laptop and she has a—

00:05:12 A desktop.

00:05:13 She has a desktop. 5th grade is desktop, 4th grade is desktop, 3rd grade is—

00:05:18 Third grade is laptop.

00:05:19 –is laptop. 2nd grade is laptop and desktop. Because she does a lot of technology so she has a laptop to take home. She does a lot of work with regard to Indepth and all that. And then desktop for 1st grade and desktop for Kindergarten. And then 6, 7—

00:05:37 7th and 8th have laptop—

00:05:38 –8 have laptops. Full time Spanish teacher has a laptop.

00:05:41 Okay.

00:05:58 Excellent. So do you ever have any issues with connection or sharing?

00:06:06 No, the problems we have had have been router, and we just replaced the router.

00:06:10 Okay.

00:06:11 The down time—

00:06:12 So do you feel like the teachers here can stream videos and do things and not get bogged down by whatever else is going on in the room next to them?

00:06:18 I don't think they should be.

00:06:19 Yeah, okay.

00:06:20 I don't think, but you know—

00:06:23 They're too – we did it for the Obama thing.

00:06:25 But that's different.

00:06:26 Yeah, that was a special thing—

00:06:27 And did you have any issues?

00:06:28 We knew the website was going to be bogged.

00:06:29 Oh, I see.

00:06:30 It didn't matter where you—the thing is we started early so we got a connection right in. And I heard from other schools that started late, they couldn't get to it.

00:06:40 But once you got it you were in.

00:06:41 Yeah, there was some hesitation but what do you expect with so many people hitting the same site?

00:06:53 You can keep that.

00:06:54 Oh! Okay great, thank you. And I will shred this after.

00:06:57 Oh, it's fine. And I do know that they have been good about discounting us with things and also, so—

00:07:04 That's great. We have similarly used a group I believe and our bill is very, very similar to what we would do.

00:07:11 Well, I just really like this company because they're just more than fair. We just upgraded the laptops, I—won't do that again during the school year!

00:07:22 Yeah, no kidding! Right, it's a big job.

00:07:23 Two weeks! And I said, "You know, he had a lead and you took them from me and you went somewhere else." And I was helping him. So they really, they gave us, our regular day is Thursday, so they didn't charge us for the one day because he was in and out. So I thought they were very fair with us about it –

00:07:41 That's good that you have a company that you trust –

00:07:44 Well, and it's just so nice to have a company that you can call and then it's fixed and you don't have to sit and wait and well, "Okay guys we can't use the computers because Mr. so and so can't get here to fix them."

00:07:53 And that's why, father tried to say, "Oh can't you –" Well, you know we do have a dad that I would turn to for technology.

00:08:07 (One sentence was inaudible, talking over each other)

00:08:08 Well, let me ask you this. Yesterday [Mrs. Land] and I were at a meeting, a principals' meeting. And they were really drilling the idea for implementing in schools, school boards that think bigger picture, and making sure that schools are set down the road. And specifically strategic planning in areas like technology. Do you as the principal feel like it is very necessary? How strongly do you feel about having a technology committee back in place here or having some group in charge of looking at the sustainability of technology?

00:08:37 You know what? I really feel because, [the IT professional] is really more somebody to just fix the technology things and to look at that and to keep things going. I really feel that I need somebody with vision to help me out and say—again Tony it's something that—it's so hard to keep up on. I'm not a techie person, I can do certain things, but I feel that I lack vision as far as, how do you keep up with progress? And make your computer program something that is really going to bring these children along and not stagnate them. Because I as a leader don't have the vision to know. So I really think that, number one, that would be one thing. I think we need a technology committee back. I think we need to have people on that technology committee that, number one, know where even the world and society is going. Know what's appropriate for children and how to bring that in to that. And how to incorporate some of that into the lesson plan. I really feel that development is strongly needed here.

00:09:41 Okay. Fair enough. Any thoughts on that?

00:09:44 Well I just see, for the children, yes they have all these techie toys, but what do they really know about the computer? I used to do history with the kids. You know, how did this start? And of course they just laugh, "You didn't have computers when you were growing up?" And one day they asked me and I said, "We had bread and water too! I was okay, believe me! I made it through!" But to them it's like, "You didn't have a colored TV?"

00:10:13 Tony do you feel, I don't know, I was thinking about this. I do a lot of thinking about whatever driving back and—do you think that all of a sudden we were hit with technology from the Diocese? "You have to put technology in." And they gave us a few tools. But I just feel sometimes like you're treading water with technology. And I'm saying, how much can the grammar schools really do to keep up with this? And keep pace with this and keep your budget going to keep up with this? And to know where you are going to go? And what's today might not be tomorrow and you've spent all of this money. And then, I don't know, I just feel like, it's a big question mark I don't know if there is ever gong to be a complete answer to developing a technology thing.

00:11:05 Right, well, here's an answer, I don't believe it's THE answer.

00:11:07 Oh, God.

00:11:08 But something that I've thought about is—you know this whole concept of what you're inquiring about, what you see as a question, probably won't be seen as a question in another five to ten years. Because this is the first time in education history to where the people in charge, the teachers, don't have the same knowledge about technology as their students. So we are flipped. We are now the learners and they are the teachers. But the reality is, the next generation of teachers that are coming out now and in the next five to ten years, they did in fact grow up with this whole schema and understanding and background of technology. And they're going to be able to bring it to education in a way that even myself. Even myself can't – I'm kind of a hybrid. I didn't grow up with technology, I kind of got it by the time I was at the end of my high school career. But even having it in the 8th grade would have been a much more beneficial thing for me.

00:11:57 Right.

00:11:58 So the reality is, I think that the teachers and the administrators in the next leg after us are really going to have a different understanding of how it all works and how to connect it all.

00:12:07 And you know what? I think just, even from some of your questions, I think, "Boy am I lacking." You know? I mean I wouldn't want to steer the school in the wrong direction. But quite frankly, I would need somebody to say, "Here's a good vision for your school. Here's how we implement it." I mean I would need somebody to walk me through it.

00:12:28 That's a great comment –

SECOND SEGMENT ENDS

00:00:00 …to transcribe. But that's a great segue into the next theme of questions that I want to ask. And that is, all the research and all the experts that I've looked into are all very quick to say, or at least talk about the notion that technology is not a savior messiah.

00:00:15 Right.

00:00:16 It is just another resource. As valuable as a teacher's experience. As valuable as any other white board or any other medium that we use to teach. So, knowing that it's not technology that is doing the teaching, that it's just another tool, that is kind of the motivation behind asking some of these questions. So having said that, when I look to these set of questions here, even number seven and eight, it's not necessarily knowing about technology. It's just about knowing how you would use that as you would any other tool.

00:00:48 Okay, that's a good perspective to take it from.

00:00:51 Part of the problem I think too is there are no guidelines from the archdiocese. And I feel that, I really believe that technology is here to stay. I mean let's face reality. And I don't feel that were moving forward with it, because the archdiocese—they used to have some guidelines and I probably have them somewhere from 1970 or something. But there's no one out there. And I kind of feel that no one thinks technology is important and other things are more important and yet our kids are going out into the world. They're going on to high school, and I always had pride our kids here would go and they'd go to the advanced computer classes. But my hands are tied, her hands are tied, we have no way of getting this out. And with no guidelines from the archdiocese, no minutes allowed, you know. That's more important, to me, more important than PE. I know kids have to exercise but I'd say that because technology is so important – and it is important. And the kids, yeah they can use—

THIRD SEGMENT ENDS

Appendix F: St. Mary's Interview

Principal: Mrs. Noble
Technology Coordinator: Mr. Robles

00:00:06 The blog was a great idea, thank you very much.

00:00:08 It will also, my blog will also give you, it'll give you a picture over time. For where did I start. Where did we start as a school. Because I write a lot about what we do as a school, and then, where we are now.

00: 00:25 Now do you share it? I mean is that why you built up such a reputation for being a great leader with technology? [a principal] has told me this, [a supervisor] has told me. Do you think it's because you put it out there with things like your blog? Maybe it just because of the [00: 00:37] meanings of what you talk about and what you bring?

00: 00:38 Yeah, and I'm very, very active in the [00: 00:39] edublogger community, but not just within the private sector. The worldwide edublogger community.

00: 00:48 Wow, I can't wait to check this out.

00: 00:50 I write for, there's a blog on [a blogging website] called [title of website]. I write for that, I'm a contributing author for that. So I've just been real involved and connected with people, so that's made me more.

00:01:02 Would you call yourself a techie kind of a person?

00:01:04 Oh, absolutely.

V01:05 That's so cool.

00:01:06 I'm a geek!

00:01:07 I love that thought. When you came to that one meeting you had that smaller computer. I've been looking for one ever since! They can be as cheap as three or four hundred bucks but I haven't found the use to justify the purchase yet! Do you know what I mean? But I was really impressed, you came to that one meeting and you were checking your emails at the table and stuff with this little tiny thing. It's so much more functional than a thumb or –

00:01:25 Yeah, we're actually looking at those for our one to one initiative. But that's jumping way ahead of ourselves in terms of your questions!

00:01:36 Let's start with the leadership one. And the first one I wanted to do is look at the third one because when I think of you, that kind of question was written with you in mind. What are the qualities of effective technology leaders and how are those qualities exhibited in your school? So you're someone who's a big proponent of technology. What would you say as a principal you're very cognizant of in terms of having to be a leader to make technology successful?

00:01:56 Well, number one, you have to lead by example. You have to be willing to embrace the learning curve and take on new technologies. If you're not willing to how can you expect your teachers to be willing to? You have to be willing to be in the trenches because, well, let me just give you an example of what I mean by that. Because I'm willing to learn technology, and because I participate in professional development around technology that sometimes my teachers don't have the time to do, because they're so busy with their day-to-day operation, then I can go into the classroom and they can say, "I want to do this, I want to blog or I want to use voice thread." And then I can go and teach the lesson and say, "Sit back with your kids, learn how to do this along with your kids. I'll teach the initial lesson and then you can do it after that."

00:02:47 Yeah, learn how to do it along—that's cool that you can get in there and do that. Now you said, "professional development." Are you referring to the leadership talk thing that you were just talking about for [a technology organization] was it?

00:03:00 I am always involved in, constantly involved in, professional development for my own technology learning. I attend as many conferences as I can. I take advantage of online opportunities like webinars and archive technology talks. But let me go back to the question because I believe there's something even more important. The very first thing I did was immerse myself. I began to write blogs and read blogs so I built my own personal learning network. The second thing I did was I took a core group of my staff and we participated in the ISTE Institute—are you familiar with ISTE?

00:03:48 I am yes.

00:03:49 Okay and it was in connection with the National Education Computing conference when it was in San Diego. And the whole purpose of doing that was to build a common vision. ISTE puts out their essential conditions for technology integration, which you should probably look at if you haven't looked at them.

00:04:09 I don't believe I have. They're common conditions?

00:04:14 They're called Essential Conditions. Now they are in the process of changing them because they morphed into a document that's 14 things and nobody can do 14 all things! And so they are trying to rework those. I just attended a session on the reworking of those. But I think the key element that I took from the ISTE Institute besides the

support and a lot of other things, was that you have to have a common vision if you want to move forward. And so I think that –

00:04:47 You mean common with your staff? Or common with what's currently in the trend with education?

00:04:50 Oh, thank you. I mean you have to build a common vision within your community. It starts with your staff. It has to include later, all of your stakeholders if you want to move forward. And the way I built a common vision – in our previous WASC study when we wrote our mission statement, we revisited our mission statement and we wrote our mission statement. And it was right after the turn of the century, so we wrote—wait. Yes, that's right! Just right after the turn of the century! We wrote in our mission statement, because it sounded so good, that we educate children for the 21st century. So the way we started about building a common vision was about three or four years ago I asked my staff the question. "We say we educate children for the 21st century, what is the difference between educating children for the 21st century and for the 20th century? And so we spent a lot of time exploring that concept. We may not have had the technology skills to do what we needed to do, but the first things that we needed to know was that we had to be convinced that we needed to change something. And I did that through a couple of pieces. Number one, I don't know if you're familiar with the fact that MIT puts online all of their—

00:06:29 Yes, their seminars and classes

00:06:31 And also their guest speakers. And they have in their archives a talk by [author's name]

00:06:36 Oh yeah!

00:06:37 Who wrote, [title of book]. Visual aid here. Who wrote [title of book]. He does a lecture where he discusses the premise of the book which is basically laid out in the first four chapters. So one of the things I did was at the faculty meeting at the beginning of the year, was that we watched that video with [the author]. And talked about what he was saying and how that impacts education. What does that mean for education?

00:07:09 That's awesome.

00:07:10 The other thing we did that helped us build a common vision is, are you familiar with the story of the [story title]?

00:07:15 No.

00:07:16 Okay, it's kind of an old story now but at the time it was the brand new story. Basically it's a story of a gentleman who put a [title of story] up on the Internet—I can't remember if it was on eBay or not—

00:07:57 You're kidding!

00:07:58 No! No kidding. It was a real eye opener when you talk about how things have changed. And how important digital communication and networking and connectedness is. And so the [author's name] book and the story were the initial stories that I told to engender conversation about, what is our vision? The third piece which I used is on YouTube, or TeacherTube, it's called, [title and author] And it talks about our students and what their future will look like. How we are educating our children for a future that we can't really even imagine. And so those three pieces formed the bases for a lot of discussion for us. So that before we did much of anything in terms of using technology, we understood that we had to do something in order to adequately prepare our students for their future.
00:09:10 That's just so great that you were cognizant of this kind of three step plan to in fact start leading start the technology leadership. That's great. I don't know how you do that. I don't know if that's something you develop over your time as a principal but that's certainly not anything they taught in PIP**.** You know what I mean? You kind of just have a knack for knowing you have to do that!

00:09:33 Well I do credit ITSE a lot for their support and participating in the ISTE Institute where we have three days to at least talk to a small group of people about you know, what are the technology standards? Why are they important? And we follow that up by attending the National Education Computing Conference. It was the first one that we'd ever been to and we were just kind of going, "Wow—"

00:10:00 [overlap in talking] And that was the one in San Diego that you mentioned?

00:10:02 Yes, that was the one in San Diego three years ago. Now I was a little more informed because I had already begun blogging and I had already begun to build a personal learning network with international educators. But you have to start somewhere. You have to be exposed to the ideas before you can make any kind of change.

00:10:22 And by the way, I wanted to mention. I know that at our school, it was initiated last year we do this thing about learning in the 21st century. And it's actually been quite helpful in teaching teachers how to even educate them on what a blog is and little tiny steps on developing one. I have no notion that the teachers are going to develop one any time soon. A couple of the teachers, two teachers are advanced and they're doing it on their own—self-starters. But he's been a good thing for our school.

00:10:48 He is who started me!

00:10:50 No Kidding!

00:10:51 About four, five years ago at one of the leadership conferences, he spoke. It was the second time I'd heard him speak and I said, "I believe what he is saying is true and I need to find out more about it." That's when I started exploring blogs, started blogging myself. Making connections with some of the premiere educational bloggers. Now, I thought about something else in context of that and I want to see if it comes back because your comment reminded me of that. (Thinks) oh well, it went out of my head!

00:11:38 It'll come back.

00:11:39 It'll come back. I wanted to say something else about the leadership issue in it.

00:11:42 Well, I want to follow up with the leadership before I move on to the next concept. In terms of leadership—

00:11:48 I remembered it! I remembered it! It's really important. The other thing as an administrator, you cannot add technology on top of what you already do. You have to replace something that you're doing with technology. And so I looked for, and you'll read about this in my blog, I look for every opportunity I can to remove things from the teachers plate in order for them to embrace the learning curve that they need in order to integrate technology into their classroom.

00:12:23 That's really good.

00:12:25 Because what happens too often is they try to do a technology project on top of what they are already teaching.

00:12:34 Instead of making it one and the same.

00:12:36 Instead of saying, "Okay, which of these things can I pull back on the traditional way and integrate technology?" You can't just keep stacking them.

00:12:46 Okay, that is exactly what I wanted to ask you. My first question under leadership is, and I'll preface this by saying that my vision of writing this paper, I was going to say that the type of leader that is going to really be successful implementing and leading technology is going to be the one that does "this." And so that's a really great example. But are there other specific leadership practices? Like that you can think of in terms of your repertoire, your toolbox of being a leader? Little quirks that would be supportive of technology? That would be another example of what you just shared? Certain things that you do to help the teachers embrace technology?

00:13:25 Well, I shared the one in the beginning. About being willing to go in and model in the classroom. Absolutely essential. I provide playground time. We have our

curriculum meeting every week and at least once a month I provide, I might introduce a technology tool, but then I provide a time for them to use that tool, to look for ways to use it in their lesson, to try it out, to explore things.

00:13:53 That's good that you're not expecting them to do it on their own.

00:13:55 Because many of them are not—I mean let's face it, I need to get a life! I'm a geek! – They're not going to go home and spend time on their computers. They're not—there are problems with the digital immigrant, digital native metaphor, but –are you familiar with that metaphor?

00:14:15 I'm not so sure.

00:14:16 okay. There's a very famous article, I think it was written by Mark Prensky. It was called *"Digital Digital Natives, Digital Immigrants."* And it's been in the blogging world, it's become an over used metaphor. And it does break down, like all metaphors, at some point. But the main point is that, the concept is that our students have never grown up in a time when they didn't have the internet. Most of our teachers are digital immigrants. And so they approach technology completely differently—

00:14:51 They just don't have that schema.

00:14:52 They don't have that schema. And I find, that even with my young teachers, they may use technology, but they've never been taught that technology is a learning tool.

00:15:07 And not the be all end all!

00:15:08 Well it's not that. It's like they might use [social networking sites] or they might use IM as a social thing, but they don't understand technology in a professional educational environment.

00:15:25 That's a really interesting comment because I'm well aware of that metaphor in a different context. It comes up a lot in research. But what the research tends to point to is this concept of the teacher not having the schema of technology is dwindling away. And perhaps even in 10 years isn't even going to be a factor for the new teacher coming into the work place. But what an observant comment that the new teacher coming into the workplace may have grown up with technology, but they may not necessarily know of it as a learning and instructional tool and a resource. Versus this social thing.

00:16:00 Although hopefully in ten years the teacher educational programs will have morphed enough that they will understand the power of the tool. We're in kind of a funny in between time.

00:16:13 In another side comment I have found that there is a big disparity in teacher preparation programs that do a great job of what you're saying versus they're just teaching them to make an Excel file. The technology requirement is there but it's just so under served in so many ways. Even when I got a masters degree in '03 I wasn't taught how to use it as an instructional tool. I was made sure that I could open up and save a file and print. It seemed so silly to me at the time, you know?

00:16:41 Yes, you weren't –you asked about specific strategies and specific things that I do. I think the other thing and this is a mix between a specific strategy and a leadership style, but technology is not—we do not do technology for technology's sake. Technology is a tool and it is integrated within the curriculum. It is not taught on it's own. The whole purpose of using technology is to enhance the learning and the education of the students. Not to teach them how to use Excel or Word or go to a computer lab and do a cute little project. Along with that, the other thing that I am very cognizant of is it's not—even though I explore the newest gadget—it's not imperative that my teachers jump on the bandwagon with every new gadget. I'm very concerned to choose tools that I introduce them to based on the learning curve. It has to have a short learning curve, and if it works for what we do, I'm not going to jump to the new latest tool and say, "Oh well, why don't you try this one now." For example we use Google and iGoogle. Every faculty member has an iGoogle page. I chose that because they could learn one application and it could bring in a lot of the technology that I want them to use. They can have RSS feeds on their Google page. We use the Google calendar for our master calendar for school. For calendaring facilities and it's all on one page.

00:18:40 That's a great idea!

00:18:42 So we use Google Notebook to take notes. And so I'm very cognizant of that. You want to package something for the teachers that they are going to be able to deal with. And the other thing, well, I'll get to this in the digital equity digital divide issue but I think that we need to use more internet based resources and more open source resources. And one of the reasons, besides digital equity which we can talk about, is also it ensures that everybody is on a level playing field. If I've got Office 2007 at home and Office 2003 at school, I use a Mac and you use a PC, you know all of those things can mitigate against the immigration of technology because people get frustrated. You have to do what you can to undercut the frustration level by providing common platforms.

00:19:33 I'm so glad to hear you say that because so often, and we will get to that digital divide, but too often that is just so generic and bland into like a race issue or a gender issue. And more to the point with the digital divide, it's far more complicated. I was surprised when I read research that the digital divide is often even considered a myth by a lot of successful authors who suggest that it was just a product of the Clinton administration and weird things like that! But in the interest of time, I don't want to keep you too much today. But let's go on to the actual implementation. I had two questions written here and I wanted to start with the second one, number five. When you have

implemented either software, as you're suggesting with Google, or actual hardware, what have been some of the obstacles and challenges that you have faced here, at [St. Mary's], or anywhere else. That have been just, things that have come up, that have been challenging.

00:20:30 Well, certainly wiring a school is challenging. Our school did not have--we were kind of cutting edge with technology. We had computers in the classroom for a long time and that's probably why my name came up with technology. I presented at NCEA probably ten years ago on the use of computers in the classroom. So that's another reason that I have that reputation. But what happened was that they put internet in a couple of classrooms and then they said, "Oh, well we want internet in more classrooms." And so it was a mess. An absolute mess! In fact I had to hire a company to come in and trace all of the cables to see how things were going. So if you have the luxury of starting from scratch you got to have a plan. The other thing that happens with technology that we've experienced here is you really do have to think five years down the road. You can't think, "Well this computer is pretty good. It's good enough." Because it's not going to be good enough!

00:21:40 Yeah, in a certain amount of time.

00:21:42 Yeah, in a very short amount of time! Shorter than you would guess. We were at a standstill with technology integration at one point primarily because the equipment didn't work! It was too old, it wouldn't access things correctly. It was too slow.

00:22:00 And this was after you had already established some kind of technological rapport, culture here at school?

00:22:04 Well, no. This is prior to the big shift. But see, we had technology in the classroom but it wasn't being used. It wasn't being used because the infrastructure wasn't adequate and the teachers were frustrated by it so they just ignored it. Obstacles in implementing technology…

00:22:26 Knowing what you've done here…

00:22:31 We've spent very little money on technology. Very little. Industry cast offs in our computer lab. We do buy refurbished computers because they're cost effective. We use open sourced software. But you really do need somebody – I have a technology coordinator who, hopefully you will get to meet! He is not a technology teacher, he is not my computer lab person, his job is infrastructure. And you really do need someone who has the knowledge—I mean the basic things I can do. I can go plug the cable back in when a kid trips over the cable and it goes off. But you do need somebody to maintain things. Because teachers are not going to use technology if every time they turn something on it doesn't work. And so I would say that is the biggest stumbling block. We started practically all over again. At one point we had 100 computers in this school, but

so many of them didn't work. And some were such dinosaurs! And I know this sounds silly, but we rarely accept donations from parents because what happens is, they want to give you their dinosaurs! And if it's not good enough for you at home, chances are it's not good enough for the kids here! So we have to look at solutions. Thin clients is one solution. Linux programs is another solution. But I think those are the kinds things you need to think about for the hardware implementation. Is that what you're kind of asking?

00:24:09 It is and I'm also hearing what you're saying that that's another challenge if you're also going back to the equity of keeping the format the same and keeping everything compatible. Let me follow that up with that one number four there. Where it's, explain the cost of how technology planning – you talked about a plan – how does [St. Mary's], how did you move forward with decisions that are primarily principal driven? Do you bounce ideas off this individual that you—what was his position title again?

00:24:39 We're calling him the Technology Coordinator.

00:24:41 Okay, is it just the two of you? You're so well versed in knowing this. Does it primarily just come from you?

00:24:48 No, yes and no. Part of building a common vision -- one of the things we did after we had this meeting and we start talking about this, was I put a blank map of the school and I said, "Okay. We know that we want to change things and build collegiality, we know that technology is going to be really important. And as a group we decided that we were going to start with the junior high. That's where we're going to start our technology push and then we're going to figure out how it's going to go down into the other grades. So one of the things we did was put up a blank map of the school. I said, "How would you arrange the school?" Every classroom moved! We set up school academies. We have a Primary Academy, K,1 and 2. The Intermediate Academy, 3,4 and 5. Junior High Information Technology Prep Academy 6, 7 and 8. They kind of came up with their own identities. And we said that if the junior high was going to be a technology academy then they need ubiquitous access to technology. So we moved all of them over into the old school building, where the computer lab was. So do I drive the decision making? Yes, but I don't impose the decision making.

00:26:22 I love that you're very cognizant of involving the teachers and collaborating as part of planning this implementation and technology implementation.

00:26:30 And so what happened, we did that, and then the lower grade teachers said, "You know, we can't get into the computer lab enough." And so what we did is we took another classroom – because our reorganization also freed up some space for us.

00:26:47 Wow! How is that possible?

00:26:50 I know! I know. It freed up two rooms. And so, it was an incredible June because every single classroom moved! But it freed up a room for us. So what we did the next year, because we'd gotten a donation of some money, is that we bought 12 computers. We had two others and so we put 14 computers. And that became the second computer lab to provide access for the classrooms down here. With first priority going to 3rd, 4th, and 5th grade. And second to the lower grades. And there are enough computers in there that teachers can go in there and use universal access time because half the class can be on computers and they can be giving direct instruction to half the class. But that came at the request of the teachers. Now that was a year ago. Now, and you'll read this in our self-study, honest to goodness, I did not say this! The teachers said this! Well, besides the fact that they are asking for more computers in the classrooms, we're going one to one computers K-8. You'll see our plan; it's a five-year plan with the first going to the junior high. We've also bought five computers for each junior high classroom so that they don't always have to go to the computer lab. Like when they're doing group work and things. But we bought desktops with the idea that as soon as we went one to one in there, those 15 computers will transfer down to this wing. And then when they go one to one, they'll go there. So the plan was collaborative.

00:28:37 That is so key! I'm going to move to the next one.

00:28:42 Sorry—

00:28:43 No! That is so awesome! I want to respect, because we're at 28 minutes here.

00:28:45 Don't worry about it. Don't worry about it.

THE FIRST TAPE SEGMENT ENDS

00:00:02 Because I'm going to repeat. One of the essential conditions of a technology program is not a teacher for the tech lab. It's a troubleshooter.

00:00:12 Yes! Yes!

00:00:15 You need that more than anything else because if the teachers are frustrated, they are not going to do it. Your job is absolutely critical.

00:00:22 And I deal with them all the time. You know? Whoa! These last few days have been kind of trying for us. I think I've got a handle on it now. Because we had a server issue, but I still got one monitor that I have to do upstairs.

00:00:42 That one that went down and took off a bank of six.

00:00:45 Right. One monitor went down and took out six of our computers with it!

00:00:52 So [Mr. Robles] does all that kind of stuff. He also rebuilds the teacher's laptops if the laptop goes south.

00:0058 It happens.

00:00:59 So you're maintaining the systems and the network?

00:01:01 Yes, maintain.

00:01:03 And he also took a class in forensics.

00:01:07 Oh really?

00:01:08 So that we can follow up on our kids.

00:01:11 Oh wow! That's very interesting. That's a really good thing to—

00:00:15 I like that forensic class that was very, very interesting.

00:00:19 I never thought that you'd even have to be prepared with something like that, but you're right. That's another whole angle---you're worried about your physical plant and then for your teachers to be able to use it. And there's the whole digital citizenship kind of a thing.

00:01:33 Exactly.

00:01:35 All right, well I'll keep going with some questions if that's okay. Feel free to share anything that you can.

00:01:39 You turned off your recorder.

00:01:41 I think we're good thank you. How would you describe, you alluded to this a little bit, but on number six here, how would you describe the technology culture here? Is it positive? Is it a work in progress? Is it challenging to continue to support this?

00:02:03 Is there an "All of the above!"

00:02:05 My gosh, it's challenging. And it's challenging in that it's new to everyone. I mean it's not like they did this five years, ten years ago. The technology is new to everybody and it changes everyday. Everyday we're always coming across new websites, new hardware. Think of the iPod. Five years ago there wasn't an iPod. Three years ago there was the iPod1. Now there's the iPod7 or something? It's always changing and you have to stay on top of that change.

00:02:45 That's kind of where [Mr. Robles] and I come around. Is that we stay on top of the change to help educate the teachers. We are always bringing things to each other's attention. One of the things that we're looking at right now, this is kind of our new cutting edge thing, is that we're having a challenge in providing funding for our music teacher. And so we're looking at WiiMusic. Which is the new—

00:03:12 Yes, I've seen that.

00:03:14 Well and they also, it was created in conjunction with the National Music Teachers. They are touting it now as having a real value in the classroom. So {Mr. Robles] and I—

00:03:30 Evaluating it over this last week or two.

00:03:34 The kids would love that, that's for sure!

00:03:35 Oh, I'm sure they would! But before we put it out to the kids we have to make sure that there's an educational value to it. And not just an entertainment value.

00:03:45 Gotcha.

00:03:47 The other thing though in terms of technology culture and whether it's challenging or a work in progress. And this is absolutely essential to who we are, it is challenging and a work in progress because it's really not about the technology it's about the pedagogy. It means that the teachers have to completely change their whole mindset of what teaching is. The whole thing about web 2.0, teachers are no longer the purveyors of facts. The educational institute is no longer the only place to go to receive knowledge. And so trying to change teachers' outlook that it's about the application of knowledge. It's about what the kids do with knowledge that is really what education is about today. So it's absolutely a work in progress because most teachers teach the way they were taught! It means looking at textbooks—and I'm not anti textbook—however, I believe for the teachers to truly change, I have to take the textbooks out of their hands. Because it's too easy to do what we're comfortable with which is teach page one to page 100 or 500 whatever it is. So right now, our 6^{th}, 7^{th} and 8^{th} grade social studies and religion is being taught textbook free.

00:05:21 Wow!

00:05:23 We have textbooks, they're resources, but our curriculum is based on the standards and this pedagogy that it's not enough for the kids to memorize information. It's much more about what they do with the information and also on digital literacy.

00:05:42 It's funny I have two teachers that are finishing up their masters program at LMU and they are trained to let go of the textbook and use technology more. But when

they do that, even with my community, which is a little different demographic, they freak out when there's no textbook given. Now I'm getting inquiries and complaints like, "They're not doing anything in there! They haven't taken a single book test." That type of stuff comes up. So I suppose that's also a challenge.

00:06:11 Blanket, a security.

00:06:13 Yes, exactly.

00:06:14 Well, and it's how parents traditionally measure education which goes back to that piece of vision. Remember it starts with the teachers but then it has to involve all of the stakeholders. I think we have to be more visual with our standards. I really believe that we have to go to a standards based report card so that the parents know exactly what material is being covered. Because the only way that parents have, the traditional way of knowing is, "Did you cover the book?"

00:06:49 Do you put standards on your website at all? Or do you make those more of a living, accessible thing for the community or no? Is that something—?

00:06:55 That's coming.

00:6:56 Okay, you feel that's important? Eventually—

00:06:58 I do. And in K, 1 and 2 we have a standards based report card.

00:07:02 We already do have a standards based report card.

00:07:04 So what does that look like?

00:07:05 [Everyone laughs] It gets a little complicated in terms of its presentation.

00:07:12 But check this out. Check this out. You haven't seen this yet [Mr. Robles], this is really exciting. I'm serving on a WASC team in San Diego.

00:07:22 Of course with your free time!

00:07:24 In my free time! San Diego has taken their standards and reduced them to one page—

00:07:33 I've been waiting for someone to do that!

00:07:34 Per subject. And their concept is that this is the minimum, we hope that you'll go above the minimum. But, if a new teacher walks into the classroom and they want to know what they are supposed to teach the eighth grade in math? Here it is, one page. If

you do that you have done your job. And we expect all of the kids to have basic proficiency in these things. So you know the whole talk about power standards and such, in a sense they have done the work for us. And so I'm sharing these today with my teachers for math.

00:08:11 How discrete are they? Could I maybe get a copy of that?

00:08:14 Yes, I'll come back from WASC with a copy of them all! I'll come back with them all!
00:08:17 Man that would be great!

00:08:18 And that's where the standards based report card has to come in. We have to identify what are the power standards. What are the truly essential things that they learn at each grade level? You can't do it, look at how much trouble, they still cut it down. But it was a lot of work—

00:08:36 It was a lot of work, yeah. Those report cards, you had to redo them several times.

00:08:44 How much teacher input is involved with creating that report card?

00:08:45 It was theirs.

00:08:46 It was theirs, they created it.

00:08:48 Yeah, they are the ones that actually created it. And then we had to take what they created and turn it into a report card and match it all up with the online curriculum and grading and so forth.

00:09:03 Is there any concern to match your report card that you're allowing the teachers to have input on to [00:09:12] a patch report card from the archdiocese?

TAPE SEGMENT ENDS

00:00:02 Let's talk about the digital divide a little bit. You had hinted at some of the things—you had hinted at, your notion of the way it looked in your school was keeping things compatible and consistent with each other. Tell me about what you feel are some equity issues in your knowledge of technology here at school? What are some of those issues about? Is it more within your own school community? Is it more what you see between other Catholic schools or beyond that?

00:00:33 Well, part of it you'll read about in our self-study. One of the things when we finish here, if we could put on a thumb drive our self-study for Tony.

00:00:39 Okay.

00:00:40 We talk pretty strongly about digital equity. And first of all, let me talk about the big picture. 63% of my kids are on free and reduced price lunch. If I don't take the initiative to provide a technology enriched curriculum that teaches digital literacy, global collaboration, digital citizenship, effective communication in the digital age—not just written communication—my students will be at an economic disadvantage. And I want to make sure that they're not at an economic disadvantage for their future. So I feel pretty strongly about what I call digital equity. That we have a moral and ethical obligation. And [Mr. Robles], you feel pretty strongly about this too.

00:01:30 Yes.

00:01:31 You're talking about fair opportunities after school and beyond.

00:01:38 Right. I think one of the biggest changes we made was Microsoft Office for instance.

00:01:42 What was that change?

00:01:44 We instituted Open Office as opposed to Microsoft Office. And one of the reasons was Microsoft Office has a big expense dollar to it. Because we're 63% lower income families, they couldn't afford this. So now when they get home they don't have it. So across the board we went to Open Office. And Open Office is free.

00:02:19 So forgive me, I don't mean to sound ignorant, so it's not so much about your school being able to pull the resources to install it, it's about what the kids have access to when they leave?

00:02:29 It's about both. The licensing is extremely expensive.

00:02:33 And for the school to stand for it also was a problem.

00:02:35 Why should I pour money into licensing that I can pour into providing technology resources for those kids? Licensing money is basically money that you're throwing away!

00:02:49 We had enough site licenses probably to put it on most of the school computers. Not all of them.

00:02:57 Not any more. That has to be renewed. That's why I—the renewal was going to kill us. But it's also for the kids. It's also because a lot of the world does use open source software. The United States has bought into Microsoft's culture, but if you do your research you'll find that there are a lot of big, multinational corporations who are moving

more towards open source. So I think that the kids need to have the flexibility to work in more than one platform. They can't just be Microsoft centric.

00:03:35 No kidding.

00:03:38 That's bad news for Bill Gates I suppose! Do you think that, I'm looking at number—

00:03:46 Oh! Let me go back for a second.

00:03:48 Please do.

00:03:49 I'm passionate for Catholic schools about open source because I think it's a social justice issue. There is almost, I have a book this thick, there is almost every single application that you could buy, there is an open source equivalent for it.

00:04:07 Really?

00:04:08 For Photoshop, Open Source Photoshop.

TAPE SEGMENT ENDS

00:00:00 I have seminars here at our school for our teachers where I Skype in presenters from around the world. Our students were taught how to do Photostory by [an individual] who is a district level technology person in the public schools in Chicago. Skyped in and taught our students and the students in Canada together at the same time on the same day, and it cost me zero dollars.

00:00:32 That's awesome!

00:00:33 We set up our projector. Our LCD projector and projected it up on the walls. Or on our whiteboards.

00:00:44 I can't think of an application that doesn't have an Open Source. So that should not be a barrier for Catholic schools to move into technology that, "I can't afford to buy the software."

00:00:57 I have been reading on this for two years and I have not once come up with that plan.
It's such a powerful point. Everything about the equity and the social justice issue is always about race or it's about gender. It's much more global and what does it really look like for us?

00:01:16 You know what I mean? I wanted to ask you, what kind of internet connection do you have here?

00:01:19 DSL. It's a standard DSL line.

00:01:22 So is it like a standard one that you would have for a home account?

00:01:25 I think the one I have at home is probably a little faster than the one here at school.

00:01:29 So do you ever have any issues with sharing bandwidth and things like that?

00:01:33 We did when we were sharing with the church.

00:01:35 Interesting.

00:01:36 But about a year ago or so we separated it from the church.

00:01:39 Okay.

00:01:40 You know they use it pretty heavy over there.

00:01:43 So you have teachers that would be using YouTube in one room and something that is a little more intensive in another room and you don't necessarily have issues?

00:01:51 Yes. We use video streaming. We use YouTube. It's something that we're looking at. We're probably going to go to commercial grade routers. We have wireless connectivity in the whole school. We also have hard wire connectivity. We have both. And as we go one to one that is something that we are going to be looking at.

00:02:15 I think the next round of egrade we may start looking at getting the infrastructure in for the –

00:02:24 I wonder if you may need like a T1 line or something that large or something?

00:02:28 Well you know, we did research into and the TI really has more to do with what you're uploading than what you're downloading. And so the download speed really doesn't increase by having the T1 line. And we don't upload as much. I mean we do download but it's in specific times.

00:02:50 Yeah, we don't run a web server here or anything like that.

00:02:52 Right, right, right. Let me just check my notes here. You think that in general—how easy is it for teachers to feel really positive about all the technology that's being – how easy is it for teachers to feel positive about it at school?

00:03:12 Well, first thing that comes to mind is one of our teachers. You know a digital immigrant three years ago. Four years ago? Knew absolutely nothing about it, now she can't live without it!

00:03:31 She's seventy years old!

00:03:34 Our oldest teacher here. And she was kicking and screaming at the beginning, but now she knows—because what it does, once you get a good handle on it—it makes your job easier. It eliminates a lot of your old paperwork. You know, your grading, the posting of a grade. All of that becomes a lot easier once the technology is in place.

00:03:59 I'm going to teach the teachers today how to use Google forms to create a self-grading quiz.

00:04:05 And once they see it, they're going to be like, "Whoa!"

00:04:08 That's so cool!

00:04:10 Especially for the what we call dip stick assessment. We moved to using curriculum mapping and understanding by design for IN because it really lends itself to the idea of moving away from being textbook dependent and also to technology integration. Because it's that kind of backwards design notion where you identify your standards and then you think about it. And we've also moved into performance-based assessment. All of this, I consider that to be part of our technology piece.

00:04:45 Yeah, it is. It very much is.

00:04:47 People miss that. They think that using technology is drill and kill or purchase software that the kids are sitting and using and that is not what our school is about!

00:04:58 It's like some Mac program that you have to buy on cd and then install.

00:05:00 Exactly.

00:05:02 And don't worry that your teachers name and age will be omitted!

00:05:05 Okay, sorry to [older teacher referenced above] there! No, but I think it's a hard concept for people though. I think when they think "technology" – we had another school who I won't name, who came out to visit us, last week? Two weeks ago? Their initial question, although by the end of the day we were in a different point, but their initial

question was, “What should our technology curriculum be?” And that’s not even a question that we ask. I don’t teach Word in second grade and Excel in third. It’s all integrated within the curriculum. Do we give a lesson in how to use PowerPoint? Or how to use presentation software? Absolutely. But it’s like one lesson and then the kids are using it for their learning not—

00:06:03 So the technology curriculum is more fundamentals and not cross-curricular? Is that what you mean by that?

00:06:11 Yes. They’re saying, “Well, what should they learn in this grade?” They need to learn those things that allow them to do what they need to do to learn. Now, putting that aside I do have stated in my curriculum that I want the kids to learn keyboarding in the intermediate grades.

00:06:30 That’s the only thing that I push, keyboarding. Keyboarding skills. The more comfortable you are with the keyboard, the easier you’re going to have—

00:06:40 We don’t even use the term typing anymore! Because a keyboard does a lot more than that! With the controls—

00:06:46 Because there’s keys on the computer keyboard that a typewriter doesn’t have. You need to know those keys also. What they do, what they’re for.

00:06:55 The idea is that the technology should be transparent. So teaching keyboarding is one of—there’s very little anymore that you have to memorize. But teaching keyboarding is an essential skill because then you’re not worried about the technical aspect of it. So that is something that we try to instruct.

00:07:20 The only thing that we do on a regular basis is the keyboarding skills.

00:07:29 I think that’s a really good point because I have, over the years, felt like there’s been a desire to have –where are the technology standards? You got them perfect? Where are they? Do you use the NETS? What do you do?

00:07:42 Yes.

00:07:43 But the reality is, you do use the NETS, but it’s really not about that for technology. It can’t necessarily be it’s own separate class.

00:07:50 Well, if you look at the net. The refreshed NETS which I assume are the ones you have. The old NETS old ones were—

00:07:58 They were kind of grade specific.

00:07:59 They were grade specific. They were not only grade specific, they were specific like you should be able to do this, this and this. But if you look at our school wide learning expectations, they are written off the NETS. That was the original—we looked at the NETS and prioritized those and then used those to write our school wide learning expectations. Because now they permeate the entire educational culture.

00:08:24 There's the culture.

00:08:25 There's the culture. I'd say that the teachers are very enthusiastic. And I encourage you, if you get the chance to talk to them.

00:08:30 It seems that way.

00:008:32 Are we where we could be? No. Are we doing it perfectly? Of course not, but you'll get a chance to see a program that the 3rd, 4th and 5th grades are using. Another free program. If you go on our website you can see the voice threads that our first graders made.

00:08:58 There's, I can't think of the name of it. another free—that's the one they took the award in.

00:09:14 Pod casting. We do a lot more podcasting now.

00:09:20 I can't thank you enough. I think I've gotten a little bit of a touch on everything. Anything else, there's probably too much floating around that you don't want to share!

00:09:29 I admit I could keep you for hours! It would be interesting to go back and read the blog. I think all of the archives are up on the address that I gave you. I did have to change the address because I started getting the spam and I didn't want to have to go through and delete the comments.

00:09:51 I'm going to stop.

TAPE ENDS

Appendix G: St. Peter's Interview

Principal: Mr. Sherlock

00:00:00 I'm going to keep checking this every once in awhile just to make sure that it's taping.

00:00:04 Okay.

00:00:05 And we'll go from there. That's good. Got to have those special badges!

00:00:09 Yeah, in this area if they don't have a badge I'm like, "Who are you?"

00:00:14 You're kidding right?

00:00:14 Seriously!

00:00:15 All right, so this first section here—

00:00:17 You saw the bars on the—

00:00:18 Yeah! As you said, this is a different school than anywhere I have—I think I would be
lost the first week if I had to change shoes with you. It's just such a drastic change. And the people I work with, I had a team of parents in—a team of parents—in my office yesterday and they were so upset that I need to crack down on haircuts and makeup. And it was like the most important thing in the world! I mean there were eight parents in my room, upset!

00:00:44 Last thing on my parents' minds!

00:00:46 You know what I mean?

00:00:47 Just, yeah!

00:00:49 Amazing! So, this first section, just talking about the kind of leader. So what kind of leader is going to be effective for implementing educational technology?" I'm actually going to be looking to the question number three. What do you think are the qualities of really good, effective technology leaders? If you can, think about in the background. Think about any staff that struggle or has been a challenge to get them to adopt technology. But what qualities should a leader have to really be a technological person and administrator if you will.

00:01:24 To be honest with you, I don't think that the leader has to have the working knowledge of all the technology. It's really good if they do, but the leader has to be able to give that freedom to the teachers. And give the support to the teachers to try new things. To experiment with different ideas of technologies. If the leader is close minded about what is to be used then I don't think the teacher will have an opportunity to pick what works best in that classroom. For example, smart boards. I worked with smart boards at my old school. They were highly effective for my third grade class. But there were teachers where they just weren't comfortable using that --- but using a document camera was like winning the lottery! Because they were able to put a picture book underneath there and be able to do their kindergarten work. They were able to put a paper under there and fold it for the students to understand how to fold paper or cut along a line. And so giving the teachers the opportunity to experiment and see what they need and not being so strict about what is to be used. There are certain things like [a web based grading program] or things that need to be used across the school. But as far as in each classroom, it depends on the teacher and giving the teacher that freedom. The leader needs to support the teacher.

00:03:20 That's an awesome answer. This may take this in a different path, but just curious, what type of quality or what type of leadership for a teacher that needs more than support? That needs pushing? Should it be aggressive? Should they be given a little more leeway? What have you found?

00:03:39 I think they need support. Giving that teacher that needs a little bit more help the opportunity for, let's say, professional development. Giving them a sub for the day or having myself go in. This is what I do, I had my sixth grade, or my seventh grade teacher, who may not be great with technology. Two periods I went in and covered for him. He went into the eighth grade class, she's great with technology, and he watched her. So giving, in a small school like mine, time for these teachers to go observe other teachers using technology and seeing this is how I can use it. This is what they mean by using the projector with the computer and pulling things online and seeing how easy it is. Because unless they know how they can use it, they won't want to. Because you tell them, "We'll get you a smart board, we'll get you a projector."

00:04:41 But that's not the problem.

00:04:42 But they don't want it because they don't know how to use it. If they can see it in action and say, "Oh, this is what I can do." Then you have success. And then of course after that comes training. Getting them used to that. So I would think that teachers that really aren't comfortable with that or need that extra push, need to see it in action in order for them to actually visualize what they are going to do. I'm sorry, one more thing. Last year we had a good relationship with [another local Catholic school]—

END OF SEGMENT 1

00:00:01 We went over, we were going places technologically. We had our five-year plan. We had all this set up.

00:00:10 This was not with this school? You were at a different school?

00:00:12 No, I was at [a different Catholic school previous to St. Peter's]. We were one step behind where [a local Catholic school] was. We had a good relationship with them so our teachers, we all took a day, and we went over there to see what they do. We had just bought smart boards, they had smart boards for a year. So we said, "Let's go see how they're doing." Our principal had a good vision at that point, of knowing what to do, and how to implement her tech plan. Because she just said, "Let's not reinvent the wheel. Let's go see how they're doing it." And I took that approach.

END OF SEGMENT 2

00:00:00 Okay, so when it comes to the decisions, let's talk a little bit about what it takes to actually implement hard technology. I see you with a [web based grading program] folder, by the way are you

[00:0014] I can't speak highly enough about it, to be honest with you. The perception of my school is that we're very, highly affluent and that we would therefore somehow be better capable of adjusting to technology. That's a complete myth. But what I will say is, [this web based grading program's] customer service is outstanding. Because they are still small enough to where they will walk you through anything on the phone. At any time. And the way that they're set up is they have so many short, concise video tutorials that my staff is technology trained. And they were very, very, capable of learning the curve. My problem is the four or five teachers—out of a staff of 30 by the way. 32 people—who just can't seem to change the way that they grade things. So I just can't speak highly enough. My fear is that in five years it is going to be so big that that type of customer service is going to be less helpful. But, if you're considering it, then I think it's awesome. I researched a few of them, I could give you my paperwork. It was the one to go with for us. Anyway, when I talk about implementing technology I'm looking at numbers four and five here. Specifically number five. What have been some of the obstacles that you've come across? I see a desk full of laptop computers. I know you've told me you've had a hands on practice with the school's website, perhaps even with installing wireless routers or routers and the wiring of machines.

00:01:45 Yes.

00:01:46 My perception is not having gone in to visit, this school had very little hardware and technology.

00:01:51 We had every teacher – the last thing that the principal did before she left was, there was a private donor that said, "I want to donate money for technology for the school." – So her thought was, we'll buy every teacher a laptop. So that's what she did.

00:02:14 That's a great first step.

00:02:15 Those were the first computers in this school. Well, no I can't say that because we have two, very outdated computer labs. Very outdated. There's a Commodore—

00:02:27 You're kidding me!

00:02:28 …in there.

00:02:29 Wow.

00:02:30 Yeah. It was embarrassing!

00:02:31 Really? An old 64?

00:02:33 Yes! Green screen and everything! But that was the first, the only technological thing
that had happened in this school. So the obstacle for me was, there was hard wiring in the school for telephone so we had internet.

00:03:01 You had dial up internet?

00:03:02 Yes. So the first thing that I did over the summer was wireless. So we have a couple of routers throughout the school. It's a brick building. So I have to have more routers than I really wanted to. And then I wanted to, the computer lab that is up here, the Writing to Read lab, and it has computers in it. The computer lab that is all the way down at the end of the school was, no one ever really went in there, it was storage.

00:03:34 Okay. Now when you say, "Computers in it" is that stuff that you'd done? Or were these older computers that were in that Writing to Read lab?

00:04:41 There were really old machines that were about 12 years old that are in there. I have since then replaced all the computers in the school. The first obstacle is updating to current technology which is wireless. These teachers had laptops, but they had to leave them at their desk. So for me it wasn't really a feasible option to really have a wired school when these teachers have laptops. They can't move them from their desk. They can't take them to the faculty room, they can't take them to the library, they can't even put them on a cart and attach them to a projector. So that was number one for me.

00:04:27 Without that internet connection, they needed that.

00:04:30 Yes, they need wireless internet. And so that was number one for me. Because there are so many tools, and there are tools out there on the web for learning. And textbooks are becoming more and more aligned with technology. There's websites and things in the textbooks now. If you have a newer textbook you have online support, you use that. That was number one and then number two was, the computers that were here in the school were absolutely inappropriate. I mean even for this school. It was just unacceptable. And so I knew certain places that just have tons of extra stuff. They look to donate and they have to. So that was my next step, to get the hardware in place. Once I got the hardware into the school my step now is to get the teachers onboard and get the teachers educated on using it all. I was going to take it the other way, to get them excited and then get the technology. I had to take what I can when I could get it. But I think it worked out nicely because they see all this new stuff coming in and they get excited. Now I got to figure out how I'm going to implement it.

00:06:06 It's nice to hear your consistency though because earlier you referenced how you've got to show them what it looks like before you can give it to them. But even though you couldn't do that with your own school you are aware of that and now you know how to go around that.

00:06:20 Just because I don't want things to come into the school and take up space –we don't have a whole lot of it—and have them not use it. So I'm already kind of figuring all that out. Those are the main obstacles. The other one is just money. We have no money. I've only spent, I'll show you everything that I've done up to this point, I've only spent about 500 dollars.

00:06:52 In technology?

00:06:53 Yes.

00:06:54 You're kidding!

00:06:55 Yeah. And it was to have a guy come in and really work on that lab down there. He dropped the ceiling, he ran wires through the ceiling. He put a projector, mounted it on the ceiling so that it's not on the cart. And ran the wires to a teacher computer. Hooked up all the computers to that one main computer so that they all click on together, they all go down together. Installed a program where, on the teacher computer, we will have the screen of every staff computer. We can lock them out, you know, a lot of that stuff. Kind of really hooked it up. It's still a mess down there, because it's under construction and I have a whole bunch of other things that are in there.

00:07:41 I'd love to check it out. That sounds like a good deal though for all that work for that amount of money. That's impressive.

00:7:47 A lot of it is just parents saying, “What can I do?” And I say, “Are you free on Saturday? Come unlock the lab and then I’ll let you go home!” And I just have to trust. I can’t be here all day on Saturday.

00:08:01 In addition to that I wanted to ask, you said so much in that answer! You’re awesome!

00:08:07 Sorry!

00:08:08 No! It’s fantastic, thank you. Talk to me a little bit about what is in place here in regards to the decision making process? And this question isn’t meant to judge your style of leadership as a principal, but is there a support staff or something that you work with? Do you pitch these ideas to the staff and then begin to implement them? Are they involved in making these decisions? Right now is it just coming top down? How does the technology decision making process happen in your first year as principal?

00:08:44 Well there is something in our WASC document about technology. It’s never been followed. So what I’m struggling with is that the very basic outline from our WASC document really is, when I came in, was really kind of not what the direction the school is going in. So we’re going to have a problem our next WASC, where the things that are in our document are really aren’t applicable to the direction the school is currently going in. Economically and all that stuff. So we have to start over. And the school is in such a low position technologically that it really kind of was – coming up with a five year plan, yeah okay. But—

00:09:51 But no really (Inaudible)

00:09:52 No. So there wasn’t one when I got here and I don’t have one yet, because I haven’t had the –

00:10:01 I think that’s understandable.

00:10:02 –put one together. And I’m sure that’s probably something I should have done, I just didn’t do it.

00:10:08 Well, on the list of things, that probably takes a lot of collaboration and effort and if you don’t have the hardware in place, or the technological culture in place, then I don’t know how you can—I guess that’s the beginning of the plan.

00:10:20 Because, asking people who don’t want to use technology to come up with a tech plan? It’s going to be a useless document.

00:10:31 I think you’re going about it in the right way. It seems that you’re going about it the right way. You get the technology first, you get the people excited—

00:10:34 But, yeah, but the thing is I still see the need for a plan before you start doing all that stuff. So what I've really kind of done is taken the lead on it. And it's been a top down thing, I have a couple of teachers who are really good with technology. They would probably be what I would call—I don't have a vice principal. I don't have anything—

00:11:00 Is there a plan down the line to have one?

00:11:02 I put into place a leadership team. Three teachers on my staff who are always here, dedicated and have agreed to this. And I put it out there for everybody. I said, "I want a leadership team. If you're interested, come to my office after the faculty meeting." Three people show up, three people are on my leadership team!

00:11:28 It's great that it worked out that way!

00:11:29 It did. And you know what? If I'd had all 10 teachers there, then all 10 teachers would have been on it. Of course that would mean that things would be a lot more delegated, but it just means that people would have a higher stake in what they're doing. But these are the three teachers. Two out of the three are technologically inclined. One is not and that's fine. So I usually take these two teachers as my lead for my tech plan. So the three of us really work together with what we want, what we can do, where we're going. And they are the ones that are the most excited. So they're the ones that I have my other teachers go and watch. So I have an elementary teacher saying, "I think I want to do what she's doing." Go watch her, I'll cover second grade for a little while. Go watch, see how she does it. And if you want it, I will get you that program. If you use it, I will buy it, kind of thing. So, what was the question?

00:12:31 We were talking about what is the process for coming up with that plan? What is the process? Right now that—

00:12:37 Speaking of process, is right now, if there is a need, I try to satisfy that need. On top of that, I want to get as much technology into the school as possible. I have technology now, the next thing I need are projectors. I have two, I want to get one per class would be great. I mounted one in a lab and then I have one on a cart. So one that can travel. I figure that's pretty fair for now. Until I get, I have a wish list. I put it on the wish list and if parents want to donate one, they donate one. I have two on a cart. So really slowly build that up. But the thing is, I can't, there is no money in our budget for technology. When I got here, and it's due tomorrow and didn't do it yet.

00:13:33 I think you have a little more leeway, right now personally, with your—

00:13:36 There was no money in our budget. There was $3000. That was the technology budget and it was spoken for before I got here. I had to write that check in October, so we had zero money.

00:13:53 But doesn't that apply to other standards as well beyond technology?

00:13:56 Yes, it's language arts. But that's where the budgetary—the direction of the school wasn't going towards technology, it was going towards (pause)

00:14:10 Good answer!

00:14:15 And so dealing with a budget of zero. Having jean day fundraisers where you get three or four hundred dollars. Two of those, that's all the money I've had. So once a month I have a jeans day fundraiser. They all bring in a dollar per dress item. Kid wants to wear crazy socks, that's two dollars for crazy socks!

00:14:38 That's amazing to me. If I tried to do that at my school I'd get locked out of the campus! To charge them to do that.

00:14:51 But that was my way of making payroll two months ago. We need 800 dollars so we had fundraisers to make payroll. So my plan is to get things in place because I can get things for free. Whatever things are going to cost me money, I'll put it on a wish list, or I'm going to wait until I get money, or donated money. And earmark it saying, "This is for technology." I can only use that money for technology. That's what I'm waiting for. I'm waiting for restricted funds. Grant writing. Any Foundation, I wrote that, haven't heard back. I'll probably do it again next year.

00:15:52 We applied to some, a lot of technology.

00:15:58 Oh really? I applied to the one to rebuild. But then they put the moratorium on the thing. I was going to do that because they would provide the entire funds to rebuild that one room. Kind of gut it and do it over again. But they put the moratorium on the construction so I'll redo the that application next year. Because they would do a capital project like that. A one-time project. So, my plan it's all top down right now in conjunction with these two teachers who are leading the way for my other teachers.

00:16:45 Very understandable for this kind of fledgling part of your tenure. In your first year as principal, with all of these other things that take precedence over technology, to be real frank. Okay, I'm going to drive the conversation a little differently, I want to respect our time. I wanted to let you know that one of the reasons why I was intrigued about talking to you after initially asking you if you would be interested in helping is because you are like the one man shop in the study that I'm doing. The other two schools that I'm studying, they've not only got a vice principal in place, in addition to a leadership team, but they've also got a technology teacher, and then they've also got a network coordinator or a technology administrator to do the maintenance. So what I'm intrigued about you is, you've got the talent and the reputation for not only coming up with the plan, not only being the person in the room installing this stuff, but then how

does maintenance work? What happens when a computer goes down? Or when someone calls and says, "I can't do this?" What happens if you get something in place and you're the only one responsible for showing people how to print up those report cards and take care of all that stuff? Tell me about how that is a challenge, because that has to be a challenge.

00:17:59 I told my staff at the very first faculty meeting back in August, before the kids came, I'm not a micromanager. And this is my first year as principal, but I knew before hand I wasn't a micromanager. That's even more so now. I don't have a VP, I don't have a tech person. I have 10 teachers and a couple support staff and two secretaries. That's it. I have a bookkeeper and then my secretary who speaks both English and Spanish.

00:18:38 Is your bookkeeper full time or no?

00:18:40 No. My bookkeeper is full time and then my secretary is very part time. So my bookkeeper is my secretary half the time. But I need someone in the office who speaks Spanish from 8-12. And she does lunch and yard duty. So it's hard. But, where were we going?

00:19:10 I was asking you about –

00:19:11 Maintenance!

00:19:12 No that's cool, just tell me a little bit about what it takes to be that person and the principal! To be the technology coordinator and administrator.

00:19:21 It's hard because things don't get done in a timely manner. It's up to me to do it. I have parents who say, "Is there anything that you need?" And I say, "Yes!" I always say, "Yes." And that's the thing. People ask me for help and I say, "Yes." And that's it. And then I take what I can get. I can't be picky right now because I don't have the resources in place to be picky. But I'm the only one here full time. These parents are giving freely. So I say, "Do what you can. Here's what I want done, do what you can." When something goes wrong I have a couple of parents who are good with computers. So when something goes wrong I say, "Talk to so and so's dad and see if they can come in after school one day and help you out." That's really my maintenance plan. Otherwise I'm down there and I'm fixing it. I never wear a tie anymore. I can't, I wish I could! I really wish I could!

00:20:38 But you've literally got your sleeves rolled up.

00:20:40 Yes. And so, I kind of envy people who can sit in their office all day. The guy I was talking to just now. He was from [a major telecommunications company]. I called two months ago when I put this lab in place, and I got the computer lab set up. The dad who did it, helped me do it, said, "You need fiber optics. You need files." So I said, "If

it's worth [them], I'll call." When I called them I told him I was disappointed because they said, "You're not a high priority area. You are a very low-income area. It is not worth it to us to put it in your area." That was very dissappointing! Once again, we are being penalized by the city for being poor. So our kids won't have a decent internet speed because of the location that we're in. Today was an eye opening experience. Well that phone call that I had a few months ago was eye opening. Because it finally struck a chord. I always worked in higher end schools and for them to tell me in so many words that, "You're a low income area, you're a low priority."

00:22:00 And just not getting a wired--

00:22:03 You know, they're not going to run—

00:22:04 That's interesting. Touching on the whole justice issue—

00:22:07 So that was, part of. That's me I call and I do all of that. So things don't get done in a timely manner. I am relying on volunteers, and I am relying on other people to take it upon themselves to see if they can fix what they can. So if a computer goes down, it may be a week before it gets back up. The thing is, the way I'm looking at it – for now—it's better than what we had. So I'm looking at it, it's progress. If I can get something better into place in the future, great. If I can consolidate a couple of the positions on the staff. Our librarian, and our Writing to Read person into one, different job? That's what I'm looking to do. I need to reclassify my staff and really think about, well, how effective is a librarian these days? A library with no computer in it? That's not really a trend that we want to go towards. We want a library that has a bank of computers in it. That's just the way it's going to be. That's just the way research is being done.

00:23:33 Can I tell you, you're giving me great answers!

00:23:35 Sorry!

00:23:36 No! I love it! I'm going to keep going so that we can wrap it up soon. I'm on this third italicized group. Although we did already hit a little bit of the Digital Divide. But this one that says Technological Culture. I want to mention that what I'm hearing from you is that when you came here, and I'm hearing things about 12 year old computers. I'm hearing about Commodore 64! It seems like the technological culture was so undeveloped when you took this position seven months ago.

00:24:14 It was stagnant for five years. The principal, who was here before, became the principal. She was a teacher and there was a need for the principal. I don't think they had the time for a search committee. And this one person said, "I'll do it." And she came in and she wasn't an administrator, she was a teacher. Who kind of took the role of the principal out of "there's no one else to do it." She didn't come in with the training of an administrator, the plan or goals, really anything like that, she just kind of maintained.

And it's really nothing bad about her, it's just kind of the way that the school was in five years ago. There was a need and she filled it because someone needed to be here. And so, she is more of a non-techie person. So that idea wasn't pushed forward too much. So for five years really nothing changed. And in five years technology has gone from floppy disks to thumb drives! To cds! I've seen in that time technology change and it changes monthly, daily. And so for something to stay put for five years—

00:25:51 That's really insightful.

00:25:52 –is a really long time for nothing to change. For the same programs to be on the same computers.

00:25:59 So in the technological world that is an exponential amount—

00:26:02 Yes! With no updates! When you don't update a computer—when I went through the old computers that were there, they shut off the automatic updates. So these computers have never been updated since 2000. That was the last update. Because you can go to the control panel or the programs and you can see when the last update was and they were all in 2000. So, I mean you get updates—

00:26:36 Weekly. Every Wednesday.

00:26:37 Yes, so you know, I said, "Okay." And you hear the computers running, like a (makes humming noise) like something's not right. The culture was stagnant. That's what I can define it as. It has not changed for five years so there's a huge need.

00:27:08 Do you feel like you, you obviously – I'm looking at number nine—you obviously understand the concept of change that needs to happen at your school. Do your teachers share that there's a need for that change?

00:27:24 They like it.

00:27:25 Are they afraid of it?

00:27:26 Most of our teachers are on the fence. They are comfortable with the hand written progress reports because that's what they've always done. They're comfortable with their grade books with the graph paper because that's what they've always done. They're comfortable with the way things are. When I came in I gave them a template for lesson plans on the computer. I said, "Every Monday morning just email me your lesson plans." And that really was the first thing that sent them over! And I didn't think I was asking for a whole lot. I came from a different culture. So I said, "Email me your lesson plans so that I can have them on my computer every week."

00:28:12 And that was a challenge.

00:28:13 That was a huge challenge! And I have one teacher who just can't do it. But I have on my email a whole file and so I have all of my teachers' lesson plans for the whole year on my email. So I can go in, when parents come in and say, "What's going on? I have a problem with this teacher." And I say, "Well why?" "Well, they were teaching this thing." And I can say, "Well you know what? Let's pull up their lesson." It's so easy. So, I'm just kind of, a lot of my teachers are kind of on the fringe. A lot of them are on board completely and some of them are going to stay put. So I'm really working with that middle group. I want to get them on board. Then those people automatically transfer over because, "Oh, well everybody else is doing it." It's like a psychology experiment almost with this, you know? You have, I forget, you probably know the term better than I do, but technology immigrants, or technology natives? You probably heard that by now. So I'm dealing with those immigrants right now. Because a couple of them are natives and a couple of them are comfortable.

00:29:44 It's tough. Last thing to comment on. Is there any other thing on the Digital Divide? The most startling thing you mentioned was the story about [a major telecommunication company] and you being informed that it wasn't necessarily a priority because of the demographic of the neighborhood. But do you see other examples of, other types of the equity issues here in terms of having access? Do you look at your students, are you concerned in a different way versus my students in a more affluent neighborhood?

00:30:14 I updated everything and I ended up having, for the computer lab that I had down there, I received 45 computers. And I said, "I don't have room for 45 computers." I knew of a lot of my families didn't have computers.

00:30:36 At home you mean?

00:30:37 At home. And, what I did was I gave one of these laptops to a family that lives in a motel. Because they can't have a desktop. So I just gave them one. Now, you need wired Internet for these computers so they really have to pay for Internet. Not really excited about that, now they have this new thing product that allows internet connectivity. Have you heard of that?

00:31:03 Vaguely, yes.

00:31:05 On TV and stuff, so I looked into that and I bought one and it comes with two and it comes with the number. So I did that, so now they can do it for like 20 bucks a year or something. So I gave about 10 computers to the families that didn't have one. Most of them were the desktops that we unloaded but the fact is you can get Internet, you can upgrade the computers, and they worked. So for me it's progress. It's not the ideal situation but now almost every one of our families has a computer. I can't put anything, I can't make anything only computer based yet. I can't make our progress reports only

through [a web based grading program]. I have to make sure all of our families have a computer and Internet access.

00:32:07 It's a conundrum.

00:32:08 I have three families that live in motels. In these motels. I have one parent I took to the bank to open up a checking account. And one of them is on my credit card because she's filed for bankruptcy and she has no credit. So, I don't think anything's really, she pays cash daily for her kids to live in that place, but the thing is, they needed some kind of credit. I trust this parent, it was a really weird situation. She didn't want to ask her family. They were the ones that got the laptop. Because their situation changes daily and weekly. And grandma and grandpa pay tuition because they don't know where they're living. So that's a huge equity thing because not everybody has access. But if I'm getting a whole bunch of free stuff, I obviously have to unload some of it. And I'm going to give it away because it's been given to me. I'm not going to charge it, I'm not going to sell it for 20 bucks a piece, I'm going to give them for free because I got them for free.

00:33:26 And is that, I'm looking at these laptops here, you had mentioned your connection still to [a local state university]. Tell me a little bit about your access that you have.

00:33:34 Last year I taught a student whose dad worked in the engineering department at [a state university]. They update their technology once a year. So they do it once every other semester. Because it's a college, they're at the cutting edge, School of Education, that whole deal. And the College of Engineering. Well, if you're going to get a degree in engineering at a university, you're going to be cutting edge. So they have to update and they update their hardware every year and they update their software every semester. So it goes into storage or it goes to schools and places that would accept year old equipment. I said, "Put me on the list! I would love it!" So absolutely got put on the list. So that's where we've gotten a lot of the things we have. Another one, we had a parent who worked for a pharmaceutical company. He was the tech guy for a huge pharmaceutical company. He was the guy in charge and said, "I'll give you all of our old computers."

00:34:43 And this was your connection at your previous school?

00:34:45 No, the, I'm sorry, the guy from [a state university] was. And I just kept in touch. And here at this school a dad came up to me and said, "I have a lot of computer equipment." Not computers but keyboards, mice, mouse pads, things like that. And I was like, "I'll take it! I'll take it." And so that's what we did. So I got some things from him and some from]the Cal State university]. And then another parishioner works there in a different department. And we have a couple Macs now! I don't know what we're going to do with Macs, but we'll figure it out! So I put the word out there that I want technology and people have come forward. All I did was put something in the bulletin. I asked my

pastor, “I’m going to put out a wish list and say here are the things that we are looking for.” And people responded. So that’s how I got everything, and that’s it.

00:36:06 That’s fantastic. That is really insightful.

TAPE ENDS

REFERENCES

Anderson, R. E., & Dexter, S. (2005). School technology leadership: An empirical investigation of prevalence and effect. *Educational Administration Quarterly, 41,* 48-82.

Argyris, C., (1990). *Overcoming organizational defenses: Facilitating organizational learning.* Boston: Allyn & Bacon.

Bain, J. D., & McNaught, C., (2006). How academics use technology in teaching and learning: Understanding the relationship between beliefs and practice. *Journal of Computer Assisted Learning, 22,* 99-113.

Bolt, D., & Crawford, R. (2000). *Digital divide: Computers and our children's future.* New York: TV Books.

Bridges, W. (2003). *Managing transitions: Making the most of change.* Cambridge: Da Capo Press.

Brinkerhoff, J. (2006). Effects of a long-duration, professional development academy of technology skills, computer self-efficacy, and technology integration beliefs and practices. *Journal of Research on Technology in Education, 39,* 22-43.

Clark, C., & Gorski, P. (2002). Multicultural education and the digital divide: Focus on gender. *Multicultural Perspectives, 4,* 30-40.

Clark, K. (2006). Practices for the use of technology in high schools: A delphi study. *Journal of Technology and Teacher Education, 14,* 481-499.

Coghlan, D., & Brannick, T. (2001) *Doing action research in your own organization.* Thousand Oaks: Sage.

Compaine, B. M. (2001). *The digital divide. Facing a crisis or creating a myth?* Cambridge: The MIT Press.

Cooper, J. (2006). The digital divide: the special case of gender. *Journal of Computer Assisted Learning, 22,* 320-334.

Cuban, L. (1986). *Teachers and machines: The classroom use of technology since 1920.* New York: Teachers College Press.

Cuban, L. (2001). How did teachers teach, 1890–1980. *Theory into practice, 22,* 159-165.

Cuban, L. (2001). *Oversold and underused: Computers in the classroom.* Cambridge: Harvard University Press.

Culp, K. M., Honey, M., & Mandinach, E. (2003). *A retrospective on twenty years of education technology policy.* Office of Educational Technology, US Department of Education.

Davidson, J., & Olson, M. (2003). School leadership in networked schools: Deciphering the impact of large technological systems on education. *International Journal of Leadership in Education, 6,* 261-281.

DuFour, R., DuFour, R., Eaker, R., & Many, T. (2006). *Learning by doing: A handbook for professional learning communities at work.* Bloomington, IN: Solution Tree.

Essex, N. L. (2004). Confidentiality and records: Ten ways to invite legal challenges. *The Clearing House. 77, 111-113.*

Evans, R. (1996). *The human side of school change.* San Francisco: Jossey Bass.

First, P. F., & Hart, Y. Y. (2002). Access to cyberspace: The new issue in educational justice. *Journal of Law and Education, 31,* 385-411.

Gordon, D. T. (2000). *The digital classroom: How technology is changing the way we teach and learn.* Cambridge: Harvard Education Letter.

Gorski, P., & Clark, C. (2001). Multicultural education and the digital divide: Focus on race. *Multicultural Perspectives, 3,* 15-25.

Guthrie, J. W. (2007). Data systems linking resources to actions and outcomes: One of the nation's most pressing education challenges. *Peabody Journal of Education, 82, 667-689.*

Hargittai, E., (2002). Second-level digital divide: Differences in people's online skills. *First Monday, 7,* 1-18.

Hargreaves, H., & Fink, D. (2006). *Sustainable leadership.* San Francisco: Jossey Bass.

Hawkins, S. (2005). Beyond the digital divide: Issues of access and economics. *The Canadian Journal of Information and Library Science, 29,* 171-189.

Hess, F. M., & Leal, D. L. (2001). A shrinking "digital divide"? The provision of classroom computers across urban school systems. *Social Science Quarterly, 82,* 765-778.

Hoffman, D. L., Novak, T. P., & Schlosser, A. E. (2001). The evolution of the digital divide: Examining the relationship of race to internet access and usage over time.

Jonassen, D. H. (2000). *Computers as mindtools for schools: Engaging critical thinking.* Upper Saddle River: Prentice Hall.

Jonassen, D. H. (2006). *Modeling with technology: Mindtools for conceptual change.* Upper Saddle River: Pearson Prentice Hall.

Jonassen, D. H., Peck, K. L., & Wilson, B. G. (1999). *Learning with technology: A constructivist perspective.* New Jersey: Merrill.

Judson, E., (2006). How teachers integrate technology and their beliefs about learning: Is there a connection. *Journal of Technology and Teacher Education, 14,* 581-597.

Kemerer, F., Sansom, P., & Kemerer, J. (2005). *California school law.* Palo Alto: Stanford University Press.

Langran, E., Langran, R., & Bull, G. (2005). Copyright law and technology. *Learning and Leading with Technology, 32, 24-26.*

Li, Q. (2007). Student and teacher views about technology: A tale of two cities? *Journal of Research on Technology in Education, 39,* 377-397.

Liu, Y., & Huang, C. (2005). Concerns of teachers about technology integration in the USA. *European Journal of Teacher Education, 28,* 35-47.

MacDonald, R. J. (2008). Professional development for information communication technology integration: Identifying and supporting a community of practice through design-based research. *Journal of Research on Technology in Education, 40,* 429-445.

Matzen, N. J., & Edmunds, J. A., (2007). Technology as a catalyst for change: The role of professional development. *Journal of Research on Technology in Education, 39,* 417-430.

McCarthy, M. (2004). Filtering the internet: The children's internet protection act. *Educational Horizons, 82,* 108-113.

National Commission on Excellence in Education. (April, 1983). *A nation at risk.* Retrieved November 23, 2007, from http://www.ed.gov/pubs/NatAtRisk/risk.html

National Telecommunications and Information Administration (NTIA). (1995). *Falling through the net: A survey of the "have nots" in rural and urban America.* Washington, DC: US Department of Commerce. Retrieved December 11, 2007, from http://www.ntia.doc.gov/ntiahome/fallingthru.html

National Telecommunications and Information Administration (NTIA). (2002). *A nation on-line: How Americans are expanding their use of the internet.* Washington, DC: US Department of Commerce. Retrieved December 11, 2007, from http://www.ntia.doc.gov/ntiahome/dn/anationonline2.pdf

Norris, P. (2001). *Digital divide: Civic engagement, information poverty, and the internet worldwide.* Cambridge: Cambridge University Press.

Sanders, M. (2006). Technology education leadership: Observations and reflections. *Technology Teacher, 66,* 31-35.

O'Bannon, B., & Judge, S. (2004). Implementing partnerships across the curriculum with technology. *Journal of Research on Technology in Education, 37,* 197-213.

Peslak, A. R. (2005). The educational productivity paradox: Studying the effects of increased IT expenditures in educational institutions. *Communications of the ACM, 48,* 111-144.

Perez, M., Shambaugh, L. S., & Parrish, T. (2008). *Answering the knock of opportunity: Addressing the data needs of California's English learners.* Stanford University. American Institutes for Research. Retrieved January 21, 2009, from http://gse.berkeley.edu/research/PACE/reports/Answering_the_Knock_of_Opportunity.pdf

Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon, 9,* 1-6.

Resta, P., & Laferriere, T. (2007). Technology in support of collaborative learning. *Educational Psychology Review, 19,* 65-83.

Ribble, M. S., & Bailey, G. D., (2004). Monitoring Technology misuse & abuse: A five-step plan for creating a digital citizenship program in your school. *Technology Horizons in Education Journal, 32,* 22-25.

Ribble, M. S., Bailey, G. D., & Ross, T. W. (2004, September). Digital citizenship: Addressing appropriate technology behavior. *Learning & Leading with Technology, 32,* 6-10.

Rubin, H. J., & Rubin, I. S. (2005). *Qualitative interviewing: The art of hearing data*. Thousand Oaks, CA: Sage.

Scheffler, F.L., & Logan, J. P. (1999). Computer technology in schools: What teachers should know and be able to do. *Journal of Research on Computing in Education, 31,* 305-326.

Selwyn, N. (1999). Why the computer is not dominating schools: A failure of policy or a failure of practice? *Cambridge Journal of Education, 29,* 77-91.

Senge, P. (2000). *Schools that learn: A fifth disciple fieldbook for educators, parents, and everyone who cares about education.* New York: Doubleday.

Servon, L. J. (2002). *Bridging the digital divide.* United Kingdom: Blackwell Publishing.

Shaughnessy, M. A. (2005). *The law and Catholic schools: A guide to legal issues for the third millennium.* Washington, DC: National Catholic Educational Association.

Silverman, D. (2006). *Interpreting qualitative data* (3rd ed.). Thousand Oaks, CA: Sage.

Stein, M. I. (2003). Globalization and or a globe of villages. *Creativity Research Journal, 15,* 11-14.

Thomas, D. (2008, Summer). The digital divide: What schools in low socioeconomic areas must teach. *The Delta Kappa Gamma Bulletin,* 12-17.

Tiene, D., (2002). Addressing the global digital divide and its impact on educational opportunity. *Educational Media International, 39,* 211-222.

Toglia, T. V. (2007). Details on the family educational rights and privacy act: How does FERPA affect you? *Tech Directions, 67, 32-35.*

U.S. Department of Education. (2001). *No child left behind.* Washington, DC: US Government Printing Office. Retrieved October 29, 2007, from http://www.ed.gov/policy/elsec/leg/esea02/index.html

U.S. Department of Education. (2004a). *Toward a new golden age in American education: How the internet, the law, and today's students are revolutionizing expectations.* Washington, DC: U.S. Government Printing Office. Retrieved January 19, 2008, from http://www.ed.gov/about/offices/list/os/technology/plan/2004/index.html

U.S. Department of Education. (2004b). *Helping practitioners meet the goals of no child left behind.* Washington, DC: U.S. Government Printing Office. Retrieved January 19, 2008, from http://www.ed.gov/about/offices/list/os/technology/reports/help-pract.pdf

U.S. Department of Education. (2007). *State strategies and practices for educational technology: Volume 1 – examining the enhancing education through technology program.* Washington, DC: U.S. Government Printing Office. Retrieved January 19, 2008, from http://www.ed.gov/rschstat/eval/tech/netts/netts-vol1.pdf

Valadez, J. R., & Duran, R., (2007ruary / March). Redefining the digital divide: Beyond access to computers and the internet. *The High School Journal,* 31-44.

Van Dijk, J., & Hacker, K., (2003). The digital divide as a complex and dynamic phenomenon. *The Information Society, 19,* 315-326.

Wayman, J. (2005). Involving teachers in data-driven decision making: Using computer data systems to support teacher inquiry and reflection. *Journal of Education for Students Placed at Risk, 10,295-308.*

Wayman, J. C., & Stringfield, S., (2006). Technology-supported involvement of entire faculties in examination of student data for instructional improvement. *American Journal of Education, 112,* 549-571.

Wresch, W. (1996). *Disconnected: Haves and have-nots in the information age.* New Jersey: Rutgers University Press.

Yamagata-Lynch, L. C., (2003). Using activity theory as an analytic lens for examining technology professional development in schools. *Mind, Culture, and Activity, 10,* 100-119.