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Educators' Perceptions of a 21st Century Digital Literacy Framework

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This is to certify that the doctoral study by

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Abstract

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Stephen S. Spengler

MS, Wilkes University, 2004

BA, Muhlenberg College, 1995

Doctoral Study Submitted in Partial Fulfillment

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Abstract

The concept of literacy has expanded to include understanding and effective utilization of information, media, and technology. The Children's Internet Protection Act requires school districts to teach proper online use and behavior. The lack of a technology requirement in a rural, public school district in Northeastern Pennsylvania that meets the needs of 21st century learners and the conditions of the Children's Internet Protection Act was the rationale for the development of this project study. The study's conceptual framework stemmed from theories related to new literacies, multimodality, computer education practices, and millennial learners. The research questions examined educators' perceptions of topics and skills to include in a curricular framework that addressed the lack of a comprehensive technology requirement to improve 21st century digital literacy skills for all students. A qualitative case study design was selected and data from 40 open ended questionnaires, one 5-member focus group discussion, and two 6-member focus group discussions were open coded and thematically analyzed. Emergent themes relating to a digital literacy course framework included information access skills and the application of technology. Findings were validated through member checking and triangulated with 62 existing curricular documents. The project for this study consisted of a curricular framework for a 90 day 21st century digital literacy high school course that can be used by any school district to enhance the preparation of students for life after high school. Such use of the findings and culminating project may positively affect social change through a modern definition of literacy thus contributing towards the development of a positive and prepared 21st century citizenry.

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Dedication

This work is dedicated to my wife, Katie and our three children Kyla, Lexi, and Jace. Without them, I would not have become the man, the husband, and the father I am today. It is through their love, understanding, and support that I have become a better person than I ever was before.

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Section 1: The Problem

Introduction

Students in the early 21st century are continuously receiving information, communicating, viewing media, and using a myriad of technology-based tools. According to Kaware and Sain (2015), teaching learners in a world of instant information is a challenge for educators. The use of the Internet, smartphones, computers, tablets, gaming systems, and multimedia devices may be problematic for the educational community. In order to correctly teach children to evaluate, interpret, and effectively use technology, educators have to support technology, utilize technology in their classrooms, and teach proper use of technology to accomplish tasks (Kaware & Sain, 2015; Kelly, 2013; Hung, Lee, & Lim; 2012; Liu & Tee, 2014).

Contemporary literacy carries a broad definition. Students are required to have the ability to understand and effectively utilize the information, media, and technology available. Aqili and Nasari (2010) differentiated traditional literacy from literacy in the 21st century as a range of abilities to successfully communicate using various media, read e-books, utilize e-mail, find and evaluate online information, utilize presentation software, employ electronic communications to establish dialogue with experts, and write for both a local and global community. Hobbs (2011) and Chase and Laufenberg (2011) supported this changed meaning by suggesting that literacy, due to the varied methods of communication and expression, is greater than the ability to just read, write, speak, and listen. Literacy, due to the influence of technology, now includes complex and integrated

forms of images, video, sound, music, and interactivity that the learner needs to possess in their bag of learning tools.

A student might be comfortable and confident with technology use, but that comfort and confidence do not necessarily translate into literacy. Judson (2010) and Leung (2010) stated educators assume students are literate in technology simply because they have spent their lives around it. Leung advocated the teaching and learning of technology related skills, but reminded educators that they are not automatically learned (Walsh, 2010). The fast pace of technology creates an ideal opportunity to reflect upon a modern definition of literacy and how education can be compelled to change its approach to literacy. Students are accustomed to using technology but it will take educators to provide the framework to focus students on gaining broad literacy skills.

This project study will explore teacher perceptions of a 21st century digital literacy framework, incorporating the components they believe to be necessary. The remainder of this section includes a definition of the problem, a rationale for selection, operational definitions associated with the problem, a discussion centered on the significance of the problem, guiding research questions addressing the problem, a review of the literature centering on the problem, project study implications, and a summary of important parts.

Definition of the Problem

The Child Trends Databank (2010) reported that 77% of children in the United States ages 3 to 17 used the Internet at home, more than three times as many in 1997. In addition, 93% of children had access to a home computer, which is up from 15% in 1984

(Child Trends Databank, 2010). Access to technology and to the connectedness of the Internet is rising. Children, ages 8 to 10, spent about 45 minutes on the computer on a typical day, whereas older children (ages 11 to 14, and ages 15 to 18) spent more than 90 minutes (Child Trends Databank, 2010). The method that children use to access online content is also varying. The PEW Internet and American Life Project (2012) reported that 31% of children ages 14 to 17 owned smartphones and 92% of teen smartphone owners access online content on a daily basis. The data show that the use of technology is increasing as children get older, home Internet use is increasing among children ages 3 to 17, and the methods used for accessing content varies.

On August 15, 2011, the Federal Communications Commission (FCC) released the order to implement the Children's Internet Protection Act (CIPA). The law requires school districts to teach proper online use and behavior as a requirement for receiving E-Rate funding. E-Rate assists schools and libraries to obtain access to high-speed connectivity and the discounts to support the connectivity. Many school districts require students to take a technology course to fulfill a graduation requirement, but the courses may not currently meet the requirements of the CIPA order. The district may not receive funding, and there may be a lack of higher levels of information and media literacy components (Nelson, Courier, & Joseph, 2011).

The increased availability and use of technology by children is potentially advantageous to the educational environment. However, Hazen (2010) stated that access to technological tools is not useful if the student is not proficient in applying them in a practical environment. Requiring a course that meets the demands of CIPA and supports

broadening the parameters of the course will create a better opportunity for districts to satisfy the technological needs of students (Allen, 2007).

The local setting is a rural school district in northeastern Pennsylvania. The district serves over 10,000 students from kindergarten through grade twelve in nine schools. There are two high schools, two junior high schools, one intermediate school, and five elementary schools. Specifically, the research site is the district's two high schools serving students in grades nine through twelve. One high school has approximately 1,600 students while the other serves approximately 1,800 students. Having a course that focuses on the application of current technological skills as well as ethical problem solving may produce a better prepared local student populace.

Rationale

Evidence of the Problem at the Local Level

The lack of a technology requirement in a rural, public school district in northeastern Pennsylvania that meets the requirements of CIPA and supports the 21st century learner was the rationale for the development of this project study. In 2010, by issue of the district's Board of Education, the district eliminated the Information Processing course, which served as the technology requirement for district students. For the 2012-2013 school year, the district's business education courses were slated for curriculum revision. In order to comply with the Board of Education and the regulations of the CIPA order, the district is seeking to redesign the Information Processing class to meet the CIPA order requirements while remaining current.

Evidence of the Problem From the Professional Literature

The Educational Testing Service (2006) reported that college students and high school students lacked in their ability to utilize and apply information available online. Several years later, experts still stressed the lack of students being able to utilize and apply information related to 21st century technology related skills (Nelson et al., 2011; Poore, 2011; O'Sullivan & Dallas, 2010; Koltay, 2011; Potts, Schlichting, Pridgen, & Hatch, 2010) including proficiencies in technology, media literacy, and information literacy (Hignite, Margavio, Thomas, & Margavio, Geanie, 2009; Kong, 2009; Milic & Skoric, 2010). In a survey of business experts, human resource directors, and business educators, Ali and Katz (2010) found that the 21st century business world sought new hires who possessed information-communication technology skills. The data suggested that students were lacking the same skills as students in 2006, while employers were still seeking them.

Latham and Gross (2007, 2008a, 2008b) distinguished how students learned what they knew about information literacy and technology. The most frequently reported method for learning information and related technology skills was self-taught. Fifty-nine percent in the first study reported learning the skills independently (Latham & Gross, 2007). Seventy-four percent in the second study reported learning the skills on their own (Latham & Gross, 2008a). Eighty-five percent in the second study also reported learning the information literacy skills independent of formal instruction (Latham & Gross, 2008a). Researchers have suggested that K-12 education administrators have not come to

an agreement of what should be included in information literacy instruction (Latham & Gross, 2008b).

The Enhancing Education Through Technology component of the Elementary and Secondary Education Act charged schools with documenting grade 8 students' technology literacy levels (No Child Left Behind Act of 2001, 2002). The collection of data was to have begun during the 2006-2007 school year. However, the U.S. Department of Education (2009) reported that most states continue to neither measure nor monitor students' technology proficiency levels. Hohlfield, Ritzhaupt, and Barron (2010) stated that technology literacy can be an extremely challenging task to measure, but assessments have been developed that are geared towards performance-based skills necessary to measure it.

Definitions

Digital literacy – "Digital literacy represents a person's ability to perform tasks effectively in a digital environment, with 'digital' meaning information represented in numeric form and primarily for use by a computer" (Jones-Kavalier & Flannigan, 2006, p. 9).

Information literacy – Information literacy is the ability to seek, access, and apply information (American Association of School Librarians & the Association for Educational Communications and Technology, 1998b).

Media literacy - Media literacy is "the way people analyze and interpret messages from mass media" (Aqili & Nasiri, 2010, p. 452).

Computer literacy - "Computer literacy is an understanding of the concepts, terminology and operations that relate to general computer use. It is the essential knowledge needed to function independently with a computer. This functionality includes being able to solve and avoid problems, adapt to new situations, keep information organized and communicate effectively with other computer literate people" (Computer Literacy Initiative, 2012, para. 1).

Significance

Many educators and scholars believe that the fundamental goal of high school is to guide students toward acquisition of the knowledge and skills to survive at the next level (Ali & Katz, 2010; Allen, 2007; Kong, 2009; Rosen, 2011; Silvernail, Small, Walker, Wilson, Wintle, 2008; Stripling, 2010). However, the skills required upon leaving high school change. Technology affects most aspects of life including education (Snape & Fox-Turnbull, 2011). Therefore, schools should provide students with opportunities to learn, use, and apply the necessary technology skills to excel.

Numerous educators and scholars have identified media literacy (Aqili & Nasiri, 2010; Arke & Primack, 2009; Bittman, Rutherford, Brown, & Unsworth, 2011; Chang, Liu, Lee, Chen, Hu, & Lin, 2011; Considine, Horton, & Moorman, 2009; de Abreu, 2010; Hignite et al., 2009; Milic & Skoric, 2010; Torres & Mercado, 2006; Turner, 2011), technology literacy (Amtman & Poindexter, 2008; Crompton, 2004; Hutchinson & Reinking, 2011; Shankar, Kumar, Natarajan, & Hedberg, 2005), computer literacy (Al-Alaoui, Ohannessian, Choueiter, Akl, Avakian, Al-Kamal, & Ferzli, 2008; Heinrichs & Lim, 2010), and information literacy (Carroll, 2011; Erjavec & Volcic, 2010; Heinrichs

& Lim, 2010; Judson, 2010; Ladbrook & Probert, 2011; Leung, 2010; Salisbury & Karasmanis, 2011; Teske & Etheridge, 2010) as individually influencing students beyond the walls of the secondary classroom. However, as researchers have suggested, this technology-driven world requires students to be proficient in all of the areas mentioned above (Alverman, 2004; Arke & Primack, 2009; Blummer, 2008; Chase & Laufenberg, 2011; Covello, 2010; Crompton, 2004; Eshet- Alkalai, 2004; Eshet-Alkalai & Chajut, 2009; Gainer, 2010; Hobbs, 2011; Izzo, Yurick, Nagaraja, & Novak, 2010; Judson, 2010; Koltay, 2011; Markauskaite, 2006; Nelson et al., 2011; Potts et al., 2010; Rosen, 2011; Watt, 2010).

The results of this study may afford educators the opportunity to provide input towards the development of a 21st century digital literacy framework including the components they believe to be necessary within the framework. The outcomes of this study may assist educators in adopting a framework that promotes contemporary computer skills, foundational concepts of information access skills, and the application of technology to complex and sustained situations (Kaminiski, Seel, & Cullen, 2003). The significance of this study for schools, and to the educational community as a whole, derives from the belief that schools prepare students for the next steps. Whether that next step is attending a university or seeking employment, school districts should consider changing the outdated technology application-based courses and replacing them with 21st century digital literacy-based courses.

Guiding/Research Question

Teaching technology skills to students at the research site in a timely manner has historically been a problem. As education moves forward, many educators and researchers allude to the need for 21st century literacy and technology skills beyond high school (Ali & Katz, 2010; Allen, 2007; Kong, 2009; Rosen, 2011; Silvernail et al., 2008; Stripling, 2010). This doctoral project study is to address teachers' perceptions of the facets of a 21st century digital literacy framework including the components they believe to be necessary within the framework. The guiding research question is: What are teachers' perceptions of a 21st century digital literacy framework? The first subquestion is: What are teacher perceptions of an information literacy component of a 21st century digital literacy framework? The second subquestion is: What are teacher perceptions of a media literacy component of a 21st century digital literacy framework? The final subquestion is: What are teacher perceptions of a computer and technology skills component of a 21st century digital literacy framework?

Review of the Literature

This section includes a review of the current and relevant findings in the literature related to 21st century digital literacy. In this literature review, I identify and analyze research that supported the implementation of a new framework for 21st century digital literacy. The literature review section begins with a description of the search process for seeking related literature and studies. It then includes an analysis of the conceptual framework. I then explore media literacy concepts and their influence on 21st century

literacy as well as information literacy's relevance and components. Finally, I explore the need for computer or technology literacy.

Literature Review Process

The references in the literature review were gathered through the use of electronic databases. Walden University's federated search interface, Thoreau – Search Multiple Databases guided the initial search process. Specifically, the databases that literature came from were Education Research Information Center (ERIC), Education Research Complete, SAGE Journals Online, ProQuest Central, Teacher Reference Center, and Academic Search Complete/Premier. Boolean search logic uncovered peer-reviewed articles published within the last ten years with a focus on *digital literacy*. The initial search yielded over 1,600 pieces of literature. Applying *21st century* and *literacy* to the search criteria assisted in uncovering a conceptual framework. Through expansive scanning of abstracts and for relevance, occurrences in literacies related to media, computer, and information were numerous. As a result of the primary explorations, more specific searches were added to include terms such as, *media literacy*, *computer literacy*, *information literacy*, and *technology literacy*. It was through the consequential searches that the outline of the conceptual framework, historical context, and scaffold of the study began to form.

Conceptual Framework

A conceptual framework, as Merriam (2009) described, is the underlying component to all research. Nevertheless, in qualitative research, where research develops through the inductive processes, it can be difficult to construct it. It is also true that the

beliefs and ideals that the researcher brings to the study come into play with the development of the conceptual framework. Maxwell (2005) described the qualitative conceptual framework as "the system of concepts, assumptions, expectations, beliefs, and theories that supports and informs your research" (p. 33). New literacies, multimodality, computer education practices, and the role that education plays with millennial learners form the conceptual framework for this study.

New literacies. The study is based in theoretical perspectives related to new literacies (Brown & Lockyer, 2006; Honan, 2012; Marcus, 2009; Pacino & Noftle, 2011; Potts et al., 2010). The new literacy perspective focuses on the skills beyond traditional print world literacy. Pacino and Noftle (2011) stated that the meaning of literacy and reading comprehension has changed as a result of technology and that "21st century students have grown up interacting with various technological devices that require them to be adept in digital, multimodal, multiple literacies in the context of the literacy skills necessary to function effectively across cultures" (p. 484). In addition, the combination of content-area standards and 21st century standards suggest that citizens, to be considered literate in the 21st century, need to take on a new literacy that is inherently driven by technology (Potts et al., 2010).

Multimodality. The theory of multimodality is also a theoretical perspective that supports this study. According to Johnson and Kress (2003), multimodality is a domain of inquiry that allows for meaning acquisition without the limitations of traditional methods, such as reading, writing, listening, and speaking. Hull and Nelson (2005)

considered multimodality as an enhanced method for learning. Considine et al., (2009) discussed skills children are bringing to the classroom and the issues that arise:

> Because of the availability of digital technologies, today's teenagers bring to school a rich and different set of literacy practices and background that is often unacknowledged or underused by educators, As always, it is the responsibility of today's educators to build a bridge between the knowledge students already have and the content they need to learn to be successful inside and outside of school. (p. 471)

However, many educators are unprepared to meet the demands of a new literacy that includes multimodal texts, Web-based audio and video, and interactive simulations (Barone & Wright, 2008). Paying close attention to multimodality delivery and learning concepts will assist in leading this doctoral study towards the guiding research question.

Computer education practices. The teaching of computers has been an evolving topic in education since the early 1960s (Perez & Murray, 2010). In the early stages of implementation, computer education was a mainstay of computer science and necessary for computer programming. During the 1970s, computers' impact on society, public policy, and emerging computer fields began to drive the need for more defined instruction targeting specific needs (Neill, 1977). By the 1980s, curriculum focused on what computers are, how they operate, and what they can accomplish for the world of math and science (Hoffman & Blake, 2003), while the emergence of information literacy instruction from librarians focused on seeking information (Pinto, Cordon, & Diaz, 2010). During the 1990s through the early 2000s, the teaching of computers changed

from operating and understanding computers to teaching productivity (Hoffman & Blake, 2003), and accessing information using the computer. Teachers were no longer focusing on what the computer is and how it operates, but almost solely on productivity software applications. Available technologies, information access, and desirable knowledge at the time shaped the evolution of computer education (Cesarini, 2005). Understanding that the teaching of computers and technology is an evolutionary subject will further support the framework of this doctoral study and assist in guiding it towards the guiding research question.

Millennials. Millennials are children born between the years 1982 and 2002 (Howe & Strauss, 2000). Pedro (2006) suggested that the use of technology facilitated all of their activities related to communication and collaboration. As a result of a comfort level with the utilization of technology to facilitate everyday tasks, millennials enter an educational system that may lack the ability to take advantage of the new literacies that they bring with them (Considine et al., 2009). Millennials are in the midst of living in a wired and connected world, but they seldom realize the impact of what they do when using technology (Nicholas and Regina, 2008). Nelson et al. (2011) stated that students leaving the K-12 environment often lack a common inventory of skills, are unable to utilize information technology resources, think they know more than they do, and still possess a wide range in computer proficiencies. Understanding that there are differences in methods for the delivery of instruction to millennials and ultimately preparing them for post-high school will further assist in steering this doctoral study towards the guiding research question.

Media Literacy

Twenty-first century citizens live in a world saturated by digital or electronic media. Whether it is television, radio, satellite, YouTube, or Facebook, there are multitudes of places where they can view media, create it, and even post it for the world to see. de Abreu (2010) stated that while children have more access to technology and media than any generation before them, it is essential for educators to understand the implications of its use. Conversely, when seeking others' content it becomes increasingly important to understand that it represents the interpretation of the creators and may not adequately reveal the underlying social, societal, political, or economic implications. Student are highly connected and can record, post, and become a contributor to the growing electronic body of knowledge through the simple use of a smartphone. As Buckingham (2007) stated, the information that connected devices provide access to create a need for students to be able to evaluate and interpret critically. As a result of this technology and connectedness, it becomes imperative to educate students in the aspects of media literacy.

Aufderheide's (1993) definition of media literacy identified the concept as a driving force to understand, create, and develop meaning through text, images, sounds, and video. According to de Abreu (2010) media literacy education provides students with the tools to consume information critically in order to determine truth from fiction. The impact of media literacy surfaces when students recognize and understand the influences of electronic media, the impact of electronic media on literacy and their exposure to large quantities of it in everyday life.

Modern media is readily available anywhere, anytime, anyplace and instantly becomes a tool that could be utilized for learning (Hull & Nelson, 2005). Walsh (2010) identified multimodality as the act of making meaning out of the interaction and production of electronic, digital, or multimedia materials. Considering this definition then, it is understandable why the impact of technology in everyday life suggests that literacy is much more than reading, writing, speaking, and listening. In the multimedia, technology-driven 21st century, multimodality becomes a central idea affecting the ways that students acquire, synthesize, and demonstrate their attainment of meaning.

Considine et al. (2009) stated that technology has changed the way that information reaches the learner. Considering that printed text was once a new technology much in the same way that multimodal, digital, Internet-based, Web sites are, then the act of reading and comprehending would indicate that literacy has evolved or changed. Students are engaging in reading outside of school through different digital means, which is much more than simply decoding the understanding of the text (Potts et al., 2010). It is the act of reading and comprehending, but the delivery is in a multimodal, interactive, online, and digital format.

Hobbs (2011) stated that many technology delivered messages expose children to vast amounts of content. If students spend increasing amounts of time interacting with media, then the ability to manipulate and create becomes more important as access to multiple forms of information continues to expand. de Abreu's (2010) consideration of the importance of media literacy, along with Koltay's (2011) support of media literacy uncover a need for children to better understand the role that digital media plays in

everyday life. This call for an increased understanding of the weight and impact of media literacy goes beyond an educational role (Buckingham, 2007; Considine et al., 2009; Koltay, 2011). Digital media will increasingly embed into the lives of children as they continue to utilize technology. Gainer (2010) identified school as the ideal place to require media literacy education. However, technology delivered viewpoints challenge the traditional model of teacher as the center of information distribution. With smartphones, tablets, eReaders, and other connected devices entering the classroom, students possess the tools to seek, evaluate, and produce the media themselves. A failure to connect the technology-based world of the millennials to classrooms could be detrimental to their grasp of media literacy that is increasingly more and more important in the 21st century (Considine et al., 2009).

Information Literacy

Information literacy provides the learner with the tools to seek, evaluate, synthesize and create using the vast array of available print, video, audio, and various digital technologies available. The American Association of School Librarians and the Association for Educational Communications and Technology (1998b) developed a conceptual framework to provide librarians, media specialists, and educators with the guidance and tools to be able to access, utilize, and make informed judgments on the myriad of information formats available to them. It is a set of skills required for accessing and evaluating information whether students are inside or outside of the school environment.

Portable devices with access to Internet-based content can be as powerful as a notebook computer or as simple as an eBook reader. Due to the rapid explosion of available information through technology, being information literate is a necessary skill needed to combat Shenk's (1997) *data smog*. Data smog, or the cloudiness or haze of too much information, occurs as result of an excess of easily accessed information. Data smog can dissipate when students develop skills in the discernment, analysis, evaluation, and navigation through the mass of information that technology and the Internet have made available. Information literacy is the tool or set of tools to ensure the proper application of technology, effectively and efficiently find information, evaluate the results, and ultimately oppose data smog (Kong, 2009).

Ladbrook and Probert (2011) studied Australian grade 10 students' information literacy tendencies and approaches towards information retrieval. Teachers administered surveys seeking data regarding information searching habits, tools, and abilities. Surveys distributed to participating teachers queried how students were using information literacy to integrate, utilize, and apply various information technologies to respond to assignments and projects. An additional research-based project developed for this study provided the researchers with observation data and feedback related to student information and information technology use. Primary findings indicated that the students lacked critical thinking and information literacy skills. Findings also supported teacher beliefs that students have high technology skills, but relied too heavily on broad-based searches using *Google* and *Wikipedia*. Ladbrook and Probert (2011) suggested that all

students receive a formal information literacy education to assist in information literacy skills development.

Allen (2007), in the assessment of middle and high school student information-technology skills, determined a need for information literacy instruction. Allen investigated schools across the United States seeking answers to what students will need in the 21st century related to information access. The investigation in looking at other schools supported the idea that information literacy instruction was haphazard with students receiving varying levels of instruction in an assortment of aspects of information seeking. This was the drive to assess students in basic information literacy skills in the school. An assessment of student information literacy skills identified that some aspects of information literacy were taught better than others, younger students had a better grasp on it than older students, and teachers had a limited view on information literacy as a whole (Allen, 2007). As a result, the school implemented an information literacy curriculum across all grade levels.

Hignite et al. (2009), in their assessment of information literacy skills of 600 in-coming college students indicated that only 40% obtained proficiency. The instrument specifically targeted the ability of students to gather, analyze, and apply the knowledge learned by using technology. Additional measures included the understanding of the legalities and ethics related to information access and the ability to apply technology to organization, evaluation, and communication of research results. Hignite et al. stated that although students possess numerous technology skills, the information technology skills required to attain proficiency on their assessment were lacking. The researchers

suggested that students' technology use has evolved, but their ability to sort through all the information is still subpar. It was also suggested that the courses that provided previous experiences in information literacy may also be lacking or focus on only the technology skills. Hignite et al. (2009) suggested that "if such courses are to continue to provide value to students, it would appear that significant future attention must be devoted to achieving greater success in such endeavors" (p. 6).

Shankar et al. (2005) stated that technology is the component that has made information literacy more challenging for students. The ability to analyze and evaluate information often intertwines with technology skills even though they are different skillsets (Shankar et al., 2005). In their study of information literacy skills, as it related to Ellis's (1989) research on information seeking, it was found that the majority of students were not demonstrating high levels of information literacy. Search terms were not specific enough to return results that represented a broad perspective on the topics. Starting points were not thoroughly investigated enough and too often, the task defined them. In other words, students were not applying appropriate information literacy skills to seek, differentiate, and apply the learned skills.

Computer Literacy

Milic and Skoric (2010) stated that computer literacy is a very difficult term to define. Its origin lies in the ability to program computers, but that quickly evolved into the ability to use computers for tasks. The Computer Literacy Initiative (2012) defined computer literacy as:

> An understanding of the concepts, terminology and operations that relate to general computer use. It is the essential knowledge needed to function independently with a computer. This functionality includes being able to solve and avoid problems, adapt to new situations, keep information organized and communicate effectively with other computer literate people. (p. 1)

Even though computer literacy has been traditionally difficult to define, not being literate in the use of computers can be detrimental to the ability to function in society. Computers are everywhere in this world. Being able to use them becomes a requisite skill to communicate, seek information, work, and to entertain. Computers in various forms will likely remain a part of everyday life in the 21st century and beyond (Milic & Skoric, 2010; Eshet-Alkalai, 2004; Allen, 2007; Nelson et al., 2011; Educational Testing Service, 2005).

It has been suggested that it is nearly impossible, without computer literacy proficiency, to be able to succeed in science, mathematics, language arts, and just about anything else that society requires from its citizens (Kaminski et al., 2003; The Computer Literacy Initiative, 2012). Computer literacy appears to be a requisite skill in the 21st century, but just being able to operate computer technology may not adequately prepare children for life after school. As Ng, Schweitzer, and Lyons (n.d.) suggested, students may fail to develop the personal professional skills and ultimately may not benefit from an environment where the setting is indicative of post-high school experiences. The result

is an inability to connect the world of the millennials to the expectations of the classroom and the post-school world where we expect them to learn and develop. Even though Millennials may come to school with all of these technology skills, they may not necessarily possess the ability to apply them properly.

In their study of expectations of undergraduate professors, Nelson et al. (2011) found that computer and application skills drove motivation for evaluation of computer literacy. Though much of the data suggested that technology literacy is something that integrates into all content areas and courses, the data suggested that the course should focus less on applications and computers and more on functioning in today's technology-based society. Grant, Malloy, and Murphy (2009) further stated that technological skills are necessary skills that apply to any device usage, but it is the use and application of technology that truly indicates literacy.

The Educational Testing Service (2005) identified a growing agreement among educational professionals that too many students possess the computer skills, but not the information and media literacy skills required to function beyond school. In a study of English students using technology to complete assignments, Herring (2011) found that students can use the technology and grasp new technologies quickly, but that there is still a need for students to be taught more information literacy techniques. If post-secondary life requires students and employees to have higher levels of literacy related to technology use and application, and the public continues to call for technology education, then simply entering into those domains with core computer skills will not be enough (Dugger, 2009).

While some critics of the use of computers have been concerned about the impact of too much use in school, entertainment, and in the everyday lives of students, researchers have not definitively identified a negative impact on students' lives. Studies that have been conducted focused on the lack of adequate sleep (Mei-Yen, Wang, & Yi-Jong, 2006), the deviation away from personal and professional goals (Suhail & Bargeez, n.d.), negative changes in behavior (Balkan & Adalier, 2011; Mei-Yen, Wang, & Yi-Jong, 2006; Niculovic, Zivkovic, Manasijevic, & Strbac, 2012), general computer anxiety (Aydin, 2011; Erdogan, 2009;Fakun, 2009), and the decline of physical activities (Burke, Beilin, Durkin, Stritzke, Houghton, & Cameron, 2006; Straker, Pollock, Zubrick, & Kurinczuk, 2006; Vandelanotte, Sugiyama, Gardiner, & Owen, 2009). Future researchers could attempt to determine if the rates of using computers for pedagogical purposes has a negative impact on the everyday lives of children.

Conclusion

High schools are still subject to the historical methods of learning that limit students' ability to utilize new methods and technologies (Dede, 2007). Friedman (2005) discussed a flat world where society asks its graduates to seamlessly navigate and work in a global, knowledge-based economy. These skills or abilities are a modern modification to the concept of being literate, where reading, writing, speaking, and listening are at the core, but the methods and tools are formed from the demands of the 21st century. If education and society have such high expectations, then students must not only be capable of reading the information, but also have a proficiency in locating, evaluating,

synthesizing, and communicating the information to others inside and outside school (Potts et al., 2010).

Technology and the increasing number of ways to access media and information have created a unique dilemma in education. Educational leaders understand that harnessing the power of technology is necessary to prepare students for life after high school. However, in the 21st century, technology and its various forms is a broadly defined term. Literacy in being able to operate and employ technology affords students the ability to master hardware and software skills. Media literacy provides a level of proficiency allowing students to demonstrate skills in determining accuracy and validity in what they read, see, and hear. Information literacy is the understanding that there is a need to seek information, being able to sort through it all, and then produce a response. Separate, they are three skills. Combined, they are a powerful 21st century tool that prepares students for life after high school. Allen (2007) summed up the call to educate students in all three of the above-mentioned literacies:

> In the twenty-first century, students will not only need to proficiently use all types of hardware and various software products, access and assess information, and synthesize the information gathered and use it ethically, but they will also need to be responsible users of the equipment, software, and data; to be able to collaborate with others on many fronts; and to be facile in communication what they have learned to varied audiences. (p. 19)

To develop proficiency in the literacies identified above, students could take a course that integrates all three and demonstrates their importance to students. The course would serve as a foundation of new literacies and proficiencies that would provide the launching point to being 21st century literate.

Implications

As more and more technology becomes a part of everyday life in the early 21st century, it is imperative that education provides the necessary skills and knowledge for students in order to integrate into today's technological society. Considering teachers' perspectives of a 21st century digital literacy framework and what the components are is the first step towards providing those skills. However, as the literature (Jones-Kavalier & Flannigan, 2006; Honan, 2012; Markauskaite, 2006; Pacino & Noftle, 2011; Potts et al., 2010) suggests there is much debate over what to include in a broadened definition of literacy. The literature refers multiple times to the varying components of information literacy, media literacy, and technology skills literacy and to their necessity in the 21st century. Studies focusing individually on the three components were numerous and provided a solid justification for each (Amtman & Poindexter, 2008; Aqili & Nasiri, 2010; Arke & Primack, 2009; Bittman et al., 2011; Carroll, 2011; Chang et al., 2011; Considine et al., 2009; Crompton, 2004; de Abreu, 2010; Erjavec & Volcic, 2010; Hignite et al., 2009; Heinrichs & Lim, 2010; Hutchinson & Reinking, 2011; Judson, 2010; Ladbrook & Probert, 2011; Leung, 2010; Milic & Skoric, 2010; Salisbury & Karasmanis, 2011; Shankar et al., 2005; Teske & Etheridge, 2010; Torres & Mercado, 2006; Turner, 2011). However, the rationale for this study is to determine the best

approach and content focus in order to prepare the research site's students for the challenges of the 21st century. In order to do that, the traditional literacy subjects will need to include technology, media, and information (Alverman, 2004; Arke & Primack, 2009; Blummer, 2008; Chase & Laufenberg, 2011; Covello, 2010; Crompton, 2004; Eshet- Alkalai, 2004; Eshet-Alkalai & Chajut, 2009; Gainer, 2010; Izzo et al., 2011; Hobbs, 2011; Judson, 2010; Koltay, 2011; Markauskaite, 2006; Nelson et al., 2011; Potts et al., 2010; Rosen, 2011; Watt, 2010).

Data gathered from this study will form the foundation of a 21st century digital literacy framework. I anticipate that the 21st century digital framework will be used to modify the research site's curriculum offerings to include a course that promotes the 21st century digital literacy framework, meets the requirements of CIPA at the research site, and ultimately becomes a graduation requirement. If such a course is assigned as a graduation requirement, the research site will make strides towards providing students with the information, technology, and media literacy skills required to function in the 21st century world.

Summary

This project study explores teacher perceptions of what should form a 21st century digital literacy framework, including the components they believe to be incorporated within the framework. Judson (2010) suggested there is a misbelief by the educational system that students are literate in all aspects involving technology. Just because they have spent their lives around technology, there is no guarantee that they are literate or engage in proper use. Researchers (Borawski, 2009; Chase & Laufenberg, 2011; Hobbs,

2011;) continue to advise schools to provide an evolved form of literacy instruction to include more than just reading, writing, speaking, and listening. As a result, children know how to operate the technology, but few remain consumers of research, ethical use, and sound technological choices (Eshet-Alkalai, 2004). It will take educators to identify what is necessary in order to focus on developing the digital literacy skills necessary for students to be productive citizens and consumers.

Section 2 describes the methodology for the study. It includes the identification of the research design and the justification for its selection. A description of the participants, gaining access to the research site, establishing relationships between researcher and participants, and measures for ethical protection are identified. Furthermore, an explanation for the use of the data collection tool and the role of the researcher are presented. Finally, discussion of the planned method for data analysis and the specific steps are provided.

Section 2: The Methodology

Introduction

According to Izzo et al. (2011), legislators and business leaders in the 21st century call for students to be prepared with the skills required to succeed after high school. However, Izzo et al. suggested that those skills no longer comprise only the core subjects of mathematics, English, social studies, and science. They now integrate and comprise of what many researchers (Brown & Lockyer, 2006; Honan, 2012; Marcus, 2009; Pacino & Noftle, 2011; Potts et al., 2010) indicated as new literacies, digital literacies, or 21st century skills. The problem is that many students know how to use the technology (Judson, 2010; Leung, 2010; Walsh, 2010), but lack being skilled in the application and understanding of technology's use and impact. In order to develop 21st century literate students, it was the intent of this study to have educators provide input in the development of a framework for 21st century digital literacy.

In this case, I sought input from teachers related to their views and experiences with the various facets of 21st century digital skills. Section 2 of this project study provides justification for the design and approach used to address the local problem and answer the guiding/research question and corresponding subquestions:

(RQ1) What are teachers' perceptions of a 21st century digital literacy framework?

(RQ2) What are teacher perceptions of an information literacy component of a 21st century digital literacy framework?

(RQ3) What are teacher perceptions of media literacy component of a 21st century digital literacy framework?

(RQ4) What are teacher perceptions of a computer and technology skills component of a 21st century digital literacy framework?

For this study, I employed the use of an online questionnaire, focus group discussion, and document study to seek educators' input regarding their perceptions of a 21st century digital literacy framework. The utilization of the three methods addressed the central research question and the three subquestions and documented what they believed to be necessary through an inductive, qualitative research and analysis process (Hatch, 2002). This section also includes specific information regarding the setting, measures for ethical treatment of participants, and data collection and analysis procedures. Section 2 concludes with a presentation of the study's findings.

Research Design and Approach

Qualitative Research

This study was motivated by a desire to involve educators in determining what skills are necessary to be literate in the 21st century. A qualitative case study emerged for this doctoral study because of the essential need to understand how people grasp where they live and work (Merriam, 2009). Case studies, as Yin (1981) indicated, are inquiries into phenomena in the real life setting and are bound to a specific system. In this case, the researcher was seeking feedback from teachers related to their views and experiences with the various facets of 21st century digital skills. As Merriam (2009) suggested,

understanding the complexity of the case in the most complete way possible is the goal of a case study.

To gather the views, opinions, and feedback from the participants, I decided upon three methods of data for the collection. The first type of data was gathered using the electronic questionnaire of the researcher's design found in Appendix B. Focus groups were held to follow-up and expand upon the data gathered through the online questionnaire. The third type of data collected was through document study and used as a way to verify and support the findings of the online questionnaire and focus groups. This is the reason why a qualitative case study design was selected for this project.

Participants

Setting

The setting for the study was a rural school district in eastern Pennsylvania. The district serves approximately 55,000 people living in seven municipalities covering 305 square miles. There are two high schools, two junior high schools, two intermediate schools, and three elementary schools A review of local school data indicated that the district serves over 10,000 students from kindergarten through grade twelve: 50% White (not Hispanic), 24% Black or African American, 23% Hispanic (any race), 2% Asian (not Hispanic), and 1% other. Four of the nine buildings receive Title I funding with 57% of the students identified as economically disadvantaged. Twenty-one percent of the population was identified as special education and 3.5% were identified as English Language Learners (PA School Profile, 2014).

The research site was the district's two high schools serving students in grades nine through twelve. A review of the local buildings' data indicated that one high school has approximately 1,600 students while the other serves approximately 1,800 students. The first building, identified as School 1, has an enrollment by ethnicity of 38% White (not Hispanic), 31% Black or African American, 27% Hispanic (any race), 2% Asian (not Hispanic), and 2% other (PA School Profile, 2014). The second building, identified as School 2, has an enrollment by ethnicity of 62% White (not Hispanic), 19% Black or African American, 15% Hispanic (any race), 2% Asian (not Hispanic), and 2% other (PA School Profile, 2014). The average years of educational experience at the building for the teachers at the research site were 11.53 (School 2) and 13.21 (School 1). The average years of total educational experience for the teachers at the research site were 12.78 (School 2) and 14.48 (School 1) (PA School Profile, 2014).

Selection Criteria, Justification, and Working Relationship

Selection criteria. The research sample was taken from the faculty at the research site (School 1 and School 2) with a combined faculty of 274 full-time teachers. Of the 274 faculty members, approximately 70 faculty members taught classes or their instruction covered content related to the central research question and the three subquestions. In light of their link to the research questions, each of these 70 faculty members were invited to participate in the study. The research site's administrative staff and support staff were excluded from participation in the study due to the instructional and content-related requirements identified above.

Fifty-one faculty members agreed to participate in the online questionnaire with 40 participants following through to completion. Of the 40 participants in the online questionnaire portion, 25 agreed to participate in at least one of the three focus group discussions. Specifically, seven agreed to participate in the focus group discussion focusing on media literacy, nine agreed to participate in the focus group discussion focusing on information literacy, and nine agreed to participate in the focus group discussion focusing on computer technology literacy. Due to various scheduling, communication, and time conflicts, actual participant numbers reflected five in the media literacy group, six in the information literacy group, and six in the computer technology literacy group.

Justification. The sample size for this study was appropriate for the research design and the problem being addressed. Hatch (2002) suggested that there are no direct relationships between the number of participants and a study's quality. While quantitative researchers aim to have higher sample sizes, smaller sample sizes support the qualitative researcher who is more interested in the participants' perspectives. Even though the sample for the online questionnaire was 40, the focus group discussion samples were much smaller. The small sample size for the focus group discussions were justifiable because of the participants' proximity to the local problem. Their experience and expertise made for lively and meaningful discussion that directly related to the central research question and the three subquestions. A sample of this size made it easy to document what the participants believed to be necessary components of a framework for 21st century digital literacy.

Working relationship. I am an employee of the school district and carry out numerous projects, grants, staff development, and team projects at the research site. Much of what I have worked on in the district relates to technology or curriculum. Many of the participants have worked with me on various projects during my seven years on the district. My role in this descriptive qualitative study was not district employee, but one of researcher, observer, recorder, and decoder. To ensure that I was viewed as a researcher and not an employee, I omitted my thoughts, reflections, opinions, and beliefs about 21st century literacy from the data. However, my ability to understand the workings of the district, the curriculum, and the key stakeholders afforded me the special ability to guide and facilitate the focus group discussions and understand than if I was a stranger to the research site.

Access to Participants

I obtained Walden University IRB approval to conduct my research in October 2013 (IRB approval number 11-11-13-0157624). A letter of cooperation giving permission to conduct the study at the research site was obtained from the district superintendent and local school board president. Access was gained by addressing potential participants at faculty meetings with permission and scheduling details from the research site's administrators. Interested participants were instructed to return the signed letter of consent to a locked drop box. After a designated period of time, I collected the drop box and emailed the online questionnaire link to the interested participants. The questionnaire consisted of five questions with a sixth question prompting for interest in participating in one of three focus group discussions. The focus group discussions took

place at a private and neutral location in the research site at prearranged and agreed upon dates and times.

Ethical Protection of Participants

Reciprocity is the give and take of social interaction and qualitative researchers use it as a tool to gain access to research sites and provide participants with sense of opportunity (Harrison, MacGibbon, & Morton, 2001). The qualitative nature of this study placed me into an area of extreme confidence with the participants, especially pertaining to the focus group discussions. Reciprocity was a vital attribute of this study and ultimately is what drew participants to it. There was no direct compensation to participate. No monetary gifts or food enticed potential participants to take part. It was ability for teachers to share their views and opinions on a subject, such as literacy in the 21st century that enticed them to participate. The participants realized that their input would be utilized to form the framework for digital literacy and providing their voice was the benefit. It was the give and take of a reciprocal relationship that provided a comfort level where both researcher and participants received mutual benefits (Harrison et al., 2001).

Ethical safeguards. Hatch (2002) reminded us that "when researchers ask others to participate in their studies at any level, they owe them respect, concern, and consideration" (p.52). I asked participants to reflect and share their experiences and feelings about standards, teaching, students, teachers, skillsets, and curriculum in the district. Providing confidentiality for consenting participants was paramount for this study. The purpose of appearing at faculty meetings was to explain the research study's

objectives and the overall goal of the project. I discussed in great detail the measures for ethical protection including procedures for letter of consent, IRB procedures and approval, data collection methods, sharing of transcriptions, and reporting methods. All potential participants had the opportunity at these meetings to present any questions regarding the study, data collection procedures, measures for ethical protection, or anything else related to instructions.

Consent. A letter of cooperation to conduct the study was provided by the district's superintendent and school board president. All participants signed a letter of consent (Appendix K) prior to the distribution of the online questionnaire. Participants signed the letter of consent and returned it in an unmarked provided envelope. They returned the letter of consent in the unmarked envelope to a locked drop box in the research site's administrative offices. The drop box was placed out of normal traffic areas in the office in order to provide as much anonymity as possible. The letter of consent described the study, the procedures for the online questionnaire and focus groups, assurances that participation was voluntary and anonymous, my contact information, and the contact information of the Walden University representative responsible for rights as a participant in a study. Participants were reminded that their involvement in the study was completely voluntary and that they may remove themselves from the study at any time.

Confidentiality. Participants' right to anonymity were protected throughout the timeline of the study. Researcher confidentiality, member checking, and informed consent were the major means of protecting participants from harm. The use of aliases in

lieu of real names was applied to each respondent in the online questionnaire. They were coded as "Educator 1," "Educator 2," etc. In the focus group discussions, teacher names were omitted from the recordings and were transcribed as "Speaker 1," "Speaker 2," etc. All electronic records and data were stored electronically on a password protected external hard drive, a personal password protected home computer, and a password protected Google Drive. All research data will be permanently deleted following the five year requirement for the retention of data. Electronic data will be deleted from the password protected external hard drive, my personal password protected home computer, and the password protected Google Drive. No identifiable participant information was, or will be used, in any written, electronic, or audio format. No video formats were utilized at any time during this study.

Data Collection

Data for this study were collected through three methods: online questionnaire, focus group discussions, and document study. Data identified teachers' attitudes, beliefs, experiences, and provided an opportunity to give input related to the development of a framework for 21st century digital literacy. Open-ended questions in both the online questionnaire and focus group discussions were used to identify key elements related to media literacy, information literacy, and computer technology literacy that participants found necessary to be included in a framework for digital literacy. Data collected through document study were used for triangulation to support the data collected through the online questionnaire and focus group discussions.

Online Questionnaire Data

Dornyei (2003) suggested that a questionnaire is capable of providing abundant pieces of data in a more condensed period as opposed to going through the formalities of the interview process. Instead of interviewing potentially every participant and having to wade through initial coding and data interpretation, the online questionnaire provided a quick and broad snapshot of the perceptions of digital, media, information, and computer technology literacy at the research site. The open-ended nature of the instrument's questions was invaluable for purposeful sampling and assisted greatly in forming the three focus groups. The online questionnaire's purpose was to build background and was not intended to be used as the main source of data.

The online questionnaire (Appendix B) consisted of five open-ended questions designed to prompt the participant's views regarding 21st century digital literacy, information literacy, media literacy, and technology and computer literacy. Each of the five questions, as identified in Table 1, was designed to prompt for information related to the central research question (RQ1) and the corresponding subquestions (RQ2, RQ3, and RQ4).

Table 1

Online Questionnaire and Corresponding Research Questions

Question Number	Corresponding Research Questions
1	(RQ1), (RQ2), (RQ3), (RQ4)
2	(RQ1), (RQ3)
3	(RQ1), (RQ2)
4	(RQ1), (RQ4)
5	(RQ1), (RQ 2) (RQ 3), (RQ4)

A sixth question prompted participants for agreement to take part in one of three focus group discussions. A sub-question of the sixth question requested participants to identify which of the literacies they would be willing to discuss further. The design of questions one through five had validity in mind, while question six assisted in purposeful sampling for the focus groups. The online questionnaire used favorable qualitative writing techniques that were in agreement with the literature of Hatch (2002), Merriam (2009), Fink (2009), and Glesne (2011).

Study presentations at faculty meetings began in January 2014 with minimal response. Additional presentations requesting participation were made in February 2014 and March 2014. Once the letters of consent were turned in and collected, the participants received the link to the online questionnaire from my Walden University email to their personal email. Emails went to participants in the beginning of April 2014 and continued,

as letter of consents were returned, throughout the entire month of April 2014. Forty online questionnaire responses were returned by the middle of May 2014. It was anticipated that the online questionnaire would have been completed much earlier, but having to make repeated requests for participation put the data collection months behind. Even though it was a challenge to get online questionnaire sample numbers up, the use of an electronic online questionnaire truly afforded participants some flexibility in timing and ultimately made it easy to analyze in an electronic format.

Focus Group Discussion Data

According to Merriam (2009), focus groups are interviews and discussions that center on a topic or set of topics that involve people who share a common knowledge or interest in the topic. Three 60-minute focus group discussions, each targeting one of the sub-research questions, were conducted to follow-up and expand upon the data gathered through the online questionnaire. Participants volunteered to take part in the focus groups by answering yes to question six of the online questionnaire and by identifying an area of interest in the sub-question to question six. Furthermore, purposeful sampling from responses on the online questionnaire was used to select 6 to 12 participants to three focus groups based on participants who demonstrate similar knowledge and learned experiences related to the online questionnaire (Hatch, 2002).

Each focus group had a unique set of five, open-ended questions (Appendix C), allowing each participant to respond and share their views without any issues of constraint or fear of sharing. Each focus group discussion, as identified in Table 2, was

designed to prompt for information related to the central research question (RQ1) and the corresponding subquestions (RQ2, RQ3, and RQ4).

Table 2

Focus Group Discussion and Corresponding Research Questions

Focus Group Discussion	Corresponding Research Questions
Media Literacy Focus Group Discussion	(RQ1), (RQ3)
Information Literacy Focus Group Discussion	(RQ1), (RQ2)
Computer technology Literacy Focus Group Discussion	(RQ1), (RQ4)

Probes, subquestions, and follow-up questions were used to build upon conversation, clarification, and discussion expansion. Data from the focus groups were gathered through note-taking and through audio recording equipment to capture all the nuances of a group discussion. I later transcribed each of the three focus group discussions and consequently followed up with data analysis.

Document Study Data

The third type of data collection was document study. Merriam (2009) recommended the use of document study, because they are ready-made sources of data and are not dependent upon human beings to generate. For this doctoral project, document study was used as a way to verify and support the findings of the online questionnaire and focus groups. Bowen (2009) suggested that even though it may only

take a small number of documents to demonstrate credibility and minimize bias, document study remains a key step in triangulation of data.

It was the intent of the document study portion of the data collection to provide supportive data to the data collected through the online questionnaire and the focus groups. This ultimately assisted in answering the central research question (RQ1) and the corresponding subquestions (RQ2, RQ3, and RQ4). The search for documents occurred via the Internet for curricula, course outlines, modules, lesson plans, textbook references, and existing instructional frameworks that exhibit characteristics of 21st century digital literacies including media, technology and computer, and information literacies. The search mainly produced curricular and course frameworks from professional organizations or associations, educational service agencies, departments of education, and universities.

Researcher's Role and Potential Bias

I am the director of instructional technology for the district and, as the title suggests, the use of technology and the integration of technology is my responsibility. Though none of the participants are subordinate to me, I have worked with many of them on numerous initiatives in the district and we have always shared professional and mutually respectful relationships.

As my job title suggests, technology is a large part of my role in the district and the study did focus on 21st century literacy. Obviously, technology was a big topic and came up numerous times during the online questionnaire and the focus group discussions. However, my role in this descriptive qualitative study was neither district employee nor

instructional technologist, but one of researcher, observer, recorder, and decoder. My beliefs, work, and thoughts about technology and literacy could have influenced the outcomes of the study. In order to guarantee credibility and consistency, I did employ data triangulation strategies, member check procedures, and identification of researcher's reflective commentary. It was shared often through discussion and presentation that this was a process that required honest and open discussion from the participants and that every piece of data, whether positive or negative, was important to this study to reveal important concepts in 21st century literacy.

Data Analysis

Hatch (2002) identified an inductive model that applied to the mining of theory within the data. The model, designated Steps in Inductive Analysis, was applied to and followed for this study. Data gathered during through the online questionnaire, focus group discussions, and document study were analyzed using an inductive approach, always taking in account the research question and the corresponding subquestions. The application of an inductive model for this study assisted greatly in uncovering themes as they related to the participants' commentary.

Process

Timing. Analyzing qualitative data, according to Merriam (2009) and Glesne (2011), is a constant action that starts with gathering the first piece of data; moving into credibility checking; and finishing up with the reporting phase. For this study, there were three sources of data: online questionnaire, focus group discussion, and document study. Document study was used for triangulation to confirm the quality, accuracy, and validity

of data from the other two sources. For the online questionnaire and focus group discussions, I collected the data, coded it, and analyzed it as soon as it was transcribed. Member checks were conducted after the data were coded and analyzed.

Inductive analysis and coding. I analyzed online questionnaire and focus group discussion data using Steps in Inductive Analysis (Hatch, 2002). This inductive approach was applied to the data analysis phase using thematic analysis and coding. Thematic analysis involves the coding and organizing of data into themes and patterns (Glesne, 2011). The coding process involved mining through the data searching for themes, ideas, and groupings. I marked similar items so that they could be retrieved for analysis. Coding made it much easier to search the data, make comparisons and identify patterns that required me to investigate deeper (Merriam, 2009). Microsoft Excel was utilized in order to expedite the coding and analysis. This was an important decision because it simplified the manipulation of the data, organized the themes, and made it simple to explore possibilities of data analysis.

Evidence of Quality and Procedures

Qualitative researchers rely on dense and rich descriptions along with in-depth, interviews and discussions in order to obtain good data (Harrison et al., 2001). Consideration was taken to guarantee credibility and consistency through member checks, identification of researcher's reflective commentary, and triangulation of data. Finally, transferability was accounted for through rich description of the setting, participants, findings, and the inclusion of quotes from the questionnaires, focus groups, and documents studied.

Member checking. Merriam (2009), Creswell (2008), and Hatch (2002) endorse member checking as one of the best ways check the accuracy of the data. Merriam (2009) explained it further because "participants should be able to recognize their experience in your interpretation or suggest some fine tuning to better capture their perspectives" (p. 217). Member checking serves to provide credibility of the study by giving participants the opportunity to confirm what the data said. I conducted individual member checks after the online questionnaire and focus group discussions' information had been analyzed, coded, and written up in draft form. All participants that took part in a focus group discussion received a draft copy of the group discussions via email, seeking to clarify any data and provide any additional input. I asked the participants to review their own data, provide input specific to the questions in the procedures letter, type in their responses, print out, and place into an interoffice folder and send to my district mailbox. I requested that the responses be typed, so handwriting would not be recognized. I also asked that they refrain from any identifying commentary in their typed response. All data returned from the member check was to verify the research study information and ultimately verify the credibility of the study's results. Member checking allowed me to verify the participants' perspectives, involve them in development of the written product, and assisted me in identifying new ideas and interpretations (Glesne, 2011).

Triangulation. I used triangulation to ensure the credibility, confidence, and accuracy of data. Triangulation is the process of validating data findings using multiple sources of data, individuals, theories, or different data collection methods (Creswell, 2008; Glesne, 2011; Hatch, 2002; Merriam, 2009). Triangulating data in qualitative

research is a system where the researcher examines each source of data to seek common themes to apply credibility to the conclusions (Lodico, Spaulding, & Voegtle, 2010). Triangulation for this qualitative project study involved online questionnaire data, focus group discussion data, and document study.

Thick description. Merriam (2009) stressed the importance of "providing enough description to contextualize the study such that readers will be able to determine the extent to which their situations match the research context, and hence, whether findings can be transferred" (p. 229). In this qualitative case study, themes were uncovered from the analysis of teachers' perspectives relating to 21st century digital literacy, information literacy, media literacy, and technology and computer literacy. Transferability was accounted for by using thick description for the details regarding the setting, participants, and findings. I included numerous participant quotes from the online questionnaire and focus group discussion.

Negative data. Establishing credibility in the study included the identification of negative data. The reporting of and reflection on all data assisted in the presentation of a final explanation of what the data presented. It ensured that were no biases against the data and that the reflections of the majority of the subjects were presented in the study (Merriam, 2009). I searched for negative data throughout the data collection and analysis phases, but primarily through data coding process. Specifically, I sought data that did not fit the explanations or themes that stood out and used these data to demonstrate that biases in the data did not affect the reporting of the data to support the theory.

Qualitative Results

Data Process

I gathered data through the use of an online questionnaire, three focus group discussions, and document study. Forty faculty members participated in the online questionnaire. Five participants took part in the media literacy focus group discussion, six in the information literacy focus group discussion, and six in the computer technology literacy focus group discussion. For the document study portion of the study, I read through and analyzed 62 sources of data that were saved and backed up according to procedures identified in the Ethical Protection of Participants segment of Section 2. I collected, sorted, and saved electronic data from the online questionnaire and focus group as they were collected. Online questionnaire data were collected using a private, password-protected online survey tool and then downloaded into a Microsoft Excel Spreadsheet and then saved and backed up according to procedures identified in the Ethical Protection of Participants segment of Section 2. Each of the three focus group discussions was recorded using audio recording equipment to capture all the nuances of a group discussion. I transcribed each of the three discussions using Microsoft Word and then saved and backed up according to procedures identified in the Ethical Protection of Participants segment of Section 2.

Anonymous data collected through the online questionnaire were labelled as Teacher 1, Teacher 2, Teacher 3, and so on. To preserve participant anonymity, I labelled participants using pseudonyms. For the media literacy focus group participants, I applied Media 1, Media, 2, Media 3, Media, 4, and Media 5. For the technology and computer

focus group participants, I applied Technology 1, Technology 2, Technology 3, Technology 4, Technology 5, and Technology 6. For the information literacy focus group discussion participants, I used Information 1, Information 2, Information 3, Information 4, Information 5, and Information 6. Data collected through the document study were saved with anonymous filenames identified as Document 1, Document 2, Document 3, and so on.

After I analyzed the online questionnaire data and focus group data, I drafted a document with the data organized in spreadsheets that detailed the results. Once the draft was in readable form, I conducted member checks as identified in the Evidence of Quality and Procedures portion of Section 2. Each of the focus group participants were provided with a copy of the findings for review and commentary.

Data Analysis

Prior to any analysis, I read all of the data returned through the online questionnaire, focus group discussions, and documents to get an overall feel for what was included in the data sets. Hatch (2002) believed that "without a thorough sense of what's included in the overall data at the outset, the direction of early analysis may be off the mark and lead to a great deal of frustration and wasted time and energy" (p. 162). In order to analyze the online questionnaire, focus group discussion data, and documents, I applied the organized, step-by-step inductive model of data analysis identified as Steps in Inductive Analysis (Hatch, 2002, p.163):

1. Read the data and identify frames of analysis.

2. Create domains based on semantic relationships discovered within frames analysis.
3. Identify salient domains, assign them a code, and put others aside.
4. Reread data, refining salient domains and keeping record of where relationships are found in the data.
5. Decide if your domains are supported by the data and search data for examples that do not fit with or run counter to relationships in your domains.
6. Complete an analysis within domains.
7. Search for themes across domains.
8. Create a master outline expressing relationships within and among domains.
9. Select data excerpts to support the elements of your outline.

The initial frames of analysis for the categorizing of the data were essentially predetermined through the use of the questions from the online questionnaire which were derived from the literature review. I conducted a thorough review of each online questionnaire response, focus group transcription, and curricular documents seeking to make meaning out of the data. I organized each of the responses from the online questionnaire and focus group discussions in a spreadsheet by questions one through five instead of organizing any of the responses by participant. For the document study, I had to understand all of the various formats and layouts of the documents before I organized them into overarching ideas within each document. I organized each of the documents'

overarching ideas into the spreadsheet mentioned above. The file was saved and backed up according to procedures identified in the Ethical Protection of Participants segment of Section 2. I excluded question six, because it was not a data gathering question, but merely a method to survey interest for focus group discussion participation. This step assisted me in organizing the data into manageable ideas as I read through each online questionnaire response, focus group transcription, and document.

The next step was to create domains based on semantic relationships within the frames of analysis. As a result, the following domains were identified: digital, media, information, computer, and literacy. Each of the domains was assigned a color and typed into the columns of the above-mentioned spreadsheet. I have included a listing of the color designations in Appendix D: Data Color Coding Key. Each color represented the font color I used for identifying text during the coding process. I then read the online questionnaire, focus group discussion, and document data again and I color coded keywords based on the colors of the domains identified above. These keywords were typed into the spreadsheet columns underneath the appropriate domain. This spreadsheet is located in Appendix E and is named Data Analysis: Coding. The file was saved and backed up according to procedures identified in the Ethical Protection of Participants segment of Section 2.

The next step was to complete a deeper analysis within the domains and search for themes across domains. I analyzed the keywords in each domain and grouped them within the domain. I used numbers to identify the groupings and sorted the keywords within each domain in the spreadsheet. At the end of this step, I produced a new

spreadsheet with the keywords sorted and categorized under each domain. This new spreadsheet was named Data Analysis: Relationships within Domains and can be located in Appendix F. The file was saved and backed up according to procedures identified in the Ethical Protection of Participants segment of Section 2.

After I analyzed and made connections within the domains, I turned to analyze and seek out themes across domains. I focused on identifying relationships between domains by grouping the categories. I created another spreadsheet and organized it by category. I made sure to have corresponding categories line-up in each column for ease of reading. This additional spreadsheet can be found in Appendix G and is called Data Analysis: Relationships Across Domains.

The final data analysis step was to demonstrate how the keywords in the Data Analysis: Relationships Across Domains spreadsheet were associated. I read through the keywords and discovered two themes that tied the two groups of keywords together. In order to identify the manner in which the keywords in the two themes were connected, I took the Data Analysis: Relationships Across Domains spreadsheet and split it into two spreadsheets: Theme 1: A 21st century digital curriculum should include hard technology skills and Theme 2: A 21st century digital curriculum should include soft skills. These themes can be found in Appendix H (A 21st century digital curriculum should be reinforced by soft skills) and Appendix I (A 21st century digital curriculum should include hard technology skills). I organized the keywords within the domain columns so that similar keywords were together. From these two spreadsheets, I developed the master outline that can be found in Appendix J and is named Data Analysis: Outline.

For the final step of the analysis, the online questionnaire, focus group discussion, and document data were read through once more looking for specific evidence to support the elements found within the domains. I copied the quotes from the various sources of data and pasted them into a Microsoft Word document organized by theme. This served as a repository of supporting evidence that would be drawn from to support the themes in my master outline.

Findings

Obtaining data for this study through online questionnaires, focus groups, and documents produced a very broad range of responses, ideas, and concepts. It was evident through the data analysis that the participants are enthusiastic about learning, teaching, and the students who enter their classrooms and what they bring to the table. They have expectations for certain skillsets and are vocal about the need for schools to provide instruction related to the topics at hand. The responses that were provided were astute and well thought out. Eventually, two themes emerged: a 21st century digital curriculum should include hard technology skills; and a 21st century digital curriculum should be reinforced by soft skills.

A 21st Century Digital Curriculum Should Include Hard Technology Skills

The most commonly discussed topic in the online questionnaire, focus group discussions, and the document study related to the idea that students require more hard skill instruction in computers and technology. “To be literate in the 21st century means to be proficient in Microsoft Office, able to use search engines via the Internet, and utilize social media appropriately and safely.“ Participant data produced five sub-themes that

provide focus to the hard technology skills. They were seeking to have students proficient in the use of software, multimedia, proper use of social media, hardware supports, the Internet. “Literacy is the ability to read and write. This once meant paper and pencil. It now means computing, researching, typing, formatting, Web surfing, and utilizing apps on mobile devices.”

Teachers indicated that it is imperative that students have a basic proficiency in software. “There should be some specific technology targets that every kid can make. By 3rd grade we will be able to use a word processing document and type a report. By 4th grade we will be able to use PowerPoint, and so on.” They specified that students should be able to produce work in application software, such as spreadsheets, word processing, presentation, and database software. “They need to be able to open a Word document. They don’t even understand what the word “Word” means. They don’t understand what we mean by Microsoft Office. They need to understand what we mean by spreadsheet and Excel. They don’t understand what PowerPoint means.” “I think the application part is what is lacking. When I ask my students to research something or if give then even a simple spreadsheet, they are all over the place.”

A second component to further student development in software use is being able to utilize apps for mobile devices. “I think it is a universal misunderstanding that we are all on the same levels of understanding when it comes to mobile technology. Kids know way less than we think they do.” Participants felt strongly that technology has been changing so rapidly and that mobile technology is something that schools need to do more of. “We need to focus more on smart phones, tablets, and being able to find the

appropriate apps that accomplish the needed tasks." According to the data, participants indicated that mobile apps are a key component to remaining digitally aware, demonstrating technology literacy, and to having access to information. "If you have a phone, you can find or do what you need, but we need to teach kids to do it the right way."

The third component of software that stood out in the data is the understanding and ability to use electronic communications software. "Being able to communicate through technology is a necessity. Whether messaging or emailing, you have to be able to conduct business through technology." Participants strongly recognized that the normal hours of operation of school go well beyond the traditional time structure of the past. "Students need to be able know how to use technology to communicate effectively. They also have to understand the difference between using technology to communicate casually versus formally. They don't know how to send a professional email with complete sentences, punctuation, and real words." Teachers are online. Students are online. Mobile devices, email, message applications, and social networking all provide the opportunity for communication. "Today being digitally literate should include the ability to at least send me an email that makes sense and has the attachment. They can't attach the assignment, even though the directions say so." Teachers suggested that when students possess these hard skills, teachers can focus on using the technology for integration and response rather than spending their time teaching the skills. "Students are so limited in their skills in applications right now. I think we are doing such a disservice to our kids by not doing more." "I am worried that we are under this false assumption that

all kids are coming to school digitally prepared and know how to do things. But they don't."

"Digital literacy is more visual, audio-based, and interactive as opposed to just the singular old school definition of paper and pencil. It's multimedia for learning." The second requirement for hard technology skills is that students possess a working proficiency in the use of and creation of multimedia. "Audio, video and other media and multimedia tools are necessary for today's students to learn outside the classroom." "Having a wealth of multimedia gives students more options to get that goal of what I'm trying to get across to them." Current hardware, software, and Internet all have strong multimedia components to them and for them to be tools to learn and create, students must be able to use them. "Digital literacy is much different than I pick up my text. I turn to page 84. I look at the example and I write down the answer. Now I go to YouTube and I type in the topic and have it explained or demonstrated to me."

Participants indicated that students should be able to produce work using video, images, audio, and digital texts. "They should be aware of how to take, edit, manipulate, images, video, and audio for classroom projects." "Digital literacy is not necessarily the written word. Kids should be able to produce picture based responses to questions or projects. They are taking so many pictures on their own and that would be a simple thing to be able to do." Furthermore, they should have a grasp on various tools to warehouse media and be able to apply media literacy when evaluating multimedia. "Students should be able to comprehend essential ideas from video, music, TV, Internet, social networking sites, and multimedia sites. It doesn't stop there, though. They also have to be taught to

develop higher order critical thinking skills to truly know what they're interacting with." "Not only should the curriculum involve how to access media in a digital society, but also how to determine the accuracy of information that is available." "Not all kids have the ability to locate/evaluate/document desired digital media. Without these skills, they're not going to be able to take advantage of all the great resources online." Teachers suggested that when they possess these skills in multimedia, teachers can focus on using multimedia to reinforce content and for student projects. "I do video projects with the kids. There are too may skills that I have to teach them. Not only do they not know how to make them, but they also have to be taught things they should know that they shouldn't put in video."

Social media seems to impact just about everything. As a result, the participants felt that it is necessary for student to be proficient in the use of social media. "The curriculum should involve not only how to access social media in a digital society, but also discuss the appropriateness of what is placed in social media." To be deemed proficient, the student must understand not only how to use it, but use it properly. "I think the biggest effect of digital communication is the constant connectedness that young people have and how it's changing how people socialize. Social media seems to run everything, but I see how some people can't control what they post on these sites." The data suggest that educators want to use social media and they realize that there are values in it. "If students truly understood how to use technology, it could benefit them. With our society of students today, too many students only use it for the social side of social media." However, they are careful in their responses, because they realize that kids are not up to speed in the use of it. "Social media in a controlled school environment is great!

There can be so much sharing of files, videos, discussions, etc. It's quite powerful, but social media can also be very scary. We should be teaching and demonstrating how to utilize social media appropriately and safely." Teachers suggested that when social media has application, along with students sharing in proper use, classrooms become interconnected learning and communications hubs extending beyond the walls of the school. "Nobody teaches digital social skills. We probably learned how to act socially from out parents, but we as parents have never been taught digital social skills. This leaves a generation of kids who miss out and need some formal guidance."

"Learning essential skills like familiarity with a variety of technologies (i.e. smartphones, computers, tablets, etc.) as well as being able to adapt to new technologies are necessary." Participants identified hardware and technology support as a key to being technology proficient. "Students should be able to understand hardware components to include knowing how to troubleshoot non-working equipment." "There's so much technology today and so much of it differs from one brand or company to another. Our kids get used to using one software/hardware system, which is great, but they lack the ability to transfer basic skills from one technology to another." Students can possess all of the software and social media skills they want, but if they cannot determine what is wrong when it is not working, then it is all for naught. "They should be able to identify and fix hardware and be able to troubleshoot all technology. Kids give up to quickly when something doesn't work."

Participants recollected at how much they think students know about technology, but are surprised that they do not. "I'm amazed at how many kids don't know how to

avoid viruses, spyware, and malware. They can't determine what they can or can't click on. I can't imagine what their home computers look like. They need hands-on learning about system security, so that their systems aren't compromised." "Teach students troubleshooting techniques for hardware and software. I'm not talking about major things here. I'm talking about if it doesn't work right, reboot the machine. Close the program and re-open it. Look to see if the network cable is plugged in. I'm amazed at how they don't know this kind of stuff." "Students should also be able to understand software programs in order to understand errors that may occur and how they can be fixed." Participants identified computers and parts of computers as being troublesome for students. "Students need to be able to select the correct hardware and application for the task at hand and use it proficiently and efficiently." "We need to do a better job of teaching the kids about what's what in computer hardware. They really lack the ability to recognize computer hardware components and how they work or interact with other computer parts."

The final requirement that participants identified is proficiency in navigating, using Web browsers, searching for information, downloading, and familiarity with terminology related to the Internet. The Internet is well on its way to being everywhere. "To have digital literacy I believe that a person should have the knowledge to navigate the Internet in order to perform tasks necessary to be successful in their profession." "Students must be able to understand how to utilize search engines accurately and efficiently and they must be able to examine the usefulness of returned information." Using the Internet for learning, teaching, working, and research was one of the frequently

mentioned terms in the data. “Many students use the Internet, but they lack the knowledge to use it for a search engine for research and knowledge. They believe that every Web site is truth even though it might not be factual.” The ability to search for information and sort through it is the most applicable thing for the classroom. “I think we need to do a better job of teaching search techniques. You can show kids how to do things on the Internet, but there’s a difference between searching the Web and using functional databases on the Web. They need to know how to choose the proper tool for the task at hand.” Every day, more and more devices are connecting to the Internet. More technologies are being developed to communicate on the Internet. For finding information, posting discussions, downloading and uploading of class documents and projects, teachers look to the Internet as a requisite skill for now and the future. “I require students to have the ability to access information quickly, navigate through Web pages and browser options, ability to navigate efficiently and quickly through programs of operating systems. If they don’t have these skills, they will fall behind and ultimately not be prepared for what’s out there and what’s going to be expected of them.”

Participant data suggested that many students do not possess the hard technology skills that teachers require of them. Furthermore, the participants pointed out that if students are unprepared to perform the requisite technology hard skills in the K-12 environment, then they are going to be absolutely unprepared at the next level. The data suggested that students need to be proficient in the use of software, multimedia, proper use of social media, hardware supports, the Internet, computer programming, searching, and computer security. However, these skills are merely the hands-on skills. Teacher

participants also indicated that there are numerous soft skills that they want students to have to work in partnership with the hard technology skills.

A 21st Century Digital Curriculum Should be Reinforced by Soft Skills

The data showed that teachers want students to go beyond just knowing how to do technology things. In the 21st century, technology skills are necessary, as indicated by participants' call for technology hard skills. However, it is the application of hard technology skills using soft skills where teachers see students truly excelling. "I think it is necessary for students to be self-sufficient. The massive amounts of information and ways to pick things up on your own make it a wonderful skill to have. However, it isn't something you can just teach. Kids have to develop this ability with guidance." Teachers are seeking students who are independent learners that understand the global perspective and are able to think critically. "In today's world, you are global. You have to be. There's no excuse to not know where things are in the world or what's going on. Kids need to be global, but they won't get there without being able to work more independently." Five themes stood out in the data indicating that participants are seeking students who are able to be independent learners, understand the impact of what they are seeing and hearing, be good digital citizens, apply skillful research techniques, and collaborate. "I think with the 21st century to be literate you need the knowledge of technology because you are working globally. It is just not someone sitting across from you anymore. You're not just affecting your immediate self. You have to be able to think bigger than that."

Students are bombarded with messages by the minute from not only the traditional mass media, but also from individuals and groups. "Anyone can be considered

media on the Internet. It is very important to learn that you have to check credentials and find multiple sources of any information that you feel strongly enough about to share with others or comment on." The power of the Internet is that there are tools that provide companies, groups, and individuals with the mechanism to spread their message. "I want my students to be objective when reading everything on the Internet. They need to take notice as to where the information is coming from and who is posting it." Whether it is television, radio, YouTube, Facebook, Snapchat, or Instagram, students receive these messages and they interpret them. This bombardment is what teachers are having problems with, because they feel that students are not adequately prepared or savvy enough to translate the messages. "I would like students to not only understand what they see, but move beyond just understanding it and apply higher order critical thinking skills such as bias and propaganda." Teachers are seeking students who are able to identify factors that influence their decisions and determine fact versus opinion. "Somewhere in their educational life, students need guidance related to ensuring the truthfulness and quality of information found, and a means of ensuring that important information is not missed or omitted."

All the technology in the world does not guarantee that people will use it appropriately. "I believe that one of the largest issues with information literacy today is that students have no qualms about plagiarizing online content. To remedy this, students need to be able to process digital content by summarizing it, evaluating its authenticity, and using it in an appropriate fashion." A good digital citizen respects others in a world where they are not always face to face. "In the 21st century, literacy means being able to

use digital devices to communicate in a safe, intelligent, and well-informed manor." "Being responsible online is about making choices and knowing what to do, when to do it, where to do it, how to do it, and why or why not to do it." They also recognize other people's hard work and label it as such. "The importance of copyright is huge! It is way too easy for students to go out on the Internet and copy things without giving credit where they need to." "Kids don't understand how to do citations. They don't understand, because they think that if you can copy and paste it, then it's their words. They don't understand the concept of where they got that it, which is a huge plagiarism issue." Finally, good digital citizens act online in a safe and secure manner making good choices. "I want students to safely use proper applications to communicate. It presents a challenge in the realm of security and ethics, though. They do not understand the importance of keeping information secure and proper. They seem apt to post anything online." "Digital literacy has to include safety online. Too many kids do not understand the severity of sharing information online. This is something that has to be understood from day one." When students come to the classroom able to act as a good digital citizen, teachers are empowered to do more and provide their students with more real world activities. "All of this is about acceptable use. We have to ensure that kids know that acceptable use isn't just something that you sign off in school. It's something that they need to do in their world outside of school."

Too many students simply open up a Web browser, go to Google, enter a term, and then write down the results. "Research isn't using the first three things you find in Google. It's finding the information, determining the validity of the information, and

doing further research to determine the reliability of the sources." Participant data suggested that many of the students they come across believe this is what research is. "They don't know how to follow a procedure for research. They won't go the extra step of analyzing the results. They get a bunch of results and then they say that's good enough. They're completely missing the point of researching." There is no evaluation. There are no credibility checks. Research is basically a Google search. "I want students to be able to do the search and find information quickly, efficiently, and accurately. Where they need practice and guidance in is the ability to determine credible versus not credible works." According to the participants in the study, a good researcher in the 21st century is able to follow a procedure for good research practice, choose the best digital tool for finding the most applicable information, able to evaluate and analyze the credibility of the search results, and think critically and draw conclusions from the research. "There is a process to research. There is a huge critical thinking component tied to finding and using information. They go out and find it, write it up, but they never find the connection back to the question. They're unable to draw any conclusions and tie it all up." "We need to focus students on learning to access the information, how to determine the validity of the information, how current it is, and decide whether to rely solely on it or continue future research."

Communication and collaboration is necessary in any situation, workplace, or classroom. "I expect students to be able to do team problem solving projects. There aren't many jobs where employees work alone anymore. It is a necessary skill to be able to work with others." The ability to work with others, share ideas, and collaborate was

deemed a necessity by the teacher participants in this study. Technology can easily assist in facilitating and encouraging collaboration and communication. "I think the biggest effect on people today is the increase of digital communication. There is this constant connectedness we have and it really changes how people interact. The main thing I see is that students need to be able to do it the right way. To use it professionally is a whole different story than using it with your friends." "Using technology to share information with others is a must. My students all have access to course sites where we share projects, homework, assignments, discussions, and presentations. If students don't have the experience or the ability to pick that sort of thing up quickly, they will be lost and at a major disadvantage." Participants identified effective communication skills, collaboration, teaming, and idea exchange as key elements to be included in a set of soft requisite skills for 21st century students. "The core of sharing in a team setting is being able to express your own ideas. I expect my students to be able to understand the ideas of others in a group setting, be able to quickly evaluate those ideas, and be respectful of all of the ideas on the table. I think kids have problems sometimes accepting the views of others in an electronic setting and are very quick to dismiss them."

As suggested by the responses above, soft skills are a set of abilities that may not be something that can actually be taught, but time can be spent on providing students with opportunities to develop them. The data from the participants indicated that the soft skills fully support the hard skills that were presented earlier. Participants highly suggested that the two sets of skills afford students with the best opportunity to succeed in using and applying technology to 21st century learning.

Summary

The experiences and opinions that were discussed by the participants were consistent with the concepts and ideas found during the review of the literature. First, the participants' overall feelings that students lack the technology and related skills necessary for the 21st century was consistent with many sources (Hignite et al., 2009; Koltay, 2011; Kong, 2009; Milic & Skoric, 2010; Nelson et al., 2011; O'Sullivan & Dallas, 2010; Poore, 2011; Potts, Schlichting, Pridgen, & Hatch, 2010). Second, the importance placed on software skills, multimedia, and social media (Amtman & Poindexter, 2008; Crompton, 2004; Hutchinson & Reinking, 2011; Shankar et al., 2005) aligned with multiple sources. The participants' call for hardware and computer support skills (Al-Alaoui et al., 2008; Heinrichs & Lim, 2010) was also consistent with the literature. The views regarding the Internet and search engines (Carroll, 2011; Judson, 2010; Heinrichs & Lim, 2010; Ladbrook & Probert, 2011; Leung, 2010; Salisbury & Karasmanis, 2011; Teske & Etheridge, 2010) were also consistent with the ideas presented in the literature. The ideas related to the soft skills that were often identified as 21st century skills in the literature, (Ali & Katz, 2010; Allen, 2007; Kong, 2009; Rosen, 2011; Silvernail et al., 2008; Stripling, 2010) were aligned with the information found in the literature. Ultimately, the ideas that the participants shared related to independent learning (Hignite et al., 2009; Shankar et al., 2005), impact of media (Aqili & Nasiri, 2010; Arke & Primack, 2009; Bittman et al., 2011; Chang et al., 2011; Considine et al., 2009; de Abreu, 2010; Hignite et al., 2009; Milic & Skoric, 2010; Torres & Mercado, 2006; Turner, 2011), digital citizenship, research (Carroll, 2011; Erjavec & Volcic, 2010; Heinrichs &

Lim, 2010; Judson, 2010; Ladbrook & Probert, 2011; Leung, 2010; Salisbury & Karasmanis, 2011; Teske & Etheridge, 2010), and communication (de Abreu, 2010; Nicholas, 2008; Pedro, 2006) were all presented in the literature as key components of a 21st century skillset.

A thorough review of the professional literature supported what the participant data suggested: students lack both hard and soft technology skills that teachers require them to have to function in the 21st century classroom. When I triangulated the online questionnaire and focus group discussion data with the document study, I discovered that the participants' requirements were almost completely in line with the International Society for Technology in Education's Standards for Students (2007):

- Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
- Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
- Students apply digital tools to gather, evaluate, and use information.
- Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
- Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.

- Students demonstrate a sound understanding of technology concepts, systems, and operations. (pp. 1-2)

The parallels between the data and what was identified in the professional literature validated the belief that students require more instruction pertaining to technology and the hard and soft skills that are considered to be a component of that instruction. It was this information that reinforced the project development of a 21st century digital literacy framework. The following section provides an explanation of the project and the framework, which was the outcome of the research conducted for this study.

Project as an Outcome

This project study was motivated by a review of the definition of literacy and what it means to be prepared to succeed after high school. Success was once identified through proficiency in English, mathematics, sciences, and social studies. However, students are asked to also be proficient in 21st century skills (Brown & Lockyer, 2006; Honan, 2012; Marcus, 2009; Pacino & Noftle, 2011; Potts et al., 2010). The literature identified that many students know how to use the technology (Judson, 2010; Leung, 2009; Walsh, 2010), but lack the application and understanding of technology. Now, as a result of the data analysis from this project, there is evidence from participants to support it at the local level.

Judson (2010) and Leung (2009) supposed that educators assume that students are literate in technology simply because they have spent their lives around it. Leung (2009) advocated the teaching and learning of technology and 21st century skills, but reminded educators that they are not automatically learned. Hazen (2010) emphasized that

technology is worthless if children do not possess real world application. The participants in this study had major assumptions regarding the skillset of students walking into their classrooms. They expected that students could do many of the basic hard technology skills let alone be able to do some of the higher level soft skills where they are applying technology. The combination of teacher participant expectations and the ideas stated in the professional literature, support that there is a need for more technology instruction at the local level. The project stemming from the study addresses this problem by using the data and supporting literature to develop a framework for 21st century digital literacy.

Conclusion

Data for this study were collected through three methods: online questionnaire, focus group discussions, and document study. Open-ended questions in the online questionnaire and focus group discussions were used to identify key elements related to media literacy, information literacy, and computer technology literacy that participants found necessary to be included in a framework for digital literacy. The online questionnaire and focus group discussion questions were designed using favorable qualitative writing techniques that were in agreement with the literature of Hatch (2002), Merriam (2009), Fink (2009), and Glesne (2011). Data collected through document study were used for triangulation. The application of an inductive approach to data analysis uncovered that a 21st century digital curriculum should include hard technology skills and that those skills should be reinforced by a set of higher level soft skills.

Section three provides a deeper description of the project and its goals in order to address the data presented in Section two. This section includes a further review of the

literature as it relates to the project, a discussion regarding the project implementation and timetable, resources, potential barriers, project evaluation, and implications for social change.

Section 3: The Project

Introduction

The findings of this qualitative case study revealed that educators have strong perceptions of what skills are required to form a 21st century digital literacy framework. The participants shared detailed ideas regarding the components they believed to be incorporated into such a framework. Furthermore, the study indicated that educators held strong beliefs that the research site incorporate these ideas into a course that promotes 21st century digital literacy, meets CIPA requirements, and potentially develops into a graduation requirement.

Section 3 provides the description and goals of the curricular framework, along with the rationale for choosing this project to address the problem of lacking of a structured framework that promotes contemporary computer skills, foundational concepts of information access skills, and the application of technology to complex and sustained situations. I also include a literature review to support the choice and construction of the project and to specify the criteria used to guide project development. I address the implementation and next steps, including potential resources, existing supports, and potential barriers. A proposal for implementation is provided, along with the information about the roles and responsibilities of key stakeholders. Section 3 concludes with a project evaluation and implications for social change at both local and broader levels.

Description and Goals

The problem this study was designed to address was that many students know how to use the technology, but lack being skilled in the application and understanding of

technology's use and impact. In order to develop 21st century literate students, it was the intent of the study to have educators provide input in the development of a curricular framework for 21st century digital literacy. Data were collected through an online questionnaire, focus group discussions, and document study. The culminating project consisted of a designed curricular framework that integrated the input from the participants along with the information from the professional literature. Though the resulting curricular framework is not meant to detail all of the instructional steps in lesson plans, the goal was to provide the research site with the necessary tool for implementation.

Rationale

Teachers, administrators, scholars, and, researchers believed that the purpose of high school is to help students be successful at the next level (Stripling, 2010; Ali & Katz, 2010; Rosen, 2011; Kong, 2009; Allen, 2007; Silvernail et al., 2008). Ali and Katz (2010) surveyed business experts, human resource directors, and business educators and the respondents identified information-communications technology skills as paramount in the 21st century business world. Even though 21st century skills are in demand, many educational experts continued to stress the lack of students possessing them (Koltay, 2011; Nelson et al., 2011; O'Sullivan & Dallas, 2010; Poore, 2011; Potts, Schlichting, Pridgen, & Hatch, 2010)

The lack of a technology requirement at the research site supports the notion of a lack of proficiency in 21st century skills and is the catalyst for this doctoral study. The project (see Appendix A) serving as the culmination of this study is the development and

design of a curricular framework that includes the participants' input regarding what they deem necessary to be included in a 21st century digital literacy framework. It addresses the local problem, because the data was directly gathered from the participants who are the stakeholders at the local level. The online questionnaire and the three focus group discussions were designed to prompt and collect participants' views, opinions, and experiences regarding what should be included in a 21st century digital literacy curricular framework. It is my assertion that designing this curricular framework based upon the participants' input will increase student opportunity to develop higher-level proficiencies as 21st century literate individuals.

Review of the Literature

Introduction

The literature review for this section addressed the project and provided research justifying that a curriculum framework was an appropriate response to the problem. I conducted searches for peer-reviewed, full-text articles related to *21st century learning* via Walden University's federated search interface, Thoreau –Search Multiple Databases. Boolean search techniques were submitted to the following databases: Education Research Information Center (ERIC), Education Research Complete, SAGE Journals Online, ProQuest Central, Teacher Reference Center, and Academic Search Complete/Premier. The results proved to be exhaustive, but results narrowed once I added the terms *literacy, skills, classes, secondary, high school, courses,* and *curriculum*. In addition to searching through Walden University's research databases, I conducted an Internet-based search for matrices, frameworks, lists, or identifiers related to 21st century

digital or technology skills. After expansive scanning and reading of abstracts, articles, and lists, the resources were recorded and organized by relevance.

Analysis of Research and Theory

The local data that emerged from this doctoral study was the primary motivation for the selection of the project. The participants determined through the data collection that there is a need for a digital literacy course requirement for high school students at the research site. Through an additional review of the literature, I analyzed research to validate the creation of a curriculum framework for a 21st century digital literacy course. In addition to the professional literature, the project was further justifiable through the analysis of the research related to 21st century skills, curricula, and technology. The development of the project was appropriate and in line with the findings of the doctoral study, the professional literature, and the available matrices, frameworks, lists, and identifiers related to 21st century digital skills.

The need. The local participants in the study agreed that there is a need for a course or a curriculum that requires students to learn, apply, and create using technology. Educator 2 believed that "we are doing such a disservice to our [students]. I am worried that we are under this false assumption that all kids are coming to school digitally prepared." Information 1 stated, "It has to do with the fact that we are not giving [technology instruction] at a younger age. We have to start as if they are a brand new blank slate every year. We don't have time for that." Participant Technology 1 stated, "We just assume they know [technology] and they don't." Educators and employers across the United States cite 21st century skills, along with the technology-based skills to

support, as the most important skills that students need before they graduate from high school and college (Ali & Katz, 2010; Drew, 2012; Eshet-Alkali & Amichai-Hamburger, 2004; Kay, 2009; Klosterman, Sadler, & Brown, 2012; O'Sullivan & Dallas, 2010; Rotherham & Willingham, 2009; Safar & Alkhezzi, 2013). However, as stated in the literature, many students are graduating without these skills (Hilton, 2008; Koltay, 2011; Nelson et al., 2011; O'Sullivan & Dallas, 2010; Poore, 2011; Potts, Schlichting, Pridgen, & Hatch, 2010; Rotherham & Willingham, 2009), making it even more important to focus on meeting the needs of students. Much of the discussion in the literature and in the study focusses on the needs of today, but it is very important to realize that students need preparation for the jobs of tomorrow. In some cases, those jobs do not exist and students will need a core set of skills that will promote adapting to the new technologies and demands placed on them (Baynard, 2010; Casner-Lott & Wright, 2011; Kelly, 2014; Loertscher, Trilling & Fadel, 2010; Noftle & Pacino, 2010; Wagner, 2008).

A number of existing frameworks supported the need for 21st century skills and technology-related skills (Cisco Systems, Intel Corporation, & Microsoft Corporation, 2009; Educational Testing Service, 2007; International Society for Technology in Education, 2007; Metiri Group & North Central Research Educational Laboratory, 2003; Partnership for 21st Century Skills, 2009). The purpose behind the development of these frameworks was to meet the needs of society as it continues to evolve through the 21st century. The framework developers and partners, suggested that technology and technology supported work methods have advanced the purpose of education from that of a knowledge acceptance role to that of a design, develop, create, and conceptualize role

(Cisco Systems, Intel Corporation, & Microsoft Corporation, 2009; Metiri Group & North Central Research Educational Laboratory, 2003; Partnership for 21st Century Skills, 2009). As a result, the rapid evolution of technology and the social and economic impact have huge implications for our educational system and our students.

Topics for instruction. In the professional literature, 21st century skills is a broad term interpreted differently from person to person and organization to organization (Dede, 2010). However, in reviewing the various frameworks, I discovered consistencies between what this study's data presented at the local research site and what was in the frameworks. Collaboration, creativity, critical thinking, problem solving, technology literacy, information literacy, and media literacy are referenced in the frameworks and in the local data (Cisco Systems, Intel Corporation, & Microsoft Corporation, 2009; Educational Testing Service, 2007; International Society for Technology in Education, 2007; Metiri Group & North Central Research Educational Laboratory, 2003; Partnership for 21st Century Skills, 2009).

The Partnership for 21st Century Skills framework (2009) emphasized innovation, information literacy, media literacy, and technology skills, and asked students to apply them to life and career. The International Society for Technology in Education framework (2007) stressed the ability to transfer knowledge to research and learn new technologies in a safe, legal, and ethical manner to develop original works, explore complex systems, and identify trends. The Metiri Group & North Central Research Educational Laboratory (2003) developed the enGauge 21st Century Skills based upon skills believed to be necessary to flourish in a digital world. The collaboration focused on

providing students with the digital tools, thinking strategies, and communication skills to evolve with a world transformed through technology. The Educational Testing Service (2007) developed the ICT Literacy structure that stressed the knowledge and experience with hardware, software, networks, and digital technologies. The work of Cisco Systems, Intel Corporation, & Microsoft Corporation (2009) led to the creation of the Assessment and Teaching of 21st Century Skills framework. This collaboration led to a focus on changing the way student think, the way they work, the tools they have access to, and how being productive is defined in the 21st century. Taking into consideration the feedback from the study's participants and the literature, the instructional units found within the study's culminating project stressed all of the items mentioned above.

Professional development. In addition to references to the need for a 21st century curriculum and the topics for instruction, there were numerous references to professional development for teachers. The professional literature emphasized that, without proper training and professional development, 21st century curricula will never take hold in schools (Dede, 2010; Hung, Lee, & Lim; 2012; Hutinger, Bell, Daytner, & Johanson, 2005; Kay, 2009; Rotherham & Willingham, 2009; Young, 2012) The participants in the study also identified professional development as an issue. Participant Technology 2 felt that these ideas and concepts are difficult to get behind "because most of us here have been teaching for 10-15 years and we haven't been giving those skills to teach digitally." The Partnership for 21st Century Skills framework (2009) and the International Society for Technology in Education framework (2007) acknowledged teacher professional development to reinforce their own skills as vital to proper implementation.

Conclusion

The need for students to move beyond high school with 21st century digital skills drove this doctoral study and led to the development of a digital literacy curriculum project. The local data that emerged from this study, along with the professional literature, and available 21st century skill frameworks supported the development of the project. Through participant data and identified content in existing frameworks, the structure of the digital literacy curriculum project was validated. Finally, the literature, local data, and existing frameworks identified professional development as necessary for proper implementation.

Implementation

The study's culminating project consisted of designing and laying out a 21st century digital literacy course curricular framework that integrated the input from the participants along with the information from the professional literature. Though this project does not detail all of the day-to-day steps found within a teacher's lesson plan, the goal was to provide the research site with the necessary tool for implementation. As a result, this project is meant to serve as a district curricular framework that would be presented to the research site and ultimately added to the district's program of studies.

Potential Resources and Existing Supports

Resources found at the local research site are the primary means needed to complete and maintain a 21st century digital literacy curriculum. The information required to implement the curriculum is available from current research, local business and technology educators, existing curricula, and continued study of digital literacy.

Current professional research linked to digital literacy was the core component, along with teacher input, in the development of the curricular framework. Teacher input was the primary means of data collection regarding the needs of student and it ultimately confirmed what was highlighted in the professional literature.

In addition to the relevant information about digital literacy through research and teacher input, the technology-based resources are needed. Resources to implement and maintain a digital literacy course already located at the local level include computer and technology equipment, productivity software, multimedia authoring and editing software, Internet access, and various Web-based tools. At the time of the study, there was adequate technology resources in place at the local level to implement the digital literacy curriculum.

Potential Barriers

Although, at the time of the study, adequate resources were located at the local level, this will change. This project is a curriculum framework for a digital literacy course that requires a significant budget to maintain and support the resources associated with the curriculum. Technology changes and ages, thus making it a subject that may require more updates to it than other topics. A commitment to preserve currency of the course resources could be a future barrier, as budget constraints, funding priorities, and decision makers change over time. Budget cuts and the redirection of funding from the state and federal governments may potentially alter the ability to support, update, and replace the resources necessary to run the curriculum.

Keeping pace with technology is a daunting task and teaching students how to use technology and technology-related skills requires a higher level of maintenance of the curriculum and its resources. Participants voiced constant concern regarding the need for more training and time to meet with other teachers as a necessity for keeping pace with technology. In addition to monitoring current trends and skills in technology, educators must update their skills at a higher rate as well. Continued professional development and training in the hands-on technology skills should be required to keep pace with the changes in technology. A lack of a continuous professional development cycle for the teachers of this digital literacy curriculum could negatively affect the purpose and continued offering of the course.

The research site maintains an active professional development calendar with multiple opportunities for teachers to meet and discuss curricular related items. That barrier can be planned for and ultimately removed from the equation. However, the maintenance, support and updating of technology along with training and teacher support require budget commitments. Time to collaborate and meet with other educators can always be identified and allocated, but it is beyond the scope of this project to identify, locate, allocated funds, and recommend purchases. With that being said, recognizing and discussing these potential barriers, including information about them, and focusing on the curricular objectives, may assist in minimizing these potential barriers in the future.

Proposal for Implementation and Timetable

After the data collection and analysis, I began drafting the curricular framework for the digital literacy course in October 2014. In early November 2014, a copy of the

curricular framework was disseminated to the research site's business and technology teachers. The business and technology teachers are the teachers who would teach the course if the project was carried through to implementation. A copy of the curricular framework was also provided to the appropriate district personnel via email. Any future updates, changes, or edits to the digital literacy curricular framework would require to be shared with the same stakeholders.

Roles and Responsibilities

I created the digital curriculum framework (Appendix A) based on current research and participant data collected through the online questionnaire and focus group discussions. Document study was also utilized as a method of triangulation and provided the third leg of supported data collection. I, along with other stakeholders, remain responsible for keeping the proposed digital literacy curriculum current and relevant through research, input, and technology professional literature. Any future curriculum updates, changes, additions, and deletes would require district approval and would have to include input from the district's business and technology teachers.

Project Evaluation

Ross (2010) stated that "when evaluation is part of the culture of the program, it is on-going and intertwined with all the program components, stakeholders, and structures" (p. 494). Evaluation is a growing active process that considers all of the project's or program's information, actions, participation, and usefulness of data to inform decisions related to its progress (Fretchling, 2002). The on-going evaluation of this project will be

used to make decisions about the objectives, content, currency, applicability, and direction of the digital literacy course curriculum and its related tools and skills.

Curriculum evaluation should consider the quality and value of the curriculum's content, resources, currency, and structure. Glatthorn, Boschee, F., Whitehead, & Boschee, B. (2012) defined curriculum evaluation as a structured process that seeks "the assessment of the merit and worth of a program of studies, a field of study, or a course of study" (p. 358). This project is a curricular framework for a digital literacy course and it should be evaluated no differently than any other curriculum. The evaluation of this project is recommended as a model for future evaluation of the digital literacy curriculum. After a thorough review of curriculum evaluation options and models, I selected Stuffelbeam's (1971) Context, Input, Process, Product Model (CIPP) due to its focus on formative and summative evaluation.

Stuffelbeam's (1971) model sets to determine a programmatic success and to make decisions based upon that level. It is centered on identifying what needs to be evaluated; deciding what needs to be collected to determine levels of success; collecting the information about it; and making the information available to the stakeholders. It relies heavily upon formative and summative evaluation to establish the effectiveness of the curriculum piece. Evaluation, in this manner, becomes continuous and is expected at all levels of the program.

The context evaluation portion considers whether or not the program's objectives are being met. Stuffelbeam (1971) advised that evaluators consider the environment in which the curriculum is being delivered, whether or not the learners' needs are being met,

and if the organization supports or does not support the curriculum. In order to perform this portion of the evaluation, data would have to be collected that includes classroom observation, resource and technology review, school support, teacher knowledge related to the content, and feedback from students. To examine the context of the delivery of the digital literacy curriculum, I would ask the following questions:

- Is the classroom ideal for the content of this course?
- Are there enough resources and technology in the room to successfully teach this course?
- What problems hindered the success of the class?
- Do teachers have enough technology skills to teach the class?
- What input do students have related to the class?

The input evaluation portion considers how the curriculum is being carried out. Stufflebeam & Shinkfield (2007) direct evaluators to identify and assess system capabilities, to research and validate relevant approaches, and to recommend alternative strategies. In order to carry out the input evaluation portion, data would have to be collected from department members, teachers, building administrators, professional literature, business leaders, and project data. To examine how the curriculum is being carried out, I would ask the following questions:

- Is the content being taught applicable and current?
- Is the content within the course framework inclusive or does content need to be added or taken away?
- Are the resources keeping pace with the content related to currency?

- Is the technology that students have access to current and still supports the needs of the curriculum?

The process evaluation looks at whether the curriculum is being carried out or not. It is an ongoing progress check according to Stufflebeam & Shinkfield (2007). The purpose of this evaluation is to determine if the curriculum is being carried out or if changes need to occur to do so. Stufflebeam (1971) also suggested that an additional purpose is to determine the degree that teachers accept the course material and carry it out accordingly. To assess how well the implementation is being carried out, I would ask the following questions:

- Is the course and its content running smoothly?
- Were there any problems related to the technology in the course?
- Did the instructional units go as planned?
- What specific units or areas of instruction had the most trouble?

Stufflebeam's (1971) product evaluation assess the outcomes of the project. Zhang, Zeller, Griffith, Metcalf, Williams, Shea, & Misulis (2011) describe the rationale "to measure, interpret, and judge a project's outcomes by assessing their merit, worth, significance, and probity. Its main purpose is to ascertain the extent to which the needs of all the participants were met" (p. 66). It involves determining the success or failure of the objectives, looking at supportive data, and making decisions whether to move forward, terminate, or make changes to the curriculum. It is a summative type of evaluation that determines the success and failures of the curriculum, and provides suggestions as to the curriculum's sustainability and transferability (Zhange et al., 2011). To evaluate the

outcomes of the curriculum and gather information to interpret the curriculum's worth, I would ask the following questions:

- Did the learners learn the various aspects of the curriculum? How do you know?
- Were the course and unit objectives met? How do you know?
- Does the curriculum assist students in developing 21st century digital literacy skills?

Without an effective approach to evaluation, a program, project or curriculum will not improve or adapt to changes. At the local level, additions, enhancements, and changes to curricula are in the hands of the administrators. Even though the CIPP model has been around for a long time, it was applicable due to the emphasis on decision making at both the formative and summative levels. At the research site, this process seems appropriate and fitting for those administrators who evaluate the curriculum, determine changes, and make additions.

Implications Including Social Change

Local Community

This project study was important to the local school community since it targeted an instructional need as recognized by educators at the research site. Implications from this project would have an immediate impact on students, teachers, and administrators at the research site. This project also reaches beyond the local school community by possibly impacting the other buildings in the district. However, this project targeted the research site which comprised of the districts two high schools that serve grades 9 through 12. In future considerations of the scope of this curriculum, it may be aligned to

the lower grade levels at the junior high schools, intermediate schools, and elementary schools.

Students. The Manpower Group (2014) surveyed 37,000 employers and 35% of them had difficulty filling critical positions. The employers cited a lack of technical expertise and lower levels of critical thinking, flexibility, and collaboration. This project meets this problem head-on in an effort to afford students at the local site with the technical skills, critical thinking, flexibility, and experiences in collaboration. The students would benefit greatly by gaining the experiences that would eventually assist them to be productive 21st century citizens at the next level whether be further schooling or work. In addition to adding to their marketability, a digital literacy course would better prepare students to complete higher level 21st century project work in other content areas and classes. Students would be able to apply the skills, theories, and practices developed in this course.

Teachers. This project could benefit the teachers who teach the curriculum by providing them with an organized, current, research-based, peer approved, framework. The digital literacy framework provides focus for the teachers to be on the same page as far as the requisite skills, resources, technology, and additional skills covered by the course. Furthermore, as part of the curricular evaluation process, it involves them in the constant review and revision procedures. They would be able to provide input regarding the direction, resources, and content of the course in order to maintain currency. In addition to those teachers directly affected, other content area teachers would benefit in that students at the local level would possess a higher level of technical and thinking

skills. This would afford additional teachers the ability to require students to integrate more technology-based projects and strategies into their classrooms.

Administrators. Administrators at the research site are charged with providing students with the requisite education to prepare them life beyond high school. As the participants in this study indicated, digital literacy, technology literacy, media literacy, and information literacy were all things that they felt were necessary for students in school and beyond school. If these literacies are considered requisite, then a digital literacy curriculum provides administrators with the vehicle to assist students in meeting the demands of learners. Furthermore, it assists administrators at the local site with providing teachers the opportunity to develop and implement higher level technology-based projects and expectations.

Far-Reaching

Literacy in the 21st century literacy extends well beyond reading, writing, speaking, and listening (Hobbs, 2011). The influence of technology devices, images, video, sound, music, interactivity, and connectivity drives a deeper meaning for learners to be literate (Chase and Laufenberg, 2011). This is why a digital literacy curriculum extends well beyond the scope of the individual students in a school or district. It provides a curriculum framework for districts everywhere to implement a locally researched approach that assists students in reaching a proficiency in digital literacy. It answers the need "to meet the challenges of delivering content and skills in a rich way that genuinely improves outcomes for students" (Rotherham & Willingham, 2009). Technology is prevalent in every aspect of life and we ask citizens to be proficient in its

use and application of 21st century skills. Technology discovery and instruction is the bridge to an improved citizen who values global education and solves problems using creative and forward thinking methods (Wheatley, Dobbs, Willis, Magnan, & Moeller, 2010).

Conclusion

The findings of this project study revealed that educators have strong perceptions of what skills are required to form a 21st century digital literacy framework. The data generated from the study provided the catalyst for the direction, function, and goals of the project. The participant response data and the professional literature provided a concrete rationale for choosing this project to address the problem of lacking of a structured framework that promotes core computer skills, information access skills, and the application of technology to complex and sustained situations. Along with a plan to maintain the curriculum for currency and relevancy, the project serves as structured format to assist schools and districts to promote proficiency in a digital literacy course and ultimately prepare students with the skills to function in 21st century society.

Section 4 focusses on my personal reflections related to the project study, the research process, and myself as a leader, scholar, practitioner, and project developer. It includes reflections on the strengths and weaknesses, along with the projects potential for social change. The section ends with recommendations for the application of future research.

Section 4: Reflections and Conclusions

Introduction

The intent of Section 4 is to present the view of the project from the researcher's perspective. The discussion begins with a focus on the strengths of the project and recommendations based on limitations of the project. Special attention will be given to the subject of scholarship, leadership and change, and the analysis of the researcher as a scholar, practitioner and project developer. In addition to these reflections, discussion will also focus on the project's potential impact for social change. Section 4 concludes with a discussion of the implications, applications, and directions for future research.

Project Strengths

A curriculum framework for a 21st century digital literacy course served as the project for this qualitative case study. Using a curriculum framework format to address the local problem, answer the guiding research question, and incorporate the data was a key strength of this project. The curriculum format directly addressed the local problem of a lack of a course requirement that focuses on digital literacy. The curriculum paid strong attention to the functional use and understanding of computers and technology, word processing, spreadsheets, presentation software, and multimedia development. It also integrated and applied concepts related to the Internet, digital citizenship, research skills, collaboration, and independent learning. The curriculum framework also aligned with the participant data obtained through online questionnaire and focus group interviews. In addition to addressing it at the local level, the curriculum addressed similar needs as identified in the professional literature and through document study.

The participants at the local level were a key component of this study. Not only were they the primary source of data, but their input in the online questionnaire and focus group discussions was the piece that validated this project as a curricular tool to answer the problem at the local level. Noftle & Pacino (2010) indicated that literacy, especially in the 21st century, is such a broadly defined term that it becomes a challenge to meet the demands of literacy. They further discussed how important it is to understand that the value lies in the experience and input of the educators who have the responsibility to prepare students. Without teacher involvement, there is no sense of involvement, ownership, comfort or motivation to provide relevant and current instruction (Mualuko, Mukasa, & Judy, 2009).

At the local research site, curriculum revision is a planned process. This is a strength of this project, because the project would be subject to on-going review and evaluation for currency and applicability. As a result, the opportunities to keep the quality of this curriculum high and keep stakeholders involved will be numerous. It will allow the ability to keep a 21st century digital curriculum current and focusing on the tools, methods, and content that have evolved over time. "Stakeholders in education must continue to demand and support quality instruction that will effectively engage and challenge students while preparing them for the literacy demands of the 21st century" (Young, 2012, p. 78).

Recommendations for Remediation of Limitations

As indicated during the focus group discussions and the online questionnaire data, one of the major subjects that arose was professional development. Many of the

participants called for more professional development related to technology. The local problem arises out of a lack of computer or technology instruction in the district, but a participant pointed out that “Before we put all this blame on teachers maybe we have to look at our professional development program.” This may be true of the district as a whole, but considering this project is a digital literacy curriculum, then there must be professional development built around it. A major limitation of this project is that it does not identify or outline the professional development needed to give the teachers the skills required to teach the curriculum. In order to remediate this problem, a professional development schedule or outline would need to be developed based on the topics and skills taught in the curriculum. This professional development outline would need scheduling throughout the year on scheduled teacher in service days and other allotted training days. This would take commitment from the district and the local building administrators to schedule these teachers separately, understanding that they may not be able to take part in other building wide trainings. There would also have to be an understanding that the skills required for these teachers would have to be maintained at high levels in order to remain current.

An additional limitation of this project is that the local problem centered on students missing identifiable skills. The project identified specific skills or information to be covered, but much of this was based on personal experiences and data from the local participants. Though the problem was local, the data collected was subjective and this type of data may not be meaningful or precise enough to be replicated at other schools. If another school was to address this limitation, the staff at the local school or district would

have to be given the opportunity to develop their own curriculum using this framework as a template. Curriculum writers would have to adapt what is found in this framework to their unique locality and add or subtract content as they see fit.

A final limitation of this project is akin to the issue of subjectivity mentioned. A curriculum that is based on upon technology with application of hard and soft skills is not going to cover everything. In addition to the breadth of the content, there is the timeliness or currency factor. Technology changes at very high rates and this project may not cover everything. Another educator or school is going to identify skills that are not covered by this project. It is not all inclusive and again is subjective to the problem at the local site. However, addressing this limitation is simple and can be answered through constant curriculum review. Periodic evaluation and reviews of the curriculum by the teachers will allow for the integration of for local specific needs or new technologies.

Scholarship

My personal beliefs regarding scholarship always turned my attention to teachers and the art of teaching. After completing this study, my belief holds true. Gathering online questionnaire data and leading focus group discussions, the local site is dense with teacher leaders. As a result of this level of interaction with the teacher participants, I see the high levels of scholarship as identified through teachers taking on more instructional and school-based leadership roles. As York-Barre & Duke (2004) recognized, teacher leadership is fundamental to schools for the following reasons:

- When teachers, as employees, participate in the decision-making, they are committed to the results of the decisions.

- Teachers have front-line knowledge of the classroom and school issues.
- It is important to identify and reward accomplished teachers who, in turn seek even more learning and development.
- When schools provide leadership roles to teachers, they are modeling democracy. As a result, the ultimate beneficiaries from this are the students.

This project helped me to realize that scholarship at the school level lies in the hands of the site's teacher leaders. Scholarship was evident in their passion for education, their contribution to their school, and in their responses to my online questionnaire and focus group discussions. The biggest realization is that the ultimate receivers of this scholarship are the students who teacher leaders influence on a daily basis.

Project Development and Evaluation

My past experiences with project development were of a rather simple process: a need was identified for a unit of study; objectives were set; lessons were designed; and a culminating project or assessment was created. It was not much of a process, but it met the need of a classroom level project or unit of instruction. Once I began the process of a doctoral level study, I discovered clear limitations to this model. Through the doctoral study process, I developed a much better progression through scholarly steps that I will apply to all future project development opportunities. I was guided to a process that included the identification of supporting evidence of a local problem, designing an appropriate statement of the problem, developing relevant research questions, performing a review of professional literature, collecting and analyzing data, designing a project to answer the research questions, and reporting the results.

At first glance, the doctoral study process appears to be a lengthy one. For an emerging doctoral researcher, it is. However, as they progress through it, it is clear that it is logical, precise, and thorough. I developed the most during the literature review component of the process. Through the literature review process, I honed my skills searching through professional literature and furthered my development to include the pieces in my writing. The ability to search through literature, apply evaluation techniques, filter through, and select applicable pieces is a skill that I will carry forward to all aspects of future information searches.

Data collection was not something I did on a daily basis, but knowing the importance of this function is what I will perform better in my professional career as an educator. The search and selection of a methodology, instrument development, and collection and analysis of data is an extremely detailed and lengthy process. I learned that no matter how daunting this practice is, it is a rewarding step in the process. I discovered that it was during this stage in the process that I became fully invested in it. I bettered myself professionally and personally. This is the step where I developed in running focus groups, designing questionnaires, and working with different people. This is a practice that I will also carry forward into future professional practice.

Finally, I learned the value of safeguarding the research process and working towards the guarantee of confidentiality. Though it seemed obvious at the time, it was not until I reflected on the process that I understood the application of it. In our personal and professional lives, we are presented with opportunities that require the application of trust and confidentiality. Through the detail of the Institutional Review Board process and

application and the eventual write-up of the process, I began to understand the importance of it. Once I sat down and held focus group discussions, I completely understood it. Through this process, I significantly enhanced my ability to be professionally and personally supportive of confidentiality and the importance of trust.

Leadership and Change

The focus of this doctoral study was the realization of a local problem and designing a solution to meet the needs of it. To do this, the researcher has to be close to the problem. This project is also about change. To foster change in a school setting, I realized that it takes active and willing leaders to guide the change. The closest leaders to a local problem, such as the one presented in this study, are school leaders and teacher leaders. I realized that the transformational leadership work of Burns (1978), Bass (1985), Bass & Avolio (1994), and Leithwood & Poplin (1992) held true to the need for school leaders to consider the implication of the individuals in schools, apply new ways of thinking and accepting change, hold high expectations, be an inspirational presence, and model positive roles and behaviors. Leading a doctoral study and requiring building leaders to assist you and support you in it is vital. I would have never been able successfully complete such a process and produce a valuable project response without it.

Lieberman, Saxl, & Miles (Jossey-Bass, 2007) shed light on the teacher leader as an individual who understands the school culture and diagnoses problems, constantly develops new skills through coursework and self-learning, builds trust and rapport with colleagues and students, manages high levels of work, and builds skill and confidence in other teachers and students. Considering these characteristics, a teacher is the true

frontline leader who, in cooperation with the school leader, is a key component of change in the building. This frontline level of leadership is what concreted the collaborative structure at the research site and ultimately carried this doctoral study and project forward with success. It is a concept that will assist me greatly in any future endeavors at the building level.

Analysis of Self

This section includes an analysis of me as a scholar, practitioner, and project developer. The doctoral study process has assisted me greatly in achieving higher levels of growth and furthered me in much of my prior knowledge as a professional educator and researcher. As a result of the doctoral study process, I anticipate that I will apply these developed skills throughout my career. The growth that I have undergone has allowed me to have a keener sense and view of research, literature, project development, and being a part of the larger educational system. Ultimately, I have developed well beyond my expectations on the project side of this doctoral study. Through the online questionnaire, document study, focus group discussions, and literature review, I accumulated a wealth of knowledge related to digital literacy. Along with the experience of writing a complete curricular framework, I have developed as a truly practical educator.

Scholar

Merriam Webster (December 27, 2014) defines *scholar* as a "person who has studied a subject for a long time and knows a lot about it." Considering this definition, I would deem myself an expert on digital literacy. Through the literature review, research

question development, instrument design, data collection, data analysis, and project development, I have added to my level of scholarship as a researcher, curriculum writer, and educator. I further developed in leaps and bounds in evaluating scholarly research related to literacy and technology, developed an online questionnaire and focus group discussion guides, held discussions on the subject, and compiled and shared the results in a scholarly format.

Practitioner

During this process, I have worked hard to maintain high levels of productivity in the career, family, and doctoral pieces of my life. Ultimately, it was a difficult juggle of roles and many times, it left me discouraged and exhausted. Finding the happy medium between all three is something I dealt with and, when it was most challenging, I pushed forward. In retrospect, the doctoral process has aided me greatly in reflecting as a member of the education community. In analyzing myself as a practitioner, I have renewed my sense as an asset to the educational world. The content and focus of this study has honed my skills as an instructional technologist and educator. The hours spent writing the curriculum project sharpened my ability to include the stakeholders input while keeping alignment with the professional literature.

As an educator, I strongly believe that we can always make ourselves better, apply new or different strategies, or change to different needs. I spend much of my professional time communicating and working with others. I have always felt better than adequate as a communicator, but the doctoral process has improved me. As a result, I feel I am a better collaborator, organizer, leader, and communicator. Additionally, the work

performed to complete this study has given me the drive to use more data and research to lead initiatives in the future.

Project Developer

During the development of the project for this doctoral study, I tapped into prior knowledge and experiences related to organization, planning, and implementing projects. Technology and curriculum work is a large component of my daily work in the district, so I was able to apply my years of experience in those areas to this project. In addition to content knowledge, I have also had experience in carrying out projects. However, as I realized through this process, I was able further build upon my prior knowledge and experience. The doctoral process is a systemic process that requires great planning and detail that designs a project based on a local problem and need. Consequently, I had to refine my experiences and ultimately grew as a project developer.

The Project's Potential Impact on Social Change

As schools seek to make technology more available and increase the integration of it, life outside of school mirrors the same need (PEW Internet and American Life Project, 2012). Technology is advantageous to the educational environment, because it is a component of life in the early part of the 21st century. However, as Hazen (2010) emphasized, all the access and integration is worthless if students do not possess effective proficiencies in applying and using technology. Add the federal requirements of CIPA (CIPA FCC 01-120) and the local need becomes greater for a course such as this. However, it just is not a need at the local level. If the professional literature indicates that there is a mass of learners ill prepared and lacking 21st century skills to integrate into the

real world (Judson, 2010; Leung, 2009; Walsh, 2010), then a curriculum similar to this project would be beneficial for society.

The data collected from this doctoral study indicated that educators have strong perceptions of what skills are required to form a 21st century digital literacy framework. The project incorporated participant input. The participants additionally believed that the research site should develop a course to promote digital literacy, meet CIPA requirements, and potentially require it for graduation. I applied this research to the production of a digital literacy curriculum. This curriculum provides teachers and schools with the necessary framework to offer such a course.

There are no longer technology classes at the lower grade levels in the research site's school district. Teachers at the research site rely upon previous teachers to provide students with technology skills. However, this is not always the case, so students come to the high school missing digital literacy skills. Carrying out the study and developing the project provided a credible solution for the local site's problem. The research from this project study may also be applicable beyond the local setting. The curriculum's design is editable, so districts outside the local setting may adopt it.

Implications, Applications, and Directions for Future Research

Implications

The research presented in this doctoral study had an immediate impact on the local setting. Much of the discussion that came out of the focus group discussions have filtered out from the participants to the rest of the district. When the decision to eliminate computer instruction at the lower grade levels carried out, teachers hypothesized that it

would create problems for upper grade level instruction and the expectations of teachers on the student skill level pertaining to technology. However, there was never any data collected on the subject. This doctoral study generated the discussion and in turn, participants in the study turned to their other colleagues and the debate has been building. The biggest implication is that this research is serving as a catalyst for discussion centered on the local problem. Recognition and discussion are the first step in implementing and suggesting answers to the problem.

Application

Since the inception of this doctoral study, it was clear to me that educators want their students to use technology in their classrooms. It was also clear, once I began collecting data, that educators did not think students possessed the necessary skills to use technology in their classrooms. Though this study's work is only in infant stages, it has begun to generate discussion regarding a grade eight assessment and a remedial technology course for incoming grade nine students. This doctoral project study will assist in the development of the scope of the assessment and remedial course. Ultimately, the information from this study has helped to identify the local problem, provide data to support it, and to identify a curriculum framework to assist in helping with the local problem.

Direction for Future Research

If this course continues to be a meaningful and relevant one tied to literacy in the 21st century, then expansion is a possible direction for future research. The digital literacy course could move down to the lower grades, allowing for more advanced integration at

the upper grade levels. Future research is needed to adapt the curriculum to the lower grade levels. As a part of that research, identification of the specific needs of the local site and the input from the site's educators would be most valuable. Adaptation from the upper grade levels to the lower grade levels would also require an evaluation and research of the tools and resources available to teach the course.

At any level, on-going future research is required for the maintenance and management of the course's content and resources. For this course to remain effective, future research would identify current trends, resources, and requirements of such a course. Curriculum evaluators will need to maintain high levels of currency for a course of this nature, especially as technology and the environment at the local settings continue to evolve.

Potentially, research involving the requirements and demands of living and working in the 21st century would provide valuable direction for the evolution of the curriculum. Qualitative studies involving feedback from businesses, higher education, and a study of technologies' impact in daily function is a possible direction for future research. A study comparing the scope and sequence of the digital literacy to the information provided from the various groups in the post high school world would provide valuable information and guidance in maintaining course relevancy. In addition to that, this proposed future research could identify direction for professional related to the course.

Conclusion

Section 4 summarizes my overall view of the doctoral project study. I acknowledged the strengths of the project and made recommendations based on the limitations. I reflected on my study with an emphasis on scholarship and leadership and change. I presented an introspective view of my personal and professional development as a scholar, practitioner, and project developer. I shared reflections on the implications and application of this doctoral project study. The discussion further focused on the project's impact on social change and made recommendations related to direction for future research.

This doctoral study and, ultimately the project, developed out of a need to solve a local problem. It worked toward a solution for the lack of a digital literacy course that integrated 21st century skills. It integrated data from teacher participants at the local site, analyzed that data, identified themes found in the data, and developed a digital literacy course curriculum project as an answer to the research question and local need. The digital literacy course framework is a format for a semester long course identifying necessary hard and soft skills that provide the best chances for students at the local site to be proficient in what is required of them in the post high school world. The implications of such a course go beyond the walls of the local setting, as professional literature has suggested that this may be an issue bigger than just the research site.

I have come to realize that a curriculum, such as this one, has proponents everywhere from primary grades to high school grades. Every educator I come across has a set of expectations for their students and technology is always one of them. As I

continued through this process, educators were also seeking students who can think, apply, and properly use technology through a set of soft 21st century skills. However, like the students we teach, education is an evolutionary program. The curriculum presented through this doctoral project study is a work in progress. It is something that needs continuous evaluation and expansion, and potential rebuild as technologies and expectations evolve throughout the early parts of the 21st century.

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Appendix A – The Project

Digital Literacy Course Framework

Course Title: Digital Literacy
Grade Level(s): 9 - 12
Course Length: 90 days (18 weeks)
Course Value: .5 credits (semester-based)

Course Description: This course offers the practical application and understanding of the technologies, tools, and resources required of today's 21st century citizen. Special attention is made to the operation, components, and use of digital technology hardware and software. Learning about the function and application of productivity and multimedia software to answer problems and create original work is explored throughout the course. In addition, students are exposed to proper exploration and research using the Internet, while learning to be a successful digital citizen. The course focusses on collaboration with others while developing practical skills in independent learning.

Course Outline:

I. Computer Operation and Understanding
   a. Computing Devices in our World
   b. Hardware Specifics
   c. Networks, Internet, Cloud, and Intranets
   d. Operating Systems
   e. Files, Folders, and File Management
   f. Troubleshooting and Support

II. Word Processing
   a. Common Word Processing Programs
   b. Application Interface
   c. Edit and Format Text
   d. Format Paragraphs and Pages
   e. Bullets and Numbering
   f. Tables
   g. Graphics
   h. Proofing Tools
   i. Printing and Sharing

III. Spreadsheets
   a. Common Spreadsheet Programs
   b. Application Interface
   c. Entering Data
   d. Formatting Cells and Data
   e. Formulas and Functions
   f. Charts and Graphics
   g. List Databases
   h. Proofing Tools
   i. Printing and Sharing

IV. Presentations
   a. Common Presentation Programs
   b. Application Interface

c. Edit and Format Slides and Templates
d. Adding Content
e. Adding Graphics
f. Adding Video and Multimedia
g. Proofing Tools
h. Print and Sharing

V. Multimedia
a. Benefits of Multimedia Technology
b. Maximizing your Devices with Multimedia
c. Recording, Copying, Formatting, and Working with Digital Audio
d. Recording, Copying, Formatting, and Working with Digital Video
e. Recording, Copying, Formatting, and Working with Digital Images
f. Converting Digital Audio, Video, and Images for the Web

VI. Internet
a. Use of the Internet
b. Internet Connections, Speeds, and, Bandwidth
c. The Web, Web sites, Addresses, and using a Web Browser
d. Searching for Information and Search Engines
e. E-mail and Creating E-mail Addresses
f. Sending/Receiving E-mail and Attachments
g. Getting the Message Across with Proper E-mail Etiquette

VII. Digital Citizenship
   a. Intellectual Property and Copyright
   b. Copyright Violation and Measures to Prevent
   c. Computer Security and Privacy
   d. Securing your Computing Devices
   e. Protect yourself and Family Members
   f. Understanding the Parameters of Social Media and Sharing

VIII. Research
   a. Understanding Information and Where to Find it
   b. Identifying the Best Tool to Find the Right Information
   c. Understand Primary Versus Secondary Research
   d. Ethical Practices in Research
   e. Proper Bibliographical Identification
   f. Fact, Opinion, and Propaganda
   g. Objective, Bias, and Emotional Language
   h. Accuracy and Credibility
   i. Drawing Conclusions and Reporting

IX. Collaboration
   a. Articulating Thoughts and Ideas
   b. Listening and Communicating Effectively
   c. Effective Work in Group Diversity
   d. Technology Tools in the Collaborative Work Group
   e. Solving Problems and Managing Conflict
   f. Feedback and Reflection in the Collaborative Work Group

X. Independent Learning
   a. Desire and Ability to Learn on your Own
   b. Independent and Critical Thinking
   c. Assessing Prior Knowledge and Experience
   d. Transferring Skills to New Concepts
   e. Problem Solving and Decision Making on your Own
   f. Strategies and Methods Towards Independent Learning
   g. Using Technology to Support Independent Learning
   h. Evaluating your Independence

Course Name: Digital Literacy **Grade Level(s):** 9 -12
Unit Name: Computer Understanding and Operation **Unit Length:** 1 week

International Society for Technology in Education – Student Standards:

Technology Operations and Concepts
(a) Understand and use technology systems
(c) Troubleshoot systems and applications
(d) Transfer current knowledge to learning of new technologies

National Business Education Standards - Information Technology:

Impact on Society - Assess the impact of information technology in a global society
Hardware - Describe current and emerging hardware; configure, install, and upgrade hardware; diagnose problems; and repair hardware
Operating Systems and Utilities - Identify, evaluate, select, install, use, upgrade, customize, and diagnose and solve problems with various types of operating systems and utilities
Information Technology and Business - Describe the information technology components of business functions and explain their interrelationships

Pennsylvania State Standards – Business, Computer and Information Technologies:

(15.4.12.C) Develop criteria for analyzing hardware options to meet defined needs
(15.4.12.D) Evaluate emerging input technologies
(15.4.12.E) Analyze the different operating systems and recommend the appropriate system for specific user needs
(15.4.12.M) Evaluate the impact of emerging technologies on various career paths and provide examples of industry certifications within the field

UNIT: COMPUTER UNDERSTANDING AND OPERATION

Unit Objectives:

- Describe the importance of computers in today's world
- Identify the main parts of a computer
- Identify the steps for starting and shutting down a computer
- Describe other common computing devices such as laptops, netbooks, tablets, and phones
- Identify the primary hardware components of a computer
- Explain an operating system
- Explain the common functions of an operating system
- Describe a network and the types of networks
- Explain the terms Internet, Cloud, World Wide Web, and intranet
- Manage files and folders
- Perform basic file operations
- Apply basic troubleshooting procedures and techniques

Activities:

Practice:

- Topic introduction, presentation, and discussion

Review:

- Concepts, terminology, and skills

Application:

- Hands-on practice, videos, simulations, and discussion
- Crack your Computer Open Project Participation:
- Individual, team, and whole-group

Resources:

- Lynda.com
- Atomic Learning
- YouTube
- TeacherTube
- Teacher developed materials
- Web resources
- Microsoft.com
- gcflearnfree.org/
- tutorialspoint.com/computer fundamentals/

Assessments:

- Pre-Assessment
- Post-Assessment
- Teacher observation
- Daily classwork
- Crack your Computer Open Project

Remediation:

- Assistance – Teacher/peer and Web-based tutorials
- Adjustment – Length/breadth
- Alternative – Assignments/projects

Enrichment:

- Research new technologies
- Research technology related careers
- Research and report on technology use in everyday life through the past 100 years

Course Name: Digital Literacy **Grade Level(s):** 9 -12
Unit Name: Word Processing **Unit Length:** 2 weeks

International Society for Technology in Education – Student Standards:

Technology Operations and Concepts
(b) Select and use applications effectively and productively
(c) Troubleshoot systems and applications
(d) Transfer current knowledge to learning of new technologies

National Business Education Standards - Information Technology:

Input Technologies - Achievement Standard: Use various input technologies to enter and manipulate information appropriately
Productivity Software - Identify, evaluate, select, install, use, upgrade, and customize productivity software; diagnose and solve software problems
Information Technology and Business - Describe the information technology components of business functions and explain their interrelationships

Pennsylvania State Standards – Business, Computer and Information Technologies:

(15.4.12.A) Apply the creative and productive use of emerging technologies for educational and personal success
(15.4.12.D) Evaluate emerging input technologies
(15.4.12.G) Create an advanced digital project using sophisticated design and appropriate software/applications
(15.4.12.M) Evaluate the impact of emerging technologies on various career paths and provide examples of industry certifications within the field

Unit Objectives:

- Describe the functionality of common word processing applications
- Identify the main components of the application interface
- Identify the menus, toolbars, tabs, groups, and commands
- Use toolbars to perform various tasks
- Edit and format text
- Format paragraphs and pages
- Apply bullets and numbering
- Create and define tables
- Insert and manipulate graphics
- Proofread and review documents
- Print and share word processed documents

Activities:

Practice:

- Topic introduction, presentation, and discussion

Review:

- Concepts, terminology, and skills

Application:

- Hands-on practice, videos, simulations, and discussion
- Integrated Business Simulation Project – Word Processing portion

Participation:

- Individual, team, and whole-group

Resources:

- Lynda.com
- Atomic Learning
- YouTube
- TeacherTube
- Teacher developed materials
- Web resources
- Microsoft.com
- Saylor.org
- O'Reilly Media
- Microsoft Word
- Microsoft 365
- Google Drive
- Google Docs

Assessments:

- Pre-Assessment
- Post-Assessment
- Teacher observation
- Daily classwork
- Integrated Business Simulation Project – Word Processing portion

Remediation:

- Assistance – Teacher/peer and Web-based tutorials
- Adjustment – Length/breadth
- Alternative – Assignments/projects

Enrichment:

- Create more advanced documents
- Create publications such as flyers, posters focusing on page layout and paragraph format
- Research and report levels of word processing related to specific careers

Course Name: Digital Literacy **Grade Level(s):** 9 -12
Unit Name: Spreadsheets **Unit Length:** 2 weeks

International Society for Technology in Education – Student Standards:

Technology Operations and Concepts
(b) Select and use applications effectively and productively
(c) Troubleshoot systems and applications
(d) Transfer current knowledge to learning of new technologies

National Business Education Standards - Information Technology:

Input Technologies - Achievement Standard: Use various input technologies to enter and manipulate information appropriately
Productivity Software - Identify, evaluate, select, install, use, upgrade, and customize productivity software; diagnose and solve software problems
Information Technology and Business - Describe the information technology components of business functions and explain their interrelationships.

Pennsylvania State Standards – Business, Computer and Information Technologies:

(15.4.12.A) Apply the creative and productive use of emerging technologies for educational and personal success
(15.4.12.D) Evaluate emerging input technologies
(15.4.12.G) Create an advanced digital project using sophisticated design and appropriate software/applications
(15.4.12.M) Evaluate the impact of emerging technologies on various career paths and provide examples of industry certifications within the field

Unit Objectives:

- Describe the functionality of the common spreadsheet applications
- Identify the main components of the application interface
- Identify the menus, toolbars, tabs, groups, and commands
- Use toolbars to perform various tasks
- Enter data into a spreadsheet
- Perform basic formula and function tasks in a spreadsheet
- Format cells and sheets
- Insert charts and graphs into a spreadsheet
- List and database features in a spreadsheet
- Proofread and review spreadsheets
- Print and share spreadsheets

Activities:

Practice:

- Topic introduction, presentation, and discussion

Review:

- Concepts, terminology, and skills

Application:

- Hands-on practice, videos, simulations, and discussion
- Integrated Business Simulation Project – Spreadsheet portion

Participation:

- Individual, team, and whole-group

Resources:

- Lynda.com
- Atomic Learning
- YouTube
- TeacherTube
- Teacher developed materials
- Web resources
- Microsoft.com
- GCFLearnfree.org
- Free-Training-Tutorials.com
- Excel Function Dictionary
- Microsoft Excel
- Microsoft 365
- Google Drive
- Google Sheets

Assessments:

- Pre-Assessment
- Post-Assessment
- Teacher observation
- Daily classwork
- Integrated Business Simulation Project – Spreadsheet portion

Remediation:

- Assistance – Teacher/peer and Web-based tutorials
- Adjustment – Length/breadth
- Alternative – Assignments/projects

Enrichment:

- Create more advanced spreadsheets
- Apply more advanced spreadsheet skills: formulas, data analysis, pivot-tables
- Cross application integration: word processor
- Research and report levels of spreadsheets related to specific career

Course Name: Digital Literacy **Grade Levels:** 9 -12
Unit Name: Presentation **Unit Length:** 2 weeks

International Society for Technology in Education – Student Standards:

Technology Operations and Concepts
(b) Select and use applications effectively and productively
(c) Troubleshoot systems and applications
(d) Transfer current knowledge to learning of new technologies
Communication and Collaboration
(b) Communicate information and ideas effectively to multiple audiences using a variety of media and formats

National Business Education Standards - Information Technology:

Input Technologies - Achievement Standard: Use various input technologies to enter and manipulate information appropriately
Productivity Software - Identify, evaluate, select, install, use, upgrade, and customize productivity software; diagnose and solve software problems
Information Technology and Business - Describe the information technology components of business functions and explain their interrelationships

Pennsylvania State Standards – Business, Computer and Information Technologies:

(15.4.12.A) Apply the creative and productive use of emerging technologies for educational and personal success
(15.4.12.D) Evaluate emerging input technologies
(15.4.12.G) Create an advanced digital project using sophisticated design and appropriate software/applications
(15.4.12.M) Evaluate the impact of emerging technologies on various career paths and provide examples of industry certifications within the field

UNIT: PRESENTATION

Unit Objectives:

- Describe the functionality of common presentation applications
- Identify the main components of the application interface
- Identify the menus, toolbars, tabs, groups, and commands
- Use toolbars to perform various tasks
- Edit and format slides and templates
- Add content to screens
- Add graphics to screens
- Add video, audio, and animation to screens
- Proofread and review presentations
- Print and share presentations

Activities:

Practice:

- Topic introduction, presentation, and discussion

Review:

- Concepts, terminology, and skills

Application:

- Hands-on practice, videos, simulations, and discussion
- Integrated Business Simulation Project – Presentation portion

Participation:

- Individual, team, and whole-group

Resources:

- Lynda.com
- Atomic Learning
- YouTube
- TeacherTube
- Teacher developed materials
- Web resources
- Microsoft.com
- Microsoft PowerPoint
- Microsoft 365
- Google Drive
- Google Slides
- Prezi

Assessments:

- Pre-Assessment
- Post-Assessment
- Teacher observation
- Daily classwork
- Integrated Business Simulation Project – Presentation portion

Remediation:

- Assistance – Teacher/peer and Web-based tutorials
- Adjustment – Length/breadth
- Alternative – Assignments/projects

Enrichment:

- Create more advanced presentations
- Apply more advanced presentation skills: slide masters, Web formatting, video features, packaging presentation
- Cross application integration: word processor and spreadsheet
- Research and report levels of presentation software skills related to specific career

Course Name: Digital Literacy **Grade Level(s):** 9 -12
Unit Name: Multimedia **Unit Length:** 2 weeks

International Society for Technology in Education – Student Standards:

Technology Operations and Concepts
(a) Understand and use technology systems
(c) Troubleshoot systems and applications
(d) Transfer current knowledge to learning of new technologies
Creativity and Innovation
(b) Create original works as a means of personal or group expression
Communication and Collaboration
(a) Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media

National Business Education Standards - Information Technology:

Input Technologies - Achievement Standard: Use various input technologies to enter and manipulate information appropriately
Productivity Software - Identify, evaluate, select, install, use, upgrade, and customize productivity software; diagnose and solve software problems
Information Technology and Business - Describe the information technology components of business functions and explain their interrelationships.
Interactive Media - Use multimedia software to create media rich projects.

Pennsylvania State Standards – Business, Computer and Information Technologies:

(15.4.12.A) Apply the creative and productive use of emerging technologies for educational and personal success
(15.4.12.D) Evaluate emerging input technologies
(15.4.12.G) Create an advanced digital project using sophisticated design and appropriate software/applications
(15.4.12.K) Evaluate advanced multimedia work products and make recommendations based on the evaluation
(15.4.12.M) Evaluate the impact of emerging technologies on various career paths and provide examples of industry certifications within the field

UNIT: MULTIMEDIA

Unit Objectives:

- Describe the benefits of multimedia technology
- Explain how multimedia expands the features of technology devices
- Explain the concepts of recording, copying, and working with multiple formats of digital audio
- Identify the characteristics of digital audio
- Identify various formats of digital audio
- Explain how to edit, manage, and convert digital audio
- Explain the concepts of recording, copying, and working with multiple formats of digital video
- Identify the characteristics of digital video
- Identify various formats of digital video
- Explain how to edit, manage, and convert digital video
- Explain the concepts of recording, copying, and working with multiple formats of digital images
- Identify the characteristics of digital images
- Identify various formats of digital images
- Explain how to edit, manage, and convert digital images
- Identify the features of Web-based audio, video, and image formats

Activities:

Practice:

- Topic introduction, presentation, and discussion

Review:

- Concepts, terminology, and skills

Application:

- Hands-on practice, videos, simulations, and discussion
- Project: Student Video – Product promotion
- Project: Student Audio – Podcast
- Project: Student Images – Images for Web sites

Participation:

- Individual, team, and whole-group

Resources:

- Lynda.com
- Atomic Learning
- YouTube
- TeacherTube
- Teacher developed materials
- Web resources
- Audio software – e.g. Audacity
- Video editing software – e.g. Lightworks
- Image editing software – e.g. Gimp

Assessments:

- Pre-Assessment
- Post-Assessment
- Teacher observation
- Daily classwork
- Project: Student Video – Product promotion
- Project: Student Audio – Podcast
- Project: Student Images – Images for Web sites

Remediation:

- Assistance – Teacher/peer and Web-based tutorials
- Adjustment – Length/breadth
- Alternative – Assignments/projects

Enrichment:

- Apply more advanced multimedia skills: video editing, audio recording, image editing for television
- Cross application integration: audio, video, and images
- Research and report levels of multimedia experience related to specific careers

Course Name: Digital Literacy **Grade Level(s):** 9 -12
Unit Name: Internet **Unit Length:** 2 weeks

International Society for Technology in Education – Student Standards:

Technology Operations and Concepts
(a) Understand and use technology systems
(b) Select and use applications effectively and productively
(c) Troubleshoot systems and applications
(d) Transfer current knowledge to learning of new technologies
Research and Information Fluency
(b) Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
(c) Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
Communication and Collaboration
(a) Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media

National Business Education Standards - Information Technology:

Impact on Society - Assess the impact of information technology in a global society
Input Technologies - Achievement Standard: Use various input technologies to enter and manipulate information appropriately
Information Retrieval and Synthesis - Gather, evaluate, use, cite, and disseminate information from technology sources
Information Technology and Business - Describe the information technology components of business functions and explain their interrelationships

Pennsylvania State Standards – Business, Computer and Information Technologies:

(15.4.12.A) Apply the creative and productive use of emerging technologies for educational and personal success
(15.4.12.L) Find and use primary documentation; employ an accepted protocol for citation
(15.4.12.M) Evaluate the impact of emerging technologies on various career paths and provide examples of industry certifications within the field

Unit Objectives:

- Describe the uses of the Internet
- Identify the requirements for an Internet connection
- Explain bandwidth
- Describe the components of the Web
- Explain how Web addresses work
- Explain how to connect to the Internet
- Explore Web sites by using a browser
- Describe how to save favorite Web sites
- Search for reliable information on the Web
- Explain how e-mail works
- Describe how to create an email address
- Demonstrate how to write and send e-mail messages
- Describe methods to properly manage e-mail messages
- Identify correct e-mail etiquette

Activities:

Practice:

- Topic introduction, presentation, and discussion

Review:

- Concepts, terminology, and skills

Application:

- Hands-on practice, videos, simulations, and discussion
- Integrated Business Simulation Project – Creating an Internet Presence portion

Participation:

- Individual, team, and whole-group

Resources:

- Lynda.com
- Atomic Learning
- YouTube
- TeacherTube
- Teacher developed materials
- Web resources
- Google
- District supported email for students – e.g. Gmail

Assessments:

- Pre-Assessment
- Post-Assessment
- Teacher observation
- Daily classwork
- Integrated Business Simulation Project – Creating an Internet Presence portion

Remediation:

- Assistance – Teacher/peer and Web-based tutorials
- Adjustment – Length/breadth
- Alternative – Assignments/projects

Enrichment:

- Advanced searching skills
- Research Internet technologies related to networking
- Web site design project

Course Name: Digital Literacy **Grade Level(s):** 9 -12
Unit Name: Digital Citizenship **Unit Length:** 1 week

International Society for Technology in Education – Student Standards:

Digital Citizenship
(a) Advocate and practice safe, legal, and responsible use of information and technology
(b) Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity
(c) Demonstrate personal responsibility for lifelong learning
(d) Exhibit leadership for digital citizenship

National Business Education Standards - Information Technology:

Impact on Society - Assess the impact of information technology in a global society
Ethical and Legal Issues - Describe, analyze, develop, and follow policies for managing ethical and legal issues in organizations and in a technology-based society
Information Technology and Business - Describe the information technology components of business functions and explain their interrelationships

Pennsylvania State Standards – Business, Computer and Information Technologies:

(15.3.12.L) Evaluate characteristics of positive role models and their contribution to the development of a professional image
(15.3.12.M) Critique etiquette skills for building and maintaining a professional image
(15.3.12.N) Demonstrate appropriate work ethic in the workplace, community, and classroom
(15.3.12.T) Demonstrate application of digital citizenship in work and personal situations
(15.4.12.B) Evaluate the impact of social, legal, ethical, and safe behaviors on digital citizenship

American Association of School Librarians – Standards for the 21st Century Learner:

(1.3.1) Respect copyright/intellectual property rights of creators and producers
(1.3.3) Follow ethical and legal guidelines in gathering and using information
(1.3.5) Use information technology responsibly
(2.4.1) Determine how to act on information (accept, reject, modify)

UNIT: DIGITAL CITIZENSHIP

Unit Objectives:

- Explain intellectual property and copyright as they apply to computing
- Identify acts of copyright violation and the measures to prevent those acts
- Identify the legal concerns associated with information exchange
- Explain computer security and privacy
- Explain the security settings on your computer
- Identify the options for keeping your computer up-to-date
- Identify guidelines for protecting your computer
- Identify measures that you can use to protect your privacy
- Explain how online predators operate
- Identify guidelines to protect your family from online predators
- Understand the parameters of social media
- Explain how social media sites (Facebook) work
- Explain how blogs and wikis function
- Understand the parameters of sharing media

Activities:

Practice:

- Topic introduction, presentation, and discussion

Review:

- Concepts, terminology, and skills

Application:

- Hands-on practice, videos, simulations, and discussion
- Respect the Net – Personalized Netiquette Guidelines Project

Participation:

- Individual, team, and whole-group

Resources:

- Lynda.com
- Atomic Learning
- YouTube
- TeacherTube
- Teacher developed materials
- Web resources
- GCFLearnfree.org
- Cyber Smart
- NetSmartz
- iSafe
- OnGuard Online
- Digital Citizenship.net
- Common Sense Media
- BrainPop/BrainPopJR
- Teachinctrl.org

Assessments:

- Pre-Assessment
- Post-Assessment
- Teacher observation
- Daily classwork
- Respect the Net – Personalized Netiquette Guidelines Project

Remediation:

- Assistance – Teacher/peer and Web-based tutorials
- Adjustment – Length/breadth
- Alternative – Assignments/projects

Enrichment:

- Internet safety plan
- Steps to securing your computer
- What is Digital Literacy Wiki development

Course Name: Digital Literacy **Grade Level(s):** 9 -12
Unit Name: Research **Unit Length:** 2 weeks

International Society for Technology in Education – Student Standards:

Research and Information Fluency
(a) Plan strategies to guide inquiry
(b) Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
(c) Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
(d) Process data and report results

National Business Education Standards - Information Technology:

Information Retrieval and Synthesis - Gather, evaluate, use, cite, and disseminate information from technology sources

Pennsylvania State Standards – Business, Computer and Information Technologies:

(15.3.12.A) Evaluate work product and make recommendations based on content
(15.3.12.C) Create a research project based upon defined parameters
(15.3.12.E) Evaluate chosen print and electronic resources for advanced research
(15.3.12.F) Evaluate a speaker's reasoning and intent; ask questions to deepen understanding
(15.3.12.H) Evaluate presentations for language, proper techniques and media choices
(15.3.12.I) Synthesize information gathered from multiple sources (e.g., digital, print, face to face)
(15.3.12.K) Apply cultural mores to evaluate intent of verbal and non-verbal behaviors
(15.4.12.L) Find and use primary documentation; employ an accepted protocol for citation

American Association of School Librarians – Standards for the 21st Century Learner:

(1.1.1) Follow an inquiry-based process in seeking knowledge in curricular subjects, and make the real-world connection for using this process in own life

UNIT: RESEARCH

(1.1.2) Use prior and background knowledge as context for new learning
(1.1.3) Develop and refine a range of questions to frame the search for new understanding
(1.1.4) Find, evaluate, and select appropriate sources to answer questions
(1.1.5) Evaluate information found in selected sources on the basis of accuracy, validity, appropriateness for needs, importance, and social and cultural context
(1.1.6) Read, view, and listen for information presented in any format (e.g., textual, visual, media, digital) in order to make inferences and gather meaning
(1.1.7) Make sense of information gathered from diverse sources by identifying misconceptions, main and supporting ideas, conflicting information, and point of view or bias
(1.1.8) Demonstrate mastery of technology tools for accessing information and pursuing inquiry
(1.2.1) Display initiative and engagement by posing questions and investigating the answers beyond the collection of superficial facts
(1.2.2) Demonstrate confidence and self- direction by making independent choices in the selection of resources and information
(1.2.4) Maintain a critical stance by questioning the validity and accuracy of all information
(1.2.5) Demonstrate adaptability by changing the inquiry focus, questions, resources, or strategies when necessary to achieve success
(1.2.6) Display emotional resilience by persisting in information searching despite challenges
(1.2.7) Display persistence by continuing to pursue information to gain a broad perspective
(1.3.1) Respect copyright/intellectual property rights of creators and producers
(1.3.2) Seek divergent perspectives during information gathering and assessment
(1.3.3) Follow ethical and legal guidelines in gathering and using information
(1.3.5) Use information technology responsibly
(1.4.1) Monitor own information-seeking processes for effectiveness and progress, and adapt as necessary
(1.4.4) Monitor gathered information, and assess for gaps or weaknesses
(2.1.3) Use strategies to draw conclusions from information and apply knowledge to curricular areas, real- world situations, and further investigations
(2.1.4) Use technology and other information tools to analyze and organize information

(2.2.1) Demonstrate flexibility in the use of resources by adapting information strategies to each specific resource and by seeking additional resources when clear conclusions cannot be drawn
(2.2.2) Use both divergent and convergent thinking to formulate alternative conclusions and test them against the evidence
(2.2.3) Employ a critical stance in drawing conclusions by demonstrating that the pattern of evidence leads to a decision or conclusion
(2.4.1) Determine how to act on information (accept, reject, modify)

Unit Objectives:

- Understand how to identify information being sought
- Identify best tools to seek information being sought
- Access various types and sources of information related to information being sought
- Identify primary versus secondary research
- Consider ethical practices related to primary research
- Identify applicable sources through bibliographic citations
- Determine fact, opinion, or propaganda
- Identify objective, bias, or emotional language
- Demonstrate how to check for accuracy
- Determine credibility of source
- Draw conclusions from research

Activities:

Practice:

- Topic introduction, presentation, and discussion

Review:

- Concepts, terminology, and skills

Application:

- Hands-on practice, videos, simulations, and discussion
- Research Project

Participation:

- Individual, team, and whole-group

Resources:

- Web-based search engine access
- Library database access (EBSCO, GALE, PA Power Library, Ask Here PA)
- Newspaper access and retrieval
- Video databases (Discovery Education, BrainPop, Encyclopedia Britannica, Culture Grams)
- Teacher developed materials
- Web-based resources

Assessments:

- Pre-Assessment
- Post-Assessment
- Teacher observation
- Daily classwork
- Research Project

Remediation:

- Assistance – Teacher/peer and Web-based tutorials
- Adjustment – Length/breadth
- Alternative – Assignments/projects

Enrichment:

- Expanded research and higher level integration
- Digital video project to present findings
- Audio podcast outlining the research process
- Research presentation

Course Name: Digital Literacy **Grade Level(s):** 9 -12
Unit Name: Collaboration **Unit Length:** 2 weeks

International Society for Technology in Education – Student Standards:

Communication and collaboration
(a) Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media
(d) Contribute to project teams to produce original works or solve problems

Pennsylvania State Standards – Business, Computer and Information Technologies:

(15.3.12.O) Identify the diverse communication skills necessary within an organization
(15.3.12.P) Demonstrate leadership communication skills through delegating, negotiating, goal setting, and generating ideas
(15.3.12.Q) Analyze communication channels and their effectiveness within the corporate culture
(15.3.12.R) Evaluate best practices of communication based on culture, practice, and laws related to supervising others in a corporate entity
(15.3.12.W) Collaborate via electronic communication with peers, educators, and/or professionals to meet organizational goals
(15.3.12.X) Identify the diversity within a work group and the strategies for effective communication

American Association of School Librarians – Standards for the 21st Century Learner:

(1.1.9) Collaborate with others to broaden and deepen understanding
(1.3.4) Contribute to the exchange of ideas within the learning community
(2.1.5) Collaborate with others to exchange ideas, develop new understandings, make decisions, and solve problems
(3.1.2) Participate and collaborate as members of a social and intellectual network of learners
(3.2.1) Demonstrate leadership and confidence by presenting ideas to others in both formal and informal situations
(3.2.2) Show social responsibility by participating actively with others in learning situations and by contributing questions and ideas during group discussions
(3.2.3) Demonstrate teamwork by working productively with others

(3.3.3) Use knowledge and information skills and dispositions to engage in public conversation and debate around issues of common concern
(3.3.5) Contribute to the exchange of ideas within and beyond the learning community
(4.1.7) Use social networks and information tools to gather and share information
(4.3.1) Participate in the social exchange of ideas, both electronically and in person

Unit Objectives:

- Articulate thoughts and ideas effectively
- Understand the importance of listening effectively
- Communicate effectively in different environments and formats
- Demonstrate the ability to work effectively with diverse teams
- Research topics and cite evidence to probe and reflect on ideas in team environment
- Develop ideas and create products with involvement of all team members
- Assume shared responsibility for collaborative work
- Apply technology tools as agreed upon by team to communicate and manage project tasks
- Work in team environment to solve problems and manage conflicts
- Understand the importance of feedback from others and how it improves work

Activities:

Practice:

- Topic introduction, presentation, and discussion

Review:

- Concepts, terminology, and skills

Application:

- Hands-on practice, videos, simulations, and discussion
- Collaborative Team Project

Participation:

- Individual, team, and whole-group

Resources:

- Collaborative project wiki
- Collaborative project handouts
- Web resources
- Teacher developed materials

Assessments:

- Pre-Assessment
- Post-Assessment
- Teacher observation
- Daily classwork
- Collaborative Team Project

Remediation:

- Assistance – Teacher/peer and Web-based tutorials
- Adjustment – Length/breadth
- Alternative – Assignments/projects

Enrichment:

- Digital audio and video associated with project
- Develop project Web site

Course Name: Digital Literacy **Grade Level(s):** 9 -12
Unit Name: Independent Learning **Unit Length:** 2 weeks

International Society for Technology in Education – Student Standards:

Research and information fluency
(a) Plan strategies to guide inquiry
(d) Process data and report results
Critical thinking, problem solving, and decision making
(b) Plan and manage activities to develop a solution or complete a project
(c) Collect and analyze data to identify solutions and/or make informed decisions

Pennsylvania State Standards – Business, Computer and Information Technologies:

(15.3.12.E) Evaluate chosen print and electronic resources for advanced research
(15.3.12.F) Evaluate a speaker's reasoning and intent; ask questions to deepen understanding
(15.3.12.J) Apply strategies to overcome barriers to active listening
(15.3.12.T) Demonstrate application of digital citizenship in work and personal situations

American Association of School Librarians – Standards for the 21st Century Learner:

(1.1.2) Use prior and background knowledge as context for new learning
(1.1.6) Read, view, and listen for information presented in any format in order to make inferences and gather meaning
(1.2.2) Demonstrate confidence and self- direction by making independent choices in the selection of resources and information.
(1.4.1) Monitor own information-seeking processes for effectiveness and progress, and adapt as necessary
(1.4.4) Seek appropriate help when it is needed
(2.3.1) Connect understanding to the real world
(2.4.2) Reflect on systematic process, and assess for completeness of investigation

(2.4.3) Recognize new knowledge and understanding
(2.4.4) Develop directions for future investigations
(3.4.1) Assess the processes by which learning was achieved in order to revise strategies and learn more effectively in the future
(3.4.2) Asses the quality and effectiveness of the learning product

Unit Objectives:

- Demonstrate the desire and ability to learn on your own
- Demonstrate independent and critical thinking
- Build upon existing knowledge
- Transfer current skills to new concepts
- Apply problem solving and decision making based on independent learning
- Understand that learning is a process and that everyone learns differently
- Develop strategies to gather information and acquire knowledge independently
- Develop and reflect upon individual learning methods and strategies
- Apply basic technology skills such as: Internet searching and navigation; access resource databases; and productivity software
- Develop organization skills

- Apply research skills:
  - Evaluate data for fact and opinion
  - Identify objective, bias, or emotional language
  - Check for accuracy
  - Determine credibility
- Understand the value of thinking and acting autonomously
- Evaluate your own shortcomings as a learner
- Respond to change

Activities:

Practice:

- Topic introduction and presentation

Application:

- Hands-on practice and discussion
- Personal Independent Learning Plan

Participation:

- Individual and whole group

Resources:

- Web resources
- Teacher developed materials

Assessments:

- Teacher observation
- Daily project completion
- Personal Independent Learning Plan

Remediation:

- Assistance – Teacher/peer and Web-based tutorials
- Adjustment – length/breadth
- Alternative – assignments/projects

Enrichment:

- Digital audio and video associated with project
- Develop project Web site
- Integrated Independent Project

Appendix B: 21st Century Digital Literacy Online Questionnaire

Directions: Please type your responses in the area provided beneath each question. Please be as detailed as possible when typing your response.

1. Jones-Kavalier & Flannigan (2008) identify **digital literacy** as "a person's ability to perform tasks effectively in a digital environment" (p. 9). Please detail the essential components of what you would consider 21st century digital literacy?

2. Aqili & Nasiri (2010) identify **media literacy** as the way people analyze and interpret messages from mass media. Please detail the essential components of what you think should be covered in a curriculum integrating media literacy.

3. The American Association of School Librarians & The Association for Educational Communications and Technology (1998b) identified **information literacy** as "the ability to find and use information" (p. 1). Please detail the essential components of what you think should be covered in a curriculum integrating information literacy.

4. The Computer Literacy Initiative (2011) defines computer and technology literacy as "an understanding of the concepts, terminology, and operations that relate to general computer use" (para 1). Please detail the essential skills and components related to **computer and technology literacy** and how that fits into a 21st century digital literacy framework.

5. Define literacy in your own words. Contemplate what it means to be **literate** in the 21st century and discuss how digital literacies, (information, computer, and media), could foster a change in the way that literacy is defined.

6. Do you agree, if selected, to participate in follow-up focus group interviews related to the areas of **media literacy, information literacy, and computer technology literacy?**

   _____ Yes _____ No

   Please select one or more of the following literacies that you would be willing to be part of further discussion on.

   _____ Media Literacy
   _____ Information Literacy
   _____ Computer and Technology Literacy

Appendix C - Focus Group Discussion Questions

Computer technology Literacy Questions:

1. In our opening activity, you provided words that either described or you associated with the term *literacy*. Let's begin the major portion of the discussion by steering it towards *what it means to be literate in the 21st century*.

   Probes/subquestions:
   a. Why is it important to be literate? Please explain why.
   b. Does literate or literacy have a different meaning today…say, as opposed to in the 20th century? Please explain your answers or comments.
   c. What do you think it means to be literate in the 21st century? Please provide detail.
   d. Since you are in the business of education and the group is discussing literacy and literacy in the 21st century, how do you evaluate what it means to be literate in the 21st century? What would that evaluation look like?

2. Thank you for that meaningful discussion on literacy. Let's turn our attention to the terms *digital* and *digital literacy*.

   Probes/subquestions:
   a. What does *digital* mean to you? Please provide detail in your response.
   b. Does the term *digital* change what it means to be literate? Please explain your answers.
   c. Is *digital literacy* different from the classic definition of *literacy*? What makes it different?
   d. What skills or functions make up being digitally literate? Please explain.
   e. How does digital or being digitally literate affect your expectations of students?

3. The Computer Literacy Initiative defines computer and technology literacy as "an understanding of the concepts, terminology, and operations that relate to general computer use."

   Probes/subquestions:
   a. As an educator, is this definition adequate? Please explain your thoughts.
   b. Does "general computer use" reflect all of the other technological stuff? Please explain.
   c. How does computer and technology literacy affect you in your everyday life? How often do you, as both an educator and/or a member of society, apply information literacy skills? Provide examples if you can.

   d. How has computer technology evolved and how do you keep pace with it? Please explain.
   e. Do educators adequately prepare today's student in information literacy skills?
   f. Do you think the definition should differ from the Computer Literacy Initiative's? What should it be?

4. What are the essential components of *computer and technology literacy* that you deem necessary as being covered in a curriculum that targets 21st century literacy?

   Probes/subquestions:
   a. What aspects of computer technology literacy do you apply or use in your classroom? Please identify.
   b. Do you use or expect to utilize technologies other than computers in your classroom? Please expand upon your input.
   c. Do you expect your students to come to your classroom with specific skillsets related to computer or technology literacy? Please identity and explain. What are your expectations? What do they lack in? What do they excel in? Are your expectations out of sync with what their levels really are?
   d. Where should concepts related to computer technology literacy best taught? Please explain.
   e. So how important is it that students have certain levels of computer technology literacy? Why? What purpose do higher computer and technology skills serve?
   f. How do higher levels of computer and technology literacy benefit students? Benefit your classroom?

5. In closing, what are your final thoughts regarding computer technology literacy, digital literacy, and/or literacy?

Information Literacy Questions:

1. In our opening activity, you provided words that either described or you associated with the term *literacy*. Let's begin the major portion of the discussion by steering it towards *what it means to be literate in the 21st century*.

   Probes/subquestions:
   a. Why is it important to be literate? Please explain why.
   b. Does literate or literacy have a different meaning today…say, as opposed to in the 20th century? Please explain your answers or comments.
   c. What do you think it means to be literate in the 21st century? Please provide detail.

   d. Since you are in the business of education and the group is discussing literacy and literacy in the 21st century, how do you evaluate what it means to be literate in the 21st century? What would that evaluation look like?

2. Thank you for that meaningful discussion on literacy. Let's turn our attention to the terms *digital* and *digital literacy*.

   Probes/subquestions:
   a. What does *digital* mean to you? Please provide detail in your response.
   b. Does the term *digital* change what it means to be literate? Please explain your answers.
   c. Is *digital literacy* different from the classic definition of *literacy*? What makes it different?
   d. What skills or functions make up being digitally literate? Please explain.
   e. How does digital or being digitally literate affect your expectations of students?

3. The American Association of School Librarians & The Association for Educational Communications and Technology identified information literacy as "the ability to find and use information."

   Probes/subquestions:
   a. Is this definition adequate to you as an educator? Please explain.
   b. What should the definition of information literacy be?
   c. Is information literacy just a library thing or is it much more than that? Please explain.
   d. How does information literacy affect you in your everyday life? How often do you, as both an educator and a member of society, apply information literacy skills? Provide examples if you can.
   e. Do educators adequately prepare today's student in information literacy skills?

4. What are the essential components of *information literacy* that you deem necessary as being covered in a curriculum that targets 21st century literacy?

   Probes/subquestions:
   a. What aspects of information literacy do you apply or use in your classroom? Please identify.
   b. Do you expect your students to come your classroom with specific skillsets related to information literacy? Please identity and explain.
   c. Where are the concepts of information literacy best taught? Please explain.

   d. So how important is it that students have specific levels of information literacy?
   e. How do higher levels of information literacy benefit students? Benefit your classroom?

5. In closing, what are your final thoughts regarding information literacy, digital literacy, and/or literacy?

Media Literacy Questions:

1. In our opening activity, you provided words that either described or you associated with the term *literacy*. Let's begin the major portion of the discussion by steering it towards *what it means to be literate in the 21st century*.

   Probes/subquestions:
   a. Why is it important to be literate? Please explain why.
   b. Does literate or literacy have a different meaning today…say, as opposed to in the 20th century? Please explain your answers or comments.
   c. What do you think it means to be literate in the 21st century? Please provide detail.
   d. Since you are in the business of education and the group is discussing literacy and literacy in the 21st century, how do you evaluate what it means to be literate in the 21st century? What would that evaluation look like?

2. Thank you for that meaningful discussion on literacy. Let's turn our attention to the terms *digital* and *digital literacy*.

   Probes/subquestions:
   a. What does *digital* mean to you? Please provide detail in your response.
   b. Does the term *digital* change what it means to be literate? Please explain your answers.
   c. Is *digital literacy* different from the classic definition of *literacy*? What makes it different?
   d. What skills or functions make up being digitally literate? Please explain.
   e. How does digital or being digitally literate affect your expectations of students?

3. Aqili & Nasari (2010) identify *media literacy* as the way people analyze and interpret messages from the mass media.

   Probes/subquestions:
   a. As an educator, is this definition adequate? Please explain your thoughts and ideas.

b. How does media literacy affect you in your everyday life? Please explain or tell the group how. How often do you consume media? Where do you consume it (e.g. TV, radio, Internet, etc.)? How often do you, as both an educator and a member of society, apply media literacy skills? Provide examples if you can.
c. Does the term "mass media" apply to today? What are the traditional mass media outlets? What are the non-mass media outlets that come to mind when thinking about media literacy? How do these other, non-mass media formats apply to today's society? Do children view media? Where are they viewing media?
d. Do educators adequately prepare today's student in media literacy skills? Why? Why not? Please provide detail with your answers.
e. What should the definition of media literacy be? Does the Aquili and Nasari (2010) definition even apply to today? Is it lacking? If so, what is it lacking?

4. What are the essential components of *information literacy* that you deem necessary as being covered in a curriculum that targets 21st century literacy?

   Probes/subquestions:
   a. What aspects of media literacy do you apply or use in your classroom? Please identify and explain.
   b. Do you expect your students to come your classroom with specific skillsets related to information literacy? Please identity and explain. What are your expectations? What do they lack? What do they excel in? Are your expectations out of sync or in sync with what their levels really are?
   c. Where should concepts of media literacy best taught? Please identify and explain.
   d. So how important is it that students have certain levels of media literacy? Why? What purpose do higher levels of media literacy serve?
   e. How do higher levels of media literacy benefit students? Benefit your classroom?

5. In closing, what are your final thoughts regarding information literacy, digital literacy, and/or literacy?

Appendix D: Data Color Coding Key

Data from the online questionnaire and the three focus group discussions were color coded to simplify the identification of themes in the data. The following data color codes were utilized to identify themes related to literacy, digital literacy, media literacy, information literacy, and computer technology literacy.

- Purple: literacy
- Yellow: digital literacy
- Blue: media literacy
- Green: information literacy
- Red: computer and technology literacy

Appendix E: Coding

DOMAIN 1 YELLOW Digital	DOMAIN 2 BLUE Media	DOMAIN 3 GREEN Information	DOMAIN 4 RED Computer	DOMAIN 5 PURPLE Literacy
multi-disciplinary	messages	ways to find information	Typing	use information
smart phones	mass media	reliable	searching	books
smart boards	twitter	scholarly	programs that address essential jobs	computers
tablets	Facebook	radio	types of computers	Internet
spreadsheets	Instagram	documentaries	uses of computers and devices	visual
video	oral	podcasts	how devices share information	smartphones
email	identify themes, techniques, literary devices	search engines	viruses	apps tablets
presentations	analyze	literacy	spyware	math
computer science	media types	Internet	install software	reading
hardware	compare sources	cite appropriately	install hardware	comprehension
software	social networking	sources	remove programs	understanding
research	valid	organizing	basic programming	electronic communications
organize information	relevant	presentations	hardware	take photos
communicate	objective	spreadsheets	security	manipulate data
download	where it comes from	business vs. personal	password	function and knowledge
ethically	fact vs opinion	interpret	business etiquette	change
apps	supporting arguments	software	letter constructions	global community
wikis	validity of sources	apps	files and organization of files	use appropriate media
blogs	appropriate	communication	document compression	communicate
transfer	ethical and moral aspect of media	databases	word	digital citizenship
Internet	purpose	format and write a paper	excel	information sharing
enhance teaching and learning	compare/contrast	reference sites	smartphone	writing
word processing	manipulate information	research guidelines	notebook	identify
social media	specific side or position	advanced searchers	emailing	analyze
safety and security	how to use, where to use it, and when it's too much	steps to research	uploading	define
responsibility	edit or manipulate	formulate ideas	downloading	interpret
adapt to new	understand and evaluate	creative thinking	finding tutorials	numerical information
document sharing, saving, and storage	create effective communication	problem-solving	help button	language
text messaging	video	critical thinking	internet	social awareness
appropriate and correct	music	systems thinking	software	financial awareness
Google	internet	problem identification, formulation, and solution	transfer skills from software to software	team builder
Facebook	email	creativity	emphasize core subjects	adaptable
Twitter	billboards	privacy	basic technology skills	good choices
job	critical thinking	acceptable use	information literacy skills	real life literacy
staying on task	bias	what to do with the information once you find it	media literacy skills	self-sufficient
understanding	propaganda	critique	PowerPoint	critical thinking
fluency	accuracy	evaluate	adapt to new technologies	draw conclusions
digital media	entertainment	reorganize the information	tabletss	lifelong learning
engage	copyright	independent lifelong learners	search engines	personal growth
evaluate	reliable	learning how one learns	copy and paste pictures or charts	self-assessment
casually vs formal	navigate	effective	using and sharing multimedia files	
analyze	plagiarism	efficient	internet browsing	
gaming	political	online information and offline information	apps	
reliability	skeptic	copyright	troubleshooting	
tools	workspaces	plagiarism	manipulate the web browser	
pictures	browser search results	navigation	plug-ins	
mindset	RSS feeds	library card	using a variety of platforms	
navigation	competition for ratings	wiki	understanding the fluid nature of technology	
digital books	24 hour news media	sorting	basic computer programming	
multiple sources of technology	hyperbole	cross references	accuracy/reliability of information	
interpret	satire	summarizing	spell check	
differentiate	serious	authenticity	font sizes	
numbers	sources goal or intention	high quality sources	page layouts	
information based	persuasion	bias	toolbars	

flow of information
access
receive
active and responsible participant
etiquette
21st century
self-sufficient
instant
global
rapid
connected
YouTube
choices
problem solving
instant
ever changing
efficient
faster
multitask
focus
privacy
sharing
collaboration
contribute to learning communities
exchange ideas
intellectual property/copyright
social responsibility
real-world context

cross-checking
virus
spyware
malware
tablets
charts
graphs
slideshows
credentials
multiple sources
understand why messages are written
blogging
literacy
differentiate
viewpoint
credibility
online
two-way media
opinion
data
Google
validate
digital generation
think critically
draw conclusions
divergent/convergent thinking
validity of information

validity
tablets
smart phones
computers
digital devices
storing information
transferring information
terminology
learning styles
literacy avenues

save and save as
transferring digital information
multimedia
technology for occupation
networks
problem solving
social media
usernames and passwords
shift vs caps lock
applying for jobs online
flash drives
vocabulary
Read/view/listen multiple formats
information processing
Best selection of tool
Productivity (personal and professional)
Present information

Appendix F: Relationships Within Domains

DOMAIN 1 YELLOW Digital	DOMAIN 2 BLUE Media	DOMAIN 3 GREEN Information	DOMAIN 4 RED Computer	DOMAIN 5 PURPLE Literacy
Category 1:	**Category 1:**	**Category 1:**	**Category 1:**	**Category 1:**
spreadsheets	mass media	ways to find information	Typing	books
video	twitter	radio	searching	computers
email	Facebook	documentaries	types of computers	Internet
presentations	Instagram	podcasts	how devices share information	smartphones
software	oral	search engines	viruses	apps tablets
apps	media types	Internet	spyware	electronic communications
wikis	social networking	sources	install software	take photos
blogs	video	presentations	install hardware	
Internet	music	spreadsheets	remove programs	
word processing	Internet	business vs. personal	basic programming	**Category 2:**
document sharing, saving, and storage	email	software	hardware	use information
download	billboards	apps	security	visual
Google	entertainment	databases	password	math
Facebook	navigate	format and write a paper	letter constructions	reading
Twitter	workspaces	reference sites	files and organization of files	comprehension
digital media	browser search results	advanced searches	document compression	understanding
gaming	RSS feeds	online information and offline information	word	manipulate data
pictures	24 hour news media	navigation	excel	function and knowledge
navigation	virus	library card	smartphone	change
digital books	spyware	wiki	notebook	global community
numbers	malware	cross references	emailing	communicate
YouTube	tablets	high quality sources	uploading	digital citizenship
smart phones	charts	tablets	downloading	information sharing
smart boards	graphs	smart phones	finding tutorials	writing
tablets	slideshows	computers	help button	identify
computer science	blogging	digital devices	Internet	analyze
hardware	online	storing information	software	define
text messaging	two-way media	terminology	basic technology skills	interpret
tools	data		information literacy skills	numerical information
multiple sources of technology	Google		media literacy skills	language
	digital generation	**Category 2:**	PowerPoint	social awareness
Category 2:		reliable	tablets	financial awareness
multi-disciplinary	**Category 2:**	scholarly	search engines	team builder
research	messages	literacy	copy and paste pictures or charts	adaptable
organize information	identify themes, techniques, literary devices	interpret	using and sharing multimedia files	good choices
communicate	analyze	research guidelines	internet browsing	real life literacy
ethically	compare sources	communication	apps	self-sufficient
transfer	valid	formulate ideas	troubleshooting	critical thinking
enhance teaching and learning	relevant	creative thinking	manipulate the web browser	draw conclusions
social media	objective	problem-solving	plug-ins	lifelong learning
safety and security	where it comes from	critical thinking	using a variety of platforms	personal growth
responsibility	fact vs opinion	systems thinking	basic computer programming	self-assessment
adapt to new	supporting arguments	problem identification, formulation, and solution	spell check	use appropriate media
appropriate and correct	validity of sources	creativity	font sizes	
job	appropriate	privacy	page layouts	
staying on task	ethical and moral aspect of media	what to do with the information once you find it	toolbars	
understanding	purpose	critique	save and save as	
fluency	compare/contrast	evaluate	transferring digital information	
engage	manipulate information	independent lifelong learners	multimedia	
evaluate	specific side or position	learning how one learns	technology for occupation	
casually vs formal	how to use, where to use it, and when it's too much	effective	networks	
analyze	edit or manipulate	efficient	social media	
		authenticity	usernames and passwords	

reliability
mindset
interpret
differentiate
access
receive
active and responsible participant
etiquette
21st century
self-sufficient
instant
global
rapid
connected
choices
problem solving
efficient
faster
multitask
focus
privacy
sharing
collaboration
contribute to learning communities
exchange ideas
intellectual property/copyright
social responsibility
real-world context
instant
ever changing
information based
flow of information

understand and evaluate
create effective communication
critical thinking
bias
propaganda
accuracy
reliable
political
skeptic
competition for ratings
hyperbole
satire
serious
sources goal or intention
persuasion
cross-checking
credentials
multiple sources
understand why messages are written
literacy
differentiate
viewpoint
credibility
opinion
validate
think critically
draw conclusions
divergent/convergent thinking
validity of information
copyright
plagiarism

bias
validity
transferring information
learning styles
literacy avenues
cite appropriately
organizing
acceptable use
copyright
plagiarism
sorting
summarizing
steps to research
reorganize the information

shift vs caps lock
applying for jobs online
flash drives
vocabulary
Read/view/listen multiple formats
Information processing

Category 2:
programs that address essential jobs
uses of computers and devices
business etiquette
transfer skills from software to software
emphasize core subjects
adapt to new technologies
understanding the fluid nature of technology
accuracy/reliability of information
problem solving
Best selection of tool
Productivity (personal and professional)
Present information

Appendix G: Relationships Across Domains

DOMAIN 1 YELLOW Digital	DOMAIN 2 BLUE Media	DOMAIN 3 GREEN Information	DOMAIN 4 RED Computer	DOMAIN 5 PURPLE Literacy
Category 1:	**Category 1:**	**Category 1:**	**Category 1:**	**Category 1:**
spreadsheets	mass media	ways to find information	Typing	books
video	twitter	radio	searching	computers
email	Facebook	documentaries	types of computers	Internet
presentations	Instagram	podcasts	how devices share information	smartphones
software	oral	search engines	viruses	apps tablets
apps	media types	Internet	spyware	electronic communications
wikis	social networking	sources	install software	take photos
blogs	video	presentations	install hardware	
Internet	music	spreadsheets	remove programs	
word processing	Internet	business vs. personal	basic programming	
document sharing, saving, and storage	email	software	hardware	
download	billboards	apps	security	
Google	entertainment	databases	password	
Facebook	navigate	format and write a paper	letter constructions	
Twitter	workspaces	reference sites	files and organization of files	
digital media	browser search results	advanced searches	document compression	
gaming	RSS feeds	online information and offline information	word	
pictures	24 hour news media	navigation	excel	
navigation	virus	library card	smartphone	
digital books	spyware	wiki	notebook	
numbers	malware	cross references	emailing	
YouTube	tablets	high quality sources	uploading	
smart phones	charts	tablets	downloading	
smart boards	graphs	smart phones	finding tutorials	
tablets	slideshows	computers	help button	
computer science	blogging	digital devices	Internet	
hardware	online	storing information	software	
text messaging	two-way media	terminology	basic technology skills	
tools	data		information literacy skills	
multiple sources of technology	Google		media literacy skills	
	digital generation		PowerPoint	
			tablets	
			search engines	
			copy and paste pictures or charts	
			using and sharing multimedia files	
			internet browsing	
			apps	
			troubleshooting	
			manipulate the web browser	
			plug-ins	
			using a variety of platforms	
			basic computer programming	
			spell check	
			font sizes	
			page layouts	
			toolbars	
			save and save as	
			transferring digital information	
			multimedia	
			technology for occupation	
			networks	
			social media	
			usernames and passwords	

shift vs caps lock
applying for jobs online
flash drives
vocabulary
Read/view/listen multiple formats
Information processing

Category 2:	Category 2:	Category 2:	Category 2:	Category 2:
multi-disciplinary	messages	reliable	programs that address essential jobs	use information
research	identify themes, techniques, literary devices	scholarly	uses of computers and devices	visual
organize information	analyze	literacy	business etiquette	math
communicate	compare sources	interpret	transfer skills from software to software	reading
ethically	valid	research guidelines	emphasize core subjects	comprehension
transfer	relevant	communication	adapt to new technologies	understanding
enhance teaching and learning	objective	formulate ideas	understanding the fluid nature of technology	manipulate data
social media	where it comes from	creative thinking	accuracy/reliability of information	function and knowledge
safety and security	fact vs opinion	problem-solving	problem solving	change
responsibility	supporting arguments	critical thinking	Best selection of tool	global community
adapt to new	validity of sources	systems thinking	Productivity (personal and professional)	communicate
appropriate and correct	appropriate	problem identification, formulation, and solution	Present information	digital citizenship
job	ethical and moral aspect of media	creativity		information sharing
staying on task	purpose	privacy		writing
understanding	compare/contrast	what to do with the information once you find it		identify
fluency	manipulate information	critique		analyze
engage	specific side or position	evaluate		define
evaluate	how to use, where to use it, and when it's too much	independent lifelong learners		interpret
casually vs formal	edit or manipulate	learning how one learns		numerical information
analyze	understand and evaluate	effective		language
reliability	create effective communication	efficient		social awareness
mindset	critical thinking	authenticity		financial awareness
interpret	bias	bias		team builder
differentiate	propaganda	validity		adaptable
access	accuracy	transferring information		good choices
receive	reliable	learning styles		real life literacy
active and responsible participant	political	literacy avenues		self-sufficient
etiquette	skeptic	cite appropriately		critical thinking
21st century	competition for ratings	organizing		draw conclusions
self-sufficient	hyperbole	acceptable use		lifelong learning
instant	satire	copyright		personal growth
global	serious	plagiarism		self-assessment
rapid	sources goal or intention	sorting		use appropriate media
connected	persuasion	summarizing		
choices	cross-checking	steps to research		
problem solving	credentials	reorganize the information		
efficient	multiple sources			
faster	understand why messages are written			
multitask	literacy			
focus	differentiate			
privacy	viewpoint			
sharing	credibility			
collaboration	opinion			
contribute to learning communities	validate			
exchange ideas	think critically			
intellectual property/copyright	draw conclusions			
social responsibility	divergent/convergent thinking			
real-world context	validity of information			
instant	copyright			
ever changing	plagiarism			
information based				
flow of information				

Appendix H: A 21st Century Digital Curriculum Soft Skills

DOMAIN 1 YELLOW Digital	DOMAIN 2 BLUE Media	DOMAIN 3 GREEN Information	DOMAIN 4 RED Computer	DOMAIN 5 PURPLE Literacy
Category 2:	**Category 2:**	**Category 2:**	**Category 2:**	**Category 2:**
21st century				
real-world context				
mindset				
global				global community
ever changing				
information based				use information
				information sharing
multi-disciplinary				
social media				
		independent lifelong learners		lifelong learning
				self-assessment
				function and knowledge
		formulate ideas		
		creative thinking		
		systems thinking		
		creativity		
			Best selection of tool	
			Productivity (personal and professional)	personal growth
			Present information	
				financial awareness
job			programs that address essential jobs	
	political			
	opinion			
	viewpoint			
	competition for ratings			
	specific side or position			
	identify themes, techniques, literary devices		identify	
	where it comes from			
	messages			
	purpose			
	propaganda			
	bias	bias		
	fact vs opinion			
	supporting arguments			
	manipulate information			manipulate data
	edit or manipulate			numerical information
	hyperbole			
	satire			
	serious			
	sources goal or intention			

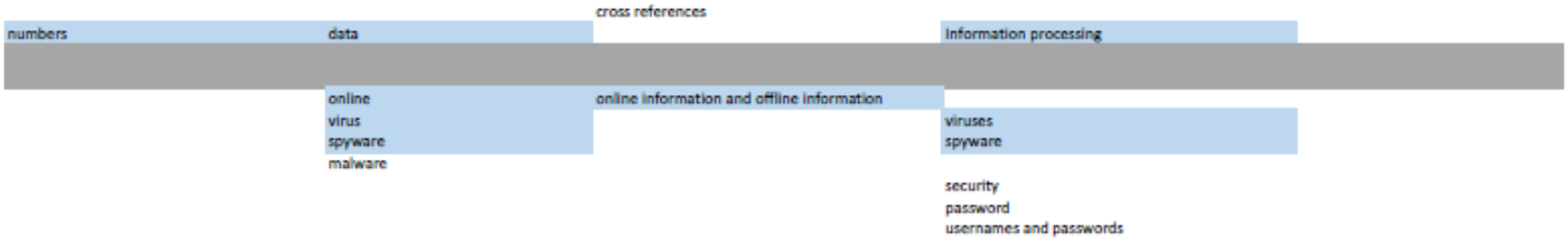
	persuasion cross-checking credentials multiple sources understand why messages are written			
				digital citizenship
	relevant			
appropriate and correct	appropriate			
intellectual property/copyright	copyright	copyright		
	plagiarism	plagiarism		
		cite appropriately		
		scholarly		
		authenticity		
ethically	ethical and moral aspect of media			use appropriate media
etiquette			business etiquette	
choices	how to use, where to use it, and when it's too	what to do with the information once you find it		good choices
social responsibility				social awareness
safety and security				
responsibility				
active and responsible participant				
privacy		privacy		
		acceptable use	uses of computers and devices	
	accuracy		accuracy/reliability of information	
	validity of information	validity		
	compare/contrast			
	compare sources			
	objective			
evaluate		evaluate		
analyze	analyze			analyze
interpret				interpret
problem solving		problem solving	problem solving	
		problem identification, formulation, and solution		
	critical thinking	critical thinking		critical thinking
	think critically			
reliability	reliable	reliable		
	credibility			
	skeptic			
	draw conclusions			draw conclusions
	divergent/convergent thinking			
research		research guidelines		
		steps to research		
transfer		transferring information	transfer skills from software to software	
casually vs formal				
understanding	understand and evaluate			understanding
				comprehension
		critique		
		interpret		

		sorting		define
		summarizing		
receive				
access				
instant				
rapid				
connected				
faster				
adapt to new			adapt to new technologies	adaptable
engage				
communicate	create effective communication	communication		communicate
		effective		
efficient		efficient		
focus				
self-sufficient				self-sufficient
differentiate	differentiate			
staying on task				
organize information		organizing		
		reorganize the information		
fluency	literacy	literacy		real life literacy
		literacy avenues		
sharing				
collaboration				
contribute to learning communities				
exchange ideas				
multitask				
flow of information				
			understanding the fluid nature of technology	
				team builder
		learning how one learns		
		learning styles		
enhance teaching and learning				
			emphasize core subjects	
				visual
				math
				reading
				writing
				language

Appendix I: A 21st Century Digital Curriculum Hard Skills

DOMAIN 1 YELLOW Digital Category 1:	DOMAIN 2 BLUE Media Category 1:	DOMAIN 3 GREEN Information Category 1:	DOMAIN 4 RED Computer Category 1:	DOMAIN 5 PURPLE Literacy Category 1:
spreadsheets	charts graphs	spreadsheets	excel	
software word processing		software	software word	
apps		apps	apps	apps
presentations	slideshows	presentations	PowerPoint	
text messaging			Typing	electronic communications
			spell check font sizes page layouts toolbars save and save as shift vs caps lock help button	
		databases		
		format and write a paper business vs. personal	letter constructions technology for occupation applying for jobs online	
		podcasts		
wikis		wiki		
blogs	blogging			
video	video	documentaries		
digital media	media types	radio	multimedia	
pictures			copy and paste pictures or charts	take photos
digital books				books
	music			
	oral			
	billboards			
	two-way media			
	mass media		media literacy skills	
Google	Google			
Facebook	Facebook			
Twitter	Twitter			
YouTube				
	Instagram			
	social networking		social media	
	entertainment			

	RSS feeds			
gaming				
	digital generation			
			using a variety of platforms	
		computers	types of computers	computers
			notebook	
		digital devices	how devices share information	
smart phones		smart phones	smartphone	smartphones
smart boards				
tablets	tablets	tablets	tablets	tablets
hardware			hardware	
tools				
			install software	
			install hardware	
			remove programs	
			files and organization of files	
			document compression	
			flash drives	
			plug-ins	
			finding tutorials	
			networks	
			troubleshooting	
			basic technology skills	
		terminology	vocabulary	
multiple sources of technology				
download			downloading	
			uploading	
Internet	Internet	Internet	internet browsing	Internet
			Internet	
document sharing, saving, and storage	workspaces	storing information	using and sharing multimedia files	
			transferring digital information	
			Read/view/listen multiple formats	
navigation	navigate	navigation	manipulate the web browser	
email	email		emailing	
	24 hour news media			
computer science			basic computer programming	
			basic programming	
		ways to find information	information literacy skills	
		library card		
	browser search results	search engines	search engines	
		advanced searches	searching	
		high quality sources		
		sources		
		reference sites		


cross references
numbers
data
Information processing
online
virus
spyware
malware
online information and offline information
viruses
spyware
security
password
usernames and passwords

Appendix J: Data Analysis Outline

I) A 21st century digital literacy framework should build upon hard technology skills
- A) Software
  - 1) Application software
    - a) spreadsheet software
    - b) word processing software
    - c) presentation software
    - d) database software
  - 2) Apps (software) for mobile devices
  - 3) Electronic communication software
- B) Multimedia
  - 1) Digital media
    - a) video creating and editing
    - b) picture taking and editing
    - c) music and sound editing
  - 2) Web 2.0
    - a) wiki development and use
    - b) blog as a form of writing and journaling
    - c) podcasting as a form of expression
  - 3) Media literacy
    - a) mass media
    - b) documentaries
    - c) radio
    - d) two-way media
    - e) billboards and written media
- C) Social media
  - 1) Google apps
  - 2) Facebook
  - 3) Twitter
  - 4) YouTube
  - 5) Instagram
- D) Hardware and support
  - 1) digital devices
    - a) computers and notebooks
    - b) smart phones
    - c) tablets
  - 2) Support
    - a) terminology and vocabulary
    - b) installing
      - (1) hardware
      - (2) software

(3) plug-ins
c) troubleshooting
d) file structure and organization
3) Computer and security
a) protection against viruses, spyware, and malware
b) computer security
4) Computer Programming
a) computer science essentials
b) basic programming
E) Internet
1) navigation
2) Web browser
3) downloading and uploading
a) document sharing
b) cloud storage and collaboration
c) sharing multimedia
d) collaborative workspaces
4) search engines
a) search results analysis
b) advanced searches

II. A 21st century digital literacy framework should include soft skills
A). Independent learning
1) real-world global understanding
2) creative and systems thinking
3) lifelong learning
4) information based and sharing
5) self-assessment
6) apply appropriate technology tools
7) adapt to new technology
8) be self-sufficient
9) be organized
10) be fluent in real-world matters
11) stay connected and be engaged

B. Influence and impact of media
1) identify factors that influence
a) political
b) bias
c) propaganda
d) source of information
2) fact and opinion
a) cross-checking
b) data to make valid decisions

c) credentials

C. Digital citizenship
1) intellectual property rights
a) copyright
b) scholarly use
c) plagiarism
d) citation and reference
2) safety and security
a) privacy
b) good choices
3) acceptable use
a) social responsibility
b) ethical
c) responsibility

D. Research
1) search and access information
2) evaluate accuracy of information
3) analyze credibility of sources
4) steps and guidelines for proper research
5) think critically about information
6) draw conclusions

E. Collaboration
1) communicate effectively
2) collaborate with others
3) contribute to team environment
4) exchange ideas

Appendix K: Letter of Cooperation

October 3, 2013

Institutional Review Board

Walden University

Minneapolis, MN 55401

Dear IRB Members,

After reviewing the proposed study, "Perceptions of a 21st Century Digital Literacy Framework" presented by Mr. Stephen S. Spengler, a doctoral student at Walden University, permission has been granted for the study to be conducted with the Pocono Mountain School District.

This project study's intent is to explore teacher perceptions of a 21st century digital literacy framework, including the components they believe to be incorporated within the framework. A qualitative design was selected for this study and data will be collected using an online questionnaire delivered to instructional faculty at the research site (East and West High School), focus group (targeting media literacy, computer/technology literacy, and information literacy), and document study (curricula, existing frameworks, etc). The data collected will be analyzed through an inductive manner with attention to the research question, the corresponding sub-questions, and the relationships discovered. The overall goal of this study is to utilize participants' perceptions of a 21st century digital literacy framework to assist educators in meeting the demands of 21st century learner's literacy needs.

I agree to provide Mr. Spengler with access to the educators of the Pocono Mountain School District's East and West High School for the purpose of gathering data through an online

questionnaire, focus groups, and document study. Mr. Spengler will contact the research site's administrators during the first half of the 2013-2014 school year to set up the initial instructional staff meeting, establish the online questionnaire, and begin focus group development. Mr. Spengler will provide the Pocono Mountain School District Administrative offices with copies of all Walden University IRB-approved documents prior to data collection. It is understood that all data collected will be completely anonymous and participants will not be asked to provide any personal information that would identify them in the questionnaire or the focus groups. Participants will be given the opportunity, even after they agree to participate, to opt out with no questions asked. All data will be coded to identify themes, patterns or relationships. Steps will be taken to ensure the security and anonymity of the data through an encrypted portable hard drive and all data will be stored off-site in the researcher's home. Upon conclusion of the study, a copy of the final write-up will be provided to the district.

If Walden University's IRB has any concerns about the permission being granted by this letter, please contact Dr. Elizabeth Robison at (570) 839-7121, ext. 10111.

Sincerely,

(Signature Dr. Elizabeth M. Robison Signature Meg Dilger)
Printed Name Dr. Elizabeth M. Robison Printed Name Meg Dilger)
(Title Superintendent Title President)
(Date Oct. 3, 2013 Date 10-3-2013)