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Walden University
2015

Abstract

Diffusion of E-textbooks in K-12 Education: A Delphi Study

by

Sheila Cartwright

MS, University of West Georgia, 2002

BS, New York University, 1975

AAS, Borough of Manhattan Community College, 1973

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Education

Walden University

February 2015

Abstract

This basic interpretive qualitative study was conducted to discover why e-textbooks had not been adopted extensively in K-12 education as a replacement for printed textbooks. The objective was to determine the barriers and challenges being confronted by state educational technology directors when introducing this innovative technology in a formal learning environment that could greatly impact teaching, learning, and creative analysis. This research was based on diffusion of innovation theory using a Delphi method of inquiry. The Delphi panel consisted of 12 experts who had knowledge of digital text technologies and were the most influential when making purchasing decisions when introducing new technologies into a K-12 instructional setting. The Delphi questionnaire consisted of 2 initial rounds and the final consensus round (for a total of 3 rounds) that determined the panel's reasoning for the late adoption of e-textbooks in K-12 classrooms. The results of this study clearly identified cost and equipment management in addition to the lack of supportable funding to sustain e-textbook technologies as the major reasons hindering their adoption. This study promotes positive social change by providing decision-makers an opportunity to reflect on the challenges impacting their adoption of e-textbooks in K-12 education so they can work towards a solution. This can be accomplished by appointing visionary leaders on the state and local levels who can develop a strategic plan to initiate the transition from printed materials to digital content that are relevant, flexible, and educational. Thus, new policies could be implemented that would provide funding flexibility to finance the acquisition of devices to support digital content and allocate funding that can help to sustain them.

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Dedication

This dissertation is dedicated to Kenneth M. Reaves, who is my partner and best friend. Ken has provided me with a tremendously amount of support and encouragement throughout my entire doctoral program and dissertation. His support was consistent and steadfast.

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I would like to extend by sincerest thanks to Dr. Abbie Brown, my mentor, and Dr. Robert Foshay, my methodologist, for their continuous support, assistance, and persistence as they guided me through this dissertation process. Your suggestions and feedback are immeasurable with the gratitude that I feel for the countless hours that you spent helping me bring this dissertation to fruition. I would also like to thank Dr. Andrew Thomas for his thorough and thoughtful comments, which helped me to move forward on this journey.

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Chapter 1: Introduction to the Study

This chapter introduces the purpose of the study, which determined why some states have been slow to adopt e-textbooks in their K-12 educational environments. In it, I present an overview of the study by defining the problem statement, the research question, the theoretical framework, and the nature of the study. The assumptions, limitations, and delimitations on the study are also addressed. In addition, the significance of the study and the social change implications are discussed.

Background

Jonassen (2006) theorized that technology can effectively support the cognitive process of human development by assisting learners collect and analyze information from different perspectives, identify and solve problems, while developing critical thinking skills. Jonassen, Howland, Marra, and Crismond (2008), Jonassen (2006), and Papert (1993a, 1993b), proposed that cognitive processes that engage and support diverse learning behaviors can demonstrate how learners can use different technologies to develop critical thinking and problem solving skills. Their theory disclosed that conditions for instruction must consist of complex and relevant learning environments, collaboration, and diverse perspectives that support various styles of learning. Jonassen et al. (2008) and Jonassen (2006) reasoned that learning objectives should involve reasoning, critical thinking, comprehending and applying knowledge, self-instruction, and thoughtful reflection. Jonassen et al. (2008) argued that meaningful learning requires a learning environment that is *active (manipulative/observant), constructive (articulative/reflective), intentional (goal directed/regulatory), authentic*

(complex/contextualized), and *cooperative.* They believed that these frameworks would establish learning communities where students shared common interests with each of them collaborating and supporting one another towards conventional learning goals. This classroom would be a knowledge community stocked with an assortment of resources to motivate and engage students in the learning process (Jonassen et al., 2008).

Jonassen (2006) developed the concept of *mindtools*—technology-based tools and learning environments that have been modified to operate as intellectual links with the learner in order to connect and assist in developing critical thinking and higher-order learning. These concepts could be applied to e-textbooks, which can be used as a tool in the teaching and learning process and support the most significant concept of learning, conceptual change. Conceptual change occurs when learners modify their preconceived ideas based on newly acquired knowledge (Jonassen, 2006). The State Educational Technology Directors Association (SETDA; as cited in Fletcher, Schaffhauser, & Levin, 2012) proposed several interrelated advantages for increasing the use of digital content in today's classrooms to improve student knowledge and engagement. They cited the ability to modify content to adjust to instructional goals, personalizing learning to adapt to special learning requirements, providing the ability to unleash exploration and discovery of diverse resources, and to assist educators with individualizing learning requirements to adapt to their students' needs (Fletcher et al., 2012).

Studies conducted by Papert (1993a, 1993b), Jonassen (2006), Jonassen et al. (2008), and SETDA (2008) supported the use of innovative technologies in K-12 education. Their research implied that students can use technology to interpret and

organize their personal knowledge. Knowledge cannot be transmitted to another person by formal instruction, but must be constructed from within and fortified through participation in related activities (Jonassen, 2006; Jonassen et al., 2008; Papert, 1993a, 1993b). Learning should have continuity, thus allowing an individual to consistently use foundation knowledge to enhance or engage in further discovery (Jonassen, 2006; Jonassen et al., 2008; Papert, 1993a, 1993b). These researchers proved that technology can be used as an academic tool that enables learners to construct significant individual explanations and images of the world through diverse perspectives (Jonassen, 2006; Jonassen et al., 2008; Papert, 1993a, 1993b; SETDA, 2008). Students can use e-textbooks to receive and process information, which they can in turn use to construct knowledge and develop problem-solving and critical thinking skills. Therefore, this analysis revealed that innovative technologies such as e-textbooks are tools that can be utilized to influence learners' cognitive growth connected to reasoning, memory, problem solving, and critical thinking, thus fortifying the use of emerging technologies such as e-textbooks in the teaching and learning process.

The universal design for learning (UDL) framework advocates the use of digital books to provide adaptable ways of presenting knowledge and information. Digital resources can be made accessible through assistive technologies and provide learning opportunities for students who have physical and learning disabilities, in addition to students who are learning English as a second language (Center for Applied Special Technology [CAST], 2011). UDL principles are structured around *multiple means of representation*, which provide diverse learners alternatives to access and process

information and knowledge; *multiple means of action and expression*, which offer learners alternatives to demonstrate what they have learned; and *multiple means of engagement*, which appeals to a learners' interests by recommending appropriate challenges to enhance the learners motivation to acquire knowledge (CAST, 2011; National Center on Universal Design for Learning, 2011). The U.S. Department of Education, Office of Educational Technology (2010) advocated the integration of innovative technologies that people use in their daily lives to be utilized in the classroom to enhance student learning, accelerate best practices, and to collect and use information that can aid student achievement. It is this belief presented in the National Education Technology Plan of 2010 that promotes the use of emerging technologies that will inspire and motivate learners to achieve success in school while supporting the UDL principles for learning and their ideas on the use of digital content in the classroom (U.S. Department of Education, Office of Educational Technology, 2010). In addition, Secretary of Education, Arne Duncan, has announced that the nation should move as quickly as possible away from printed textbooks and towards digital ones (Lawrence, 2012; Lederman, 2012).

UDL provides a plan for developing instructional objectives, techniques, resources, and assessments for using digital content in the classroom (CAST, 2011; National Center on Universal Design for Learning, 2011). UDL demonstrates how using e-textbooks can change the way that learners receive and handle information (CAST, 2011; National Center on Universal Design for Learning, 2011). These principles show that digital content can be used to present knowledge and information so that students can

show what they know (CAST, 2011; National Center on Universal Design for Learning, 2011). This philosophy asserts that digital content can be used to tap into the various interests of students. UDL established that e-textbooks can be used productively and efficiently in a classroom setting to construct knowledge (CAST, 2011; National Center on Universal Design for Learning, 2011). Developments in digital technologies and the learning disciplines have made personalized instruction feasible in realistic, economical ways that are designed to assist and support the learner in acquiring knowledge (CAST, 2011; National Center on Universal Design for Learning, 2011). Applying well-organized digital technologies utilizing UDL principles can support simpler and more effective individualized courses for instruction (CAST, 2011; National Center on Universal Design for Learning, 2011). Digital content can provide tasks to assist learners comprehend, navigate, and participate in flexible learning environments. This poses a strong argument for the adoption of e-textbooks in K-12 education (CAST, 2011; National Center on Universal Design for Learning, 2011).

The 2011 Horizon Report produced as a collaborative effort between the EDUCAUSE Learning Initiative (ELI) and the New Media Consortium reported that e-books are one of six emerging technologies that will have a major impact on teaching, learning, and innovative analysis, which can change people's perceptions on how they read and access information. The 2011 Horizon Report stated that in today's society, people want perpetual access to information related to their occupations, interests, and research, which is one reason why e-books are expanding in the consumer market and are making a strong presence in colleges and universities (The New Media Consortium & the

EDUCAUSE Learning Initiative, 2011). According to studies conducted by Library

Journal School Library Journal (2010a, 2010b, 2010c), electronic reference books are

becoming popular with students and researchers because they can be easier to navigate

and to search than printed resources. Also, e-books provide libraries with a diverse

collection that can serve a range of requirements for their face-to-face patrons and distant

learners enrolled in college and university online education programs (Library Journal

School Library Journal, 2010a, 2010b, 2010c).

In this era of social networking environments, e-books have the capability to be

used as a social networking tool and provide interactive learning environments in K-12

education (Library Journal School Library Journal, 2010a, 2010b, 2010c). In essence,

digitized content is changing people's perception of how they read, access information,

and interact with colleagues because they can be retrieved in so many different formats

and have the ability to be downloaded onto so many different types of devices (The New

Media Consortium & the EDUCAUSE Learning Initiative, 2011). In addition, e-books

can help to reduce costs regarding lost, damaged, and stolen books as well as eliminate

physical storage requirements as they do not require shelf space (Library Journal School

Library Journal, 2010a, 2010b, 2010c). Some other advantages offered by e-books are

their large storage capacity, search capabilities, mobility, and immediate accessibility

(Baker, 2010). Gonzalez (2010) stated that e-books can also assist struggling and at-risk

students because of the various functionalities.

These studies indicated that the process of how people access and process

information has been transformed by the entrance of e-books. They revealed that digital

content is being adopted by consumers, colleges, and universities at an escalating rate because mobile technologies provide convenient ways for individuals to conduct business, research, and explore interests by providing perpetual access to information any time and any place at reduced costs. It also demonstrates that e-books are serving the needs of a tremendous audience, which poses reasons why the adoption of e-books is increasing in popularity in the consumer, college, and university marketplace at a steady pace. The implication is that e-books are an instructional tool that offers many advantages for the K-12 classroom. This research proposed that e-books could be effective as an instructional tool that could impact how teachers teach and students learn.

Considering this information regarding the benefits of using digitized content in K-12 educational environments, currently only 22 of the 50 states have taken major steps towards digital textbook implementation (Fletcher et al., 2012). These 22 states have introduced either definitional or funding flexibility, launched a digital textbook initiative, and/or launched an open educational resource (OER) initiative that was mandated by state legislature (Fletcher et al., 2012). The adopting states share common traits, which include a dedicated state leadership, a philosophy for innovation, a conviction to increase district flexibility in spending by offering content alternatives, and clear-cut implementation strategies (Fletcher et al., 2012). The remaining 28 states have not transformed their classrooms to use e-textbooks instead of traditional printed materials. Even though e-textbooks are an innovative technology that can save school districts a significant amount of money (Greaves, Hayes, Wilson, Gielniak, & Peterson, 2012) and contribute to meaningful learning as an instructional tool (CAST, 2011; U.S. Department

of Education, Office of Educational Technology, 2010), they have not materialized as a decisive alternative to traditional printed textbooks and reference materials in K-12 classrooms; limited research has been conducted on why e-textbooks have not been adopted rapidly in K-12 learning environments.

Scholars and educators can speculate on many reasons for these barriers, but the outcome is that there are not enough schools using digital instructional materials. Is the late rate of adoption in K-12 sectors due to technological limitations such as the lack of e-reader devices, personal computers, and learning programs within school systems that has resulted from lack of funding or, possibly, are e-book publishers not addressing the needs of K-12 learning environments (Aptara Corporation, 2011)? Other considerations that should be examined are the variety of complex business models such as the following: (a) short-term loans, licensing agreements regarding simultaneous use and multiple users, unrestricted synchronized access, and subscription options (Buckley, & Tritt, 2011; Hoseth & McLure, 2012; Hurlbert, 2010; Polanka, 2011); (b) portability, network connectivity, navigation, ease of use, readability, cost effectiveness (Lamb & Johnson, 2011); (c) the different file formats being used, the issue with Digital Rights Management (DRM) restrictions, which limits sharing, printing, and copying e-books (Baker, 2010; Library Journal School Library Journal, 2010a, 2010b, 2010c); (d) concerns about content piracy (Baker, 2010); (e) and/or which publishing platforms or technology to use (Hurlbert, 2010). Romero (2011) stated that accessing e-books in the public domain and those made available through open access are viable alternatives that provide better continuing access at less cost; however, the selections may be limited. In addition, e-

books necessitate numerous transformations in nearly all phases of operation regarding the publishing industry, the consumer, and their reading practices, changing and defining a business model, converting the production chain, changing marketing strategies and pricing policies, in addition to the redistribution of authors' proceeds and concerns associated with protecting the rights of all participants (Romero, 2011).

A survey conducted by Aptara Corporation (2011), a digital publishing company that has converted tens of millions of traditional pages to e-books, disclosed that K-12 education only represents 6% of the total market compared with the consumer market (30%) and the college market (25%). Publishers producing e-books for the K-12 market are notably lagging in e-book revenues compared to all other market sectors, especially the college division (Aptara Corporation, 2011). Thus far, these studies have shown that e-books are gaining in popularity in the consumer market and e-textbooks are being used in colleges and universities nationally and internationally, but there is a late adoption rate in K-12 education.

The prospect of e-textbooks offering extensive possibilities to support the classroom curriculum has not been adequately explored in the current research. The research has disclosed limited growth in usage in K-12 learning environments, but the "why" has not yet been answered as few studies have been conducted about the diffusion of e-textbook technology. A review of the literature published in the past 5 years did not reveal information that focused on diffusion studies involving e-textbook usage in K-12 learning environments, nor was there information available explaining e-textbooks' slow rate of adoption. With 22 states currently initiating some form of adoption policies to

transfer from traditional printed text to e-textbook technology, this diffusion study aim was to discover what interrelated issues was preventing the late adopters from introducing formal policies to make this transition to adopt digital content in their K-12 institutions. Currently, K-12 educational systems would be considered late adopters according to Rogers's (2003) diffusion of innovation theory, as it appears that they are not adopting e-textbooks widely for classroom instruction.

Due to the lack of research regarding the adoption of e-textbooks in K-12 classrooms, there was a gap in the literature that this study addressed. According to Larson (2010), the concept of e-books has been available for nearly two decades; however, little research has been conducted on e-book integration into the K-12 classroom. In addition, the findings that have been presented were somewhat conflicting in nature (Larson, 2010). Shamir and Korat's (2007) research relating to e-books stated that e-books are still in their formative phase, with inconsistent data available regarding their effectiveness.

Problem Statement

E-book technologies are changing people's perception of how they read, retrieve information, and collaborate with colleagues. A variety of studies have proposed that e-books can be effective as instructional tools that can impact how information is retrieved and analyzed. Research revealed that consumers, colleges, and universities have been adopting digital content at an increasing rate because mobile technologies provide accessible methods of doing business, conducting research, and developing personal interests by providing continuous access to information. With decreasing budgets

(Greaves et al, 2012), increased acceptance of social media, and distance education programs (The New Media Consortium & the EDUCAUSE Learning Initiative, 2011), e-textbooks may be the solution to resolve issues regarding educational costs, information and communication technologies, and media literacy in the classroom. However, there is a gap in the literature regarding the diffusion of e-textbooks in formal educational environments. Therefore, the goal of this investigation was to determine why e-textbooks have not been widely adopted in K-12 education.

Purpose of the Study

This research was conducted to discover why e-textbook usage in the classroom has not been extensively adopted in K-12 education. The objective was to determine the barriers and challenges decision makers have confronted when introducing this innovative technology in a formal learning environment. Therefore, the purpose of this study was to examine the obstacles that are hindering the adoption of e-textbooks in K-12 education and to make recommendations for future diffusion studies on innovative technologies in education.

Research Question

This study was driven by this single question: Why have a majority of state educational technology directors not adopted e-textbooks as a replacement for traditional printed textbooks?

Theoretical Framework

This research was based on diffusion of innovation theory. The diffusion of innovation theory was used to determine why e-textbooks have not been adopted

extensively in K-12 education as a classroom resource and a replacement for expensive

textbooks. Rogers (2003) defined diffusion as a process that is communicated through a

specific network over a period of time between members of a social system to bring

about positive social change. The communication aspect of the process was to share

information about a new idea or practice so that a decision could be made by the

members of the group to adopt or reject the innovation (Rogers, 2003). This was

established by the type of innovation decision required, the form of communication

media that was used to diffuse the innovation, the characteristics of the social system, and

the extent of change that the diffusion would affect (Rogers, 2003). Rogers's diffusion

theory disclosed that people must realize the comparative benefit for accepting an

innovation as better than the beliefs that preceded it in order for it to be accepted. Norms

and values are traditional behavior patterns designed for the members of a social system

that describe a variety of acceptable behaviors and provides guidelines for the members

to follow (Rogers, 2003). Adoption of any new innovation will be determined by its

compatibility with those existing values, past experiences, and needs of the potential

members (Rogers, 2003).

   According to Rogers, in order for an innovative-decision process to take place, an

individual must be exposed to an innovation, acquire information about the new idea or

practice, develop an opinion about the innovation, make a decision whether to accept or

discard it, apply the innovation, and finally endorse the decision to adopt or reject the

idea. Surry (1997) stated three reasons why diffusion theory is important to the field of

instructional technology. First, most instructional technologists do not understand why

their innovations are adopted or rejected (Surry, 1997). Second, instructional technology

is essentially an *innovation-based field* and many of the innovations developed by

instructional technologists symbolize extreme innovations in their structure, method, and

approach to instruction (Surry, 1997). Third, the study of diffusion theory could lead to

the development of a methodical model of adoption and diffusion, which can result in the

design and development of successful and academically reliable innovations (Surry,

1997).

Rogers's (2003) diffusion of innovation theory classifies members in a social

system into categories: *innovators*, *early adopters*, the *early majority*, the *late majority*,

and the *laggards*, based on their innovativeness in adopting new ideas or practices.

Rogers stated that adopters follow an S-curve that deals with the evolution of the

introduction of an innovative technology and the adoption process over time. Innovation

theory describes the processes and phases involved in the rate of adoption among a social

system's members (Rogers, 2003). Salter (2005) stated that change follows a course and

that the characteristics of these categorized individuals will determine when or if they

will adopt an innovation.

Rogers's (2003) model of the innovation decision process consisted of five stages:

knowledge, which takes place when a person is exposed to information about an

innovation and acquires an awareness of its purpose; *persuasion*, which happens when a

person forms an opinion about the innovation; *decision*, which occurs when a person

participates in actions that would lead to adoption or rejection of the innovation;

implementation, when an individual puts the innovation into practice; and *confirmation*,

when a person decides to keep accepting or to reject the innovation after putting it into use.

Researchers have recognized that e-textbooks are a technological innovation that can apply the principles of diffusion theory to better understand its dissemination into a social system for several reasons. Yates (2001) stated that diffusion theory presents a structure that helps advocates understand why some innovations are adopted by some and not others. E-textbook advocates can use diffusion theory to clarify, calculate, and explain issues that increase or hinder the diffusion of innovations. Second, it is essential to have a concrete understanding of how to introduce these new ideas into the social system, and diffusion theory helps promote an understanding of this process (Yates, 2001). This is especially true for e-textbook technologies because they are continually changing with new devices, functionality, and application components constantly being introduced. Third, diffusion research provides numerous successful prototypes that can be used to develop a successful diffusion movement for an innovations adoption (Yates, 2001). Diffusion theory helps identify characteristics such as (a) the *relative advantage* to adopt an idea because it is perceived to be better than a previous practice, (b) its *compatibility* with existing norms and values of the group, (c) its *complexity*, referring to an innovations ease of use, (d) its *trialability*, which will determine if favorable results were evident with an innovations use, and (e) *observability*, if the results are perceived as beneficial to the group (Rogers, 2003). Also, the diffusion structure offers a means to view the communication channels used and the time it will take to diffuse the innovation (Rogers, 2003).

Rogers (2003) defined a change agent as "an individual who influences clients'
innovation-decisions in a direction deemed desirable by a change agency" (p. 366).
According to Rogers, change agents typically hold a high level of proficiency concerning
the innovations that are being diffused. He identified seven responsibilities for the change
agent when introducing an innovation into a system:

1. change agent identifies a need for change,

2. establishes an information exchange relationship,

3. diagnoses problems,

4. creates a need for change,

5. translates intents into action,

6. stabilizes adoption and prevents discontinuance, and

7. achieves a terminal relationship with clients (Rogers, 2003, p. 400).

State educational technology directors were solicited to participate in this study because
they qualify as change agents who are knowledgeable about e-book technologies, can
influence the decision-making process, and have the authority to make purchasing
decisions (SETDA, n.d.). State educational technology directors participate in strategic
planning regarding technology policies and infrastructures (SETDA, n.d.). These leaders
have the authority to adopt or reject e-textbooks in their K-12 educational systems and
would be better able to disclose the barriers that are hindering their adoption (National
Association of State Technology Directors, 2010; SETDA, n.d.). This leadership could
serve as change agents by adopting an innovative technology that could significantly
transform teaching and learning practices.

Nature of the Study

This basic interpretative qualitative study employed diffusion of innovation

theory. This study used a Delphi method of inquiry for data collection and analysis. The

Delphi method works well with qualitative research because it allows the researcher to be

flexible as well as sensitive to the social framework from where the data are being

collected (Skulmoski, Hartman, & Krahn, 2007). The Delphi method is appropriate as a

research method when there is insufficient information available about a problem or trend

(Skulmoski et al., 2007). Questions incorporated in a Delphi study may be of any type

that involves an opinion, in addition to predictions on the frequency of potential

improvements, attraction of selected upcoming circumstances, or the method for

accomplishing or circumventing an approaching situation (Gordon, 1994). The Delphi

method offers to the individuals concerned or employed in the research, assessment, or

investigations what is really proven or not recognized about a particular issue (Gordon,

1994; Skulmoski et al., 2007). It is an adaptable instrument used to collect and evaluate

the required information (Gordon, 1994; Skulmoski et al., 2007).

The purpose of this study was to examine the obstacles that have hindered the

adoption of e-textbooks in K-12 education and to make recommendations for future

diffusion studies on innovative technologies in education. The Delphi method of inquiry

was selected to examine a complicated issue that had limited information available in the

current literature (Skulmoski et al., 2007). By engaging a panel of experts who have

decision making authority, major concerns could be identified that were not previously

considered (Gordon, 1994; Skulmoski et al., 2007). This panel could identify complicated

underlying issues that could evolve over a specific period of time (Franklin & Hart, 2007). For this study, I defined an expert as an individual who has been recognized as a knowledgeable, practiced, or recognized specialist in the discipline being studied (Baker, Lovell, & Harris, 2006).

In this study, I used a questionnaire to collect the responses. The questionnaire was presented in the form of an online survey to 12 participants to keep the responses at a manageable level without the cumbersome task of extensive and complex data collection, analysis, reaching a consensus, and confirming results. This homogenous panel possessed experience and knowledge of e-book technologies, showed an eagerness to participant in the study, had the time to respond and complete each round, and had proficient communication skills. This sample size enabled me to identify some reasons for the late adoption in using e-textbooks as a replacement for traditional printed textbooks in K-12 classroom settings. Skulmoski et al. (2007) recommended that a sample size of 10 to 15 homogeneous expert panelists is sufficient to reap satisfactory results.

The questionnaire was sent individually so that the panelists could remain anonymous to the other respondents. By using unidentified, organized, and controlled responses, intimidation from emphatic individuals was avoided so that a consensus could be obtained. Another implication was that by maintaining the confidentiality of the state educational technology director, their identities, the integrity, and dependability of this study would be upheld because the participants were open and honest with their responses.

Three rounds are generally sufficient when dealing with a homogenous group of experts (Gordon, 1994; Skulmoski et al., 2007). Summations of the previous round's responses permitted member checking as the state educational technology directors from the non-adoptive states were asked to reply to the summaries after each round, which would confirm my interpretation of their remarks. This enabled me to report accurately the participants' experiences concerning e-textbook technologies. The third and final round of the Delphi questionnaire provided an opportunity for the state educational technology directors from the non-adoptive states to evaluate their agreement with the final consensus. Thus, the categories resulting from the third and final round of the questionnaire formulated the final consensus, which resulted in a well thought out explanation (Merriam, 2002; Trochim, 2001) for the late adoption of e-textbooks in K-12 education. The goal of this investigation was to come to a consensus regarding the benefits and challenges that would be encountered by introducing e-textbooks in K-12 educational environments and why their adoption has been so slow. This explanation was then transferred to conclusions about other future occurrences, which is the purpose of a Delphi study.

An open-ended question was presented to the panel because it allowed for a broader range of answers to the initial question (Skulmoski et al., 2007). Therefore, this panel of experts was initially asked to answer one question: Why has your state not adopted e-textbooks as a replacement for traditional printed textbooks? It was expected that a broad or open-ended question would result in a wider variety of answers because it would "focus [on] the collective intelligence of the research participants" (Skulmoski et

al., 2007, p. 10). However, more information was accumulated with a broad, open-ended question that involved additional time for me to analyze the collected data (Skulmoski et al., 2007).

State educational technology directors from the non-adoptive states were selected for this panel because they are the individuals who can influence the decision-making process, have substantial knowledge of digital text technologies, would be the most influential when it comes to making purchasing decisions when introducing new technologies into the instructional setting (SETDA, n.d.), and would be the best qualified to answer the research question as to why their states have not adopted e-textbooks in their K-12 educational environments. Also, state educational technology directors have the influence to accept or reject this innovative technology. They represent the leadership of each state's department of education who participates in strategic planning and the development of state government technology policies and infrastructures (National Association of State Technology Directors, 2010). These leaders were better able to reveal what reasons would hinder or cause the educational system in their state to adopt or reject the innovation (SETDA, n.d.). State educational technology directors are also in a position to serve as change agents to bring about positive social change in their school districts by adopting an innovative technology that could greatly impact the teaching and learning process. Because the state educational technology directors from the non-adoptive states were considered experts in their field, their integrity enhanced the credibility of the study. In the 22 states that have formally adopted e-textbooks in their school districts, the decisions regarding their adoption were made at the state level and

then passed down to the district level (Fletcher et al., 2012). They accomplished this feat

by introducing flexible funding initiatives, allowing for flexibility in design, acquisition,

dissemination, and usage (Fletcher et al., 2012).

    In order to answer the research question as to why a majority of state educational

technology directors have not adopted e-textbooks as a replacement for traditional printed

textbooks, a basic interpretive qualitative study was used as its primary objective was to

uncover and explain how individuals interpret their experiences (Merriam, 2002).

Qualitative research is unique when it comes to researching a complex issue (Trochim,

2001). This research method excels at constructing detailed data, which require

organization in order to produce a description to convey a consensus (Trochim, 2001) as

to the reason for the late adoption of e-textbooks as a replacement for traditional printed

textbooks in K-12 education. The goal was to present from the state educational

technology directors' perspective their views on why their states had not adopted e-

textbooks as a replacement for conventional printed textbooks in their K-12 school

systems.

    I used triangulation, 12 expert participants that served as diverse data sources,

memoing that provided rich thick descriptions taken throughout the entire research

process, bias clarification that explained my prior experiences, biases, and information

that may influence the development of the study (Merriam, 2002). I analyzed negative or

discrepant information and also scrutinized opposing opinions from the participants to

achieve diverse viewpoints (Creswell, 2003) regarding the late adoption of e-textbooks in

K-12 education. In addition, I used peer debriefing, an external auditor throughout the

research process, and spent a significant amount of time in the field (Creswell, 2003) examining the outcomes of each iteration of the Delphi questionnaire to avoid researcher bias in the analysis, interpretation, and reporting of the participants' experiences.

Construct Definitions

Barriers to adoption: There are several obstacles that may hinder the adoption of an innovation: unreliability, the innovation does not perform as expected, difficulty in learning to use an innovation, incompatible with existing norms and values of the group, and trialability (Rogers, 2003).

Compatibility: Compatible with existing norms and values of the group (Rogers, 2003).

Complexity: Refers to the innovation's ease of use (Rogers, 2003).

Discontinuance: A decision to reject an innovation after it was formerly adopted. There are two types of discontinuance: *replacement discontinuance* is the decision to reject an innovation in order to adopt another innovation and *disenchantment discontinuance* is a decision to reject an innovation because of dissatisfaction with its operation (Rogers, 2003).

Early adopters: Members of a social group who are open to new ideas, compassionate, rational, educated, and are more adaptable toward change than the lesser adoptive categories (Rogers, 2003). Their adoption rate is significantly longer than the innovators, but they tend to adopt an innovation after a specific period of time (Rogers, 2003).

Early majority: Members of a social group who have above average social positions that communicates with early adopters, but rarely holds positions of opinion leadership; their tendency is to adopt an innovation at a slower rate (Rogers, 2003).

E-book: An electronic document that contains text and/or other content that resulted from combining the familiar design characteristics of a book, which is presented in an electronic format (Armstrong, 2008; Gonzalez, 2010; Nelson, 2008; Zucker, Moody, & McKenna, 2009). These elements are static because of the stability of e-books (Vassiliou & Rowley, 2008). E-books normally contain some or all of these characteristics: a main theme with pages that turn, text-to-speech functionality, annotations, hyperlinks, search capabilities, bookmarking, highlighting, interactive tools, narration, and multimedia capabilities such as text, music, sound, animations, and are read on a computer screen or other digital reader device (Vassiliou & Rowley, 2008; Zucker et al., 2009). These functionalities are dynamic because an e-book is constantly changing as new technologies are being developed (Vassiliou & Rowley, 2008).

E-textbook: Integrates the existing characteristics of a traditional printed textbook including the content, reference materials, exercises, and dictionaries into an electronic format. It also uses various types of interactive activities that are organized into a multimedia learning environment that could include videos and virtual world functionality (Education Bureau, 2009). Digital textbooks can be used as a customizable digital resource that can adjust to the teachers and students needs and provide flexibility in how the content can be used in a classroom setting (Vassiliou & Rowley, 2008). The most flexible type of digital content are OERs, which offer teaching and learning

resources licensed through Creative Commons (n.d.) so that the resources may be used, reused, and personalized to meet explicit needs and are frequently accessible at no cost (Duffey & Fox, 2012).

Expert: An individual, who has been recognized as a knowledgeable, practiced, or recognized specialist in the discipline being studied (Baker et al., 2006).

Innovation diffusion theory: Proposes that the rate of adoption of an innovation will be determined by the momentum by which the members of the group accepts or rejects the innovation (Rogers, 2003).

Innovators: Members of a social system, who come from a higher socioeconomic group, have more formal education, serve as opinion leaders in their community, are more cultured, and are innovative towards new ideas and practices (Rogers, 2003).

Laggards: Members of a social system who are the last to adopt an innovation. They are traditional thinkers with limited access to social networks and financial resources (Rogers, 2003). These individuals must be certain that an innovation will work and meet expectations before they will adopt it (Rogers, 2003).

Late majority: Members of a social system who have limited financial resources (Rogers, 2003). They approach an innovation with a high degree of uncertainty and will adopt an innovation only after the majority of the social system has accepted an innovation (Rogers, 2003). Peer pressure is essential for these members to adopt an innovation (Rogers, 2003).

Observability: Members of a social system perceive the results of an innovation as beneficial to the group (Rogers, 2003).

Relative advantage: Members of a social system will adopt an idea because it is perceived to be better than a previous practice (Rogers, 2003).

Trialability: Determines if favorable results will become evident with an innovations use (Rogers, 2003).

<h2 style="text-align:center">Assumptions, Limitations, and Delimitations</h2>

The assumptions, limitations, and delimitations on the study will be addressed in the subsequent segments. These segments will discuss specifics presumed to be accurate, but which were not really confirmed. It presents possible threats to the validity of the study and the boundaries that shaped the study.

Assumptions

It was an assumption that the validity of a Delphi study was based on the expertise of the participants. It was also assumed that a dependable professional consensus was achieved because the method depended on anonymous, controlled responses, and was structured to prevent the pressure of assertive individuals or coercion to reach a consensus. Another assumption was that maintaining the confidentiality of the identities of the participants preserved the integrity and validity of this study because the participants were free to answer the question honestly and without pressure. It was also an assumption that when the participant accepted the invitation to participate in this study that he or she was acknowledging that he or she was influential when making innovative technology purchases, had knowledge of e-textbook technologies, and had time to participate in all three rounds of the Delphi questionnaire, which was completed within a

5-week period. This could be considered a threat to validity because these participant selection criteria could not be verified.

Limitations

A Delphi study is intended to present practical forecasts about the future (Franklin & Hart, 2007; Gordon, 1994; Skulmoski et al., 2007). The outcome of this investigation was not an explanation of any existing experience, but was an account of the consensus of professional opinions that was arrived at during the progression of the Delphi questionnaires (Franklin & Hart, 2007; Gordon, 1994; Skulmoski et al., 2007). This study formulated predictions about the potential issues related to the barriers that are hindering the adoption of e-textbooks in K-12 instructional environments. Predictions are not assurances of any specific outcome (Skulmoski et al., 2007). The definitive outcome of this review was the communication of an innovative theory on the barriers that have hindered the adoption of e-textbooks in K-12 education. There was no generalizability (aka external validity) in this study. It was the consensus opinion of 12 people who were not representative of the relevant population. This was a *theory generating* study and as such it was fundamentally exploratory.

This study was limited by its simplification. I selected only 12 English-speaking participants who expressed an interest in participating in the study, had the time to respond in each round, and were capable communicators. Also, when the expert consented to participate in this study, he or she was divulging that he or she was influential when making innovative technology purchases and was extremely

knowledgeable of e-book technologies and their development. These were criteria that I could not confirm.

Another limitation that might have presented itself during the course of this study was researcher bias based on a single individual organizing and rating the participants' responses. However, I used peer professionals to review my work as a form of member checking in an attempt to reduce the possibility of researcher bias. Self-reports of my interpretations of the state educational technology directors' views concerning the late adoption of e-textbooks in their states could be considered a limitation of the study; however, the 12 expert panelists served as diverse data sources who commented on the summations after each round to add confirmability, validity, and credibility to the study by assisting me in the accurate reporting of their experiences.

Delimitations

This study was directed only at state educational technology directors from the non-adopting states who resided in the United States and it did not consider the opinions of other experts that were not located nationally, which only provided a one-sided view on e-textbook usage. Also, it did not take into account any legislative or budgetary limitations that may have been placed on these educational systems. As a result, there may have been some bias interjected based on these experts' practices, experiences, education, and viewpoints regarding e-textbook technology; therefore, it cannot echo the opinions of other educators or society. This study concentrated explicitly on the self-reports of participants on perceived barriers that hindered the adoption of e-textbooks in formal K-12 educational environments. As proposed, this study did not consider teachers,

technological specialists, or local administrators who might have a different perspective on e-book technology or who did not have decision-making authority.

Significance of the Study

E-textbooks were used as an example of an innovative technology to disclose barriers and establish patterns that hindered the adoption of any innovative technology in K-12 formal education that can serve as a learning tool that can greatly impact teaching, learning, and creative analysis. The theory that resulted from this study was useful for testing not just what hindered e-textbook adoption, but also what could hinder the adoption of other promising technologies in K-12 educational systems. This research also provided an opportunity for state educational technology directors who were selected to participate in this study to re-examine e-textbooks that could revolutionize how learners read, access information, and conduct research.

Social Change Implications

This study could lead to improved adoption of e-textbooks that can promote positive social change by providing flexible ways of presenting and receiving information (National Center on Universal Design for Learning, 2011) while reducing costs in an era of budget constraints in K-12 education (The Digital Textbook Collaborative, 2012; Greaves et al., 2012). With dwindling budgets (Greaves et al, 2012), increased popularity of social networking tools, distance education (The New Media Consortium & the EDUCAUSE Learning Initiative, 2011), and major digitized projects anticipated by Google (Google Books, 2011), e-textbooks may be the answer to resolve issues relating

to cost, information and communication technologies, and media literacy in the classroom.

Aqili and Nasiri (2010) believed that the inclusion of diverse multimedia technologies into global society is changing the way people obtain knowledge about the world and challenges the basic foundations of the educational system. De Abreu (2010) proposed that in this new technological society, educators are seeking new methods to empower their students with knowledge of digital frameworks. In actuality, digital education is an efficient way to provide students with a comprehensive way to construct ideas, media, and language (de Abreu. 2010).

Summary

Chapter 1 presented an introduction to the study with the reasoning for its purpose. It included why e-textbooks were selected for this study, and why they are being used as an example to determine some reasons for the late adoption of any innovative technology in K-12 education. Sections also discussed the conceptual framework, the nature of the study that supported this investigation, the method of inquiry, the significance of the research being conducted, and the social change implications.

Chapter 2 will present a detailed account of the current research regarding e-book usage in education, including the benefits and challenges that surround this innovative technology and its impact on the teaching and learning process. The literature review will reveal the gap in the literature relating to the adoption of e-textbooks in K-12 formal education. It will also serve as a guide to help state educational technology directors

make decisions regarding e-book technology. An overview of diffusion of innovation theory will be examined as it pertains to the rate of adoption of innovative technologies.

Chapter 3 will provide a thorough discussion of the methodology used in this study. It will open with an explanation of the research design and the qualitative research model. This chapter will discuss what conceptual frameworks will be used as a foundation for this research. It will also disclose the role of the researcher concerning data collection. In Chapter 3, further clarification will be stated to provide the reasoning of how the research question was developed, provide more information in the selection of the panel, provide detail information on best practices used during the study, and further elaborate on the criteria used to collect and analyze the data collection process. The selection of the participants in this study will also be discussed. I will elaborate on how the survey question was delivered individually via e-mail to each of the expert panelist so that they could remain anonymous. I will conclude with a discussion of the efforts taken to improve the validity, reliability, and accuracy of the study.

Chapter 4 will reveal the results of this study. The first section will begin with an explanation of the data collection process including my methods for recording the data, data tracking procedures, and the data analysis process. The development of the expert panelists' opinions that arrived at the final consensus will be discussed. The process will be explained in the form of six thematic summations generated by the panelists. Opposing views and supplementary commentaries will be conveyed. The last section will discuss the study's value that includes its credibility, transferability, dependability, and

confirmability procedures comprising of my journal, an external auditor, and peer examination.

In Chapter 5 I interpret the research findings that explain the late rate of adoption of e-textbooks in K-12 education. The six thematic summaries generated from the participants' responses are linked to the research questions and compared to what was previously reported in the literature review. The summations are analyzed within the context of the theoretical framework. A description of dissenting opinions and the participants' added remarks conveying their influence on the final consensus are discussed. Recommendations for administrators responsible for technology-related, institutional policy, and purchasing including a recommendation for further research are stated. The chapter concludes with my reflections regarding my e-textbook experiences, an assessment of the final results, and a closing statement.

Chapter 2: Literature Review

Even though the concept of e-books has existed for several decades, the topic of

e-books in K-12 education is still so new that a foundational literature of scholarly

inquiries and public reporting is incomplete, and the conclusions that have been reported

are to some extent conflicting (Larson, 2010). To a great degree, only articles that

promoted e-book usage and reports without academic methods are available. Therefore,

studies associated with student interaction with them and their attitudes and feelings

regarding this innovative technology are in their infancy, and studies dealing with the

diffusion of e-textbooks have not been adequately addressed in the literature. Research

concerning e-books acknowledged that e-books are still evolving, with data lacking

reliability regarding their effectiveness (Shamir & Korat, 2007).

This review will demonstrate that the current literature has limited information

available focused on diffusion studies involving e-book usage in K-12 learning

environments or any information available explaining e-textbooks' slow rate of adoption,

which will expose a gap in the literature addressed by this study. This chapter will present

the current research on the subject of e-books in general and, more specifically, e-

textbooks, disclosing the advantages and challenges that they face. It will also serve as a

guide for decision makers who are interested in incorporating this technology into their

educational systems.

In my quest to retrieve information for my e-book research topic, I searched the

Walden University EBSCO databases including Education Research Complete, ERIC

(Educational Resource Information Center), Academic Search Complete, and the Walden

dissertations; Google Scholar and Google Web Search; and the University of Georgia Library, which includes the GALILEO databases. The primary search words that I used for my research included *e-books*, *electronic books*, *eBook*, *technology and education*, *digital textbooks*, *e-texts*, *readers and technology*, *e-readers*, *electronic book readers*, *media literacy*, and *reading and technology*. These terms were also combined with *education* and *technology*. Many of the articles collected as a result of this search were commentaries or editorials and did not reflect disciplined research with logical methodology; so I discarded those and selected only articles that demonstrated academic reporting, scientific methods, and/or were related to education, specifically K-12 education, even though they may have been limited in scope and structure.

Background

In the traditional sense, the concept of electronic books (e-books) is not new. The evolution of e-books began in 1971 when Michael Hart birthed the first digitized document when he typed and sent the United States' Declaration of Independence on the computer after receiving $100,000 of computer time from the operators of the Xerox Sigma V mainframe at the Materials Research Lab at the University of Illinois (Project Gutenberg, 2013). This marked the beginnings of Project Gutenberg, which is an ongoing initiative with the sole purpose of making information, books, and other resources accessible to the general public in formats that can be accessed on a limitless number of hardware devices that people can easily read, utilize, cite, and explore (Project Gutenberg, 2013). This initiative is still ongoing with the goal to digitize and promote the

concept and dissemination of e-books (Project Gutenberg, 2013). The goal of Project

Gutenberg is to digitize 1,000,000 books (Hart, 2004; Lebert, 2009).

The first e-book technology was the Dynabook that was developed in 1972 by

Alan C. Kay. This device demonstrated the first concept of the tablet computer that

incorporated the fundamentals of a graphical user interface (GUI), including screens,

processors, storage memory, and a software component called *Smalltalk* (Kay, 1972).

Dynabook supported the first version of e-books. Kay (1972) wanted this device to be

designed for children of all ages that embodied the constructivist learning theories of

Jerome Bruner, Seymour Papert who was one of the inventors of the Logo programming

language, and Jean Piaget, the developmental psychologist. However, the Dynabook was

never marketed commercially.

Digitized text was also endorsed by the federal government. In 1980, the Paper

Reduction Act promoted the reduction of paper for government agencies, businesses, and

educational institutions to strengthen relationships between these entities, to maximize

accountability, to ensure privacy and confidentiality, and to effectively utilize

information technology. This act promoted the use of information technology to digitize

documents to reduce cost, to minimize maintenance, distribution, and disposition (The

U.S. National Archives and Records Administration, n.d.).

With the creation of the protocol TCP/IP in 1990, by Vinton Cerf and Bob Kahn,

the Internet was born (Lebert, 2009). The Internet expanded into a new media that spread

worldwide by 1994 and it brought with it a new medium that made access to documents,

newspapers, magazines, and an unlimited amount of information available to anyone who

had access to a computer with an Internet service provider (Lebert, 2009). The Internet

started a craze for information on demand anytime and anywhere, it provided self-

authoring opportunities for novice writers, and virtual libraries also made their

introduction (Lebert, 2009). According to the statistics, reported on the Internet World

Stats (2011), as of March 11, 2011, 2,095,006,005 people use the Internet (Aud et al.,

2011). Thus, the audience that utilizes digitized documents is growing at a substantial

rate.

Currently, the Google Books Library Project, formerly known as Google Print,

launched in 2004 (Google Books, n.d.a). It has currently partnered with Harvard

University, the University of Michigan, the New York Public Library, Oxford University,

Stanford University, Austrian National Library, Bavarian State Library, Columbia

University, Committee on Institutional Cooperation (CIC), Cornell University Library,

Ghent University Library, Keio University Library, Lyon Municipal Library, University

of California, The National Library of Catalonia, University Complutense of Madrid,

University Library of Lausanne, University of Virginia, University of Texas at Austin,

and the University of Wisconsin–Madison. This consortium has been trying to catalog all

available books into a virtual library that is stored in a digital cloud and can be accessed

by anyone, anywhere (Google Books, n.d.b). The goal is to make information more

available in different languages to the general public (Google Books, n.d.b). These books

come in two formats: ePub and PDF format (Google Play, 2013). This effort makes

books more shareable and more sociable.

In addition, the Association of American Publishers (AAP; 2011)—which is the United States' national trade association of the book publishing industry that consists of 300 members including business, educational, specialized, smaller and non-profit publishers, academia presses, and scholarly organizations—revealed in their March 2011 sales report that e-books continue to increase in popularity. Sales in March 2011 had increased by 145.7% to $69.0 million from $28.1 million in March 2010 (AAP, 2011). This showed that e-books are increasing in popularity in the consumer market since their inception and their popularity is continuing to grow.

Definition of E-books

For the purpose of this study, an e-book was defined as an electronic document that contains text and/or other content that resulted from combining the familiar design characteristics of a book, but is presented in an electronic format (Armstrong, 2008; Gonzalez, 2010; Nelson, 2008; Zucker et al., 2009). These elements are static because of the stability of e-books (Vassiliou & Rowley, 2008). E-books normally contain some or all of these characteristics: a main theme or topic with pages that turn, chapters, a table of contents, text-to-speech functionality, annotations, hyperlinks, search capabilities, interactivity, bookmarking, highlighting, interactive tools, narration, and multimedia elements such as text, music, sound, special effects, and animations (Fedigan, 2011; Vassiliou & Rowley, 2008; Zucker et al., 2009). E-books can be read on a computer, laptop, smart phone, tablet, or other digital reader device (Fedigan, 2011; Vassiliou & Rowley, 2008; Zucker et al., 2009). These functionalities are dynamic because an e-book

is constantly changing as new technologies are being developed (Vassiliou & Rowley, 2008).

An e-textbook integrates the existing characteristics of a traditional printed textbook including the content, reference materials, exercises, and dictionaries into an electronic format (Zimerman, 2011). It also uses various types of interactive activities that are organized into a multimedia learning environment that could include videos and virtual world functionality (Education Bureau, 2009). Digital textbooks can be used as a customizable digital resource that can adjust to the teachers and students needs and provide flexibility on how the content can be used in a classroom setting (Vassiliou & Rowley, 2008). The most flexible type of digital content are OERs, which offer teaching and learning resources licensed through Creative Commons so that the resources may be used, reused, and personalized to meet explicit needs and are frequently accessible at no cost (Duffey & Fox, 2012; SETDA, n.d.).

Another format of the e-book is a vook, a video book, which is a new advancement in reading that blends a written book, high-quality video, and the Internet into a distinct story (Vook, Inc., 2011). A vook can be read like a book, videos can be viewed to improve the story, and social media can be used to interact with authors and friends without switching between platforms (Vook, Inc., 2011). Vooks are available in two formats: one, as a web-based application that can be read on a computer and two, as an application for the iPad, iPod touch, or iPhone for mobile reading anytime and anywhere (Vook, Inc., 2011). An Internet browser is all that is needed to use this innovative technology (Vook, Inc., 2011). Applications can be downloaded and installed

through the Apple iTunes store, and synchronized to an Apple mobile device (Vook, Inc.,

2011).

Technology and Literacy

Digital and media literacy was defined as a combination of visual literacy, media

literacy, computer literacy, and information literacy (Hobbs, 2011). Hobbs's definition of

digital and media literacy competencies was stated as:

> (1) the use of texts, tools, and technologies to access both information and
>
> entertainment; (2) the skills of critical thinking, analysis, and evaluation; (3) the
>
> practice of message composition and creativity; (4) the ability to engage in
>
> reflection and ethical thinking; as well as (5) active participation in social action
>
> through individual and collaborative efforts. (p. 14)

Digital and media literacies are necessary for an individual to be literate in modern

society, to successfully navigate the Internet so that they can critically examine and

interpret enormous amounts of information, and identify various forms of communication

(Hobbs, 2011). Twenty-first century education will demand that teachers apply new

knowledge when instructing their students and develop new pedagogy practices to adapt

to the exponential growth rate of both information and communication technology (ICT)

(Bagwell, 2008).

Even though these thoughts may be speculative in nature they do contribute to the

knowledge base that the way people read, access, and process information is becoming

more extensive. Information is available in so many different formats that to be literate in

today's society, an individual must possess the necessary skills to retrieve the information in various formats and be able to critically analyze and interpret it.

The National Educational Technology Standards (NETS) project was established by the International Society for Technology in Education's (ISTE) Accreditation and Professional Standards Committee. It was financed by The National Aeronautics and Space Administration (NASA) in collaboration with the U.S. Department of Education, Apple Computer, and the Millken Exchange on Education Technology. ISTE revised the NETS for Students in 2007 to assess the competences and knowledge students will need to learn and live productively in a progressively global and digital society. According to ISTE's standards, students will be required to apply technology to evaluate, learn, and discover knowledge concepts. According to ISTE's NETS for Students (2007), digital age skills are imperative to prepare learners to be employed, live, and contribute to society in order to bring about positive social change.

ISTE's standards fortify the need for media literacy in K-12 education. All of these skills can be acquired with innovative teaching strategies and the use of technology. Today's learners need to know how to access and interpret various forms of information in our 21st century society in order to be productive citizens. In order to accomplish this, these students need to know how to access information from various sources such as e-books.

In this new technological society, educators are seeking new methods to empower their students' knowledge with digital frameworks (De Abreu, 2010). De Abreu believed that media literacy instruction is a strategic methodology to support learning without

stifling the learner's creativity in the 21st century classroom. She argued that media

literacy is a way that can help educators instruct students on becoming critical thinkers

and develop digital citizenship. De Abreu stated that media literacy instruction offers

students a chance to critically examine information to determine its validity and

reliability. This researcher alleged that digital education is an efficient way to provide

students with a comprehensive way to construct ideas, media, and language.

Goldsborough (2009) and the International Reading Association (2009) identified the

significance of incorporating information and communication technologies (ICTs) into

the current literacy curriculum. They considered conventional explanations of reading

and writing as inadequate in today's society. In addition, the *Common Core State*

Standards Initiative (2010) suggested that today's students need to be able to collect,

understand, assess, fuse, incorporate, and design print and non-print content in various

media formats to be productive citizens in today's global workforce. It is a widely held

opinion that these literacies are here to stay, and it is the responsibility of all teachers to

orchestrate learning opportunities in which students can collaborate and communicate

within a technology-rich environment (Larson, 2009). ISTE's NETS for Students (2007)

advocated for the following performance standards to be incorporated into the classroom:

creativity and innovation; communication and collaboration; research and information

fluency; critical thinking, problem solving, and decision making; digital citizenship; and

technology operations and concepts.

E-textbooks are an example of an innovative technology that can support the

concepts presented for media literacies and technology in education by providing an

environment viable for learners to access and retrieve information using interactive digital content. E-textbooks can permit access to digital media and environments that will enable learners to collaborate, communicate, and network with their peers and experts globally. E-textbooks can provide students with digital content that will allow them to discover, analyze, categorize, and assess information. Digital content permits immediate updates to information anytime and anyplace. Based on the concepts pertaining to technology and literacy, e-textbooks can be used as an instructional tool that can provide learners with an instrument that can help them to collect information from various sources and develop critical thinking and problem solving skills. These concepts support UDL principles, which offer learners choices on how they can retrieve and restructure information and knowledge while increasing their motivation to learn (CAST, 2011b; National Center on Universal Design for Learning, 2011). Jonassen et al. (2008) alleged that meaningful learning requires a learning environment that is *active, constructive, intentional, authentic, and cooperative* supported by technology. The many facets of e-textbooks can support these principles.

Education

Aptara Corporation (2011), a digital publishing company that has converted tens of millions of traditional printed pages to e-book formats, conducted a survey of publishers' who converted printed text to digital configurations to answer the increase demand for e-books with a progression of three surveys from 2009 to 2011. The results concluded that personal computers were the initial digital content device used and consequently continue to be most suitably accepted as the standard in the industry as an

e-book platform, however with the development of ePub formats and the sudden increase in the development of tablet-like devices, this implies that the personal computer as a major platform will gradually decrease in its significance (Aptara Corporation, 2011). EPub is a file-packaging specification that manages the organization, page layouts, and metadata intricacies that are native to scholarly publishing (Chesser, 2011). It should also be noted, that 21% of trade publishers have elected to develop enhanced e-books, which would include links and multimedia with audio and video (Aptara Corporation, 2011).

These studies implied that learning platforms are changing as e-book technology is changing, which will have a major impact on how information can be retrieved and analyzed. This also indicated that there is a movement to standardize e-book formats that will eliminate some of the problems with DRM issues, which is one of the challenges that hinders the adoption of e-textbooks in K-12 education.

Colleges and Universities

The adoption of e-textbooks on college campuses and universities are advancing at a steady rate and most of the research conducted on e-textbooks are focused on this educational sector. The majority of the research was directed at college students (Gibson & Gibb, 2011; Shen, 2011; Shepperd, Grace & Koch, 2008) and instructors' attitudes (Camacho & Spackman, 2011; Foasberg, 2011; Hoseth, & McLure, 2012), format (Barron, 2011; Buzzetto-More, Smith, 2008; Sweat-Guy, & Elobaid, 2007), experience and perceptions of e-books (Brezicki, 2011; Kissinger, 2011), student preferences (Kirk, 2010), and usage (DeFosse, 2012; Fluke & Barnes, 2008; Grudzien & Casey, 2008).

Also, many advantages have been noted as a result of these studies enlisting college professors and their students. Some advantages of e-books that were stated are: multiple access (Romero, 2011), instant delivery (Romero, 2011), unlimited storage capacity (Baker, 2010; Gibson & Gibb, 2011; Hoseth, & McLure, 2012; Romero, 2011), no shipping and handling charges (Romero, 2011), instantaneous access (Baker, 2010; Gibson & Gibb, 2011; Hoseth, & McLure, 2012; Volokh, 2010), lower cost for books (Alkadi, 2009; Baker, 2010; Buzzetto-More et al., 2007; Gibson & Gibb, 2011; Petrides, Jimes, Middleton-Detzner, Volokh, 2010; Walling, & Weiss, 2011), browsing and keyword search capabilities (Alkadi, 2009; Baker, 2010; Buzzetto-More et al., 2007; Hoseth, & McLure, 2012; Petrides et al., 2011; Romero, 2011; Volokh, 2010), cut and paste capabilities (Petrides et al., 2011), and portability (Alkadi, 2009; Baker, 2010; Gibson & Gibb, 2011; Hoseth, & McLure, 2012). Romero (2011) and Volokh (2010) posed that e-books offered availability to out of print materials. By using digital content, access to out of print books is available free to download from Google Books and Project Gutenberg (Volokh, 2010). E-books can also incorporate other characteristics such as hyperlinks (Gibson & Gibb, 2011; Romero, 2011), bookmarking (Romero, 2011), annotations (Petrides et al., 2011; Romero, 2011; Volokh, 2010), highlighting (Romero, 2011), and underlining (Romero, 2011) as well as linking to other sections of the book or external resources such as dictionaries (Romero, 2011; Volokh, 2010), thesaurus (Romero, 2011; Volokh, 2010), and multimedia files and characteristics (Buzzetto-More et al., 2007; Gibson & Gibb, 2011; Romero, 2011).

It appeared that these studies were conducted to further the advancement of e-textbooks in higher education and to serve as a criteria of student and instructor expectations to heighten the digital book experience (Hoseth, & McLure, 2012). Hoseth and McLure argued that these studies may be used to provide data for textbook publishers to better prepare their products to satisfy consumer expectations and demonstrate the possibility to quicken turnaround time between authorship and publication making new editions available within a very short timeframe. However, these researchers suggested that there are still conflicting views regarding its usage, which may impact their adoption.

Today, there are an increasing amount of use studies that describe student and faculty reactions to e-book technology (Hoseth, & McLure, 2012). Hoseth and McLure asserted that even though these studies differ in phraseology of population and the explicit methodology used, they reveal many general patron responses and procedures that appear to be connected to the present position regarding e-book functionality and ease of use. It appeared reasonable to propose that user apprehensions may become more detailed or discriminate as e-books develop more refine characteristics and as the availability of scholarly e-books increases and becomes more diverse (Hoseth, & McLure, 2012).

These studies are important because they revealed academia's reaction to this innovative technology. They also revealed what users feel about e-textbooks, which will impact their rate of adoption in education with cost being a major factor. These studies also showed the expectations and attitudes that members in academic circles have regarding this innovative technology concerning their compatibility with their existing

norms and values, relative advantage that the technology has more advantages than disadvantages, and complexity relating to ease of us (Rogers, 2003).

K-12 Education

Researchers have proposed several uses for e-books in education. They proposed that e-books have increased reading comprehension and vocabulary levels in young readers and have aided at-risk learners and students with disabilities. Larson (2007) conducted a qualitative case study of a 5th-grade class to investigate how the integration of technologies in an electronic reading workshop supported the emergence of new literacies. The electronic reading workshop presented numerous opportunities for students to respond to e-books as technology users and readers. Larson used electronic journals with built-in teacher prompts and informal group discussions to reveal responses from four extensive groupings: personal meaning, literary analysis, character, and plot connections. She used multimodal characteristics including interactive tools, hyperlinks, video, and audio, which she felt that researchers were just beginning to assess as to their value, advantages, and potential use.

Larson (2007) proposed that e-books could be used as a tool to diversify reading experiences and differentiate instruction and could also provide a way to integrate technology into instruction, which would appeal to multiple learning styles. Larson believed that students with special needs could also benefit from the various formats that accompany e-books. The author alleged that these tools encouraged readers to physically interact with the content through highlighting, underlining, insertion, deleting, replacing text, note-taking, adding comments, attaching files, or recording audio annotations while

manipulating screen layout, font size, and page format. Larson felt that a broad variety of mobile devices could be used effortlessly to provide immediate access to an array of books using wireless resources. Larson concluded that the search capabilities permitted readers to locate explicit words or phrases within the text or access a specific page.

The conclusion derived from this study suggested that 21st century students will require skills to effectively utilize a variety of changing information and communication technologies that are constantly emerging in today's society. Although this research was limited in scope and the methods were not definitively stated, it suggested that e-books could provide teachers with instructional tools to help them become innovative instructors by using technological tools to implement instruction. This study advocated for e-books as an alternative method to introducing literature into a traditional setting to enhance learning, encourage a love of reading, and serve as a means to integrate technology into instruction. This research also revealed that e-textbooks showed promise in advancing literacy development, specifically reading comprehension. Although research investigating the application of e-books is in their initial stages, existing results seem hopeful in sustaining electronic texts as a resource to promote children's literacy.

Larson's (2009) study used qualitative case study techniques. She used categorical aggregation and several sources of data to determine potential classifications of information and their significance. Her data sources consisted of field notes and interviews with the classroom teacher, her students, and their respective parents. Larson gathered the students' digital notes to examine and analyze for emerging reader response topics and relationships. Her findings concluded that students with special needs such as:

English-language learners (ELL), visually impaired, and struggling readers, could benefit

from the supplementary content multimodal features like: animations, audio capabilities,

music, video, and hyperlinks that were available with e-books. Larson believed that e-

book readers have the potential to provide struggling readers assistance with its multiple

features, including different font sizes, text-to-speech choice, built-in dictionary, and

note-taking functionalities.

Even though research on the use of e-books is in its early stages, the findings from

Larson's (2009) study concluded that digital reading devices can promote literacy

advancement in K-12 education. This analysis presented some valid conclusions that

suggested the benefits of using this technology in a classroom setting, but it also points to

the lack of research regarding the diffusion of e-books in a formal learning environment.

Zucker et al.'s (2009) research measured the effectiveness of e-books using a

comprehensive review method as well as a methodical literature review, comparison of

outcomes that effect sizes, assessment of outcomes with cause and effect, and a

discussion of studies that used either a quasi-experimental/observational narrative review

criteria or a randomized-trial synthesis criteria. Their literature review consisted of seven

studies that met the randomized-trial synthesis criteria and 20 studies that met the quasi-

experimental/observational narrative review criteria. These researchers discovered that

some of e-books features such as: highlighting text in conjunction with speech-to-text,

combined visual and verbal teaching strategies, helped support implicit decoding

scaffolds while other features such as: letter-by-letter pronunciations and built-in

dictionary helped to support explicit decoding scaffolds. Zucker et al. argued that e-books

helped students with reading disabilities, struggling readers, and beginning readers acquire phonological decoding skills. They felt that these features could benefit learners who lack automatic word recognition, which may counteract other learning sources, such as context clues or image reinforcements. Zucker et al.'s research on e-books revealed that e-books were an established approach to integrate technology in preschool and elementary classrooms, but embedded animations and graphics used to enhance comprehension may also prove to be distractions that hinder learning.

The research presented by Zucker et al. did not reveal the degree to which e-books could enhance literacy skills in the matter of decoding and reading comprehension. This study was limited because only two randomized assessments studied decoding-correlated results that inhibited definite assumptions. The narrative review implied that a number of interactive e-book characteristics sustain comprehension, while other unrelated characteristics may delay comprehension. The results of Zucker et al.'s research presented conflicting outcomes, which demonstrates that additional studies are needed to decipher the effectiveness of using e-books in a formal classroom setting; therefore, no conclusive evidence could be substantiated from this study.

Kelley (2011) conducted a basic interpretive qualitative study that consisted of a pilot test using a self-designed e-book with six, 5th-grade students to determine if using digitized content helped to increase learners reading comprehension skills. Kelley's participants completed a survey about the design features of the book and participated in interviews conducted after the session. He analyzed his data by using field notes, interviews, and questionnaires. This researcher argued that these students reading

comprehension levels were higher than their peers on the same grade level. Kelly

suggested that an effective method to consider when designing e-books would be to

integrate background information that would help the reader understand the plot,

characters, the main idea, historical context, and setting while built-in dictionaries could

assist learners with vocabulary deficiencies, which would help them to better comprehend

the text. In addition, Kelly believed that embedded graphic images and multimedia could

also help learners increase their reading comprehension skills. However, the mainstream

of e-books does not integrate any interactivity to sustain the broad range of learning

requirements in a traditional classroom. Kelly felt that e-books were basically inactive

digitized textbooks except for those that are accessed using platforms like Amazon's

Kindle and Sony's Reader, which have interactive characteristics; however they have

disadvantages if used in an educational environment. The first problem was the initial

cost of acquisition, maintenance, and replacement costs of the devices. Another drawback

was that some of the interactive elements may not be advantageous to students such as an

extensive dictionary, which may appear overwhelming to some learners.

    Kelley's research demonstrated that e-books could influence reading

comprehension levels. He pointed out some advantages and disadvantages that should be

considered when using e-books in a classroom setting, which could hinder its rate of

adoption. However, like many of the other studies conducted in K-12 education, it did not

focus on issues relating to the diffusion of e-books in a classroom setting, which revealed

a gap in the literature relating to the adoption of e-books in a classroom setting. This

study was pertinent to this analysis because it outlined a methodology that can be used in

the school reform process. When transforming an educational system specific patterns

need to be formulated to determine strengths and weaknesses regarding leadership, the

school's culture, and the school's philosophies concerning the teaching and learning

process.

      Anderson and Balajthy (2009) conducted a narrative qualitative study where they

used the stories of four participants to conclude that e-books served to motivate

struggling second grade readers consisting of ELL, who participated in this recreational

reading study to implement cooperative learning and technology in a classroom setting.

The researchers concluded that children liked using technology and reading on

computers. Anderson and Balajthy believed that using e-books could be presented in a

customized design to fit the needs of the learner.

      Anderson and Balajthy's (2009) study focused on usage and attitudes of potential

users of e-book technology, but this research was not directed at the rate of adoption of e-

textbooks in K-12 education. Their research demonstrated customizable capabilities

regarding e-book usage and how potential recipients could benefit from this technology,

but not at its rate of adoption.

      Rhodes and Milby (2007) conducted a case study of a second grade teacher and

her class to determine that e-books could scaffold students with both physical and

learning disabilities by enlarging the text format and providing access to multiple

readings. Their findings were based on interviews and the use of observation techniques

to determine that e-books and other text-to-speech readers improved students' self-image

by providing access to resources that were formerly unavailable. For children with

disabilities, the physical act of turning the pages in a book was no longer required. Rhodes and Milby believed that e-books helped to reinforce student vocabulary with built-in dictionaries, which made it easier for students with disabilities to access information. The built-in capabilities assisted learners, allowing all students to flourish in the classroom while developing fluency and comprehension skills.

Rhodes and Milby's (2007) analysis of e-books was designed to determine that e-books could scaffold students with both physical and learning disabilities. Scaffolding instruction as an instructional strategy was initiated from Lev Vygotsky's sociocultural theory, the *zone of proximal development* (ZPD*)* (Driscoll, 2005). This too dealt with usage and potential benefits, but did not consider the diffusion of e-book technology in K-12 education.

Gonzalez (2010) conducted a quantitative study involving 3rd and 4th-grade students to establish the effect on their reading comprehension when text was offered in three distinct arrangements: e-books with full text-to-speech (TTS) commentary, e-books with vocabulary and TTS support on specific vocabulary words, and traditional printed books with no additional assistance. The purpose of Gonzalez's study was to determine the advantages of using e-books for struggling readers and readers with reading disabilities. A pretest-posttest repeated measure with random task design was utilized. The outcome of the group study of variance (ANOVA) revealed a major key effect of the different text designs on comprehension calculated by verbal retelling, but not for comprehension assessed by multiple choice questions. Gonzalez discovered that the text-to-speech, built in dictionary, and animated graphics could support the improvement of

various reading skills. A post hoc examination revealed that the participants had the highest verbal retelling scores when they read e-books with full TTS narration. There was no degree of difference between struggling readers and students with reading disabilities, and paired samples *t* test revealed no noteworthy increases on the Gates MacGinitie Reading Test (GMRT-4) scores. Gonzalez also found that e-books could help learners become more familiar with the use of technology to support learning. Gonzalez believed that e-books could sustain children's literacy education in preschool through the fifth grade because they could easily be incorporated into literacy instruction, requiring students to have little practical experience.

A social change implication was that e-books may have the capability to help address important achievement disparities between those who struggle with reading and those who do not; however, the author did not believe that e-books could replace traditional books in the foreseeable future because there was limited existing research evidence. This study did not reference the diffusion of e-books in K-12 education nor did it deal with the reasons for its slow rate of adoption.

Jones and Brown (2011) conducted a quantitative study involving 22, 3rd-grade students. These students completed approval surveys and reading comprehension tests in three independent reading sessions using one traditional print-based and two e-book titles to gauge motivation for independent reading and comprehension. The surveys were intended to determine (a) the students' degree of gratification, (b) the students comfort level at reading the selected text, (c) their self-evaluation of understanding, (d) their enthusiasm to complete reading the text, (e) their desire to read additional resources, (f)

the probability of reading the book at home, (g) the likelihood that they would recommend the book to a friend, and (h) their satisfaction with the selection. This development was assessed using a standardized test. The survey variables were allocated a value and a constant measure ANOVA that was conducted on the reading comprehension tests statistics to determine the differences in test scores depending upon the layout of the book. The survey statistics collected from Jones and Brown's research were cross tabulated with the comprehension data to gauge the relationship between their enjoyment of the books and their comprehension grade. Jones and Brown used Chi-Square to categorize any relationships established between favorite chosen titles and the book layouts. Jones and Brown's findings concluded that elementary school children identified mostly with setting, characters, and the theme of the book rather than the format of the book and students did prefer e-books when given the choice to select their book from a large selection of titles. Students also revealed a preference for the functionalities associated with e-book reading such as built-in definitions, verbalization of words, automatic page turning, and the read-aloud narrative option. Jones and Brown concluded that children promptly became at ease with the e-books and accepted the technology. However, they indicated that the students were not entirely prepared to forget about traditional printed books. Buzzetto-More et al. (2007) also concluded in their research that the newer generation of readers is exposed to digital text at a very early age through the Internet, video games, and read-along CDs. So the new millennium student is accustomed to reading text on digitalized devices.

Jones and Brown's (2011) research was another study regarding usage and functionality when using e-books in a classroom. No implication was made regarding the rate of adoption of e-book technology in education. This was not a diffusion study concerning the implementation of e-books in K-12 education; however, it had merit because it reported on the potential benefits that could be derived from e-book usage. The study conducted by Buzzetto-More et al. revealed that students can easily adapt to using digital content because they use it in their everyday lives. In contrast, the traditional class setting is where students have to power-down to conform to the conventional instructional standards.

A study conducted by Moody (2010) proposed that e-storybooks were commonly used in early childhood classrooms to promote budding literacy development. The results projected that the use of superior quality interactive e-storybooks may sustain emergent literacy development due to the employment of scaffolding; hence, sustaining vocabulary development, motivation, and reading comprehension.

Moody's (2010) research implied that inferior quality e-storybooks may present distracting digital characteristics including sounds and animations not related to the story. Therefore, teachers should scrutinize digital characteristics and their purpose, the developmental suitability of e-storybooks in their classrooms, and assess the student's development over time to determine the dimensions of appropriateness based on the student's age, personality, culture, and social background. Moody argued that assessing students individually, teachers could ascertain a point of reference and then balance the instruction to the student's learning goals. Individual appropriateness portrays a learner's

exclusive learning behavior including family environment, preferences, and knowledge. Moody concluded that e-storybooks may offer benefits to students by increasing the motivation to read and impact children's literacy and oral language. Also, the results demonstrated a dual increase in children's point of reference when reading conventional storybooks compared to electronic storybooks.

Moody's (2010) research showed that e-storybooks could promote literacy and sustain vocabulary development as well as increase reading comprehension skills in early childhood classrooms. This analysis illustrated the benefits of using this technology with students, but it did not touch upon its rate of adoption in K-12 education. In the reformation of schools, emerging technologies will play a major role in the teaching and learning process. This article was important to this analysis because it recommended effective strategies that could be successful when planning for classroom instruction and how teachers should approach the art of teaching.

These studies did not change the theory of reading; they just showed evidence of using e-books as an instructional tool that can impact how students read, access, and interpret information. Even though these studies were limited in scope and definition of scholarly methodology, they all showed support for the use of digital content in the classroom. The basic conclusion was that digital content in the form of e-book technology displays promise as an educational tool that will support 21st century learning, promote the love for reading, increase reading comprehension and vocabulary skills, and motivate students to acquire knowledge. The result of this research demonstrated that e-book technology is an innovative tool that could support meaningful, authentic learning,

and contribute to students' academic success. However, they did not present data that focused on the slow adoption of e-books in K-12 education. Therefore, there is a gap in the literature that can be addressed by this study.

Textbook Costs

One major reason that had been cited as the cause for increased educational costs is the price of printed textbooks, which has increased substantially over the past 20 years (Acker, 2011; Alkadi, 2009). The US Government Accountability Office's (GAO) report to Congress on the rising cost of education that focused on how college cost changed in current years and what caused those changes, revealed that the textbook costs had doubled in the past 20 years, which was twice the rate of inflation (Acker, 2011). Acker revealed that the escalating cost of textbooks has been one of the major contributors to the rising cost of educational expenses.

Acker (2011) argued that course management systems evolving from distance learning environments have been cited as the major cause to shift the need from printed text to digital formats. E-textbooks are also a feasible option to distance education because e-textbooks can be made available to everyone regardless of their location (Acker, 2011). Miller and Baker-Eveleth (2010) stated that colleges and universities across the country are beginning to re-think the use of digitized textbooks on their campuses, because new e-readers with improved screens for displaying content and interactive information, innovative business and licensing standards for delivering quality information at affordable prices, and how digitized books are produced is being developed. Also, e-books are available in a variety of formats with an array of pricing

arrangements including subscriptions, rental fees, pay per page, and free e-books (Buzzetto-More et al., 2007).

Even though publishers were resistant to change from printed text to digital content because of the viable economic opportunities that printed books afford, partnerships between universities and publishers are now striving to reduce the cost of textbooks while supporting the needs of the learner (Acker, 2011). Alkadi (2009) stated that the advantages of e-textbooks on the college level are favorable both to the professor and the publisher because e-textbooks can be customized to include only the materials that the instructor feels that he or she needs for their class while reducing the manufacturers' printing and distribution costs. E-textbooks are also being considered being offered as modules so that professors can customize their classroom materials (Butler, 2009).

Alkadi (2009) proposed an integrated model that offered both formats of books by providing e-textbooks and a small inventory of printed texts. These costs can be redirected to server maintenance, which is needed to sustain this shift to digitized content (Alkadi, 2009). Alkadi believed that introducing more e-textbooks on college campuses, could also reduce college bookstores shipping and operation costs. Many textbook publishers are now looking into the concept of e-textbooks because they are beginning to realize that this market is an alternative to offer textbooks at a lower cost, which would help to offset their loss of profits through the used textbook market (Miller & Baker-Eveleth, 2010). Regarding publication, there is a possibility to quicken turnaround time between authorship and publication (Hoseth, & McLure, 2012), which could also reduce

cost. Colleges and universities are also considering purchasing licensing for e-textbooks just as they do for scholarly databases and offering them to their students as an alternative to printed textbooks (Butler, 2009). Chesser (2011) and Czechowski (2011) suggested that publishers should provide multiple options such as: site license, single-user license, concurrent-user licensing agreements, subscription, or purchasing e-books directly. A custom, instructor written online textbook would not only help to decrease costs, it would also permit repeated updates and amendments (Butler, 2009).

E-textbooks offer a viable alternative to offset the increasing cost of college textbooks over the previous decade even though students have been sluggish to shift to the new system (Butler, 2009). However, despite the cost advantages, quickness of corrections and modifications, and the numerous methods of presenting content, the transfer to electronic material has been sluggish. Butler stated that the lack of comfort levels when reading from a computer screen has reduced the acceptance of e-textbooks on many college campuses. However, the rising cost of tuition and a slow economy may impact this reluctance in the future (Butler, 2009).

Clearwater High School in Pinellas County, Florida, in addition to Moraga and San Bernardino counties in California, introduced e-readers into their school systems due to budget cuts and projections of future trends in education (Mardis & Everhart, 2011). Problems noted by schools using these e-readers were technical problems, battery issues, hacking issues and/or vandalism, increased cost associated with downloading books to e-readers due to licensing restraints, distractions with multimedia content, superficial reading, poor comprehension, and slower reading habits (Mardis & Everhart, 2011).

In 2010, the first national study on education technology of 997 schools was performed by Project RED (Revolutionizing EDucation) that concentrated on student achievement and its financial repercussions. Project RED is supported by Intel, Smart Technologies, the Pearson Foundation, and HP. This project was created by a group of education and industry professionals who have a strong desire to transform the educational system (Greaves, Hayes, Wilson, Gielniak, & Peterson, 2012). Their findings, which included a variety of analysis techniques such as: principal component analysis, predictive modelling, and regression analysis, revealed that supplemental print resources cost schools more than $3.4 billion a year (Greaves et al., 2012). Greaves et al. reported that Project RED also substantiated that supplemental resources cost dropped from $79 to $19 per student when digital resources was substituted for printed resources with substantial savings being derived from storage and shipping costs alone. The Digital Textbook Collaborative (2012) organized by the FCC and the U.S. Department of Education estimates a cost savings of $600 per student when considering lower paper and copying cost, transferring from printed resources to digital materials, employing online assessments, reduced dropout rates, and improved teacher attendance by transitioning from printed resources to digital content.

The introduction of the Common Core State Standards (CCSS) presents a rare possibility for states and districts to work together to create, acquire, and use instructional resources that are aligned with the new standards (Fletcher et al., 2012). CCSS also has the ability to apply substantial influence on the publishing industry as it develops

instructional resources, including textbooks and online materials to align with the new standards at reduce cost (Samuels, 2012).

The cost of traditional printed textbooks is a major concern of all educational institutions because they have been a contributing factor to the increasing cost of education and may be a driving force to influence the adoption of e-textbooks in education. Numerous studies conducted on the cost effectiveness of digital content in education considered it to be a viable solution to escalating expenditures. This technology is one of the few emerging innovations that are considered cost effective when other technologies seem to add to existing costs. E-textbooks provide a possible solution to level the increasing cost of printed textbooks over the preceding decade, but K-12 educational systems still have been slow to adopt digitized content in the classroom setting.

Open Educational Resource (OER)

Petrides et al.'s (2011) study investigated the adoption and use patterns of teachers and students as end users of open textbooks and discovered that the most significant motivator for its inception was reduced cost, ease of use, and reliable quality. This study also revealed possible new teaching and learning behaviors that supported the use of open textbooks as well as increased teacher collaboration involving curriculum development and the interactivity of these materials to scaffold student learning (Petrides et al., 2011). Additionally, Petrides et al.'s study documented challenges for the continuance of the open textbook model due to the teacher's technological effectiveness and availability of professional development to sustain the use of open textbook

applications. OER are teaching and learning materials that exist in the public domain that have unlimited or limited license rights that allows these resources to be used freely, modified, or shared with others (OER Commons, 2007-2013; SETDA, n.d.).

Even though K-12 instructional material alternatives are the responsibility of the states and their districts, the federal government's National Education Technology Plan (2010) and The Federal Communications Commission National Broadband Plan (n.d.) encourages the use of electronic and open source resources (SETDA, n.d. ; U.S. Department of Education, Office of Educational Technology, 2010). The National Education Technology Plan (2010) recommended that organizations encourage the development and use of OER and contribute to ventures that will assist in the transition from traditional printed materials to digital learning resources (SETDA, n.d. ; U.S. Department of Education, Office of Educational Technology, 2010). Fletcher, Schaffhauser, & Levin (2012) argued that OER development could be effective throughout the educational system and benefit all learning styles and learners in P-16 educational systems. Fletcher et al. also proposed that as researchers and educators' changeover from traditional printed textbooks to a more interactive digital resource system, resources that are available as OER could be converted into a new kind of *open textbook*.

The Federal Communications Commission National Broadband Plan (n.d.) recommended that the U.S. Department of Education increase the quantity of digital educational content accessible online that complies with standards recognized by the U.S. Department of Education. The Federal Communications Commission National

Broadband Plan also proposed that the federal government invest in digital educational content that is accessible under licenses that allow free access and encourage producers of traditional printed materials to market digital alternatives or offer digital rights separate from rights on printed resources. Many federal agencies possess and create new educational resources that should be made accessible online to permit inquiry and distribution (Federal Communications Commission National Broadband Plan, n.d.). The Federal Communications Commission National Broadband Plan also recommended that the U.S. Department of Education offer grants and other incentives to publishers that provide resources in digital formats that comply with education programs to enhance the teaching and learning process.

This research demonstrated that the use of OER resources is workable as an alternative to printed textbooks at reduced cost. Many of these resources are free to be used, modified, and customized to fit the students' needs, which is another benefit of OER. OER provides a setting for teacher partnerships to develop lesson plans, assessments, and provide additional sources that could be tailored to accommodate their specific instructional needs. This research also demonstrated that e-textbooks purchased through established publishers could decrease acquisition costs. OER resources eliminate the need to navigate challenges associated with DRM and copyright issues. However, the availability and selection of OER are currently limited and teacher preparation needs to be promoted to assist in its sustainability and continuance of use. The research indicated the benefits and challengers faced with using this type of digital content, but it does not

state adequately why this form of digital content is not more widely adopted in K-12 education.

State Adoption Policies

Currently, 45 states and the District of Columbia have adopted CCSS and 22 states have introduced a digital textbook proposal, defined or initiated a flexible funding strategy, and/or started an OER plan (Fletcher et al., 2012). Nearly all of these endeavors share an effective state administration, an innovative philosophy, a conviction to improve regional flexibility in controlling costs and content selection, and effective implementation strategies (Fletcher et al., 2012; SETDA, n.d.). However, policy modifications concerning instructional resources are not enough to guarantee that digital content is used effectively in the classroom (Fletcher et al., 2012). Changing to electronic instructional resources, requires states and districts to concentrate on the following interconnected concerns: continued financial support for devices, reliable internet connectivity, current procedures and strategies, prepared teachers, intellectual property and reuse rights, proficient standards, and the commitment of state and district leadership (Fletcher et al., 2012; SETDA, n.d.).

In Arizona, the Vail school district developed an initiative called *Beyond Textbooks* that has now been adopted by 67 school districts and charter schools across Arizona (Baker, 2012). This initiative consisted of digitized content designed by teachers that unwrapped the state standards and provided a venue for teacher collaboration on lesson plans, assessments, and supplementary resources that could be individualized to fit the teacher's needs (Baker, 2012). Baker stated that this program consisted of curriculum

and instructional resources and student assessments. This philosophy goes beyond

textbooks and state standards to reinforce support for learning communities for teachers,

to assist in the instruction and learning process, and enhance student achievement (Baker,

2012).

Indiana's state board of education started distributing innovation grants to

subsidize existing programs in school districts that were transitioning from traditional

print resources to electronic content in order to assist acceleration and extend the use of

digital resources (Indiana Department of Education, 2012; SETDA, n.d.).

Texas's state board of education modified the Texas Education Code (TEC)

Chapter 32 §32.005 (B) for technology allotment funds for school districts to provide for

the acquisition of e-textbooks or technological devices that enhance student learning,

pays for professional development in the proper use of e-textbooks that is directly

connected to student achievement, and provides access to technological devices for

instructional use (Texas Education Agency, 2007-2012).

On January 25, 2012, the Utah State of Office of Education (USOE) publicized

that it would develop and sustain open textbooks in the vital curriculum subjects

including: mathematics, science, and secondary language arts (Dickson, 2012; SETDA,

n.d.). The USOE intended to persuade districts and schools throughout the state to think

about implementing these textbooks to be used starting with the fall 2012 semester

(Dickson, 2012; SETDA, n.d.). They defined open textbooks as textbooks written and

produced by specialists, examined by peers, and made available online for free access,

downloading, and use by everyone (Dickson, 2012). Open textbooks can also be printed

through print-on-demand or other printing services for locations where online use is
unattainable or unfeasible (Dickson, 2012).

In 2009, Virginia approved and published its first e-textbook titled, *FlexBook:
CK-12 Physics, 21st Century—A Compilation of Contemporary and Emerging
Technologies* for high school physics under an open license funded by the CK-12
Foundation (Henrico County Public Schools, n.d.; SETDA, n.d.). This book is accessible
free to any teacher to share, use, and modify (Henrico County Public Schools, n.d.;
SETDA, n.d.). Virginia's Henrico County Public Schools hosted an annual competition
that allowed teachers to submit proposals to "Henrico 21," a public digital depository
(SETDA, n.d.). The submissions had to include a rubric, a lesson plan, links to an
important source, student handouts, and an example of student projects produced during
the course of the lesson (Henrico County Public Schools, n.d.; SETDA, n.d.). Lessons
had to be evaluated first at the school level before submissions could be made at the
division level (Henrico County Public Schools, n.d.). The content was then added to
Henrico 21, which is licensed under Creative Commons (SETDA, n.d.). This licensing
permits this content to be utilized by other teachers, schools, and districts within and
outside the state of Virginia (Henrico County Public Schools, n.d.; SETDA, n.d.). The
Educational Technology Plan for Virginia dated 2010-2015 stated that Virginia was
currently investigating traditional textbook options such as the flexbook, a free and open-
source textbook platform, which allowed educators to construct and revise collaborative
textbooks (Henrico County Public Schools, n.d.). The Commonwealth of Virginia
consisting of school division technology directors, administrators, higher education

representatives, teachers, the business community, professional organizations, and families stated that traditional printed textbooks presented limitations relating to outdated information and textbook adoption cycles, and traditional printed textbooks did not support the current standards, assessments, 21st century learning environments, curriculum and instruction, and professional development (Henrico County Public Schools, n.d.; SETDA, n.d.).

In Alabama, the state legislature approved The Alabama Ahead Act that would supply mobile devices and e-textbooks to high school students (McClendon, 2012; School Superintendents of Alabama, 2012; SETDA, n.d.). This proposal would be paid for with $100 million in state issued bonds (McClendon, 2012; School Superintendents of Alabama, 2012; SETDA, n.d.). Even though the bill was approved and signed by the governor, financial support has been postponed until a review board proposes a strategy for its execution (McClendon, 2012; School Superintendents of Alabama, 2012; SETDA, n.d.). The financial backing for this bill was expected in 2013 (McClendon, 2012; School Superintendents of Alabama, 2012; SETDA, n.d.).

Arkansas's Code 6-21-403 was amended in March 2011 by Act 288 to include electronic materials, other instructional resources, and textbooks acquired with state funding to be made accessible to students (SETDA, n.d.; State of Arkansas, n.d.).

In May 2009, California's former Governor Arnold Schwarzenegger signed into law Chapter 161, which set up the *Free Digital Textbook Initiative* (SETDA, n.d.). This law required proposals for free OER high school textbooks for science and math (SETDA, n.d.). Schwarzenegger declared that textbook publishers should offer students

buying options when purchasing textbooks, reveal the cost of purchasing textbooks to the

teaching staff, and divulge to the faculty how the latest edition is different from earlier

editions (Reagan, 2010). In addition, this legislature persuaded the Regents of the

University of California and mandated that the directors of the California State

Universities and Community Colleges put into practice a number of procedures to keep

the cost of textbooks to a minimum (Reagan, 2010). Some of those procedures included

evaluating bookstore practices for purchasing and storing textbooks, implementing

textbook rental programs, and promoting students online and on-campus book exchange

(Reagan, 2010). The California Learning Resource Network organized the assessment of

electronic resources to align with state performance standards. This e-book requirement is

effective January 1, 2020 (Reagan, 2010; SETDA, n.d.).

The state of Florida has initiated a 5-year conversion to digital instructional

resources that is slotted for implementation in the 2015-2016 academic year (SETDA,

n.d.). Districts are compelled to be prepared to spend at least half of their instructional

resource allotments on state-adopted electronic resources; districts still maintain

flexibility on how they can use their remaining allotments (Florida Department of

Education, 2012; SETDA, n.d.). The Florida state legislation also focused on several

facets of the transition including the nomination of pilot programs that will participate in

the transition to digital content; improvement and implementation of digital content for

students in all grade levels; and the electronic assessment of the instructional resources

intended for adoption (Florida Department of Education, 2012; SETDA, n.d.).

In 2010, the state of Georgia passed legislation to permit schools to use textbook funding to purchase hardware to maintain electronic resources and spent $13 million to start pilots to analyze its usage (SETDA, n.d.). In 2012, legislation was approved to allow students to take free online courses (Georgia Department of Education, 2012; Georgia General Assembly, 2012; SETDA, n.d.). Also, this legislation lets districts retain their full-time equivalent money to pay for online courses through the Georgia Virtual School or any other state-approved online supplier where the fee does not go above $250 per half unit of credit (Georgia Department of Education, 2012; Georgia General Assembly, 2012; SETDA, n.d.).

The Students Come First, Senate Bill 1184, approved in Idaho provided financial assistance to pay for professional development and instructional technology for teachers (Idaho State Department of Education, n.d.; SETDA, n.d.). Although implementation concerns have occurred, the purpose of this regulation was to provide all high school teachers with mobile devices by the 2012-2013 academic year and all high school students will be issued mobile devices by 2015-2016 (Idaho State Department of Education, n.d.; SETDA, n.d.). The state will fund the cost of the device and each district will decide on how they will be used (Idaho State Department of Education, n.d.). A Department of Education team had suggested using digital OER that can be provided by several services, such as Curriki and Khan Academy (Idaho State Department of Education, n.d.; SETDA, n.d.).

In 2010, Illinois passed Senate Bill 3547 that broaden the definition of textbooks to permit the inclusion of electronic resources and the hardware required to support it, in

addition to increased textbook funding sources to include digital resources (Illinois

General Assembly, 2010; SETDA, n.d.). Illinois is taking part in a *Shared Learning

Collaborative* project to implement a strategy that aligns instructional materials with the

CCSS and to concentrate on individualizing instruction for learners (Illinois General

Assembly, 2010; SETDA, n.d.). The objective was to connect instructional statistics to a

meaningful core curriculum and resources to advance student achievement (Illinois

General Assembly, 2010; SETDA, n.d.). The Bill and Melinda Gates Foundation and

Carnegie Corporation of New York were offering the primary funding (Shared Learning

Collaborative, n.d.). Originally, Colorado, Delaware, Georgia, Illinois, Kentucky,

Louisiana, Massachusetts, New York, and North Carolina were involved in this

collaborative pilot effort, which will ultimately be offered to all of the states (Shared

Learning Collaborative, n.d.).

On March 22, 2010, Iowa passed Senate File 2178 that broadened the definition

of textbooks to include printed books, digital resources, mobile devices, or laptop

computers and allocated textbook funding to be used to procure technology (The General

Assembly of the State of Iowa, 2010; SETDA, n.d.).

Since 1999, Louisiana's state definition of printed textbooks included digital

resources, but when SB533 was passed in 2010, the State Board of Education was

instructed to make certain that digital editions were accessible for every approved

textbook title (Lafleur, Michot, & Walsworth, 2010; SETDA, n.d.). Also, the Louisiana

Department of Education was instructed to broaden the accessibility and availability of

academic resources and digital textbooks (Lafleur et al., 2010; SETDA, n.d.). In April

2012, Louisiana removed its obsolete procedures that specified that districts use their state's textbook allowance on state endorsed resources and provided improved spending flexibility (Lafleur et al., 2010; SETDA, n.d.).

In 2011, Maine approved Title 20-A, which provided professional development for educators to be trained to use OER and other electronic learning materials (Maine State Legislature, n.d.; SETDA, n.d.). The regulation formed a digital literacy fund to develop e-learning resources and created a depository to collect data on the use of e-learning materials (Maine State Legislature, n.d.; SETDA, n.d.).

On May 19, 2009, Senate Bill 235 was signed in Maryland (Department of Legislative Services Maryland General Assembly, 2009). Maryland developed the *MDK12 Digital Library Program*, which established partnerships between the State Department of Education, state school districts, and approximately 100 private schools to negotiate statewide costs to acquire digital content and provide quality electronic resources for K-12 students (Maryland Digital Library, 2009; SETDA, n.d.).

In August 2012, the Nebraska's Department of Education started the *NeBook Project*, a partnership between the state, nonprofit organizations, and schools to generate e-books, evaluate their value, and distribute them out of a virtual library that will also provide resources to the National Archives and the Public Broadcasting System (PBS) (SETDA, n.d.). These digital books would be available in PDF format and produced for Apple's iBook Author (Reist, 2012).

In 2011, New Mexico passed HB 310, which compelled publishers to offer academic resources in an e-book format, starting with the 2013-2014 academic year (SETDA, n.d.; State of New Mexico, n.d.).

Sections 701, 751, and 753 of the New York State Education Law were revised for the 2011-2012 academic year to offer flexibility in the use of academic resources (New York State Education Department, 2011; SETDA, n.d.). These resources incorporated library resources, printed textbooks, and instructional computer hardware and software (New York State Education Department, 2011; SETDA, n.d.). New York also generated *Requests for Proposals* (RFP) for teacher professional development and instructional resources for mathematics and language arts materials that aligned with the CCSS stating a preference towards resources licensed under Creative Commons (New York State Education Department, 2011; SETDA, n.d.).

In 2011 and 2012, the North Carolina State eLearning Commission published proposals that were accepted by the governor and the State Board of Education to shift to electronic materials as the principal type of instructional resources in K-12 education within the next five years (Public Schools of North Carolina, 2012; SETDA, n.d.). The Commission promoted the development of OER starting with English language arts and mathematics as a component of the state's shift to the CCSS while collaborating with other states (Public Schools of North Carolina, 2012). The projected plan was to construct a K-12 computer infrastructure to sustain its digital project (Public Schools of North Carolina, 2012; SETDA, n.d.).

Ohio State's administrative code 3301-92-01 made reference to textbooks and academic resources that included computer hardware and instructional software (Ohio Legislative Service Commission, 2011; SETDA, n.d.). Code 3329.08 referred to textbooks and electronic textbooks (LAWWriter®Ohio Laws & Rules, 2011a). In March 2011, HB 30 retracted a textbook reserve fund prerequisite stated in Section 3315.17 for its K-12 schools making it no longer required (LAWWriter®Ohio Laws & Rules, 2011b; SETDA, n.d.). Also, HB 153, which was directed exclusively at nonpublic schools. It was ratified to include related regulations and definitions, including the phraseology, *electronic textbook* (Ohio Legislative Service Commission, 2011).

In 2012, the Washington state legislature approved the Engrossed Second Substitute House Bill (E2SHB) 2337, which granted $250,000 to the Office of Superintendent of Public Instruction (OSPI) connected to creating a library of quality, open source licensed K-12 educational instructional materials that was connected to the recently implemented CCSS for mathematics and English language arts (SETDA, n.d.; Washington State Legislature, n.d.).

The West Virginia state legislature passed SB 631 in 2010 to change the terms instructional materials, textbooks, and learning technologies to instructional resources and amended the definition to incorporate digital content (SETDA, n.d.; West Virginia Legislature, 2010). In 2011, the Department of Education stopped purchasing social studies textbooks for a 2-year period and transferred the funds to improve the educational technology infrastructure as part of a conversion to use digital content (SETDA, n.d.; West Virginia Legislature, 2010).
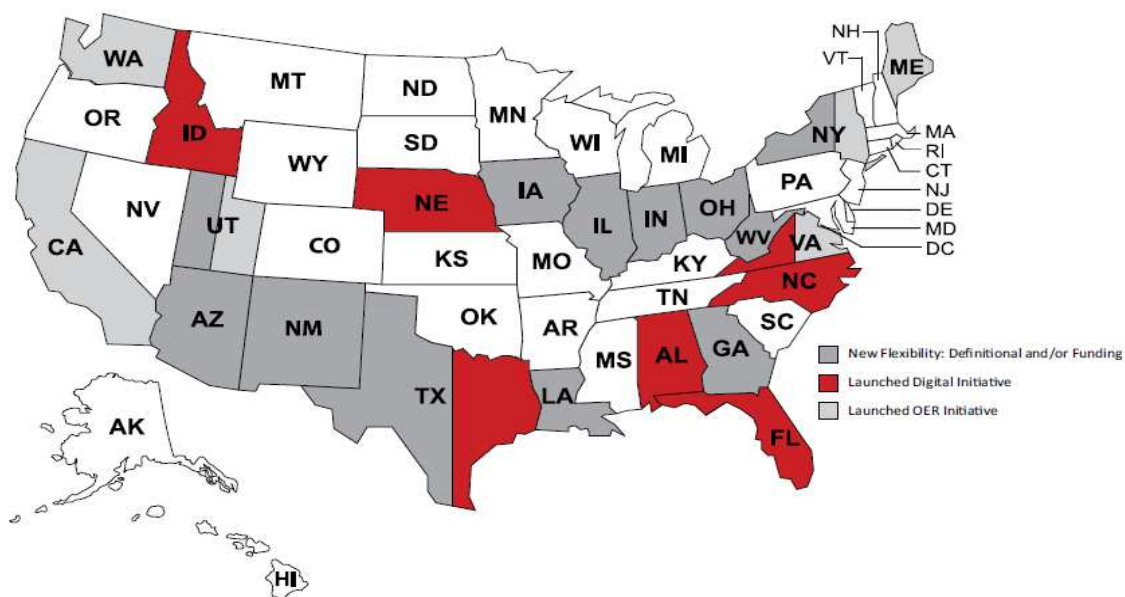
Figure 1. The state K-12 e-textbook policy innovation map. Illustrates the states that have implemented a new definitional and/or flexible funding initiative, launched a digital initiative, or launched an OER initiative. Adapted from Fletcher, G., Schaffhauser, D, & Levin, D. (2012). Out of print: Reimagining the K-12 textbook in a digital age. Washington, DC: State Educational Technology Directors Association (SETDA). Retrieved from http://www.setda.org/c/document_library/get_file?folderId=321&name=DLFE-1598.pdf, p.25.

These attempts vary in degree and specifics, but they all support the progress to include more digital content in K-12 classrooms (Fletcher et al., 2012). An initial move is to embrace electronic resources as a component of the description of textbooks or instructional materials (Fletcher et al., 2012; SETDA, n.d.). Some states have released money to include digital content, in addition to the technology that is essential to make the digital resources accessible or they have proposed improved flexibility to support instructional resources (Fletcher et al., 2012). A few of the states have concentrated on locating OER while other states have made digital content a primary focus to improve

current classroom practices (Fletcher et al., 2012). Ultimately, a variety of policy revisions have been initiated to completely integrate digital content into their instructional practices (Fletcher et al., 2012).

Amending policies concerning instructional resources is not enough to guarantee digital content is integrated into the curriculum and is managed successfully (Fletcher et al., 2012; SETDA, n.d.). When making the change to electronic educational resources, states and districts must implement a plan that will provide a reliable Internet, infrastructure, and continuous financial support for the devices that are needed to allow students to take full advantage of the digital content that is available (Fletcher et al., 2012; SETDA, n.d.). These devices should also be adaptable for other educational purposes such as: instruction, assessment, access to online learning environments, and administrative operations (Fletcher et al., 2012). Policies and practices need to be developed that will encourage the use of electronic resources and devise programs and enticements to promote its utilization (Fletcher et al., 2012; SETDA, n.d.). Districts must offer options for continued professional development together with online collaborative learning communities to exchange ideas on best practices (Fletcher et al., 2012; SETDA, n.d.). Colleges of education need to adopt teacher preparation programs to train educators on the proper use of digital content (Fletcher et al., 2012). Digital content should be licensed to intellectual property and reuse rights while taking advantage of its flexibility, sharing, and customization capabilities (Fletcher et al., 2012). Districts should provide quality control and a usability structure to provide easy access to the digital content that can be used in a variety of circumstances so teachers can prepare personalize lessons for

their classrooms (Fletcher et al., 2012). A strong state and local leadership commitment is needed to provide a vision and the support to facilitate a successful implementation strategy (Fletcher et al., 2012).

Using the knowledge of states and districts exceeding in this endeavor, SETDA proposed recommendations for K-12 state and local leaders, publishers, and policymakers to: devise a plan to implement the change from traditional printed textbooks to digital materials no later than the 2017-2018 school year. State and local leaders should develop a lucid vision and strategic plan to implement the transformation to digital and open access content that takes into account its flexibility, quality, and usefulness and clearly communicate that vision to all their school administrators, teachers, technology companies, publishers, and educational and local communities (Fletcher et al., 2012; SETDA, n.d.). This plan should be structured to minimize pointless regulations and endorse supportive strategies to take advantage of all procedures for the development, attainment, and use of instructional resources (Fletcher et al., 2012). States and districts should increase flexibility of funding to invest in infrastructure and acquire productive collaborative student technological devices to sustain the change from printed text to digital content to support instruction, assessment, professional training, and administrative operations (Fletcher et al., 2012). State and local leaders must identify and distribute efficient performance standards on how to make the transformation from printed textbooks to digital ones, including teacher training and support (SETDA, n.d.). SETDA recommends that all stakeholders collaborate to establish different, adaptable

models for the design, purchase, circulation, and use of digital content within the next five years (Fletcher et al., 2012).

The National Education Technology Plan of 2010 advocated for the integration of innovative technologies that is used in our daily lives to be utilized in the classroom to enhance student learning, accelerate best practices, and to collect and use information that can aid student achievement (U.S. Department of Education, Office of Educational Technology, 2010). The Plan promoted the use of emerging technologies to inspire and motivate learners to achieve success in school. It supported the use of technology for educators to access resources, use data to assess student development, and promote authentic and meaningful learning experiences for all students. The National Education Technology Plan declared that technology-based learning and assessments will be essential in improving teaching and learning practices, in addition to enhancing the educational system in general. Innovative technologies can be used to encourage and inspire students regardless of their socioeconomic backgrounds, culture, or ethnic origin (U.S. Department of Education, Office of Educational Technology, 2010).

These technologies can be further used to assist teachers to collaborate with each other to develop effective learning strategies and enhance their own professional development (U.S. Department of Education, Office of Educational Technology, 2010). Technologies can be used to assist teachers and students to develop options to engage learning through personalized learning goals and interests in individual or group settings (U.S. Department of Education, Office of Educational Technology, 2010). Innovative technologies can be used to connect professional specialists across disciplines,

community partners, parents, peers, and educators (U.S. Department of Education, Office of Educational Technology, 2010).

Rogers (2003) would have considered state and local leaders as *change agents* who would help to initiate reform on the part of its constituents and establish an information exchange. Change agents diagnose problems, establish relationships, and translate change into action (Rogers, 2003). Rogers thought that change agents could help to create intent to change a specific behavior or introduce a new innovation and assist in its adoption and implementation. Diffusion theory plays a major role in the adoption of an innovation for the reform to be adopted and sustained. This can be accomplished by connecting the organization to the community, keeping stakeholders informed of organizational changes, establishing a vision and culture, acquiring leadership approval and acceptance, recognizing the importance of professional learning communities, and acknowledging the individual diversity of adopters.

Advantages

There are many advantages cited in the literature regarding e-books. Zimerman (2011) stated that e-books are an appealing technology that has enormous possibilities for the future of book publishing. E-books present tremendous opportunities for a paradigm shift in the teaching and learning process and offers unlimited prospects for academic libraries (Zimerman, 2011). The advantages to libraries are the elimination of processing costs, shelving, storage requirements, and physical book circulation (Romero, 2011). Additionally, there is no threat due to lost, stolen or damaged books (Romero, 2011). Specific licensing agreements provide concurrent access to frequently used titles

(Romero, 2011). E-books also provide libraries with a wider selection of resources in specific disciplines and access to out of print titles (Vassiliou & Rowley, 2008). Another advantage related to using e-books is convenience when compared to traditional books; e-books are easier to locate and purchase (Volokh, 2010). E-readers also make it easier to read other material such as digitized national and international newspapers, and magazines (Volokh, 2010).

Gibson and Gibb (2011) evaluated a variety of second-generation e-book readers in order to establish which devices appealed most to the user, in regards to functionality, technical, physical attributes, and acceptance. The researchers found out that e-ink reduced glare and increased screen quality. In addition, Gibson and Gibb (2011) discovered that some people felt that e-books benefitted the environment. Other advantages of e-books may include: customizable features and greater distribution (Buzzetto-More et al., 2007).

Petrides et al. (2011) felt that e-textbooks offered instantaneous updates, mobility, were environmentally friendly, and lessen students' book load. Volokh (2010) stated that digital books can be easily updated and edited, digital books can be made interactive, and provide study guides for student use. Romero (2011) posed that the content of e-books is mobile and can be effortlessly retrieved by using popular web browsers. Volokh (2010) asserted that digital resource materials are more accessible. Ever since social networking has become very popular, interfacing with other users can be accomplished with the development of chat and discussion tools online (Romero, 2011). Hoseth and McLure

(2012) stated convenience as a key advantage. Thus, a major advantage of digital content is its flexibility (Fletcher et al., 2012).

<div align="center">**Challenges**</div>

The arrival of the e-textbook has presented four noticeable challenges: technical compatibility with already existing technical environments, protection of intellectual property, continuance of use, and establishing meaningful relationships between digital content and instructional goals (Chesser, 2011). These issues will be addressed in detail in the following sections.

Technical Compatibility with Existing Technical Environments

Barron's (2011) study involving e-readers in the college classroom discovered that even though e-readers are becoming increasingly popular in the consumer market, it has been sluggish being adopted in academic institutions due to its inconsistency in format, font variations, and lack of standardized page formats exhibited in traditional printed books. Barron's study revealed that college students felt that even though the Kindle was able to accommodate PDF files many of the e-reader functionalities were lost such as extensive annotations and highlighting and text-to-speech functionalities, making them inaccessible to students with disabilities. Other disadvantages noted were the inability to flip through content, the inability to sway between two different texts, text resizing, and inconsistencies across devices (Barron, 2011). Gibson and Gibb (2011) stated that some students still preferred traditional books when reading stories and that the cost of replacing e-reader devices and limited battery life as significant disadvantages.

Hoseth and McLure (2012) felt that the challenges being faced by e-book technology that needed to be resolved is the need to print electronic documents when the length of text is a consideration, to return to the text to annotate or highlight at a later time, to allow concurrent access by multiple users, and the variance in appearance and functionality of e-books on different devices. They also felt that reading text on a screen had been noted to be uncomfortable and caused eyestrain.

Fedigan (2011) declared that the design issues found in e-books also present a problem mostly with *design*, *legibility*, and *readability*. Fedigan defined design as the process of printing type, images, and structure; legibility as the quality of the font design; and readability as how the font is set and positioned on the page. The researcher stated that one element that is missing in an e-book is the two-page layout; in addition to the inability to read a book randomly because an e-book only uses word and chapter search capabilities. Roskos, Brueck, and Widman (2009) discussed e-book design as a learning and instructional tool that can facilitate knowledge and cognitive development; however, they concluded that e-book design needed to concentrate on e-book functionality that focus on engagement to support literacy, cognitively and emotionally.

Protection of Intellectual Property

Baker's (2010) research evaluating the readability of text displays on e-book readers and small screen digital devices revealed that DRM issues provided noteworthy challenges that hindered e-book formats to be available on all readers. DRM is a common term that refers to the technology that permits rights proprietors to dictate access to and the treatment of digital resources by placing prearranged limitations on how specific

media files can be used (Baker, 2010). DRM can determine how a media file can be copied, remain on a computer, shared, or modified (Baker, 2010). Trivedi (2010) asserted that consumers do not own the file; they just purchase a right to access a copy of the file. DRM and illegal access to content is still a major concern regarding e-book usage in education (Rockwell, 2011).

Vassiliou and Rowley (2008) pointed out some other disadvantages of e-readers that involved: lack of formal standardized interfaces, limited quantities of e-books in all content areas and languages, and DRM features that may limit users from sharing, e-mailing, and printing e-book content. Aptara Corporation (2011) stated that content format, device compatibility issues, distribution channel issues, quality of the converted content, DRM, and the total cost of e-book production as the greatest challenges facing the e-book publishing industry. Nawotka (2008) also posed copyright infringement, standardization of formats, evolving technology, and payment for intellectual property as major concerns facing e-books.

According to the American Library Association (1996-2013), DRM is not the major concern relating to e-books, but the business models associated with them. DRM has created major challenges for libraries and schools by restricting their capability to fulfill the information requirements of their patrons and their communities in numerous ways by: restricting the secondary transfer of publications to their users, implementing a *pay-per-use model* to distribute information, imposing time restrictions or other restrictions of use that inhibit maintaining and archiving information, and removing *fair*

use and other exceptions in Copyright Law that supports education, assessment, and research (American Library Association, 1996-2013).

Continuance of Use

Alkadi (2009) stated that the lack of tactile capabilities associated with printed text such as the feel and smell of a printed book and limited battery life of e-readers are to be considered the limitations of e-books. Buzzetto-More et al.'s (2007) study with students from University of Maryland Eastern Shore (UMES), a historically Black college, suggested that users with lack of experience with e-readers did not feel comfortable using them and they would not continue to use them after the pilot.

Establishing Meaningful Relationships between Digital Content and Instructional Goals

Behler and Lush's (2011) study concluded that e-readers have not been perfected to support the features and capabilities that are needed in an academic environment. Search capabilities, highlighting, ease of use, compact, lower costs for books, and bookmarking are all notable features, but they have limited features that would not enable visually impaired or difficulties with dexterity to operate the e-reader effectively. Volokh (2010) and Fedigan (2011) voiced another disadvantage; stating that e-textbooks diminished the dimension of illustrations and pagination; e-readers do not include the equivalent page number as the printed books, which presents problems when citing information. Another major issue involving the use of e-books is adapting to a changing reading environment that may provide an extensive learning curve for some users (Hoseth, & McLure, 2012). Other challenges faced by e-books are: cost of e-book

readers; technical difficulties, refusal to accept modified reading habits, lack of familiarity with hardware and software, and licensing fees incurred by libraries (Romero, 2011). In addition, there are difficulties that have materialized with digital content development to establish a meaningful relationship between the digital tools and instructional goals (Chesser, 2011).

Many of the e-book issues relating to screen size, battery life, readability, slow page turning, and compatibility between devices that are being mentioned in the research conducted prior to this study have been resolved with the new generation of e-book readers that are still continuing to evolve (Buzzetto-More et al., 2007). Ruecker and Uszkalo (2007) also stated that many of the issues related to design features that were presented in this study regarding highlighting, navigation, layout, bookmarking, title page, table of contents, two-page layouts, and search ability have been addressed in current generations of e-books and e-book readers.

The purpose of these studies was to illustrate how the 22 adopting states are viewing and utilizing e-textbooks in their own school systems. These studies also reveal the advantages and disadvantages relating to the implementation of digital content in K-12 learning environments, which could cause members of a social system to accept or reject e-textbook technology. This analysis also permits a look at both sides of the argument to obtain a clear view from different perspectives and to provide information so that state educational technology directors can formulate an opinion or re-examine their outlook concerning this innovative technology and make informed decisions regarding e-textbook adoption in their own school districts.

Diffusion of Innovation Theory

The three major reasons for an innovation to be adopted are compatibility, relative advantage, and complexity (Rogers, 2003). According to Rogers, an adopter must believe that the innovation is compatible with their ideas and values. With e-textbook technology, it must be compatible with local and state performance standards. The second factor is that the adopter must feel that there is a relative advantage; meaning that the user perceives the adoption to hold more advantages than disadvantages (Rogers, 2003). Therefore, e-textbooks should serve as a supplement to the classroom instruction and should apply to real world situations. The third factor associated with the adoption of an innovation is its complexity (Rogers, 2003). Ease of use is a crucial element for an innovation to be adopted because it should be able to be used by a diverse population and cater to all types of learners needs (Kelley, 2011).

Baker (2012) discovered that the participants' attitude towards reading on electronic devices may slow their adoption of that particular technology. Chan (2010) stated that technology diffusion is based on its availability, portability, affordability, and appropriateness for reading and writing in an educational environment. He stated that in order for a technology to be adopted, it had to reach some level of maturity. Whereas, availability concerns are the forerunner of any adoption movement, the permanence of the innovation directs the speed of adoption of an innovative technology (Chan, 2010). Chan posed that the solidity of the innovation reveals how directly the innovation complements consumer beliefs. If the innovation aligns with the user's values and practices, than it will have a greater rate of adoption (Chan, 2010).

Compatible innovations are accepted extensions of practices that have proven to be an improvement over a previous practice, which indicates how quickly an innovation is adopted while irregularity leads to rejection (Rogers, 2003). Chong, Lim, and Ling (2009) felt that student preference and acceptance of e-books will impact the success of its adoption. The researchers discovered that ease of use is associated with its ease of navigation and searching capabilities. Chong et al. also argued that the appearance of the e-book will be related to e-book adoption. Houston (2011) stated that the incompatibility between e-reader devices have contributed to the slow adoption of e-readers in education.

DeFosse (2012) stated that e-book technology is so new that people are only beginning to adapt to the technology, which explains its slow rate of adoption by the vast majority of society. DeFosse stated some reasons for usage as: portability, convenience, instant access, and availability. However, many readers still reject e-books because they like the ability to turn pages manually; also users like the feel, look, touch, and smell of traditional printed books, which is not a component of e-book technology (DeFosse, 2012), which could contribute to the slow adoption of e-books.

According to Fletcher et al. (2012) and SETDA (n.d.) there are numerous reasons for the late adoption of e-textbooks in K-12 education: first, state regulations and guidelines have not kept up with the advancement in technology or the benefits of using technology in education. Second, selection of content frequently transpires in such a way that it deters numerous publishers from competing in the education market, thus reducing the number of resources that could be used successfully by educators and students (Fletcher et al., 2012; SETDA, n.d.). Third, there is insufficient access to technical

support and technology in homes and schools for a balanced shift to digital content at state and district levels (Fletcher et al., 2012; SETDA, n.d.). Fourth, the commerce paradigm for the development, purchase, allocation, and use of educational resources in K-12 education is antiquated and has become an obstacle to innovation (Fletcher et al., 2012; SETDA, n.d.). Fifth, current teacher professional training programs are inadequate in numerous preparatory teacher college programs (Fletcher et al., 2012; SETDA, n.d.). Sixth, given the changeability of resources accessible on the Internet, there is an opinion that the information available is inferior in quality to print content (Fletcher et al., 2012; SETDA, n.d.).

As society moves forward into the 21st century, an innovative-decision process will take place, which will cause individuals to acquire information about an innovation, to develop an opinion about the innovation, make a decision whether to accept or discard it, apply the innovation, and finally to endorse the decision to adopt the idea (Rogers, 2003). To determine if innovations will be used in an educational environment, an innovation-development process must take into account the activities, decisions, and outcomes that resulted from recognizing a problem, conducting research, developing solutions to determine if the innovation was accepted and at what cost (Rogers, 2003). Change agents will play a major role in the transition to the new system (Rogers, 2003). Their function will be: to cultivate a desire to shift to the new system, to create an conversation to exchange information among the membership, to detect problems, to initiate an objective to change behaviors in the membership, to convert plans into actions,

to stabilize adoption and avoid rejection, and to establish a permanent relationship with its membership (Rogers, 2003).

E-book technologies fit into Rogers (2003) diffusion theory where an innovation is conveyed through specific channels by members of a specific communal group. Rogers stated that communication is a process that allows people to collaborate and exchange information in order to reach a level of mutual understanding about a specific message. These communication channels are important because it allows members of a specific group to exchange knowledge, which may enable individuals to formulate and change attitudes towards a specific innovation, idea, or practice (Rogers, 2003). People must realize the comparative benefit for accepting an innovation as better than the beliefs that preceded it in order for it to be accepted (Rogers, 2003). Rogers asserted that the level of acceptance may be revealed in monetary situations, but social status factors, straightforwardness, and performance are also important motives. Norms or traditional behavior patterns are designed for the members of a social system that describes a variety of acceptable behaviors and provides guidelines for the members to follow (Rogers, 2003). The norms of a system advise individuals on what activities they are expected to perform. Adoption of this new technology will be determined by its compatibility with the existing values, past experiences, and needs of the potential members (Rogers, 2003). Rogers has expressed the movement of how innovations evolve and the stages that transpire to get members of a group to adopt certain innovations that would better their current situation and empower them to engulf change. His modeling illustrates how innovations tend to diffuse pursuing an S-curve of adoption.

Rogers (2003) described a social system as a collection of interrelated elements that may consist of individuals, organizations, and/or subsystems who are involved in resolving problems to achieve a common objective. This is one of the primary objectives of working in groups for the purpose of learning problem-solving and critical thinking skills. These skills will be essential to be a productive citizen in this global society.

Rogers' diffusion of innovation theory posed that a change agent can be an influential force in the implementation of new technologies. This complies with my research on the adoption of innovative theories in the transformation of the educational system where technologies can be used as motivational tools to enhance meaningful learning with students. These instructional tools can be utilized to help learners develop critical thinking and problem-solving skills, which are essential in the emerging global marketplace. They can be used to differentiate instruction and reach learners with multiple learning styles.

Research Method

This study used a basic interpretive qualitative methodology to interpret the experiences of the state educational technology directors to understand why their states have not adopted e-textbooks as a replacement for traditional printed textbooks. The Delphi method of inquiry was used for data collection and analysis. These methods will be addressed in detail in the following sections.

Basic Interpretive Qualitative Study

According to Merriam (2002), "Basic interpretive qualitative studies can be found throughout the disciplines and in applied fields of practice. They are probably the most

common form of qualitative research found in education" (p. 38). A basic interpretive

qualitative study was an appropriate methodology to use to answer the research question

as to why have a large majority of state educational technology directors not adopted e-

textbooks as a replacement for traditional printed textbooks, because its main goal was to

determine and interpret these individuals' experiences (Merriam, 2002) concerning e-

textbook technology. Qualitative research is ideal when it comes to investigating this type

of complicated question (Trochim, 2001).

Creswell (2007) defined qualitative research as:

an inquiry process of understanding based on a distinct methodological tradition

of inquiry that explores a social or human problem. The researcher builds a

complex, holistic picture, analyzes words, reports detailed views of informants

and conducts the study in a natural setting. (p. 249)

Creswell (2007) also stated "Qualitative research begins with assumptions, a worldview,

the possible use of a theoretical lens, and the study of research problems inquiring into

the meaning individuals or groups ascribe to a social or human problem" (p. 37). The

primary objective of a basic interpretive qualitative study is to reveal and decipher how

individuals interpret their experiences (Merriam, 2002).

This qualitative study was conducted in a natural setting; I collected the data,

observed behavior, and interviewed the participants (Creswell, 2007; Merriam, 2002). I

used multiple data sources and inductive data analysis to interpret the participants

meaning of the problem (Creswell, 2007; Merriam, 2002). I examined the problem

through a theoretical lens; identified the historical, social, or political circumstances

involved; and provided a holistic account of the issues (Creswell, 2007). Qualitative data

analysis are inductive, which helped to identify recurring patterns and common themes

(Creswell, 2007), this assisted in arriving at an explanation of why an innovative

technology that can impact teaching, learning, and creative analysis is not widely used in

a K-12 learning environment. I served as the key instrument in the study by designing the

questionnaire and collecting the information (Creswell, 2007; Merriam, 2002). By using

multiple sources of data, I was able to examine the evidence, organize the information

into categories or themes so that I could interpret the participants meaning regarding the

problem (Creswell, 2007; Merriam, 2002). In addition, I developed a plan that was

flexible enough to accommodate changes that occurred during the data collection process

(Creswell, 2007). Also, I conducted an interpretive inquiry, whereby the participants and

my explanations were examined to determine a broader explanation for the late adoption

of e-textbooks in K-12 education (Creswell, 2007).

Qualitative research has a unique significance when examining a complicated

topic. This research method excels at producing detailed information, which requires

organization in order to provide a narrative to formulate a consensus from the

participants' perspective (Trochim, 2001). The objective was to present the views of the

state educational technology directors' perspective as to why their state has not adopted

e-textbooks as an alternative for conventional printed textbooks in their K-12 educational

environments. It also helped me formulate a deeper understanding of what these

individuals thought about this issue without the use of numerical data (Trochim, 2001).

Trochim (2001) recommended using qualitative research when establishing new theories

and hypotheses. In addition, Merriam (2002) wrote, "[qualitative] research is designed to uncover or discover the meanings people have constructed about a particular phenomenon" (p. 19).

Delphi Method

The Delphi method was developed by Norman Dalkey at the RAND Corporation in Santa Monica, California, in the early 1950s (Skulmoski, Hartman, & Krahn, 2007). The RAND researcher considered the use of expert panels to focus on predictions to resolve problems primarily with the military and potential political issues (Skulmoski et al., 2007). The Delphi method is commonly used as an established technique for collecting information from specialists within their field of proficiency (Skulmoski et al., 2007). The technique is intended to be used as a group communication exercise with the intention of capturing a consensus of views on a particular real-world topic (Hsu & Sandford, 2007). The Delphi method is a repetitive procedure used to gather and refine the unidentified opinions of specialists using a sequence of informational compilations and examination practices combined with comments (Skulmoski et al., 2007). The Delphi method is appropriately suited as a research methodology when there are limited facts available about a trend or problem (Skulmoski et al., 2007). Hartman (1981) stated that the Delphi method was designed as a consensus building model to be used for short range conflict resolutions. Hartman also stated that the Delphi method is an effective forecasting instrument that is deemed useful in long-range educational planning. Rowe and Wright (1999) similarly stated that this technique is being widely used in the field of education. In this study, the Delphi method of inquiry was used for data collection and

analysis. The Delphi method was chosen because this study involves e-textbooks, which is an emerging innovative technology with limited information available in the existing literature to explain its late adoption in K-12 educational environments.

Conclusion

Most of the studies available in the literature involved college professors and their students. These studies were directed at attitudes towards e-textbook technologies, experiences with e-textbooks, format, and usage more as a critique of the functionalities and ease of use. These studies appeared to be directed at publishers concerning the expectations of students and college professors to advance the technology to make it more beneficial for academic use. Studies in the K-12 sectors were limited in scope and availability. The studies related to K-12 educational environments showed promise for this innovative technology as an educational tool that could support learning, motivate reading, improve reading comprehension and vocabulary, provide a new way to access information, and to construct ideas and knowledge without stifling creativity. The American educational system still has not made significant advances towards transitioning from traditional printed textbooks to digital content.

Innovative techniques are needed in the teaching and learning process to engage and motivate students in their acquisition of knowledge. This philosophy is essential in education reform as researchers and educators move into a world that is technologically driven. Employers are seeking workers that possess communication, collaborative, innovative, critical thinking, and problem-solving skills. In this new globalized society workers need to be self-directed and diverse if they are to be able to compete in the

global marketplace. Educational systems need to be preparing students to meet these needs, if they are to survive and be productive citizens. All of these skills can be acquired with innovative teaching strategies and the use of technology. These strategies concerning the use of emerging technologies in the classroom curriculum will be useful in the reformation of the educational system. These tools will better prepare learners to become digital literates in a technological-driven society. These reform techniques will be invaluable when students join the global market and are essential instruments in the teaching and learning process. The research disclosed that use of technological tools such as e-textbooks can be used effectively to help students access and process information while developing problem-solving and critical thinking skills. However, these studies revealed a gap in the literature due to the lack of sufficient research relating to the diffusion of e-textbook technologies and an explanation for their slow rate of adoption in K-12 education.

Current Trends

Currently, large publishers such as Pearson MyLabs, Cengage Brain (formerly iChapters), McGraw-Hill Create and Connect, WileyPLUS and Wiley Desktop Editions, Elsevier Health Pageburst, and Macmillan Dynamic Books are all developers of interactive, media based e-textbook products (Chesser, 2011). The benefits cited by publishers are to eliminate expensive warehousing, wood pulp, print, and diesel fuel costs (Chesser, 2011). VitalSource, CourseSmart, CafeScribe, and Barnes and Noble's Nook Study are also sources for e-textbooks for higher education courses (Chesser, 2011). The largest vendors of e-books are NetLibrary, EBSCO, Ebrary, Knovel, Safari, Books 24 x

7, and Gale (Wicht, 2006). Another source for e-book access is digital learning object repositories such as Merlot (Multimedia Educational Resources for Learning and Online Teaching), Teach IS, Informing Science Learning Object Repository, California Virtual Campus Object Library, PENDOR (Pennsylvania Education Network Digital Object Repository), Wisc-Online, EdNA, and Careo, all serve to promote and distribute the sharing of learning objects among educators (Buzzetto-More et al., 2007).

This chapter included a detailed review of the literature related to e-books in general and more specifically to e-textbooks in the past five years. It began with an overview of the current trends regarding the use of e-books, followed by a comprehensive discussion focused on the elements concerning e-books in education. State initiatives that are embracing the adoption of e-textbook technologies for the 21st century learner were also described. In addition, the advantages and challenges being faced by e-books was discussed. This discussion was followed by a literature review of diffusion of innovation theory, the qualitative research model used in this study, the Delphi method, and their current relationship with e-textbooks. Current trends were also presented.

Chapter 3 will provide an extensive discussion on the Delphi methodology that was used to collect the actual data and analyze the results of this study.

Chapter 3: Research Method

In this chapter, the Delphi method will be presented as a strategy to determine the causes for the slow rate of adoption of e-textbooks in K-12 education. The qualitative research model will be summarized and the framework will be explained and rationalized. The specifics associated with the selection of the panel of experts will be discussed. The ethical procedures taken to protect the identity of the participants will be described. The data collection and data analysis processes will be clarified. This chapter will conclude with a discussion of the procedures taken to enhance the reliability, validity, accuracy, and consistency of the research.

Qualitative Research Model

The purpose of this study was to understand the reasons for the slow rate of adoption of e-textbooks in K-12 education. A basic interpretive qualitative study was an appropriate methodology to use to understand why a large majority of state educational technology directors have not adopted e-textbooks as a replacement for traditional printed textbooks. In this scenario, I was interested in comprehending how state educational technology directors interpreted this phenomenon. So, a basic interpretive qualitative study was used to interpret these individuals' experiences. Also, basic interpretive qualitative studies are the most conventional method of qualitative research used in education.

Research Design

This study was driven by the following question: Why has your state not adopted e-textbooks as a replacement for traditional printed textbooks? The Delphi method was

selected for this study because it involves e-textbooks, which is an emerging innovative technology with limited information available in the current literature to explain the late adoption of this technology in an educational setting. As a result, the reasons for its late adoption were not clearly known nor were they clearly identified or assessed. Because e-textbooks are not currently being widely used in K-12 educational environments, the Delphi method was selected to understand reasons for their lack of use. As I anticipated acquiring a deeper understanding of the related issues that hindered the adoption of innovative technologies in K-12 educational environments, a diffusion of innovation methodology within a Delphi inquiry model provided a suitable framework for this analysis.

The Delphi method of inquiry was suitable for written responses to a questionnaire, whereby the respondents would arrive at a consensus for the late adoption of e-textbooks in K-12 education. The characteristics of the Delphi method include the following: the anonymity of Delphi respondents, which permits them to freely articulate their views without any unnecessary group pressures, the repetition of rounds permits the members to change their opinions without losing validity, controlled feedback notifies the members of the other participant's opinions, which provides them with an opportunity to change their views, and a statistical summary of the members answers provides an opportunity for analysis and explanation of the collected data (Hsu & Sandford, 2007; Rowe & Wright, 1999; Skulmoski et al., 2007). Skulmoski et al. (2007) suggested two or three iterations when using a homogenous group to obtain effective results. As this was a

homogeneous group consisting only of state educational technology directors from the

non-adopting states, I used three iterations in this study.

I met these requirements by integrating the following procedures into the research

design: maintain the anonymity of each of the Delphi respondents by sending out each

questionnaire individually and not including the names of the other participants on the e-

mails for any of the three rounds of the Delphi questionnaire (See Appendices B, C, and

D). This helped to eliminate any group pressures from any domineering personalities, so

that each individual was free to make comments concerning the issues related to e-

textbook technology during the Delphi process and to change their minds based on the

feedback received from the previous rounds. In addition, I did not put the names of any of

the respondents on any of the summarizations or feedback produced from the previous

rounds. Finally, I did not identify any of the participants in the final report.

This Delphi study was conducted online so it did not involve a physical location.

An e-mail message was sent to the panelists, which included a hyperlink to the

questionnaire. The three repetitions of the questionnaire were distributed by means of the

Internet using SurveyMonkey.com. Conducting this study using an online environment

permitted me access to experts who were geographically dispersed. It also permitted the

experts to be able to respond to the questionnaire at their convenience.

To identify the best candidates for this study, I prepared a list of potential

participants from the states that have not adopted e-textbooks to help classify the experts

before selecting them to participate in the study. The list included the names of the state

educational technology directors from the non-adoptive states, their state, and their

contact information. This helped to avoid missing any essential experts that could make a major contribution to the study. These participants were derived from the State Members page listed on the SETDA website and the U.S. Department of Education's Enhancing Education through Technology (Ed-Tech) State Program contacts page. This list was cross tabulated and verified through each state's Department of Education to ascertain the best participant for the study, and then an e-mail invitation was sent out to each potential participant by me to determine if he or she wished to participate (See Appendix E). During the preparation of the potential participants, I discovered that some of these states did not have a designated technology department. It was therefore necessary to call the state department of education for each of the non-adoptive states to verify which person would be their choice as their state educational technology director and was the most knowledgeable about digital technologies as all of the members of SETDA and the contacts listed on the United States Department of Education's web site did not hold the title of state educational technology director.

Table 1

The Delphi Method

Delphi Requirements	Data Collection Protocol
Sample size of 10 to 15 experts in a homogeneous group.	This study used a homogeneous group of 12 experts.
The panel must consist of experts in the field being studied.	State educational technology directors from the non-adoptive states that were knowledgeable about e-textbooks was selected for this study.
The sample cannot be randomly selected.	A purposive sample was used. The participants was selected from states that have not adopted e-textbooks.
The participants must remain anonymous.	An e-mail invitation was sent individually to each of the participants; the names of the other participants was not included on any of the questionnaires, correspondence, or in the final report.
The purpose is to generate a consensus about a real-world topic.	The third and final round of the Delphi generated a consensus explaining why the majority of states have failed to adopt e-textbooks to replace traditional printed textbooks in K-12 education.

Role of the Researcher

Merriam (2002) stressed the main characteristic of a researcher is "to understand the meaning people have constructed about their world and their experiences" (pp. 4-5), "the researcher is the primary instrument for data collection and data analysis" (p. 5), "researchers gather data to build concepts, hypotheses or theories" (p. 5), and the researcher must be a highly qualified communicator who thoroughly describes his or her results about an experience. Creswell (2007) stated that the researcher is the key element in the study; the investigator gathers data by analyzing documents, interviewing participants, and observing behavior. Even though this study was conducted online via e-mail, these qualities were still important to its success. I was totally responsible for the

entire Delphi process, including enlisting the participants, composing the questionnaires, collecting the data, summarizing prior feedback, analyzing the data, and decoding the results. Thorough explanations of the participants' responses were essential to develop ideas and explore various viewpoints about the future of e-textbook technologies in K-12 educational environments.

The basic approach to qualitative research is to avoid researcher bias by guaranteeing thoroughness with methodical and rigorous research design, data collection, analysis, and reporting (Mays & Pope, 1995). Mays and Pope also stated two objectives that qualitative researchers should look to accomplish: to construct an explanation of the methodology and data, which can exist independently so that another skilled researcher could analyze the same data in the same manner and arrive at the same results; and to generate a reasonable and rational account of the experience under examination. Merriam (2002) suggested using triangulation to eliminate bias by using multiple sources of data collection. "The Delphi method is well suited to rigorously capture qualitative data" (Skulmoski, et al., 2007, p. 9) by providing a summary of the responses of the expert panelists in each round, thus eliminating bias on the part of the researcher.

I used these approaches during the research process to guard against researcher bias: triangulation, using the expert panelists to function as diverse data sources; member checking, requesting the experts to respond to the summaries after each round to refine the statements made by the participants; rich thick descriptions taken during the entire research process; bias clarification, I stated any prior experiences, prejudices, and directions that might have molded the progress of the analysis; negative or discrepant

information, I examined opposing opinions from the respondents to acquire diverse

perspectives regarding the late adoption of e-textbooks in K-12 education. Also, I used

peer debriefing, an external auditor throughout the research process, and spent an

extensive amount of time in the field assessing the outcomes of each round of the Delphi

questionnaire.

Access to Participants

I used e-mail to communicate with each participant so selecting a particular

location was not an issue. The e-mail addresses of the state education technology

directors was obtained either from the State Members and Bureau of Indian Education

found on SETDA's website or the U.S. Department of Education's website. The

SETDA's member list can be obtained by choosing a state from the pull down window

and the contact information for the state technology team members are viewed. On the

U.S. Department of Education website, Enhancing Education through Technology (Ed-

Tech) State Program, there is a list of all of the Ed-Tech state contacts categorized by

state.

Participants Selection Criteria

Twelve state educational technology directors from non-adoptive states were

selected for the panel of experts that participated in this study. These participants were

selected from the 28 states that have not adopted e-textbooks in their K-12 educational

systems. Each participant selected had substantial knowledge of e-book technologies,

were in a position of authority who could influence the decision-making process, and

were the most influential when it came to making purchasing decisions when introducing

new technologies into the instructional setting (Baker et al., 2006). I selected the

participants for this study based on the following selection criteria, which was listed on

the E-mail Invitation to Participate in the Online Survey letter:

- The participant was influential when making innovative technology

  purchases.

- The participant had knowledge of e-textbook technologies.

- The participant had time to participate in all three rounds of the Delphi

  questionnaire, which was completed within a 5-week period.

If the person accepted, then he or she were acknowledging that he or she met these

qualifications. An assumption was made that the potential participates had good

communication skills, as they were holding a vital position as a state educational

technology director.

Sampling

The participant selection process should be meticulously thought out to achieve

the best consensus (Rowe & Wright, 1999). Randomly selecting participants for a Delphi

inquiry is not acceptable; the characteristics and experience of preferred respondents

should be acknowledged and a proposal process should be used to choose the most

knowledgeable experts available (Ludwig, 1997). Therefore, the experience and

qualifications of suitable participants should be recognized in the selection process so that

the best respondents are chosen (Skulmoski et al., 2007). The Delphi method required

that all of the individuals chosen to participate in the study were specialist in the

discipline being reviewed. Therefore, I had to determine and select people who were

practicing in their discipline, were recognized as experts in their field, had knowledge of the topic being examined (Skulmoski et al., 2007), and were capable communicators (Ludwig, 1997; Skulmoski et al., 2007).

Delphi is not a procedure intended to challenge statistical or model-based procedures, against which human judgment is generally shown to be inferior: it is intended for use in judgment and forecasting situations in which pure model-based statistical methods are not practical or possible because of the lack of appropriate historical/economic/technical data, and thus where some form of human judgmental input is necessary. (Rowe & Wright, 1999, p.354)

Sampling strategy. This study used a type of purposive sampling, whereby I selected participants who could decisively convey a perception of the research problem and the most important trends concerning the study (Creswell, 2007). The purposive sample was selected from states that have not adopted e-textbooks in their K-12 educational environments. A purposive sample was used because the state educational technology directors from the non-adoptive states that were selected for this study could best answer the research question as to why their states had not adopted this innovative technology in their K-12 classrooms and the challenges that they were encountering regarding its adoption. Skulmoski et al. (2007) stated "there is no "typical" Delphi; rather that the method is modified to suit the circumstances and research question" (p. 5, quotes in original).

According to Skulmoski et al. (2007), the Delphi sample size could fluctuate from a 4 to 171 panel of experts. Rowe and Wright (1999) cited Delphi groups ranging from 3

to 98 experts. Ludwig (1997) suggested using a small sample of 12 to 15. Skulmoski et

al. (2007) also asserted that in a homogeneous group, a smaller sample of 10 to 15

experts could produce satisfactory results. Therefore, as I used a homogeneous group of

experts, my goal was to enlist at least 12 state educational technology directors from the

non-adoptive states to participate in this study to sustain a controllable sample size.

Gordon (1994) stated that the investigator should expect an acceptance rate of

35% to 75% of the enlisted participants. So, initially, all of the participants from the non-

adoptive states were solicited to safeguard against attrition from potential participants

who refused to participate in the Delphi survey, participants who did not qualify to

participate in the survey, and those that dropped out along the way. These 28 potential

participants were solicited with the goal to acquire 12 expert panelists that would qualify

as eligible participants and be available to complete all three rounds of the Delphi study.

If more than the required 12 accepted to participate in the study, then I would utilize all

of the participants just in case some of the participants did not complete all of the three

rounds of the Delphi questionnaire. If less than 12 agreed to participate, then I would

follow-up with a telephone call to inquire why the remaining state educational technology

directors from the non-adoptive states did not accept the invitation. I selected from those

respective states that had not introduced either definitional or funding flexibility,

launched a digital textbook initiative, and/or launched an OER initiative that was

mandated by state legislature (Fletcher et al., 2012) to derive at a consensus as to why

these states have not adopted e-textbooks as a replacement for traditional printed

textbooks.

Data Collection

As the Delphi is frequently distributed through the Internet or e-mail (Wong, 2003), the data collection began by contacting the panelists and conveying all of the instructions via e-mail. Because this study used the Delphi method to collect data, individual e-mails was used to communicate to each of the state educational technology directors. E-mails were sent individually to each of the experts so that their participation in the survey was anonymous to the other participants and their responses remained confidential. The Delphi method necessitates using unidentified questionnaires to collect data (Wong, 2003). By using experts in their field, the state educational technology directors from the non-adoptive states improved the credibility of the study. Anonymous, structured, and well-ordered replies eliminated interference from domineering personalities that would have hindered a true consensus that explained the slow rate of adoption of e-textbooks in K-12 educational systems. By maintaining the anonymity of each of the Delphi participants, the integrity of this study was upheld because the participants were able to be open and honest with their responses.

The online survey service SurveyMonkey.com was used to disperse the questionnaires and gather the written replies so that the participants' identities were safeguarded. SurveyMonkey.com permitted me to devise a simple questionnaire using a Web format. I had two alternate ways to distribute the survey such as emailing a link to each participant or placing a link on an existing web page. In this instance, I chose to e-mail a link to the participant, which was placed in the online e-mail invitation. The participants clicked on the link included in the e-mail, which opened a web page

displaying the research question with directions for the respondents on how to complete the survey. SurveyMonkey.com has an administrator interface that allowed me to download the responses after each iteration. One broad open-ended question was presented in the first round of the Delphi. The second round included summations from the previous round with another open-ended question based on the responses from the previous round. I submitted this questionnaire, when it was created, to the IRB for review before the commencement of the second round. The third round included summations from the previous rounds and an opportunity for the respondents to assess their agreement with the final consensus. I submitted this questionnaire, when it was created, to the IRB for review before the commencement of the third round. The data were gathered for each round over a 2-week period using the online survey. The first week was used to receive the responses from each of the participants and the second week was used by me to categorize the various themes that developed from the experts' opinions.

In the case of late responses, I sent a second request via e-mail to any participant who had not responded to the Delphi questionnaire after the 1-week period. According to Okoli and Pawlowski (2004) non-response is normally very low in Delphi studies because the majority of investigators have directly acquired guarantees of participation from the expert panelists. Comparable to non-response, attrition has a tendency to be small in Delphi studies because the investigator can generally determine the reason for the lack of participation by speaking directly to the non-responders as their identities are known to the researcher (Okoli & Pawlowski, 2004).

Table 2

Data Collection

Steps	Data Collection Process	Timeframe
1	E-mails were sent individually to each of the experts so that their participation in the survey remained anonymous to the other participants and their responses remained confidential.	Steps 1, 2, 3, and 4 ran concurrently and took two weeks to complete; one week to receive the response and the second week to analyze the response and to write the summations for the next round.
2	The online survey service SurveyMonkey.com was used to disperse the questionnaires and gather the written replies so that the participants' identities were safeguarded. SurveyMonkey.com permitted me to devise a simple questionnaire using a Web format.	Steps 1, 2, 3, and 4 ran concurrently and took two weeks to complete; one week to receive the response and the second week to analyze the response and to write the summations for the next round.
3	I e-mailed a link to the participants, which was placed in the online e-mail invitation. The participants clicked on the link included in the e-mail, which opened a web page displaying the research question with directions for the respondents on how to complete the survey.	Steps 1, 2, 3, and 4 ran concurrently and took two weeks to complete; one week to receive the response and the second week to analyze the response and to write the summations for the next round.
4	SurveyMonkey.com has an administrator interface that allowed me to download the responses after each iteration. One broad open-ended question was presented in the first round of the Delphi.	Steps 1, 2, 3, and 4 ran concurrently and took two weeks to complete; one week to receive the response and the second week to analyze the response and to write the summations for the next round.

(table continues)

Steps	Data Collection Process	Timeframe
5	The second round included summations from the previous round with another open-ended question based on the responses from the previous round. The questionnaire, when created, was submitted to the IRB for review.	This step took two weeks to complete; one week to receive the response from the participant and the second week to analyze the response and to write the summations for the next round.
6	The third round included summations from the previous rounds and an opportunity for the respondents to assess their agreement with the final consensus. The questionnaire, when created, was submitted to the IRB for review.	This step took two weeks to complete; one week to receive the response from the participant and the second week to analyze the responses.
7	The data were gathered for each round over a 2-week period using the online survey. The first week was used to receive the responses from each of the participants and the second week was used by me to categorize the various themes that developed from the experts' opinions.	This step took two weeks for each round; one week to receive the response from the participant and the second week to analyze the response (See steps 1 through 6).
8	In the case of late responses, I sent a second request via e-mail to any participant who had not responded to the Delphi questionnaire after the one week period (See Appendices B, C, and D).	This step ran concurrently with the second week when I was analyzing the responses that were received from the participants. If a response was not received by the end of the second week from the late responder then I considered this participant as a non-response.

Questionnaire Design

The first round of the Delphi questionnaire was comprised of only one broad open-ended question (See Appendix B): Why has your state not adopted e-textbooks as a replacement for traditional printed textbooks? The expert panelists responded with a thorough, yet concise answer to the question based on their professional knowledge, opinion, and experience. The data collected from the first round consisted mainly of qualitative written responses received from the state educational technology directors. I analyzed the data collected from the first round. The responses were coded and turned into further questions based on the themes derived from the participants' responses. (See Appendix C). The written replies from the second iteration were gathered from the panel of experts by me. These responses were analyzed and coded to formulate the summaries for the third and final round. The third and final round required the panelists to assess their degree of agreement with the consensus from the group and to voice their level of agreement with the final consensus (See Appendix D). The participants were also encouraged to leave additional written remarks connected with the topic presented in each summarization, especially, if there was something that they strongly opposed. Each questionnaire was expected to take 30 minutes or less to complete.

Member checking, asking the experts to respond to summations after each round was used throughout the research process to help moderate researcher bias. Synopses of the preceding iterations permitted member checking because the state educational technology directors from the non-adoptive states confirmed my interpretation of their

experiences. This empowered me to describe accurately the participants' experiences about their reasons for the late adoption of e-textbook technologies in their states.

Data Analysis

After the responses had been collected from each of the three rounds of the Delphi questionnaire, I examined and evaluated the data. I needed to get an overall feel for the data and reflect on its meaning (Creswell, 2007). Merriam (2002) stated "The researcher wants to obtain an in-depth understanding of a phenomenon, an individual, a situation" (p. 19). Creswell (2007) recommended "preparing and organizing data... for analysis, then reducing the data into themes through a process of coding" (p.148). Trochim (2001) described coding as "a process of categorizing qualitative data and describing the implications and details of these categories" (p. 160). I devised a coding system that interpreted the information being collected following each iteration of the Delphi questionnaire. Next, I interpreted the data by reducing the data into significant sections and assigning names to the sections, merging the codes into larger categories or themes to establish relationships between the themes (Creswell, 2007).

"In open coding, the researcher forms categories of information about the phenomenon being studied by segmenting information" (Creswell, 2007. p.67). According to Trochim (2001), open coding is "… where you consider the data in minute detail while developing some initial categories" (p. 349). Merriam (2002) stated "open coding identified and developed concepts in terms of their properties and dimensions" (p. 148). Merriam recommended "Grouping the code words around a particular concept in the data, called categorizing" (p. 148). After each of the three rounds, I used the open

coding approach to classify and develop categories that were associated with particular

ideas that were revealed from the comments made by the expert panelists to establish

relationships and to assess the data from a different perspective. The purpose was to

formulate new interpretations from the data.

After the categories and subcategories were established, I used axial coding to put

the components back together again to develop new categories. Creswell (2007) stated

"In axial coding, the investigator assembles the data in new ways" (p. 67). Merriam

(2002) defined axial coding as putting "data together in new ways by making connections

between a category and its subcategories to develop several main categories" (p. 148).

The results of the coding process resulted in thematic categories that clarified how

the participants repeatedly handled the problem (Merriam, 2002). The responses

generated from the first round of the questionnaire determined themes that structured the

questions in the second round of the Delphi questionnaire. Also, after the first and second

rounds, the participants received summations derived from the comments collected from

the previous rounds from me, which helped to influence the participants' responses in the

next iteration of the survey. Subsequently, the categories derived from the third and final

round of the questionnaire formulated the final consensus, which was assessed to

formulate the basis for a substantive theory, which described "an interrelated set of

categories grounded in the data that emerged from the constant comparative coding and

analysis procedures" (Merriam, 2002, p. 151). At that point, I had a "well-considered

explanation for some phenomenon of interest" (Trochim, 2001, p. 160-161), which in this

case was an explanation as to why e-textbooks have not been adopted by the state

educational technology directors in their states. This explanation could then be

transferred to draw inferences about other future occurrences, which is the objective of a

Delphi study.

During the course of the study I used memoing "a process for recording your

thoughts and ideas as they evolve throughout the study" (Trochim, 2001, p. 160). This

was done by keeping a log of the key facets that materialize during the course of the

study. This enabled me to supply rich descriptions and thorough explanations of the

entire research process.

Table 3

Analysis Plan

Steps	Analysis Process
1	After the responses had been collected from each of the three rounds of the Delphi questionnaire, I examined and evaluated the data.
2	I devised a coding system that interpreted the information collected following each iteration of the Delphi questionnaire.
3	Next, I interpreted the data by reducing the data into significant sections and assigning names to the sections, merging the codes into larger categories or themes to establish relationships between the themes (Creswell, 2007).
4	After each of the three rounds, I used the open coding approach to classify and develop categories that were associated with particular ideas that were revealed from the comments made by the expert panelists to establish relationships and to assess the data from a different perspective. The purpose was to formulate new interpretations from the data.
5	After the categories and subcategories were established, I used axial coding to put the components back together again to develop new categories.
6	The results of the coding process resulted in thematic categories that clarified how the participants repeatedly handle the problem (Merriam, 2002).
7	The responses generated from the first round of the questionnaire determined themes that structured the questions in the second round of the Delphi questionnaire.
8	After the first and second rounds, the participants received summations derived from the comments collected from the previous rounds from me, which helped to influence the participants' responses in the next iteration of the survey.
9	Subsequently, the categories derived from the third and final round of the questionnaire formulated the final consensus, which was assessed to formulate the basis for a substantive theory, which described "an interrelated set of categories grounded in the data that emerged from the constant comparative coding and analysis procedures" (Merriam, 2002, p. 151).
10	At that point, I had a "well-considered explanation for some phenomenon of interest" (Trochim, 2001, p. 160-161), which could be used to extract inferences about future developments, which is the objective of a Delphi study.

(table continues)

Steps	Analysis Process
11	During the course of the study I used memoing "a process for recording your thoughts and ideas as they evolve throughout the study" (Trochim, 2001, p. 160). This was done by keeping of log of the key facets that materialized during the course of the study. This enabled me to supply rich descriptions and thorough explanations of the entire research process.

One characteristic of the Delphi method was to imply that the respondents share in the role of examiners of the data. This was achieved when I provided feedback in the form of summations of the comments made by the participants in the proceeding rounds. These comments served as a catalyst to influence the participants' answers in the subsequent rounds.

Ethical Protection of the Participants

Upon receiving approval from the Walden University's Institutional Review Board (IRB), I sent out an initial e-mail invitation to each of the participates with an approved Consent form describing the nature of the study, the function of the participant, and the responsibility of the researcher (See Appendix A). Any possible ethical issues connected to this study was nominal. There was no service being rendered, no protected classes, no research sites, and no control group involved in the study (Trochim, 2001) because the study was performed online using the Internet. The panel of experts participated in this study voluntarily; specifically, the participants were not persuaded to partake in this study (Trochim, 2001). Leedy and Ormrod (2005) stated that the participants must be informed of the characteristics of the research being administered and provided an opportunity to accept or reject to participate. Orb, Eisenhauer, and Wynaden (2001) affirmed that the participants should be fully informed so that they can

make a knowledgeable decision that will enable them to willingly accept or refuse to participate in the study. Each participant received a written informed consent regarding the risks and procedures concerning the study (Trochim, 2001).

Credibility, Transferability, Dependability, and Confirmability

Even though the terms reliability and validity are not connected in a qualitative study, like they are in a conventional quantitative study, there are still logical measures that can be taken to increase the value of the research. Trochim (2001) disclosed the "criteria for judging research quality from a more qualitative perspective" (p. 162) as: *credibility*, *transferability*, *dependability*, and *confirmability*. Trochim (2001) also stated "The credibility criteria involve establishing that the results of the qualitative research are credible or believable from the perspective of the participant in the research" (p. 162). Conceivably, credibility of the study was determined by the integrity of the participants, as the participants were highly credible as experts in the discipline under review (Baker et al., 2006). Baker et al. (2006) also stated "within consensus methods of research, especially Delphi panel techniques, the use of 'experts' is fundamental to reliability" (p. 59, quotes in original).

Trochim (2001) stated "Transferability refers to the degree to which the results of qualitative research can be generalized or transferred to other contexts or settings" (p. 162). Trochim (2001) also stated "The qualitative researcher can enhance transferability by doing a thorough job of describing the research context and the assumptions that were central to the research" (p. 162). To validate the transferability of this study, I provided

rich descriptions and thorough explanations of the entire research process in the final report.

Merriam (2002) pointed out "Reliability refers to the extent to which research findings can be replicated" (p. 27). Trochim (2001) stated "The traditional quantitative view of reliability is based on the assumption of replicability or repeatability" (p. 162). In essence, nothing in qualitative research can be measured twice and if something is measured twice, the researcher will be measuring two different phenomena (Trochim, 2001). Therefore, the theory of quantitative reliability can probably be substituted with the theory of qualitative dependability (Wagner, 2008), which "emphasizes the need for the researcher to account for the ever-changing context within which research occurs" (Trochim, 2001, p. 163). Trochim (2001) also stated

> The idea of dependability … emphasizes the need for the researcher to account
> for the ever-changing context within which research occurs. The researcher is
> responsible for describing the changes that occur in the setting and how these
> changes affect the way the researcher approached the study. (p. 163)

In this study, I took responsibility by describing the changes that occurred during this study and by providing thick rich descriptions during the entire research process.

Trochim (2001) stated "Confirmability refers to the degree to which the results could be confirmed or corroborated by others" (p. 163). A data audit can be conducted after the review to determine any bias or distortion of facts (Trochim, 2001, p. 163). This is similar to what Okoli and Pawlowski (2004) recommended: "the Delphi method can employ further construct validation by asking experts to validate the researcher's

interpretation and categorization of the variables" (p. 19). In this study, I required the experts to respond to the summations of the comments that were received from the previous round, thus, the experts were validating the data that the participants submitted during the course of this study.

Creswell (2003) suggested several validation strategies: rich thick description, triangulation, peer review, negative case analysis, bias clarification, persistent field observations, external audits, and member checking in a qualitative study (p. 207-209). I used these approaches during the research process: triangulation, using various expert panelists to serve as different data sources; member checking, asking the experts to respond to summations after each round; rich thick narratives taken throughout the entire research process; bias clarification, whereby I commented on prior experiences, prejudices, and directions that might have molded the progress of the analysis; negative or discrepant information, I examined dissenting opinions from the participants to obtain different points of view regarding the late adoption of e-textbooks in K-12 education. Also, I used peer debriefing, an external auditor throughout the research process, and spent an extended amount of time in the field examining the results of each round of the Delphi questionnaire.

Conclusion

Chapter 3 presented a comprehensive description of the research method. This chapter started with a summary of the research design, a discussion on the qualitative research model, and a description of my role in the study. The study's framework was explained and defended; the procedures used to select the panel of experts as well as the

procedures used to safeguard their identities were discussed. The data collection and data analysis procedures were also conveyed. Subsequently a discussion of the measures used to enhance the credibility, transferability, reliability, and validity of the study was described.

In chapter 4, I will reveal the results of this study. The first section will begin with an explanation of the data collection process including my methods for recording the data, data tracking procedures, and the data analysis process. The development of the expert panelists' opinions that arrived at the final consensus will be discussed. The process will be explained in the form of the thematic summations generated by the panelists. Opposing views and supplementary commentaries will be conveyed. Chapter 4 will also discuss the study's value that includes its credibility, transferability, dependability, and confirmability.

Chapter 4: Results

The purpose of this study was to answer this single research question: Why have a majority of state educational technology directors not adopted e-textbooks as a replacement for traditional printed textbooks?

This chapter will reveal the results of this study. The first section will begin with an explanation of the data collection process including my methods for recording the data, data tracking procedures, and the data analysis process. The development of the expert panelists' opinions that arrived at the final consensus will be discussed. The process will be explained in the form of six thematic summations generated by the panelists. Opposing views and supplementary commentaries will be conveyed. The last section will discuss the study's value that includes its credibility, transferability, dependability, and confirmability procedures comprising of my journal, an external auditor, and peer examination.

Data Collection Process

After receiving IRB approval (#05-19-14-0103553), I prepared to solicit participants for the study. I contacted the various non-adoptive states to determine their eligibility to participant in the Delphi questionnaire. The results revealed that only four of the 28 states that have not adopted e-textbooks actually had a state educational technology director. Members that were representatives of their states in SETDA and the U. S. Department of Education's (2012) enhancing education through technology (ed-tech) state program contacts list held titles such as Executive Director, Delaware Center for Educational Technology; Assistant Superintendent and Chief Information Officer,

Office of Information Technology Services; Superintendent; Director, Office of

Educational Technology and Data Coordination; Director of Technology, State

Educational Technology Coordinator; Director, Office of Educational Technology,

Educational Technology and Online Learning Specialists; Director for North Dakota

Educational Council, Executive Director, Technology and STEM Specialist; Instructional

Technology Fellow; Director, Office of Virtual Education; Coordinator of Instructional

Technology; and State Director for Career & Technical Education. As a result, I

expanded the job title classification to administrators responsible for technology-related,

institutional policy, and purchasing to be participants in this study who had knowledge of

e-textbooks technologies, agreed to the consent form, and had time to participate in all

three rounds of the Delphi questionnaire, which was completed within a 5-week period.

This investigation used the Delphi method of inquiry to collect the data over three

rounds. The Delphi process provided a way to monitor evolving interpretations to arrive

at a consensus. Because the Delphi inquiry is a repetitive process, it allowed me to collect

feedback from the respondents after I had interpreted the responses from each round. My

explanations were consequently confirmed or disputed. Thus, evolving perceptions could

be followed more intensely and reinforced by supplementary information throughout

each round of the Delphi investigation, including the final consensus round. The

participants that completed all three rounds of this study were two technology specialists

on the district level, two educational technology coordinators on the district level, and

three instructional technology specialists on the district level for a total number of seven

participants.

Table 4

Participants Job Title

Job Title	Number of Participants that Completed All Three Rounds	Area of Responsibility
Technology Specialist	2	District Level
Educational Technology Coordinator	2	District Level
Instructional Technology Specialist	3	District Level

All three rounds produced qualitative data by querying one broad open-ended question, which the expert panelists answered using the online questionnaire. The final consensus round was an assessment permitting the respondents' to state their opinions regarding the final consensus of the six thematic summations from the preceding rounds. The data were gathered for all three iterations using the online survey service SurveyMonkey.com.

Delphi Round 1

The first round of the Delphi questionnaire was comprised of only one broad open-ended question that was similar to the research question that guided the investigation (See Appendix A). It also included directions for the respondents explaining how to respond to the question, "Why has your state not adopted e-textbooks as a replacement for traditional printed textbooks?"

The data for the first round were accumulated entirely anonymously; the respondents were unknown to each other. This was accomplished by sending out the e-

mail invitation to participate in this survey individually so that the participants were not aware of who was participating in the study.

Twelve participants agreed to participate in this study. The 12 participants presented written responses to the research question using the online service SurveyMonkey.com (See Appendix D). The average reply to the research question was 54 words in length, with the responses fluctuating in length between 9 to 133 words. Even though the respondents agreed to participate in the study by signing a consent form, I also designated a question for the respondent to state his or her name for my logistical purposes only. The purpose was for me to be able to keep track of who responded to the questionnaire and who did not. An e-mail address field was also added because some participants wanted to be contacted at their place of employment, while others wanted be contracted via their personal e-mail address. Two respondents did not include their names on the questionnaire and did not participate in the upcoming rounds. The participants were also asked to state their names for all of the upcoming rounds.

Delphi Round 2

The Round 2 questionnaire was sent to the IRB for approval before it was sent out to the participants (See Appendix B). Then an e-mail link to the Round 2 questionnaire was sent out individually to the 10 remaining participants so that he or she could remain anonymous and their confidentiality could be safeguarded. The participants were not aware who was participating in the study. Instructions for the remaining participants was included for Round 2 questionnaire with a short summary of their first round responses. Six themes resulted from the Round 1 responses. The questionnaire provided the six

thematic summations produced by me that originated from the respondents' replies to the

question presented in the Round 1 questionnaire. These summations included the

participants' reasons for the late adoption of e-textbooks in K-12 education. The themes

included cost and equipment management, Internet connectivity, local control textbook

adoption policy, state and local leadership resistance to digital content, supportable

funding for devices, and other themes and responses. The question that this questionnaire

was designed to answer was as follows: What do you think is the major reason that is

hindering the adoption of e-textbooks in K-12 education?

Each of the summations was then followed by a single open-ended question:

1. Why is Cost and Equipment Management the most important reason for the late

adoption of e-textbooks in K-12 education?

2. Why is Internet Connectivity the most important reason for the late adoption of

e-textbooks in K-12 education?

3. Why is Local Control Textbook Adoption Policy the most important reason for

the late adoption of e-textbooks in K-12 education?

4. Why is State and Local Leadership Resistance to Digital Content the most

important reason for the late adoption of e-textbooks in K-12 education?

5. Why is Supportable Funding for Devices the most important reason for the late

adoption of e-textbooks in K-12 education?

6. Why is Other Themes and Responses the most important reason for the late

adoption of e-textbooks in K-12 education?

The participants were instructed to choose as many reasons as they thought were

important. They were also instructed to explain why they selected that answer.

The respondents provided written responses to the question. The participants'

responses varied. Their responses' ranged from three to six statements (See Appendix E).

This round resulted in 34 participants responses. Two respondents did not reply to the

second round of the questionnaire. I only received responses from eight of the 10

panelists. No new themes emerged from the second round.

Table 5

Round 2 Participant Responses

Question	Average Answer Word Length	Number of Participants
1	35	8
2	36	5
3	42	5
4	49	5
5	28	7
6	23	4

Note. This table represents the six thematic units, the average word length to each
answer, and the number of participants that responded to that question.

Table 6

Participants Number of Words per Question

Participant	Question					
	1	2	3	4	5	6
1	56	55	59	0	63	0
2	77	70	58	44	51	49
3	23	18	0	0	20	13
4	16	14	15	12	3	6
5	29	0	0	84	20	0
6	37	0	0	72	26	0
7	25	0	55	0	0	0
8	15	22	23	33	12	22
Average	34.75 (8)	35.8 (5)	42 (5)	49 (5)	27.86 (7)	22.5 (4)

Note. This table displays the number of words that each participate used to answer each question. The average was calculated based on the participants who responded to the question. Question #1 was the only question that all the participants answered.

Final Consensus Round

The Round 3 final consensus questionnaire was sent to the IRB for approval before it was sent out to the participants (See Appendix C). Then an e-mail link to the Round 3 questionnaire was sent out separately to the eight remaining participants so that they could continue to be anonymous and their confidentiality could be secured. Instructions for the eight remaining participants was included in the final consensus. Again, the participants' identities remained confidential. The six themes were identical to the first round replies, but the summations reflected responses collected in the second round. The third and final round required the panelists to assess their degree of agreement with the summations from the group and the final consensus. In this round, the definition for consensus was specified for the respondents as the perception where the outcomes are "at least acceptable to every member [of the expert panel], if not exactly as they would have wished." (Reid, 1988, as cited in Wagner, 2008, p. 91). The expert panelist were also requested to rank the six themes in order of importance from the most important to the least important. The participants were also asked to leave additional remarks that would be considered in the final reporting.

The respondents were requested to state their agreement with the summations generated from the second round by using a 5-point rating scale question:

5. Strongly Agree (SA)

4. Agree (A)

3. Neither Disagree nor Agree (N)

2. Disagree (D)

1. Strongly Disagree (SD).

The participants were also asked to rank the thematic units in order of importance from most important to least important. Three respondents left an additional remark to the summations using the online service SurveyMonkey.com (See Appendix F). The average reply to the research question was 25 words in length, with the replies fluctuating between 8 to 35 words. Only seven participants completed the final round.

Data Tracking Procedures

The data accumulated in Rounds 1, 2, and 3, the final consensus round, were examined during this review using several tools and methods for analyzing data while developing knowledge of the participants' experiences. The online surveys were the first instruments used to monitor the data accumulated during the research process. Then the summations collected over the previous rounds were then distributed to the respondents in the consequent rounds to verify that my interpretations were in alignment with the participants' responses. In the third and final round of the data gathering process, the respondents were requested to rank their degree of consensus with the concluding summations and to state any additional remarks that applied to the study, which would confirm my interpretation of their experiences. Lastly, my personal journal served as an effective instrument in the data collection process that provided developing interpretations that were emerging throughout the progression of this review. These methods will be described in the sections below.

Online Questionnaire Archives

The first instrument used to monitor the collected data was the online questionnaire. SurveyMonkey.com permitted me to collect data from the respondents through the Web, which was deposited into an online archive that organized the data for analysis in a web-based format. There were two ways to examine qualitative data: I had the option of either reading all responses to a specific question at once or reading all of the replies from a specific respondent. Statistical information generated from the concluding consensus round were illustrated in easy to interpret horizontal bar graphs and tables generated from SurveyMonkey.com's internal calculator highlighting the most important reason for the late adoption of e-textbooks in K-12 education determined by the expert panelists and their level of agreement with the final consensus. Data were similarly presented stating the number of respondents who finished each questionnaire and the number of participants who responded to or omitted any questions. The online service also permitted me to export survey data gathered from each iteration of the Delphi questionnaire into a PDF, PPT, XLS, or a CSV format accompanied with charts and/or graphs depending on which format that was selected. This data were very helpful for the final consensus because it could subsequently be utilized for further investigation (See Appendix L).

Summaries

One of the principal methods used to track the data and the developing perceptions of the participants reasoning for the late adoption of e-textbooks in K-12 education were the thematic summations that were generated from the respondents

replies (See Appendices D, E, H, and I). After each iteration of data collection,

summations of the respondents' answers were communicated back to the respondents in

each of the succeeding rounds data collection (See Appendices B and C). The summaries

served as a member check so that the panelists could verify that I had accurately

described the qualitative data that were presented in the survey questions. Summations

were arranged by theme to reduce repetition in the initial answers, to direct the research

on the components of the final consensus, and to reject unrelated replies. Every

summation involved reasons that hindered the adoption of e-textbooks in K-12 education,

in an attempt to implicitly incorporate both elements into a coherent perception, whereby

the respondents could either reveal consensus or dissension. This method of organizing

and arranging the data were a very distinctive measure used in the Delphi progression,

but the respondents were permitted to provide comments to my summations in every

succeeding round. An example is the thematic summary presented for state and local

resistance to digital content (SL), which was generated in Round 1 from four participant

responses. I collected the responses from participants 2, 3, 5, and 7.

Table 7

Thematic Summary Sample Coding Process 1

Participant	Response
2	Currently, we do not have an educational technology department in our State Department of Education. Technology issues are being distributed throughout curriculum assessment. Technology plans are being developed and approved on the local level. This is a local control state with a Local Education Agency-Level Adoption policy. Textbook purchases whether they are traditional printed or e-textbook are handled at the district level and not at the state level.
3	The State Department of Education allows the local districts to use textbook funding to purchase hardware to maintain electronic resources; however, it is at the local districts discretion to convert to digital content. We have not mandated the transition to e-textbooks at the state level because we do not know enough about them and how they will impact student success. We do not want to rush into this decision without seeing the impact they will have on the other states.
5	We are on a rotation with subject and grade level during the last rotation e textbooks were not available. Each district is run separately and the state has not mandated textbooks yet.
7	My state does not have a State Educational Technology Director to implement policies and procedures. We are a local control state and the decision to implement policies such as e-textbooks is decided by the local districts. The Department of Education does not implement policies for the local districts. The State Department of Education administers policies according to federal guidelines. E-textbooks would have to become a requirement issued at the federal level for it to be executed at the state level.

Then I examined and evaluated the data. I used the open coding approach to

classify and develop the category that was associated with a particular idea that was

revealed from the comments made by the expert panelists to establish a relationship and

to assess the data from a different perspective. The purpose was to formulate new

interpretations from the data. After the categories and subcategories were established, I

used axial coding to put the components back together again to develop new categories.

Table 8

Thematic Summary Sample Coding Process 2

Participant	Response	Category
2	Currently, we do not have an educational technology department in our State Department of Education.	SL
2	Technology issues are being distributed throughout curriculum assessment.	SL
2	Technology plans are being developed and approved on the local level.	SL
3	We have not mandated the transition to e-textbooks at the state level because we do not know enough about them and how they will impact student success. We do not want to rush into this decision without seeing the impact they will have on the other states.	SL
5	Each district is run separately and the state has not mandated textbooks yet.	SL
7	My state does not have a State Educational Technology Director to implement policies and procedures.	SL

This process resulted in the summary below for SL that was presented to the

participants in the Round 2 of the Delphi process, which helped to influence the

participants' responses in the next iteration of the survey (See Appendix B).

Non-adoptive states have not organized themselves with a State Educational

Technology Director to implement policies and procedures and many have not

established an Instructional Technology Department on the state level. Technology issues

are being distributed throughout curriculum assessment. Technology plans are developed

and approved on the local level. State Departments of Education have not mandated the

transition to e-textbooks stating lack of knowledge regarding their impact on student

success as reasons for not adopting e-textbooks. There has been no focus on the adoption

of e-textbooks from the major decision-makers. Only the content coordinators, teachers,

parents, and students have pushed for e-textbooks. The Department of Education does not

implement policies for the local districts. The State Department of Education administers

policies according to federal guidelines. E-textbooks would have to become a

requirement issued at the federal level for it to be executed at the state level.

Data Analysis Process

The primary objective of this study was to accurately capture the

experiences of the expert panelists to determine the reasons for the late adoption of e-

textbooks in K-12 education. I used triangulation to analyze the data by using 12

individual data sources to validate the themes developed and used throughout the process.

Triangulation helped to curtail researcher bias by permitting the participants to comment

on my interpretation of their experiences and to confirm that their experiences were being

accurately reported.

In the first round, the 12 administrators responsible for technology-related,

institutional policy, and purchasing were asked to answer the question: "Why has your

state not adopted e-textbooks as a replacement for traditional printed textbooks (See

Appendix A)?" After their responses were collected following the first round of the

Delphi questionnaire, I examined and evaluated the data. I used the open coding approach

to classify and develop categories that were associated with the particular ideas that were

revealed from the comments made by the expert panelists to establish relationships and to

assess the data from a different perspective. The purpose was to formulate new

interpretations from the data.

I devised a coding system that interpreted the information collected following

each iteration of the Delphi questionnaire. Then I interpreted the data by reducing the

data into significant sections and assigning names to the sections, merging the codes into larger categories or themes to establish relationships between the themes. The sections that were developed were cost and equipment management (CE), supportable funding for equipment (SF), Internet connectivity (IC), local control textbook adoption policy (LC), state and local leadership resistance to digital content (SL), and other themes and responses (OT).

After the categories and subcategories were established, I used axial coding to put the components back together again to develop new categories. The results of the coding process resulted in the six thematic categories that clarified how the participants repeatedly handled the problem. The responses generated from the first round of the questionnaire determined the themes that structured the questions in the second round of the Delphi questionnaire. After the first round, the participants received summations derived from the comments collected by me, which helped to influence the participants' responses in the next iteration of the survey (See Appendices B, D, J, and M).

In the second round, eight administrators responsible for technology-related, institutional policy, and purchasing were asked to answer the question: "What do you think is the major reason that is hindering the adoption of e-textbooks in K-12 education?" The participants were told that they could select as many reasons that they so desired and leave any additional comments that they felt was pertinent to the study. The responses generated from the first round of the questionnaire had determined the themes that structured the questions in the second round of the Delphi questionnaire. After their responses were collected from this round of the Delphi questionnaire, I examined and

assessed the data. I used the open coding approach to classify and develop categories that were associated with the particular ideas that were revealed from the comments made by the expert panelists to establish relationships and to assess the data from a different perspective. The purpose was to formulate new interpretations from the data.

I devised a coding system that interpreted the information collected from the second round of the Delphi questionnaire. I then interpreted the data by reducing the data into significant sections and assigning names to the sections, merging the codes into larger categories or themes to establish relationships between the themes. The sections that were developed were cost and equipment management (CE), supportable funding for equipment (SF), Internet connectivity (IC), local control textbook adoption policy (LC), state and local leadership resistance to digital content (SL), and other themes and responses (OT). This round did not produce any new themes; the responses only enhanced the themes that were produced in Round 1. However, this was expected because the panelists were asked to answer direct questions that had resulted from the first round's themes.

After the categories and subcategories were established, I used axial coding to put the components back together again to develop new categories. The purpose was to formulate a coherent summary to present to the participants for their review and comments. As a result of this round, a consensus was taking shape from the rationale stated by the participants. Theses summations were presented to the participants in the third round, which helped to influence the participants' responses in the next iteration of the survey (See Appendices C, E, K, and M).

In the final consensus round, the data were analyzed based on the data collected from the participants as a result of the second round questionnaire. In this round, the participants were asked to examine the summations generated from the second round and specify their degree of agreement with the summaries. The participants were also asked to rank the six themes in order of importance from the major reason to the least important reason for the late adoption of e-textbooks in K-12 education. Besides specifying their degree of consensus, they were asked to leave any further remarks associated with each summation. They were told that their assessments and remarks would be considered in the reporting of the conclusions from this study (See Appendices F, L, and M).

Negative or discrepant information was analyzed by me who also scrutinized opposing opinions from the participants to achieve diverse viewpoints regarding the late adoption of e-textbooks in K-12 education. The negative or discrepant information was analyzed as a category in the coding process and were discussed in relationship to the various themes that were generated from the participants' responses (See Appendices J, K, and L).

The expert panelists, who served as diverse data sources and made comments to the summations after each round added confirmability, validity, and credibility to the study by assisting me in the accurate reporting of their experiences. I used memoing to provide detailed commentary of the data collection process, the data analysis process, and the reporting of the final results so that another researcher could do a parallel analysis of the data and come up with the same themes or different themes depending upon their interpretation of the data (See Appendices D, E, F, H, I, J, K, L, and M).

Summary of Findings

This segment described a summation of the professional opinions produced throughout this Delphi investigation. The results have been structured by theme grounded on patterns and relationships revealed in the assembled data. This format transpired after the first iteration of the Delphi process and was enhanced after the second round. The second round did not disclose any new or additional themes just an elaboration of the themes presented in the first round. The final consensus determined the organization of the themes exhibited below with summaries that the expert panelists considered to be the most important reason for the late adoption of e-textbooks in K-12 education to the least important reason for the late adoption of e-textbooks in K-12 education.

Delphi Round 1

In the first round, six themes were disclosed that answered my question on what were the major reasons for the late adoptions of e-textbooks in K-12 education. These themes replicated to some extent those that were previously identified in the literature review. This was expected to some extent because the panelists were administrators responsible for technology-related, institutional policy, and purchasing and were knowledgeable about e-textbook technologies, which was the criteria for participate selection.

Cost and equipment management. Two of the 12 participants stated cost and equipment management as their reason for the late adoption of e-textbooks. They stated that their states did not have the electronic devices to support e-textbooks due to the cost associated with equipment purchases. Also, policies are not in place that will enable their

schools to manage the equipment making it problematic to deal with issues related to stolen devices. One participant stated, "[We] lack state funds to purchase computers/e-readers." Another proclaimed that e-textbooks were "too costly and control of equipment suspect to theft."

Supportable funding for devices. One of the 12 participants stated lack of supportable funding for devices as their reason for the late adoption of e-textbooks. They declared that state funding was not available to purchase and sustain computers/e-readers for local districts, which has hindered their adoption of e-textbooks on the local level.

Internet connectivity. Four of the 12 participants cited Internet connectivity as a reason for the late adoption of e-textbooks in K-12 education for the following reasons: states have not developed "a dependable network and Internet infrastructure to support a productive digital learning environment," states have "insufficient broadband wireless or Wi-Fi connectivity available to operate innovative digital devices," "lack of Internet connectivity," and/or "students from lower income groups do not have the resources to connect to the Internet."

Local control textbook adoption policy. Five of the 12 participants stated local control textbook policy as a reason for the late adoption of e-textbooks in K-12 education. While some State Department of Education permits the local districts to use textbook funding to purchase hardware to maintain electronic resources, it is at the districts discretion to transition to e-textbooks. One participant stated, "We are on a rotation with subject and grade level, during the last rotation e-textbooks were not available. Each district is run separately and the state has not mandated e-textbooks yet."

Another participant replied, "We are a local control state and the decision to implement policies such as e-textbooks is decided by the local districts. The Department of Education does not implement policies for the local districts." A third participant declared,

> Textbook adoption is currently a district level decision and not a state decision. While the state department of education does provide a list of approved vendors or programs, each district is then free to make a decision based on what they feel best meets their needs.

A fourth participant proclaimed, "This is a local control state with a Local Education Agency-Level Adoption policy. Textbook purchases whether they are traditional printed or e-textbooks are handled at the district level and not at the state level."

These statements confirmed that e-textbooks are not being considered as a viable alternative. Many of the non-adoptive states are local control states and textbook purchases whether they are traditional printed or e-textbooks are handled at the district level and not at the state level.

State and local leadership resistance to digital content. Five of the 12 participants reported state and local leadership resistance to digital content as a reason for the late adoption of e-textbooks in K-12 education. Non-adoptive states have not organized themselves with a State Educational Technology Director to implement policies and procedures and many have not established an Instructional Technology Department on the state level. One participant stated "Technology issues are being distributed throughout curriculum assessment. Technology plans are developed and

approved on the local level." Some of the non-adoptive states have not mandated the

transition to e-textbooks stating lack of knowledge regarding their impact on student

success as reasons for not adopting e-textbooks. One participant confirmed this by

stating, "We have not mandated the transition to e-textbooks at the state level because we

do not know enough about them and how they will impact student success." Another

participant confirmed, "There has been no focus on the adoption of e-textbooks from the

major decision-makers. Only the content coordinators, teachers, parents, and students

have pushed for e-textbooks." A third participant declared,

> The Department of Education does not implement policies for the local districts.
> The State Department of Education administers policies according to federal
> guidelines. E-textbooks would have to become a requirement issued at the federal
> level for it to be executed at the state level.

Other themes and responses. One participant voiced these four reasons as a

hindrance to e-textbook adoption.

> There are several reasons why we have not adopted e-textbooks. First of all, we
> feel that there are many issues relating to copyright and digital rights restrictions
> that put limitations on how e-textbooks can be used. Second, standardization of
> file formats have not been solidified and prevents e-textbook usage across
> different platforms, which causes compatibility problems with our existing
> technological environment. Third, open educational resources are available, but
> there are still limited selections available. Fourth, there are so many forms of

licensing agreements to choose from and we are not convinced of which ones would satisfy our needs.

Five of the six themes that resulted from the first round were previously mentioned in the literature. This was expected because these participants are considered experts in their field and are familiar with the current literature. In addition, these same challenges still exist and are being experienced by these participants on a daily basis; so these reasons are a confirmation of what has been previously reported.

However, local control textbook policy is a new theme that was not previously reported in the literature as a major reason for the late adoption of e-textbooks in K-12 education, but it did emerge in this study. Six of the participants stated that e-textbook adoption is currently a district level decision and not a state decision and e-textbooks are not being considered as a viable alternative. Many of the non-adoptive states are local control states and each district is run separately using a Local Education Agency-Level Adoption policy. These states have not mandated local districts to adopt e-textbooks. Each district is free to make textbook decisions based on what they feel best meets their needs. Textbook purchases whether they are traditional printed or e-textbooks are controlled at the district level and not at the state level. States use one of two approaches to choose textbooks that are utilized in their school systems (Scudella, 2013). The first approach is a state-level textbook adoption policy and the second approach is a local education agency-level textbook adoption policy (Scudella, 2013). Twenty-nine states permit local schools to choose their own textbooks and 21 states and three territories,

known as the textbook adoption states, have their textbooks selected at the state level (Scudella, 2013).

This could become a major deterrent to e-textbook adoption because there are so many districts making their own decisions about textbook purchases. The only solution then would be for the state legislature in the non-adoptive states to mandate e-textbook adoption. This is a new theme that may present itself more fully in a study with a larger sample population. In this study, two participants strongly agreed, four participants agreed, and one participant neither agreed not disagreed with the consensus on local control textbook policy.

Delphi Round 2

Round 2 did not reveal any new themes just the rationale expressed by the panelists regarding the major reasons for the late adoption of e-textbooks in K-12 education. Some of the participants did express disagreement for some of the themes being the major reason for this condition, but they did not say that the reason should be removed from the discussion.

Cost and equipment management. Acquisition cost is a major cause for the late adoption of e-textbooks. Acquiring the initial and sustainable funding to purchase the equipment and to maintain it is problematic. Seven out of eight participants responded to cost and equipment as a major reason for the late adoption of e-textbooks in K-12 education. One participant stated, "It would take money to buy the software and get it approved for the district." A second participant proclaimed,

It is incredibly important that students have the devices that they will need in order to access e-textbooks if this is the direction that a district decides to move. It's one thing if a district is looking at BYOD options, but if they are adopting e-textbooks then devices would need to be provided for students for equity reasons.

A third participant commented,

Students from low income families can't provide the tools for e-textbooks, so it puts the burden back on the schools. Thus, forcing the schools to provide the equipment that will need[ed] to be updated on a regular bases and additional staff will be required to maintain and support the equipment.

A fourth participant replied, "Even though the cost of devices have reduced considerably, this is still a major factor when a district is faced with providing these devices for both students and faculty." A fifth participant stated that the replacement of equipment would be even costlier and take valuable time away from instruction.

Supportable funding for devices. Five out of eight participants responded to supportable funding for devices as a major cause of the late adoption of e-textbooks in K-12 education. One participant stated, "This is probably the most important reason although schools with Title I funds tend to spent lots of money on devices." A second participant asserted,

Funding for electronic devices are never ending. One cannot make a onetime purchase and think it is sustainable. Devices break down and need to be replaced on a regular bases and are sometimes lost. Therefore, the state must always have an ongoing budget to fund devices and support for the devices.

A third participant replied,

> I believe this is a huge reason for the late adoption of e-textbooks. While devices
> are not nearly as expensive as they used to be, our district has approximately
> 100,000 students and the budget does not currently allow for such a purchase.

A fourth participant confirmed,

> Local districts need supportable funding from the state in order to purchase and
> sustain mobile devices to support e-textbook technologies. Without funds you
> cannot purchase necessary supplies to make the program run. Lack of money is a
> major concern to all stakeholders.

> **Internet connectivity.** Four out of eight participants responded to Internet

connectivity as a major reason for the late adoption of e-textbooks in K-12 education.

One participant declared,

> Wi-Fi and connectivity is key. If the students do not have connectivity, then the
> system fails. My district has sufficient connectivity in the schools, but we fail in
> providing the students of financial needs proper connectivity at home. Because of
> this all of our students are put at a disadvantage. We cannot put a digital, e-
> textbook, program in place and not be able to provide all of our students with
> these resources.

A second participant proclaimed, "You must have access to use e-textbooks. If the

Internet is not up to date you cannot get online to view them." A third participant

revealed, "If a program is being adopted that is strictly online, then we must be able to

provide access for all students." A fourth participant stated that without home Internet

connectivity, "students would not be able to do homework and prepare detailed written reports. Also, a fifth participant replied, "parents hesitate when it comes to technology. If they don't have reliable Internet access."

Local control textbook adoption policy. Three out of eight participants thought that local control adoption policy was a major cause for the late adoption of e-textbooks in K-12 education. The first participant stated

Local control textbook policy is the major reason for the late adoption of e-textbooks because local control means that each district makes their own policies and there is no collaboration between other districts and the state. Everyone is doing it their way and no one is looking to the left or to the right.

The second participant proclaimed

Local school boards try to look at all of their students' needs. The boards make their adoptions based upon the needs of the communities. After books are selected, community meetings are held and parents get to vote on which adoption they feel is best for the district. Again, when there are communities that are not connected, then it is hard for the boards to make decisions to use tools that all students will not have access to use.

The third participant confirmed

These decisions should be left up to the district. When just looking at a metropolitan school district, it is going to differ greatly from a rural school district. With greatly varying needs, it would not be wise to prescribe a solution for the masses.

State and local leadership resistance to digital content. Five out of eight participants responded to state and local leadership resistance to digit content as a major reason for the late adoption of e-textbooks in K-12 education. It was the opinion of one participant that

> The state and local leadership resist digital content because the authors can change the content at any time. Thus, the leaders, local and statewide, do not have the ability to edit or sensor the content and the leadership would lose control of the subject content.

Another participant stated

> If states are going to initiate a statewide e-textbook adoption policy then the decisions need to be made at the state level and legislature needs to be passed to bring the entire state in alignment with that policy. Unless a decision is made at the state level then districts will continue to make their own decisions and there will never be a unified state policy. The states need to enlist people with visionary and innovative philosophies in order for this movement to take place.

A lack of communication between the members of the social group is evident in this reply, "incomplete information and/or no information are being provided to these educational departments." Another participant pointed out that money needed to be initiated from the state, when they stated, "It also depends on if levees have passed and money is available for an e-textbook adoption."

Other themes and responses. One participant stated four reasons for the late adoption of e-textbooks in K-12 education that was grouped in the other themes and

responses category. They stated that the number of licensing agreements that the system

must keep up with, in addition to the changing digital contents, and avoiding violating

copyright laws can become overwhelming for the districts. Also, copyright issues need to

be addressed. Another participant proclaimed that "It all boils down to cost. When a

district adopts new books... The old books are sold to smaller districts for profit."

The second round did not produce any new themes, but the participants expanded

on their explanations of the themes that were generated from the first round. This was a

productive round because the participants who had not indicated all of these reasons in

the first round had commentary to add to the various themes when they were presented in

the second round. It appears that the participants were experiencing similar challenges

and were exchanging ideas and examining thought patterns that were not previously

mentioned. In this round it was clear that a consensus was beginning to take shape and

some participants were changing their views on the reasons that were hindering the

adoption of e-textbooks in K-12 education.

Final Consensus Round

The principal objective of the final consensus round was for the expert panel to

evaluate their agreement with the final consensus. Thus, the assessment resulting from

the third and final round of the questionnaire formulated the final consensus, which

resulted in a well thought out explanation for the late adoption of e-textbooks in K-12

education. The goal of this investigation was to come to a consensus regarding the

introduction of e-textbooks in K-12 educational environments and why its adoption has

been so slow. Consensus was defined as "at least acceptable to every member [of the

expert panel], if not exactly as they would have wished." (Reid, 1988, as cited in Wagner, 2008, p. 91). The respondents were requested to state their agreement with the summations generated from the second round by using a 5-point rating scale question.

5. Strongly agree (SA)

4. Agree (A)

3. Neither Disagree nor Agree (N)

2. Disagree (D)

1. Strongly disagree (SD).

Five panelists (71.43%) strongly agreed and two panelists (28.57%) agreed with the summation for cost and equipment management.

Six panelists (85.71%) strongly agreed and one panelist (14.29%) neither disagreed nor agreed with the summation for supportable funding for devices.

One panelist (14.29%) strongly agreed and six panelists (85.71%) agreed with the summation for Internet connectivity.

Two panelists (28.57%) strongly agreed, four panelists (57.14%) agreed, and one panelist (14.29%) neither disagreed nor agreed with the summation for local control textbook adoption policy.

Two panelists (28.57%) strongly agreed, two panelists (28.57%) agreed, and three panelists (42.86%) neither disagreed nor agreed with the summation for other themes and responses.

One panelist (14.29%) strongly agreed, 4 panelists (57.14%) agreed, and two

panelists (28.57%) disagreed with the summation for state and local resistance to digital

content.

Table 9

Participants Level of Agreement with Consensus Table

	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	Total	Average Rating
Cost and Equipment Management	0.00% 0	0.00% 0	0.00% 0	28.57% 2	71.43% 5	7	4.71
Internet Connectivity	0.00% 0	0.00% 0	0.00% 0	85.71% 6	14.29% 1	7	4.14
Local Control Textbook Adoption Policy	0.00% 0	0.00% 0	14.29% 1	57.14% 4	28.57% 2	7	4.14
State and Local Resistance to Digital Content	0.00% 0	28.57% 2	0.00% 0	57.14% 4	14.29% 1	7	3.57
Supportable Funding for Devices	0.00% 0	0.00% 0	14.29% 1	0.00% 0	85.71% 6	7	4.71
Other Themes and Responses	0.00% 0	0.00% 0	42.86% 3	28.57% 2	28.57% 2	7	3.86

Note. The rating question was calculated by SurveyMonkey.com's internal calculator. The rating average for each answer choice is calculated to determine the level of agreement that each participant had to the summations generated from the second round of the questionnaire. This table shows the final consensus of the expert panelists for the reasons for the late adoption of e-textbooks in K-12 education.
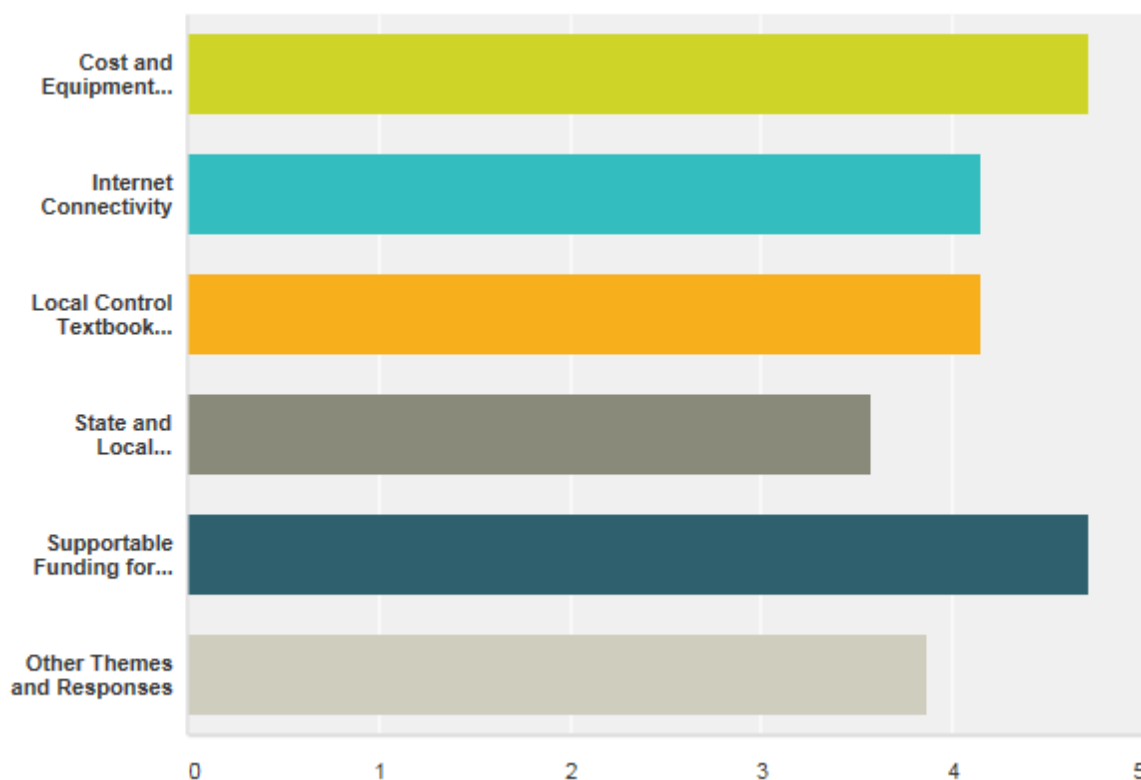
Figure 2. Results of participants level of agreement with consensus. This bar graph was generated by SurveyMonkey.com's internal calculator. It shows the level of agreement that each participant had to the summations generated from the second round of the questionnaire. This bar graph shows the final consensus of the expert panelists for the reasons for the late adoption of e-textbooks in K-12 education.

The expert panelist were also asked to rank the six themes in order of importance from the most important to the least important reason for the late adoption of e-textbooks in K-12 education . The participants were also asked to leave additional remarks that would be considered in the final reporting. The panelists ranked the six thematic summaries as follows:

Five panelists (71.43%) ranked cost and equipment management as the most important reason for the late adoption of e-textbooks in K-12 education.

One panelist (14.29%) ranked Internet connectivity as the most important reason for the late adoption of e-textbooks in K-12 education.

One panelist (14.29%) ranked state and local resistance to digital content as the most important reason for the late adoption of e-textbooks in K-12 education.

Two panelists (28.57%) ranked cost and equipment management as the second most important reason for the late adoption of e-textbooks in K-12 education.

One panelists (14.29%) ranked Internet connectivity as the second most important reason for the late adoption of e-textbooks in K-12 education.

One panelists (14.29%) ranked local control textbook adoption policy as the second most important reason for the late adoption of e-textbooks in K-12 education.

Three panelists (42.86%) ranked supportable funding for devices as the second most important reason for the late adoption of e-textbooks in K-12 education.

Three panelists (42.86%) ranked Internet connectivity as the third most important reason for the late adoption of e-textbooks in K-12 education.

One panelists (14.29%) ranked local control textbook policy as the third most important reason for the late adoption of e-textbooks in K-12 education.

Three panelists (42.86%) ranked supportable funding for devices as the third most important reason for the late adoption of e-textbooks in K-12 education.

Three panelists (42.86%) ranked local control textbook adoption policy as the fourth most important reason for the late adoption of e-textbooks in K-12 education.

Two panelists (28.57%) ranked state and local resistance to digital content as the fourth most important reason for the late adoption of e-textbooks in K-12 education.

One panelists (14.29%) ranked supportable funding for devices as the fourth most important reason for the late adoption of e-textbooks in K-12 education.

One panelists (14.29%) ranked other themes and responses as the fourth most important reason for the late adoption of e-textbooks in K-12 education.

Two panelists (28.57%) ranked Internet connectivity as the fifth most important reason for the late adoption of e-textbooks in K-12 education.

One panelist (14.29%) ranked local control textbook adoption policy as the fifth most important reason for the late adoption of e-textbooks in K-12 education.

Three panelists (42.86%) ranked state and local resistance to digital content as the fifth most important reason for the late adoption of e-textbooks in K-12 education.

One panelists (14.29%) ranked other themes and responses as the fifth most important reason for the late adoption of e-textbooks in K-12 education.

One panelist (14.29%) ranked local control textbook adoption policy as the sixth most important reason for the late adoption of e-textbooks in K-12 education.

One panelist (14.29%) ranked state and local resistance to digital content as the sixth most important reason for the late adoption of e-textbooks in K-12 education.

Five panelists (71.43%) ranked other themes and responses as the sixth most important reason for the late adoption of e-textbooks in K-12 education.

Table 10

Participants Ranking of Reasons for the Late Adoption of E-textbooks in K-12 Education

	1	2	3	4	5	6	Total	Average Ranking
Cost and Equipment Management	71.43% 5	28.57% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	7	5.71
Internet Connectivity	14.29% 1	14.29% 1	42.86% 3	0.00% 0	28.57% 2	0.00% 0	7	3.86
Local Control Textbook Adoption Policy	0.00% 0	14.29% 1	14.29% 1	42.86% 3	14.29% 1	14.29% 1	7	3.00
State and Local Resistance to Digital Content	14.29% 1	0.00% 0	0.00% 0	28.57% 2	42.86% 3	14.29% 1	7	2.71
Supportable Funding for Devices	0.00% 0	42.86% 3	42.86% 3	14.29% 1	0.00% 0	0.00% 0	7	4.29
Other Themes and Responses	0.00% 0	0.00% 0	0.00% 0	14.29% 1	14.29% 1	71.43% 5	7	1.43

Note. The ranking question was calculated by SurveyMonkey.com's internal calculator. The ranking average for each answer choice is calculated to determine, which answer choice was the most important reason to the least important reason for the late adoption of e-textbooks in K-12 education. The response with the highest ranking average was the most preferred reason selected by the respondents.
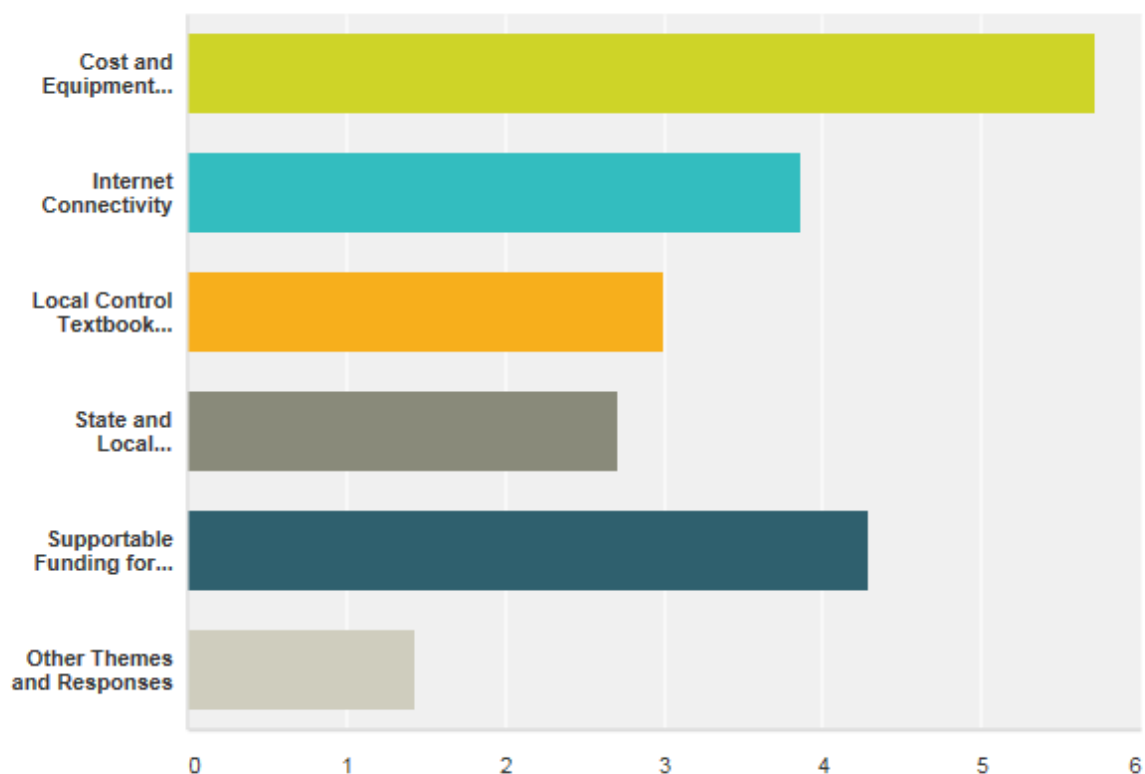
Figure 3. Results of participants ranking of reasons for the late adoption of e-textbooks in K-12 education. This bar graph was generated by SurveyMonkey.com's internal calculator. It shows the participants preference from the most important reason to the least important reason for the late adoption of e-textbooks in K-12 education.

In conclusion, cost and equipment management with an average rating of 4.71 and supportable funding for devices with an average rating of 4.71 had the highest degree of consensus for the late adoptions of e-textbooks in K-12 education. Internet connectivity with an average rating of 4.14 and local control textbook adoption policy with an average rating of 4.14 had the second highest degree of consensus for the late adoption of e-textbooks in K-12 education. Other themes and responses with an average rating of 3.86 had the third degree of consensus for the late adoption of e-textbooks in K-12 education.

State and local resistance to digital content with an average rating of 3.57 had the fourth

and lowest degree of consensus for the late adoption of e-textbooks in K-12 education.

The average ranking calculated by SurveyMonkey.com was 5.71 for cost and

equipment management, 4.29 for supportable funding for devices, 3.86 for Internet

connectivity, 3.00 for local control textbook adoption policy, 2.71 for state and local

leadership resistance to digital content was, and 1.43 for other themes and responses.

Cost and equipment management was clearly agreed to be the major reason for the late

adoption of e-textbooks in K-12 education and other themes and responses was clearly

perceived to have little relevance for e-textbook adoption by this expert panel.

Opposing Opinions and Additional Comments

Negative or discrepant information are specifically significant to a Delphi study.

In this instance, it was essential to obtain opposing opinions from the participants' point

of view regarding the late adoption of e-textbooks in K-12 education to project a holistic

picture of the participants' position. Even though it is important to ascertain consensus

among the respondents, it is also essential not to diminish or disregard opposing points of

view. Trochim (2001) argued that the confirmability of a study can be enhanced by the

investigator seeking and documenting any opposing views made by the expert panelists.

Glesne (1999) also stated, "because real life is composed of different perspectives that do

not always coalesce, discussing contrary information adds to the credibility of [a study]"

(p. 196). Throughout the second and subsequent rounds of the Delphi process, I presented

to the respondents short thematic synopses of the previous round replies. Respondents

were given the opportunity to present comments on the summations and if they opposed

any portions in the summation, they were encouraged to voice disagreeing views. This segment reports the opposing views and other remarks discovered and accumulated throughout each phase of this Delphi investigation. These opposing opinions provided me with the opportunity to present the participants' views from different perspectives, which may have impacted the average ratings for the degree of agreement with the final consensus and the average rankings generated after the participants stated their preferences for the most and least important reasons for the late adoption of e-textbooks in K-12 education.

Delphi Round 1

The first round of this Delphi study did not produce any opposing views, mainly because there were no statements made for the participants to oppose. Round 1 only involved gathering data in reply to one broad opened-ended question. Nothing materialized from the preliminary replies that were meaningfully altered from the other responses to qualify as an opposing point of view.

Delphi Round 2

In the second round, one respondent did not agree with the summary for cost and equipment management; they stated, "I'm not sure I agree with the statements above. So I'm not sure that it is the most important reason for late adoption." Another participate disagreed that cost and equipment management was a major cause for the adoption of e-textbooks; they stated "I disagree with this statement. I think that if the states stopped buying expensive textbooks they would have the money that they need to buy the hardware that is needed to enhance and support the technological equipment." This

suggestion could be used as an approach to acquire funding to finance the acquisition and support for e-textbook devices. However, these statements did not affect the outcome of the ratings for cost and equipment management because cost and equipment management still had the highest degree of agreement for the final consensus with an average rating of 4.71 and was ranked the major reason for the late adoption of e-textbooks in K-12 education. This remark only revealed a diverse perspective from two of the participants.

Two of the eight participants did not think that Internet connectivity was the most important reason for the late adoption of e-textbooks. One stated "I do not feel like this is the most important option." Another participant stated,

> I worked at a Title I school for years and the majority of my students had access
> to the Internet at home. Those that did not were able to go to a public library or
> some other location that offered Internet or wireless services.

These comments may be reasons why Internet connectivity was ranked as the third most important reason for the late adoption of e-textbooks in K-12 education because of these diverse viewpoints relating to Internet connectivity. Only one of the two participants supported their opposing view with additional information, which provided a viable solution to the problem concerning Internet connectivity. Because this is a temporary solution to the problem this may have been the reason the participants' rated Internet connectivity 4.14 and ranked it the third most important reason that is hindering the adoption of e-textbooks in K-12 education.

One participant stated "I don't think that this is the most important reason," regarding local control textbook policy. This comment may have been the overall opinion

of the entire group even though they did not state it, which may be the reason the local control textbook policy ranked fourth as the major reason for the late adoption of e-textbooks in K-12 education even though it had a rating of 4.14. Also, two participants strongly agreed, four participants agreed, and 1 participant neither agreed nor disagreed with the consensus on local control textbook policy.

Other themes and responses had the lowest rating of consensus at 3.86, which made it rank sixth as a major reason for the late adoption of e-textbooks in K-12 education. This was due to the low rankings by the participants. Five participants ranked other themes and responses as the sixth major reason for the late adoption of e-textbooks, one participant ranked it the fifth major reason, and one participate ranked it the fourth major reason for the late adoption of e-textbooks in K-12 education. Also, one participant stated, "If a school system purchases the licenses they are compliant." Another participant stated, "The number of licensing agreements that the system must keep up with, in addition to the changing digital contents, and avoiding violating copyright laws can become overwhelming for the districts." These responses showed meaningful diverse opinions that contributed to other themes and responses very low ranking (See Appendices E and K).

Delphi Final Consensus Round

The final consensus round permitted respondents to express their degree of agreement with each of the six thematic summations generated from the preceding iterations' answers. Furthermore, the respondents had the opportunity of including supplementary remarks, including opposing views. Two panelists disagreed with the

summation for state and local resistance to digital content and one participant stated that

"In regards to state and local leadership resistance to digital content, I do not think that

the states are concerned about loss of control of digital content is a valid statement." This

comment and the two disagreement ratings were contributing factors for state and local

resistance to digital content's low consensus rating of 3.57 and its average ranking of

2.71.

Another participant stated, "Internet connectivity may be a problem at home, but

there is an effort in many communities to provide connectivity. They provide

connectivity in public libraries, community centers, and some local businesses are

providing Internet connectivity." This comment may have been a factor that ranked

Internet connectivity to third place with an average ranking of 3.86. In addition, one

participant strongly agreed with the consensus on Internet connectivity and six

participants agreed with the consensus on Internet connectivity (See Appendices F and

L).

Evidence of Quality

A number of approaches were utilized to guarantee the value of this review and

the conclusions revealed in this section. Firstly, the repetitive characteristics of the Delphi

process confirmed that the panelists had numerous chances to provide comments to my

explanations of their replies generated from the previous round's questionnaire and to

articulate any opposing views if required. A concluding consensus round permitted

panelists to specify their degree of consensus with the concluding summations of

preceding rounds' answers. Additional procedures were used to improve the

confirmability of this qualitative study, including triangulation, 12 expert participants

served as diverse data sources and memoing, provided rich thick narrations taken

throughout the entire research process. Negative or discrepant information was analyzed

by me who also scrutinized opposing opinions from the participants to achieve diverse

viewpoints regarding the late adoption of e-textbooks in K-12 education. In addition, I

used peer debriefing, an external auditor throughout the research process, and spent a

significant amount of time in the field examining the outcomes of each round of the

Delphi process to avoid any bias in the analysis, interpretation, and reporting of the

participates' experiences. The outcome of every one of these methods is described in the

following sections.

Credibility, Transferability, Dependability, and Confirmability

Creswell (2003) advocated several validation strategies: rich thick description,

triangulation, peer review, negative case analysis, bias clarification, persistent field

observations, external audits, and member checking in a qualitative study. Member

checking is a method believed to be "the most critical technique for establishing

credibility" (Lincoln & Guba, 1985, as cited in Creswell, 2003). Trochim (2001) further

stated "the participants are the only ones who can legitimately judge the credibility of the

results" (p. 162).This practice occurred two times during the repetitive Delphi process

utilized in this investigation: in the second and final consensus rounds when the panelists

were asked to respond to the summations prepared by me. Respondent reactions

generally reinforced or enhanced my interpretations of the participants' viewpoints. In

addition, qualitative investigators can "enhance transferability by doing a thorough job of

describing the research context and the assumptions that were central to the research"

(Trochim, 2001, p. 162). I strived to achieve this goal in this review, by communicating

the detailed summations provided to the respondents following the first and second

rounds (See Appendices B and C). The respondents' extensive concluding remarks and

comprehensive explanations of the process, including these confirmability processes are

additional confirmations of quality (See Appendix F). I had similarly engaged the method

of triangulation to analyze the data using 12 distinctive data sources to validate the

themes developed and used throughout the process so that they could be noted in the final

report (Trochim, 2001). Creswell (2003) recommended "researchers make use of multiple

and different sources" (p. 208). I also conducted extensive field observations by

continuing reviewing the literature from 2011 until 2014, when the final report was

written. Trochim (2001) described dependability as the necessity for the investigator to

explain the fluctuating framework in which research emerges. In this study, I exhibited

accountability by explaining the fluctuations that arose during this study by providing

thick rich descriptions during the entire research process (See Appendices H, I, J, K, and

L).

Peer Debriefer

The strategy behind peer debriefing was to ask a colleague to inspect various

aspects of the unprocessed data and evaluate whether the conclusions were credible and

grounded in the data (Merriam, 2002). During this review, I recruited an acquaintance

who had currently finished a doctoral program and was familiar with e-book technology.

She had the qualifications to understand the subject matter, and she was a person that

would give me feedback on my interpretations of the results. I described the background of the study, the purpose of the analysis, the research issues, and the Delphi process. The peer reviewer confirmed the data evaluation procedures by examining the respondents' answers and my interpretations of the results (See Appendices D, E, J, and K). The peer debriefer also examined my conclusions and gave a critique (See Appendices H and I). She emphasized specific components of the study, communicated her concerns about certain elements, and offered some additional thoughts, answers, and ideas for the study.

The peer debriefer expressed an interest in the formulation of the themes that were reported by the participants and the process of preparing and organizing the data for analysis by reducing the data into categories. The peer reviewer evaluated the responses based on the suggested keywords and phrases that were stated in the participants replies. These keywords and phrases were related to the cost and management of devices that would be used to support e-textbooks that were stated by the participants as laptops, computers, and e-readers; internet connectivity having sufficient Wi-Fi and bandwidth to accommodate these devices and also issues relating to students from lower socioeconomic groups who did not have Internet access; local control textbook adoption policy, whereby the districts had been given control to select their own textbooks; state and local leadership resistance to digital content that related to lack of legislature or innovative leaders that see the benefits of e-textbook usage; supportable funding for devices, participants expressed concerns for sustainable funding to support the devices once the program was implemented; and other themes and responses, which consisted of copyright, digital rights management issues, standardized file formats, limited OERs, and

numerous licensing agreements. These themes were grouped together within categories and then these categories were combined to establish relationships between the categories. After assessing my data analysis process, the peer reviewer stated that the results produced from the data collection and data analysis process were grounded in the data and were credible outcomes (See Appendices J and K).

External Auditor

Trochim (2001) suggested that the examiner use an external auditor who would evaluate their findings and present an opinion at the end of the project. For my external auditor, I selected an academic who was qualified to evaluate the execution of the Delphi method, could identify any deficiencies, and make suggestions to improve the integrity and effectiveness of the study (See Appendix G). The external auditor was used to evaluate the results of each round and to assess the interpretations at the end of this process. The external auditor's first concern was about the small sample size because I had selected only 12 people to participate. In her experience, a more sizeable sample population had been used. However, she did concur that the sample size was adequately substantiated in the literature review.

Secondly, she was concerned that this Delphi review was a forecasting instrument that used expert panelist to derive at a consensus regarding a real world issue. She understood that the predictions indicated the reasoning for the late adoption of e-textbooks in K-12 education. Because the literature review disclosed numerous variations and diverse applications of Delphi studies, she concurred that a forecasting instrument was useful in the decision-making process. She agreed that some research concentrated

on developing a consensus with the intention of making a determination that could present itself at a later date. However, she felt that the sample size was too small to make any generalized statements because the participants only represented a specific audience and could not represent a larger population.

Thirdly, the external auditor conveyed apprehensions regarding how the themes were produced from respondents' answers because some of the themes gathered during data collection were previously mentioned in the literature review. However, upon careful examination, she recognized that this would be expected because the participants were experts in their discipline and would be familiar with the current literature especially when I asked a specific broad open-ended question directed at the problem statement.

Fourth, the external auditor expressed concern regarding the validity and reliability of the study. I explained that the feedback presented to the participants from the previous rounds in the form of the summations allowed the participants to comment on the summaries. Member checking, asking the experts to respond to summations after each round was used throughout the research process to help monitor researcher bias and to confirm my interpretation of the experts experiences. This empowered me to describe accurately the participants' experiences about their reasons for the late adoption of e-textbook technologies in their states. Member checking served as diverse data sources who commented on the summations after each round, which added confirmability, validity, and credibility to the study by assisting me in the accurate reporting of their experiences.

Lastly, the external auditor questioned the lack of ranking of responses after each round, which she rationalized as a procedure that occurred in a traditional quantitative or mixed methods study to determine the viewpoint of the panelists. To this, I explained that this was a basic interpretive qualitative study and the participants' viewpoint was determined in the final consensus round. In the final consensus round, ranking was essential in order to determine to what degree did the participants agree or disagree with the summaries collected over the previous rounds. This practice was consistent with other conventional Delphi studies.

Limitations of the Study

The opinions of the external auditor were aligned with the limitations of the study. She was concerned with the study being an instrument to forecast results, which was stated as a limitation of the study. As previously stated, a Delphi study is intended to present practical forecasts about the future (Skulmoski et al., 2007; Franklin & Hart, 2007; Gordon, 1994). The outcomes of this investigation are not an explanation of any existing experience, but are an account of the consensus of professional opinions that was arrived at during the progression of the Delphi questionnaires (Skulmoski et al., 2007; Franklin & Hart, 2007; Gordon, 1994). This study formulated predictions about the potential issues related to the barriers that are hindering the adoption of e-textbooks in K-12 instructional environments. Predictions are not assurances of any specific outcome (Skulmoski et al., 2007). The definitive outcome of this review was the communication of an innovative theory on the barriers that are hindering the adoption of e-textbooks in K-12 education.

The external auditor also mentioned about the small sample size directed at a specific audience could not be generalized to include a larger population, which was stated as a limitation of the study. It was previously stated in the limitations that there would not be any generalizability (aka external validity) in this study. This was the consensus opinion of 12 people who were not representative of the relevant population. This was a theory generating study and as such, it was fundamentally exploratory. This study was limited by its simplification. I selected only 12 English-speaking participants who expressed an interest in participating in the study, had the time to respond in each round, agreed to the consent form, and were capable communicators. Also, when the expert consented to participate in this study, he or she was divulging that he or she was influential when making innovative technology purchases and was extremely knowledgeable of e-book technologies and its development. These was criteria that I could not confirm.

The external auditor was also concerned about the validity and reliability of the study. This was another limitation that was previously stated that may present itself during the course of this study as researcher bias based on a single individual organizing and rating the participants' responses. However, I used peer professionals to review my work as a form of member checking in an attempt to reduce the possibility of researcher bias. Self-reports of my interpretations of the administrators responsible for technology-related, institutional policy, and purchasing views concerning the late adoption of e-textbooks in their states could be considered a limitation of the study; however, the 12 expert panelists served as diverse data sources who commented on the summations after

each round to add confirmability, validity, and credibility to the study by assisting me in the accurate reporting of their experiences. However, the external auditor concurred that the feedback presented to the participants at the beginning of each round served as an aid to monitor researcher bias and misinterpretations of the participants' experiences.

Summary and Conclusion

The research described in this chapter investigated why e-textbook usage in the classroom had not been extensively adopted in K-12 education as previously stated in chapter 1. It examined the barriers and challenges confronted by decision makers when introducing this innovative technology in a formal learning environment. This section described the outcomes of this review and investigation. In this section, the data collection process were described in conjunction with my methods of tracking the data and developing interpretations for the late adoption of e-textbooks in K-12 education. The results were conveyed in the six thematic summations of the respondents' answers; this was the core of this chapter, which contained the components of the consensus arrived at by the expert panelist. The dissenting views and added remarks were carefully described. Lastly, this section ended by exhibiting proof of the study's value, consisting of credibility, transferability, dependability, and confirmability methods that utilized: my journal, peer review of the entire process, and an external audit. In summation, the professional panel derived at a consensus about the reasons for the late adoption of e-textbooks in K-12 education. The expert panelists agreed that cost and equipment management and supportable funding for devices were the major reasons for the late adoption of e-textbooks in K-12 educational environments. They felt that funding was

limited to acquire the initial equipment to support e-textbooks and sustainable funding to

purchase the equipment and to maintain it was not available. They believed that

supportable funding from the state was needed in order to purchase and sustain mobile

devices to support e-textbook technologies.

Chapter 5 will present a discussion and clarification of these conclusions and offer

recommendations for future studies.

Chapter 5: Discussion, Conclusions, and Recommendations

Chapter 5 includes interpretation of the research findings that explain the late rate of adoption of e-textbooks in K-12 education. The six thematic summaries generated from the participants' responses are linked to the research questions and compared to what was previously reported in the literature review. The summations are analyzed within the context of the theoretical framework. A description of dissenting opinions and the participants' added remarks conveying their influence on the final consensus are discussed. Recommendations for administrators responsible for technology-related, institutional policy, and purchasing including a recommendation for further research are stated. The chapter concludes with my reflections on my own e-textbook experiences, an assessment of the final results, and a closing statement.

Purpose of the Study

This research was conducted to discover why e-textbook usage in the classroom has not been extensively adopted in K-12 education. The objective was to determine the barriers and challenges being confronted by decision makers when introducing this innovative technology in a formal learning environment. Therefore, the purpose of this study was to examine the obstacles that are hindering the adoption of e-textbooks in K-12 education and to make recommendations for future diffusion studies on innovative technologies in education. The goal was to answer this single question: Why have a majority of state educational technology directors not adopted e-textbooks as a replacement for traditional printed textbooks?

Nature of the Study

This study used a Delphi method of inquiry for data collection and analysis. The research panel consisted of 12 experts who were administrators responsible for technology-related, institutional policy, and purchasing. These experts were solicited to make forecasts in reply to three repetitions of a Delphi questionnaire over a 5-week period. After each round, qualitative data were collected in the form of the respondents' written answers to the Delphi questionnaire. After each reiteration, I performed a content analysis of the data. The replies were examined and then coded by me using keywords and phrases. After each repetition, the questions for the subsequent rounds were designed based on the participants' responses in the previous round. Summations of the respondents' answers were anonymously revealed to the other respondents to provide them with a chance to modify their responses, make comments, or provide disserting remarks in the next round. Throughout this process, the panel progressed toward consensus. The final consensus round concluded the study by permitting the respondents to specify their degree of consensus with the closing six thematic summations of the respondents' previous replies. The participants were also requested to rank the themes in their order of importance and to supply any additional comments that they felt was pertinent to the study. A thorough explanation of the research design method was presented in Chapter 3.

Problem Statement

E-book technologies are changing the perception of how people read, retrieve information, and collaborate with colleagues. Authors of a variety of studies have

proposed that e-textbooks can be effective as instructional tools that can impact how information is retrieved and analyzed. Research revealed that digital content is being adopted by consumers, colleges, and universities at an increasing rate because mobile technologies provide accessible methods of doing business, conducting research, and developing personal interests by providing continuous access to information. With decreasing budgets (Greaves et al, 2012), increased acceptance of social media, and distance education programs (The New Media Consortium & the EDUCAUSE Learning Initiative, 2011), e-textbooks may be the solution to resolve issues regarding educational costs, information and communication technologies, and media literacy in the classroom. However, there is a gap in the literature regarding the diffusion of e-textbooks in formal educational environments. Therefore, the goal of this investigation was to determine why e-textbooks have not been widely adopted in K-12 education.

Qualitative Research Model

The purpose of this study was to understand the reasons for the slow rate of adoption of e-textbooks in K-12 education. A basic interpretive qualitative study was an appropriate methodology to use to understand why administrators responsible for technology-related, institutional policy, and purchasing have not adopted e-textbooks as a replacement for traditional printed textbooks. In this scenario, I was interested in comprehending how administrators responsible for technology-related, institutional policy, and purchasing interpreted this phenomenon. So, a basic interpretive qualitative study was used to interpret these individuals' experiences. Also, basic interpretive

qualitative studies are the most conventional method of qualitative research used in education.

Research Design

The Delphi method was selected for this study because it involved e-textbooks, which is an emerging innovative technology with limited information available in the current literature to explain the late adoption of this technology in an educational setting. As a result, the reasons for its late adoption were not clearly known nor were they clearly identified or assessed. As e-textbooks are not currently being widely used in K-12 educational environments, the Delphi method was selected to understand reasons for their lack of use. Because I anticipated acquiring a deeper understanding of the related issues that hindered the adoption of innovative technologies in K-12 educational environments, a diffusion of innovation methodology within a Delphi inquiry model provided a suitable framework for this analysis.

The Delphi method of inquiry was suitable for written responses to a questionnaire, whereby the respondents would arrive at a consensus for the late adoption of e-textbooks in K-12 education. The characteristics of the Delphi method included the following: the anonymity of Delphi respondents, which permitted them to freely articulate their views without any unnecessary group pressures, the repetition of rounds permitted the members to change their opinions without losing validity, controlled feedback notified the members of the other participants' opinions, which provided them with an opportunity to change their views, and a statistical summary of the members' answers provided an opportunity for analysis and explanation of the collected data.

I met the requirements of the Delphi by integrating the following procedures into the research design: maintained the anonymity of each of the Delphi respondents by sending out each questionnaire individually and not including the names of the other participants on the e-mails for any of the three rounds of the Delphi questionnaire. This helped to eliminate any group pressures from any domineering personalities, so that each individual was free to make comments concerning the issues related to e-textbook technology during the Delphi process and to change his or her mind based on the feedback received from the previous rounds. In addition, I did not put the names of any of the respondents on any of the summarizations or feedback produced from the previous rounds. Finally, I did not identify any of the participants in the final report.

This Delphi study was conducted online so it did not involve a physical location. An e-mail message was sent to the panelists, which included a hyperlink to the questionnaire. The three repetitions of the questionnaire were distributed by means of the Internet using SurveyMonkey.com. Conducting this study using an online environment permitted me access to experts who were geographically dispersed. It also permitted the experts to be able to respond to the questionnaire at their convenience.

The administrators responsible for technology-related, institutional policy, and purchasing who participated in this study did represent the larger population of decision makers who have not adopted e-textbooks as a replacement for traditional printed textbooks. These participants still have not decided to accept or reject e-textbook technologies in their K-12 learning environments. I verified this after analyzing the answers that they gave in response to the research question (Why has your state not

adopted e-textbooks as a replacement for traditional printed textbooks?). Their responses revealed similar reasoning for the late adoption of e-textbooks that had been previously reported in the literature: cost and equipment management; Internet connectivity; state and local leadership resistance to digital content; supportable funding for devices; and other themes and responses. Local control textbook adoption policy was a new theme that had not been previously reported. However, these issues have not been resolved and are challenges that the participants were still experiencing in their educational systems. At the time of this research, these panelists did not think that e-textbook technologies met their educational goals and objectives, which would delay the rate of adoption of e-textbooks in K-12 educational systems. Thus, they accurately represented the audience that I intended to solicit to participate in this research study.

Summary of Findings

This diffusion study using the Delphi method of inquiry over three rounds was conducted to determine the reasons for the late adoption of e-textbooks in K-12 education. The first round began by me requesting the expert panel to answer one broad open-ended question that was similar to the research question, "Why has your state not adopted e-textbooks as a replacement for traditional printed textbooks?" The replies generated from the 12 participants resulted in six thematic summaries that provided reasons for the late adoption of e-textbooks in K-12 educational systems. The themes were related to cost and equipment management; Internet connectivity; local control textbook adoption policy; state and local leadership resistance to digital content; supportable funding for devices; and other themes and responses.

In the second round, I asked the participants to select from the reasons generated in the first round and state which causes they felt were the major reasons for the late adoption of e-textbooks in K-12 education and to explain their reasoning for selecting that theme. The question that this questionnaire was designed to answer was: What do you think is the major reason that is hindering the adoption of e-textbooks in K-12 education? No new themes emerged from this round; just enhancements to the six initial themes.

In the third and final round of the Delphi questionnaire, the consensus was determined by the expert panelists. I presented the six thematic summaries to the panelists to determine their level of agreement. Cost and equipment management and supportable funding for devices had an average rating of 4.71 and had the highest degree of consensus for the late adoptions of e-textbooks in K-12 education. Internet connectivity and local control textbook adoption policy had an average rating of 4.14 and had the second highest degree of consensus for the late adoption of e-textbooks in K-12 education. Other themes and responses had an average rating of 3.86 and had the third degree of consensus for the late adoption of e-textbooks in K-12 education. State and local resistance to digital content had an average rating of 3.57 and had the fourth and lowest degree of consensus for the late adoption of e-textbooks in K-12 education. Thus, cost and equipment management and supportable funding for devices had the highest degree of agreement amongst the expert panelist followed by Internet connectivity and local control textbook adoption policy, then other themes and responses, and finally, state and local resistance to digital content.

Finally, the panelists were asked to rank the six themes in order of importance from the most important to the least important. Cost and equipment management had an average ranking of 5.71 and was ranked the first and major reason for the late adoption of e-textbooks in K-12 education. Supportable funding for devices had an average ranking of 4.29 and was ranked the second reason for the late adoption of e-textbooks in K-12 education. Internet connectivity had an average ranking of 3.86 and was ranked the third reason for the late adoption of e-textbooks in K-12 education. Local control textbook policy had an average ranking of 3.00 and was ranked the fourth reason for the late adoption of e-textbooks in K-12 education. State and local resistance to digital content had an average ranking of 2.71 and was ranked the fifth reason for the late adoption of e-textbooks in K-12 education. Other themes and responses had an average ranking of 1.43 and was ranked the sixth reason for the late adoption of e-textbooks in K-12 education

Cost and equipment management was definitively ranked the number one reason for the late adoption of e-textbooks in K-12 education and other themes and responses was clearly perceived to have little relevance for e-textbook adoption by this expert panel.

Interpretation of Findings

At the beginning of this study, I discovered that only four of the 28 states that have not adopted e-textbooks actually had a state educational technology director. Members that were representatives of their states in SETDA and the U. S. Department of Education's (2012) enhancing education through technology (ed-tech) state program contacts list held titles such as: Executive Director, Delaware Center for Educational

Technology; Assistant Superintendent and Chief Information Officer, Office of

Information Technology Services; Superintendent; Director, Office of Educational

Technology and Data Coordination; Director of Technology, State Educational

Technology Coordinator; Director, Office of Educational Technology, Educational

Technology and Online Learning Specialists; Director for North Dakota Educational

Council, Executive Director, Technology and STEM Specialist; Instructional Technology

Fellow; Director, Office of Virtual Education; Coordinator of Instructional Technology;

and State Director for Career & Technical Education. Also, many of these states did not

have a state department of technology. As a result, I expanded the job title classification

to administrators responsible for technology-related, institutional policy, and purchasing

to be participants in this study. This lack of consistency in job titles suggested that as

school reform is evolving so is the organization of the various states and their respective

state's department of education. Also, SETDA's membership is not exclusively directed

at state educational technology directors as its name implies. Similar results was noted

from the U. S. Department of Education's (n.d.) enhancing education through technology

(ed-tech) state program contacts list. These different job titles implied different areas of

responsibilities, experiences, and skill-sets. These differences also implied that the

organizational structure of these states differed from state to state. I also discovered that

the revised SETDA website stated:

> While each state education agency is organized differently and specific job titles
>
> vary, SETDA members include state educational technology directors as well as
>
> state and regional curriculum and instruction, assessment and professional

development leaders committed to advancing technology-enabled school reform and improvement strategies in their respective states and nationally (SETDA, 2014).

This fortifies the need for updated state policies and visionary leaders to take charge and bring their states into the 21st century. Innovative state and local leaders could serve as *change agents* who would help to initiate reform on the part of its constituents and establish an information exchange. Change agents diagnose problems, establish relationships, and translate change into action (Rogers, 2003). Rogers thought that they would help to create intent to change a specific behavior or introduce a new innovation and assist in the process for the adoption and implementation of the innovation. Diffusion theory plays a major role in the adoption of an innovation for the reform to be adopted and sustained. This can be accomplished by connecting the organization to the community, keeping stakeholders informed of organizational changes, establishing a vision and culture, acquiring leadership approval and acceptance, recognizing the importance of professional learning communities, and acknowledging the individual diversity of adopters.

Cost and Equipment Management and Supportable Funding for Devices

The thematic summaries that had the highest degree of consensus according to the expert panelists were cost and equipment management and supportable funding for devices, which were both rated 4.71. The panelist ranked cost and equipment management as the first major cause for the late adoption of e-textbooks and supportable funding for devices as the second cause for the late adoption of e-textbooks in K-12

education citing lack of money was as a major concern for all stakeholders. The participants disclosed that the states needed to provide sufficient funding to the districts to assist in the acquisition of devices and software to support e-textbook technologies and to provide technological support to maintain, update, and replace devices as required. The participants also felt that it was incredibly important that students have the devices that they needed for the implementation to be successful. The participants stated that students from low income families could not provide the tools for e-textbooks, so it put the responsibility on the school districts for equity reasons and to be able to provide all students the opportunity to access all of the digital content. However, one participant stated' "I think that if the states stopped buying expensive textbooks they would have the money that they need to buy the hardware that is needed to enhance and support the technological equipment." This suggestion could be used as an approach to acquire funding to finance the acquisition and support of e-textbook devices.

Internet Connectivity

The expert panel rated Internet connectivity at 4.14; stating that this was the third major reason that hindered the adoption of e-textbooks in K-12 education. The panelists disclosed that Wi-Fi and connectivity was the key to the implementation of a digital content initiative. It was stated that many districts have sufficient connectivity in the schools, but many students from lower socioeconomic groups do not have connectivity, which will cause the system to fail. The participant also conveyed that states cannot put a digital, e-textbook, program in place and not be able to provide all of their students with these resources as Internet access is required to use e-textbooks. The panel asserted that if

a program is being adopted that is strictly online, then the states must be able to provide access for all students. One participant proclaimed that without home Internet connectivity, students would not be able to do homework and prepare detailed written reports. Also, another panelists asserted that parents hesitate when it comes to technology; if they do not have reliable Internet access. The panelists also declared that states should develop and implement an Internet infrastructure and network that is suitable to support extensive, synchronized use of devices for instruction, assessment, and administrative purposes.

Local Control Textbook Policy

The expert panel rated local control textbook policy at 4.14 as the fourth major reason for the late adoption of e-textbooks. They stated that a local control textbook policy meant that each district made their own policies and there was no collaboration between the other districts. One participant declared that the state and local school boards try to look at all of their students' needs, but the boards make their adoptions based upon the needs of their communities. Again, when there are communities that are not connected, then it is hard for the boards to make decisions to use tools that all students will not have access to use. It was also disclosed that the needs of a metropolitan school district will greatly differ from the needs of a rural school district. The participants also stated that while some State Department of Education allows the local districts to use textbook funding to purchase hardware to maintain electronic resources, it is at the local districts discretion to convert to digital content.

In many of the states, textbook adoption is currently a district level decision and not a state decision and e-textbooks are not being selected as a viable alternative. Many of the non-adoptive states are local control states and each district is run separately using a Local Education Agency-Level Adoption policy. These states have not mandated local districts to adopt e-textbooks. Each district is free to make textbook decisions based on what they feel best meets their needs. Textbook purchases whether they are traditional printed or e-textbooks are handled at the district level and not at the state level. According to Scudella (2013), states use one of two approaches to choose textbooks that are utilized in their school systems. The first approach is a state-level textbook adoption policy and the second approach is a local education agency-level textbook adoption policy (Scudella, 2013). Twenty-nine states permit local schools to select their own textbooks and 21 states and three territories, known as the textbook adoption states, have their textbooks selected at the state level (Scudella, 2013).

State and Local Leadership Resistance to Digital Content

State and local leadership resistance to digital content only had a census rating of 3.5 by the expert panelists. This rating appeared to have been lower because of some of the dissenting opinions relating to this topic. One participant stated "these decisions should be left up to the district." While another participant stated:

> If states are going to initiate a statewide e-textbook adoption policy then the decisions need to be made at the state level and legislature needs to be passed to bring the entire state in alignment with that policy. Unless a decision is made at the state level then districts will continue to make their own decisions and there

will never be a unified state policy. The states need to enlist people with visionary

and innovative philosophies in order for this movement to take place.

One participant stated:

In my opinion, the state and local leadership resist digital content because the

authors can change the content anytime. Thus the leader, local and statewide, do

not have the ability edit or sensor the content. Otherwise the leaders lose control

of the subject content.

Another participant in direct response to this comment stated, "In regards to state and

local leadership resistance to digital content, I do not think that the states are concerned

about loss of control of digital content is a valid statement."

These dissenting views caused this lower rating and these statements appear to be

ambiguous and contradictory in meaning.

Other Themes and Responses

Other themes and responses are related to issues involving copyright and digital

rights management restrictions that limit the use of e-textbooks, standardized file formats

that prevents e-textbook access across various platforms that may cause compatibility

difficulties with existing technological environment, limited OERs as well as the

numerous licensing agreements options available, which may be challenging to the

districts. These items were grouped together in the first round to form other themes and

responses. Other themes and responses, degree of consensus was rated 3.86 by the

panelists, however, they still ranked it a 1.43 or sixth in level of importance as a major

reason for the late adoption of e-textbooks in K-12 education. This implied that the

panelist found these reasons to be the least relevant when it comes to hindering the rate of adoption of e-textbooks. However, these issues still need to be addressed.

Cost and equipment management combined with supportable funding for devices was previously reported in the literature, along with Internet connectivity and other themes and responses. This would be expected because the participants are experts in their discipline and would be familiar with the current literature especially when I asked a specific broad open-ended question directed at the problem statement and these reasons are ones that they are still experiencing themselves. However, local control textbook policy was a new theme that was not previously reported in the literature as a major reason for the late adoption of e-textbooks in K-12 education.

There were other issues that were mentioned in the literature, but did not materialize in this study as reasons for the late adoption of e-textbooks in K-12 education. It was cited in the literature that states and districts need to concentrate on the following interconnected issues that contributed to the late adoption of e-textbooks in K-12 education:

District and local policies. District and local leadership need to provide a vision and funding to support effective implementation strategies (Fletcher et al., 2012; SETDA, n.d.). State regulations and guidelines have not kept up with the advancement in technology or the benefits of using technology in education (Fletcher et al., 2012; SETDA, n.d.).

Teacher preparedness. Current teacher professional training programs are inadequate in numerous preparatory teacher college programs to properly prepare

teachers to use digital content in their instruction. Also, districts must make professional development opportunities available to their teachers to familiarize them with digital content and show them how to integrate digital resources into their classroom curriculum (Fletcher et al., 2012; SETDA, n.d.).

Quality of content: Some critics argued that the commerce paradigm for the development, purchase, allocation, and use of educational resources in K-12 education is antiquated and has become an obstacle to innovation (Fletcher et al., 2012; SETDA, n.d.). Fletcher et al. (2012) and SETDA (n.d.) acknowledged that given the changeability of resources accessible on the Internet, there are still critics who believe that digital information is inferior in quality to print content. Also, digital content should be assessed at the local level and identified so that it easy to locate and operate to assist teachers individualize learning in their instruction (Fletcher et al., 2012; SETDA, n.d.).

When making the change to electronic educational resources, states and districts must implement a plan that will provide a reliable Internet, infrastructure, and continuous financial support for the devices that are needed to allow students to take full advantage of the digital content that is available (Fletcher et al., 2012; SETDA, n.d.). These devices should also be adaptable for other educational purposes such as: instruction, assessment, access to online learning environments, and administrative operations (Fletcher et al., 2012). Policies and practices need to be developed that will encourage the use of electronic resources and devise programs and enticements to promote its utilization (Fletcher et al., 2012; SETDA, n.d.). Districts must offer options for continued professional development together with online collaborative learning communities to

exchange ideas on best practices (Fletcher et al., 2012; SETDA, n.d.). Districts should provide quality control and a usability structure to provide easy access to the digital content that can be used in a variety of circumstances so teachers can prepare personalize lessons for their classrooms (Fletcher et al., 2012). A strong state and local leadership commitment is needed to provide a vision and the support to facilitate a successful implementation strategy (Fletcher et al., 2012).

Theoretical Framework

This study suggested that these participants are in the decision stage of Rogers' (2003) innovation-decision process. In this stage, the members were indecisive as to whether to accept or reject e-textbooks while some members have already implemented them into their K-12 educational systems (Rogers, 2003). The innovation-decision process is "an information-seeking and information-processing activity, where an individual is motivated to reduce uncertainty about the advantages and disadvantages of an innovation" (Rogers, 2003, p. 216). The innovation-decision process involves five stages: (a) *knowledge*, when a person gains an understanding about an innovation and acquires information on how it performs; (b) *persuasion*, when the person develops a optimistic or adverse view point about the innovation; (c) *decision*, when the person chooses to accept or reject the innovation; (d) *implementation*, when the person puts the innovation into practice; and (e) *confirmation*, when a person pursues endorsement for their decision about accepting the innovation, but may reject the decision if presented with opposing views after making the decision. (Rogers, 2003, pp. 216-217). Rogers

(2003) stated "the formation of a favorable or unfavorable attitude toward an innovation does not always lead directly or indirectly to an adoption or rejection" (p. 176).

The non-adopters of e-textbooks would be considered laggards. According to Rogers (2003), *laggards* are members of a social system who are the last to adopt an innovation. Laggards can either be traditional thinkers or individuals who are segregated from their social system. If they are traditional thinkers, they are often apprehensive of innovations and often interrelate with others who also have traditional ideals (Rogers, 2003). They also have limited access to social networks and financial resources (Rogers, 2003). If they are isolated from their social system, their lack of social interaction decreases their understanding of an innovation's proven benefits (Rogers 2003). These individuals must be certain that an innovation will work and meet expectations before they will adopt it (Rogers, 2003). Laggards are mistrustful of change agents and innovations (Rogers, 2003). Their innovation-decision process is generally prolonged, with adoption and use lingering far behind awareness-knowledge of a new practice or idea (Rogers, 2003). Opposition to innovations on the part of laggards may be completely reasonable from the laggards' perspective, as their sources and convictions may be restricted and they must be sure that a new innovation will work before they will adopt it (Rogers, 2003).

In the case of e-textbook adoption, the educational systems will adopt this innovation when an authoritative decision is made to accept this innovation. According to Rogers (2003), when an organization adopts an innovation they are frequently adopted due to two types of innovation-decisions: collective innovation-decisions and authority-

innovation decisions. The *collective innovation-decision* follows adoption when the

members of the social system agree to adopt the innovation (Rogers, 2003). The

authority-innovation decision follows adoption when a few individuals with prominent

positions of authority within an organization chooses to adopt or reject the innovation

(Rogers, 2003). These are different from the *optional-innovation decision* process when

the decision to adopt or reject an innovation is made independent of the other members in

the group (Rogers, 2003). Within an organization, specific individuals are named

champions who supports an innovation and eliminates resistance (Rogers, 2003). The

innovation process contains five stages that follow a direct sequence in the decision

process. They are broken down into two broad categories: *initiation*, which consists of

data collection, conceptualization, and planning that leads up to the decision to adopt the

innovation and the *implementation stage*, which consists of all the procedures,

arrangements, and assessments to implement the innovation (Rogers, 2003). The

initiation process consists of *agenda-setting* when the need for the innovation is defined

and the *matching stage* when a problem from an organization is matched with an

innovation then this match is organized and devised (Rogers, 2003). The second

category, implementation consists of *redefining/restructuring*, when the innovation is

adapted to the organization and organization constructs are modified to accept the

innovation; *clarifying*, occurs when the relationship between the innovation and the

organization is clearly defined; and *routinizing*, occurs when the innovation is integrated

into the routine behaviors of the organization and loses its distinct characteristics

(Rogers, 2003). According to Rogers (2003), the *rate of adoption* is "the relative speed with which an innovation is adopted by members of a social system" (p. 221).

Judging from the outcomes of this study, it is clear that the majority of the participants in this study have not determined whether to adopt or reject e-textbooks in their learning environments. There appeared to be no policy in place to implement e-textbooks. The possibility of e-textbook adoption in K-12 education is greatly reliant upon the communication channels and characteristics of the innovation impression on the social system. It appeared that the majority of the participants do not think that e-textbook technologies meet their educational goals and objectives. A major finding in this study was that the communication channel paradigm was the most important forecaster of adoption: adoption initiates when an entity is exposed to an innovation and acquires knowledge about its functions (Rogers, 2003). Communication is crucial for information to be conveyed and this study found that there was a lack of communication about the implementation of e-textbooks among most of the participants who finished the survey.

Nevertheless, Rogers (2003) emphasized relative advantage as the most persuasive forecaster of the rate of adoption of an innovation. Chan (2010) stated that technology diffusion is based on its availability, portability, affordability, and appropriateness for reading and writing in an educational environment. He stated that in order for a technology to be adopted, it had to reach some level of maturity. Whereas, availability concerns are the forerunner of any adoption movement, the permanence of the innovation directs the speed of adoption of an innovative technology (Chan, 2010). Chan posed that the solidity of the innovation reveals how directly the innovation

complements consumer beliefs. If the innovation aligns with the user's values and practices, than it will have a greater rate of adoption (Chan, 2010). The results of this study supported Chan's theory; because it was clear that the majority of the participants had not determined whether to adopt or reject e-textbooks in their learning environments. At this time, these participants do not think that e-textbook technologies meet their educational goals and objectives, which would delay the rate of adoption of e-textbooks in K-12 education.

Limitations of the Study

A Delphi study is intended to present practical forecasts about the future (Skulmoski et al., 2007; Franklin & Hart, 2007; Gordon, 1994). The outcomes of this investigation were not an explanation of any existing experience, but an account of the consensus of professional opinions that was arrived at during the progression of the Delphi questionnaires (Skulmoski et al., 2007; Franklin & Hart, 2007; Gordon, 1994). This study formulated predictions about the potential issues related to the barriers that are hindering the adoption of e-textbooks in K-12 instructional environments. Predictions are not assurances of any specific outcome (Skulmoski et al., 2007). The definitive outcome of this review was the communication of an innovative theory on the barriers that are hindering the adoption of e-textbooks in K-12 education.

This study was limited by its simplification. I selected only 12 English-speaking administrators responsible for technology-related, institutional policy, and purchasing to be participants in this study. These participants expressed an interest in participating in the study, had the time to respond in each round, agreed to the consent form, and were

capable communicators. Also, when the expert consented to participate in this study, he or she was divulging that they are influential when making innovative technology purchases and were extremely knowledgeable of e-book technologies and its development. These were criteria that I could not confirm.

Another limitation that might have presented itself during the course of this study was researcher bias based on a single individual organizing and rating the participants' responses. However, I used peer professionals to review my work as a form of member checking in an attempt to reduce the possibility of researcher bias. Self-reports of my interpretations of the participants' views concerning the late adoption of e-textbooks in their states was considered a limitation of the study; however, the 12 expert panelists served as diverse data sources who commented on the summations after each round to add confirmability, validity, and credibility to the study by assisting me in the accurate reporting of their experiences.

Implications for Social Change

This study promoted positive social change by providing decision-makers an opportunity to reflect on the challenges that is impacting their adoption of e-textbooks in K-12 education. The results of this study clearly identified cost and equipment management, in addition to the lack of supportable funding to sustain e-textbook technologies after they are acquired as the major reasons that is hindering their adoption of e-textbook technologies. Once the causes are identified then the planning process can commence to work towards a solution. This can be accomplished by instating visionary leaders on the state and local levels to develop a strategic plan to initiate the transition

from traditional printed materials to digital and OERs that are relevant, flexible, and educational. Then they can distinctly convey their objectives to their entire learning communities including school administrators, teachers, and all stakeholders. These guidelines should be designed to reduce needless procedures and authorize policies and processes that will develop and implement the use of digital content. This can be accomplished if states and districts replace outdated policies and practices to increase funding flexibility to finance the acquisition of devices to support digital content and allocate funding that can sustain them.

Reflection

My own experience regarding e-textbooks has been limited to the online databases and electronic texts used during this doctoral program. The purchase of textbooks was kept to a minimum. By using online journals and digitized texts published by Atomic Dog that was made available through the Walden bookstore greatly helped to reduce the cost of textbooks for the various courses that I was required to take. These resources showed more relevance to the curriculum because they were more current than a traditional printed textbook and it kept educational cost down by not having to purchase expensive printed texts.

My other experience with digitized resources occurs in my workplace where the purchase of e-books and electronic databases is continuing to expand with each school year. Currently, my school system has nearly 5,000 e-books available to its K-12 learning community. Approximately 4,000 of these electronic resources has been purchased through our media services department and made available to the entire school district.

Electronic resources purchased by the media specialists in the various schools range from 500 to 1,000 based on full-time student enrollment and the media budget. Individual schools media budget must be diversified spreading the dollars across digitized resources, printed texts, and supplies. This year, each media specialist contributed $1,000.00 off the top of his or her budget to the district to purchase electronic databases that would be shared and made available to the entire school district. By purchasing electronic databases on subscription across the district provides substantial savings to all concerned parties. The rationale is that e-books provide students and faculty an outlet to obtain books when they are not in school or do not have access to a library. Providing e-books extends the library day and are available to our entire district 24 hours a day, 7 days a week, and 365 days of the year including holidays. These electronic resources are accessible via a smartphone, tablet, laptop, or computer as long as they have an Internet service provider. Generally speaking, most of the students have access to a smartphone so the digital divide is narrowing in some respects. Also, the district found the purchase of e-books to be cost effective because they eliminate lost, damaged, and stolen books. Resources can be readily acquired because the books can be downloaded into an online catalog immediately after purchase without any distribution or cataloging delays. The district purchases e-books either for multiple access, single access, or subscription.

Assessing the results of this study, I recognized that the majority of the panelists in this study have not decided whether they want to adopt or reject e-textbooks in their schools. It seems to me that their state and local districts have no visionary leadership in place to develop a strategic plan to initiate the transition from traditional printed materials

to digital and OERs in their school systems. The prospect of e-textbook adoption in these K-12 environments is greatly reliant upon the communication channels that exist between the leadership, administrators, teachers, parents, students, and all stakeholders, but this is not the case. It is clear that the majority of the panelists do not think that e-textbook technologies meet their educational goals and objectives. A major conclusion in this study was that the communication channel model was the most important predictor of adoption, which is lacking with these participants. Adoption originates when a membership is exposed to an innovation and acquires knowledge about its functionalities. Communication is essential for information to be distributed amongst the membership and this study found that there is a lack of communication about the implementation of e-textbooks among most of the participants who finished the survey. Therefore, the participants are not reassured of the benefits of using e-textbook technologies in a classroom setting, which will slow down the rate of adoption of e-textbooks in K-12 learning environments.

Recommendations

The following recommendations are for the administrators responsible for technology-related, institutional policy, and purchasing:

First, state and local leaders should develop a strategic plan to initiate the transition from traditional printed materials to digital content and OERs. This should be accomplished by eliminating outdated state and local policies and implementing policies that would encourage the adoption of e-textbooks in K-12 educational environments. One participant stated,

If states are going to initiate a statewide e-textbook adoption policy then the decisions need to be made at the state level and legislature needs to be passed to bring the entire state in alignment with that policy. Unless a decision is made at the state level then districts will continue to make their own decisions and there will never be a unified state policy. The states need to enlist people with visionary and innovative philosophies in order for this movement to take place.

Another participate posed,

If the states do not organize themselves so that they are in a position to promote e-textbook adoption, it will never happen. You will have what is going on right now each district doing their own thing with no real plan in place to transition to e-textbooks. Some districts have not even considered it as an alternative to expensive textbooks, in which case, e-textbooks would save them money in the long run.

Second, states and districts should increase funding flexibility to finance the expansion of their infrastructures and to purchase technological devices that will support and sustain e-textbook technologies. These devices should be used to support instruction, assessment, professional training, and administrative operations. This recommendation resulted from the three major reasons cited by the panelists for the late adoption of e-textbooks in K-12 education as cost and equipment management, supportable funding for devices, and Internet connectivity.

Third, state and local leaders must also identify and distribute efficient performance standards on how to make the transition from printed textbooks to digital

ones, including teacher training and support. Panelists stated that there was insufficient information available for them to transition to digital content; therefore, non-adoptive states have not considered digital content as a viable alternative. One participant stated,

> We have not mandated the transition to e-textbooks at the state level because we do not know enough about them and how they will impact student success. We do not want to rush into this decision without seeing the impact they will have on the other states.

My recommendation for future research include identifying the next steps that non-adoptive states are taking to transition to a technology enriched learning environment. What inter-related planning strategies are being introduced to convert from traditional printed textbooks to digital content? The results of this study could be generalized to apply to new innovative technologies that may materialize in the near future.

Conclusion

The primary purpose of this study was to identify why e-textbook usage in the classroom has not been extensively adopted in K-12 education. The purpose was to uncover the barriers and challenges being encountered by decision makers when introducing this innovative technology in a formal learning environment. Therefore, the goal of this study was to investigate the difficulties that are impeding the adoption of e-textbooks in K-12 education and to make recommendations for future diffusion studies on innovative technologies in education.

The Delphi method of inquiry was used to determine the obstacles that is hindering the adoption of e-textbooks in K-12 educational systems. The first round of the Delphi inquiry asked the research question to the panel of experts to determine their reasons for the late adoption. Six thematic summaries resulted that was stated as reasons that hindered their adoption: cost and equipment management, Internet connectivity, local control textbook adoption policy; state and local leadership resistance to digital content; supportable funding for devices; and other themes and responses, which consisted of copyright, digital rights management issues, standardized file formats, limited OERs, and numerous licensing agreements. The second round asked the participants to identify the major reasons for the late adoption of e-textbooks cited in round one and to give reasons for the cause. The final consensus round requested the participants to evaluate the reasons generated from the first and second rounds and to rate their agreement with the comments. The participants were also asked to rank the six reasons in order of importance from the most important to the least important. The final consensus resulted in a high degree of agreement for the summations on cost and equipment management and supportable funding for devices. Also, the most important reason for the late adoption of e-textbooks in K-12 education was overtly cited as cost and equipment management by the expert panelists.

However, the cost of traditional printed textbooks is still a major concern of all educational institutions because they have been a contributing factor to the increasing cost of education and may be a driving force to influence the adoption of e-textbooks in education. Numerous studies conducted on the cost effectiveness of digital content in

education considered it to be a viable solution to escalating expenditures. This technology is one of the few emerging innovations that are considered cost effective when other technologies seem to add to existing costs. E-textbooks provide a possible solution to level the increasing cost of printed textbooks over the preceding decade, but K-12 educational systems still have been slow to adopt digitized content in the classroom setting. Historically, educational institutions have regarded technology as an added cost. E-textbooks is one of the very few technologies that is being promoted as a cost saving measure – the only instructional improvement alleged is improved access and, possibly, currency of content. However, the panel never mentioned lower cost when assessing digital content, because their focus was on the challenges facing e-textbook adoption and not the benefits of e-textbook technologies.

The introduction of the CCSS presents a rare opportunity for states and districts to work together to create, acquire, and use instructional resources that are aligned with the new standards (Common Core State Standards Initiative, 2012; Fletcher et al., 2012). CCSS also has the ability to apply substantial influence on the publishing industry as it develops instructional resources, including textbooks and online materials to align with the new standards at reduce cost (Samuels, 2012).

However, the next generation of technologically knowledgeable students is emerging and as educators it is necessary for us to be ready. When executing an e-textbook initiative, educators have to be unbiased to new approaches and techniques. In this discipline, it is time to put our personal preconceptions aside for the benefit of the learner. Digital content is not going away and the demand for them continues to rise. The

only way educators will be able to construct worthwhile curricula is if they collaborate to generate curricula that are relevant in today's society. "Digital content includes richly diverse fields of knowledge, supporting opportunities for interaction with materials, resources, and experts beyond the classroom. And digital content is always up-to-date and virtually infinite, supporting a wide variety of interests and topics (The Digital Textbook Collaborative, 2012, p.11)".

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Appendix A: Consent Form

You are invited to take part in a research study of the adoption of e-textbooks in K-12 education.

The researcher is inviting State educational technology directors to be in the study. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named Sheila Cartwright, who is a doctoral student at Walden University.

Background Information:
The purpose of this study is to discover why e-textbooks are not widely adopted in K-12 education. The objective is to determine the barriers and challenges being confronted by decision makers when introducing any innovative technology in a formal learning environment. The Delphi questionnaire will consist of two initial rounds and the final consensus round (for a total of three rounds) that will determine the panel's reasoning for the late adoption of e-textbooks in K-12 classrooms. The questionnaire should take approximately 30 minutes or less to complete with the survey being conducted over a 5-week period.

Procedures:
If you agree to be in this study, you will be asked to:
- Participate in three rounds of a Delphi study to determine the reasons for the late adoption of e-textbooks in K-12 education.
- The questionnaire should take approximately 30 minutes or less to complete with the survey being conducted over a 5-week period.

This study will be driven by this single question: Why has your state not adopted e-textbooks as a replacement for traditional printed textbooks?

Voluntary Nature of the Study:
This study is voluntary. Everyone will respect your decision as to whether or not you choose to be in the study. There will no repercussions if you decide not to be in the study. If you decide to join the study now, you can still change your mind during or after the study. You may stop at any time.

Risks and Benefits of Being in the Study:
Being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as time constraints. Being in this study would not pose risk to your safety or well-being.

The benefits of this study would be to disclose barriers and establish patterns that could hinder the adoption of any innovative technology in K-12 formal education that can serve as a learning tool that can greatly impact teaching, learning, and creative analysis. The results of this study will serve as a guide for future diffusion studies on innovative technologies in education and the challenges that they will face when being introduced to K-12 educational systems.

Payment:
There will be no payment, thank you gifts, or reimbursements involved as a result of participating in this study.

Privacy:
Your identity will remain anonymous to the other participants. The researcher will not use your personal information for any purposes outside of this research project. Also, the researcher will not include your name or anything else that could identify you in the study reports. This Delphi study will be conducted online so it will not involve a physical location. Security risks will be at a minimum. Data will be kept for a period of at least 5 years, as required by the university.

Contacts and Questions:
You may ask any questions you have now. Or if you have questions later, you may contact the researcher via sheila.cartwright@waldenu.edu. If you want to talk privately about your rights as a participant, you can call Dr. Leilani Endicott. She is the Walden University representative who can discuss this with you. Her phone number is 1-800-925-3368, extension 1210. Walden University's approval number for this study is **IRB will enter approval number here** and it expires on **IRB will enter expiration date.**

The format of the study: Delphi Questionnaire

Please print or save this consent form for your records.

Statement of Consent:

I have read the above information and I feel I understand the study well enough to make a decision about my involvement. By replying to this e-mail with the words, "I consent", I understand that I am agreeing to the terms described above.

Appendix B: Delphi Round 1 Questionnaire

Diffusion of E-textbooks in K-12 Education: A Delphi Study

Based on your professional opinion, expertise, and interpretation, please reply to the following question with a thorough, yet concise response.

This questionnaire may take 30 minutes or less to complete.

Please leave your name for statistical purposes only. Your identity will remain anonymous to the other participants and your contribution to this study is confidential.

1. Why has your state not adopted e-textbooks as a replacement for traditional printed textbooks?

2. Please state your name.

3. Please state your e-mail address so that you can be contacted for Round 2 of the Delphi questionnaire.

Thank you for participating in the first round of the Delphi questionnaire. The second round of this study will begin in approximately one week. The interim week will be used for analytical purposes. Summaries of your responses will be presented in the second round of the Delphi questionnaire.

Note: Adapted from Wagner, M. D. (2008). *Massively multiplayer online role-playing games as constructivist learning environments in K-12 education: A Delphi study* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3325359)

Appendix C: Delphi Round 2 Questionnaire

Diffusion of E-textbooks in K-12 Education: A Delphi Study

Please review each summation listed below and then respond to the question based on your professional opinion, interpretation, and assessment of the summation.

This questionnaire may take 30 minutes or less to complete.

Please leave your name for statistical purposes only. Your identity will remain anonymous to the other participants and your contribution to this study is confidential.

Which of the items summarized below is the most important reason for the late adoption of e-textbooks in K-12 education and why?

You may choose as many reasons that you think are important. Please explain why you selected that reason and rate its level of importance.

These are the themes and summations that were examined and categorized from the first round's responses.

1. Cost and Equipment Management:
States do not have the electronic devices to support e-textbooks due to cost associated with equipment purchases. Also, policies are not in place that will enable the schools to manage the equipment making it problematic to deal with issues related to stolen devices.

Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?

2. Internet Connectivity:
Internet connectivity was cited as a reason for the late adoption of e-textbooks in K-12 education for the following reasons: states have not developed a dependable network and Internet infrastructure to support a productive digital learning environment, states have insufficient broadband wireless or Wi-Fi connectivity available to operate innovative digital devices, and/or students from lower income groups do not have the resources to connect to the Internet.

Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?

3. Local Control Textbook Adoption Policy:
While some State Department of Education allows the local districts to use textbook funding to purchase hardware to maintain electronic resources, it is at the local districts discretion to convert to digital content. Other states provide a list of approved vendors or

programs, but textbook adoption is currently a district level decision and not a state decision. Textbook rotation policies by subject and grade level is exercised in some states, but e-textbooks are not being selected as a viable alternative. Many of the non-adoptive states are local control states and each district is run separately using a Local Education Agency-Level Adoption policy. These states have not mandated local districts to adopt e-textbooks. Each district is free to make textbook decisions based on what they feel best meets their needs. Textbook purchases whether they are traditional printed or e-textbook are handled at the district level and not at the state level.

Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education?

4. State and Local Leadership Resistance to Digital Content:
Non-adoptive states have not organized themselves with a State Educational Technology Director to implement policies and procedures and many have not established an Instructional Technology Department on the state level. Technology issues are being distributed throughout curriculum assessment. Technology plans are developed and approved on the local level. State Departments of Education have not mandated the transition to e-textbooks stating lack of knowledge regarding their impact on student success as reasons for not adopting e-textbooks. There has been no focus on the adoption of e-textbooks from the major decision-makers. Only the content coordinators, teachers, parents, and students have pushed for e-textbooks. The Department of Education does not implement policies for the local districts. The State Department of Education administers policies according to federal guidelines. E-textbooks would have to become a requirement issued at the federal level for it to be executed at the state level.

Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education?

5. Supportable Funding for Devices:
State funding is not available to purchase computers/e-readers for local districts, which has hindered the adoption of e-textbooks on the local level. It is too costly for local districts to purchase e-readers, computers, and/or laptops without funding provided by the state.

Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education?

6. Other Themes and Responses:
Issues relating to copyright and digital rights restrictions that limit the use of e-textbooks has hindered e-textbook adoption. Standardized file formats that prevents e-textbook access across various platforms, may cause compatibility difficulties with existing technological environment. Limited open educational resources as well as the numerous licensing agreements options available hinders e-textbook adoption.

Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?

8. Please state your name.

Thank you for participating in the second round of this Delphi questionnaire. The final round of this study will begin in approximately one week. The interim week will be used for analytical purposes. Summaries of your responses will be presented in the third and final round of the Delphi questionnaire.

Note: Adapted from Wagner, M. D. (2008). *Massively multiplayer online role-playing games as constructivist learning environments in K-12 education: A Delphi study* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3325359)

Appendix D: Delphi Final Consensus Questionnaire

Diffusion of E-textbooks in K-12 Education: A Delphi Study Final Consensus

The concluding round of this Delphi study will determine this panel's consensus with the summations generated from the previous rounds responses. Please examine the summations listed below and specify your degree of agreement with these summations. Please leave any supplementary remarks that may be pertinent to this study. The final report will reflect your assessments and remarks.

The term **consensus** means that the summations are at least agreeable to you as a member of this expert panel, even if they are not precisely as you may have wanted.

This questionnaire may take 30 minutes or less to complete.

Please leave your name for statistical purposes only. Your identity will remain anonymous to the other participants and your contribution to this study is confidential.

These are the themes and summations that were examined and categorized from the previous rounds responses.

Cost and Equipment Management: Acquisition cost is a major cause for the late adoption of e-textbooks. Acquiring the initial and sustainable funding to purchase the equipment and to maintain it. It would take money to buy the software and get it approved for the district. It is incredibly important that students have the devices that they will need in order to access e-textbooks if this is the direction that districts decides to move. Students from low income families can't provide the tools for e-textbooks, so it puts the burden back on the schools. Thus, forcing the schools to provide the equipment that will need to be updated on a regular basis. Also, additional staff will be required to maintain and support the equipment. Even though the cost of devices have reduced considerably, this is still a major factor when districts are faced with providing these devices for both students and faculty. Replacement of equipment would be even costlier.

Internet Connectivity: Wi-Fi and connectivity is key. If the students do not have connectivity, then the system fails. Districts have sufficient connectivity in the schools, but we fail in providing the students of limited financial means proper connectivity at home, putting some of our students at a disadvantage. We cannot put a digital, e-textbook, program in place and not be able to provide all of our students with these resources. You must have access to use e-textbooks. If the Internet is not up to date you cannot get online to view them. If a program is being adopted that is strictly online, then we must be able to provide access for all students. Without home Internet connectivity, students would not be able to do homework and prepare detailed written reports. Also, parents hesitate when it comes to technology; if they do not have reliable Internet access.

Local Control Textbook Adoption Policy: Local control textbook policy means that each district makes their own policies and there is no collaboration between other districts and the state. Local school boards make their adoptions based upon the needs of their students and their communities. Community meetings are held and parents get to vote on which books they feel are best for their district. Again, when there are communities that are not connected, then it is hard for the boards to make decisions to use tools that all students will not have access to use. When looking at a metropolitan school district, it is going to differ greatly from a rural school district. With greatly varying needs, it would not be wise to prescribe a solution for the masses.

State and Local Leadership Resistance to Digital Content: If states are going to initiate a statewide e-textbook adoption policy then the decisions need to be made at the state level and legislature needs to be passed to bring the entire state in alignment with that policy. Unless a decision is made at the state level then districts will continue to make their own decisions and there will never be a unified state policy. The states need to enlist people with visionary and innovative philosophies in order for this movement to take place. Also, incomplete information and/or no information are being provided to these educational departments, which is hindering adoption. State and local leadership also resist digital content because the authors can change the content at any time and the leadership feels that they would lose control of the subject content.

Supportable Funding for Devices: Schools with Title I funds tend to spent lots of money on devices. Funding for electronic devices are never ending. One cannot make a onetime purchase and think it is sustainable. Devices break down and need to be replaced on a regular bases and are sometimes lost. Therefore, the state must always have an ongoing budget to fund devices and support for the devices. Local districts need supportable funding from the state in order to purchase and sustain mobile devices to support e-textbook technologies. Without funds you cannot purchase necessary supplies to make the program run. Lack of money is a major concern to all stakeholders.

Other Themes and Responses: The number of licensing agreements that the system must keep up with, in addition to the changing digital contents, and avoiding violating copyright laws can become overwhelming for the districts. Also, copyright issues need to be addressed. It all boils down to cost.

1. Please specify your degree of agreement with the summaries mentioned above.

	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree
Cost and Equipment Management					
Internet Connectivity					
Local Control Textbook Adoption Policy					
State and Local Resistance to Digital Content					
Supportable Funding for Devices					
Other Themes and Responses					

2. Rank the following statements from most important to least important by dragging and dropping the choices.

__Cost and Equipment Management

__Internet Connectivity

__Local Control Textbook Adoption Policy

__State and Local Resistance to Digital Content

__Supportable Funding for Devices

__Other Themes and Responses

3. Please leave any additional remarks associated with the summations.

4. Please state your name.

Thank you for your participation in this Delphi study; your dedication is deeply valued.

Note: Adapted from Wagner, M. D. (2008). *Massively multiplayer online role-playing games as constructivist learning environments in K-12 education: A Delphi study*

(Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 3325359)

Appendix E: E-Mail Invitation to Participate in the Online Survey

Dear _____,

My name is Sheila Cartwright and I am a doctoral student in the Department of Education at Walden University. I would like to invite you to participate in my research study to examine the barriers that are hindering the adoption of e-textbooks in K-12 education. You may participate if you are an *Administrators responsible for technology-related, institutional policy, and purchasing for your State Department of Education who is influential when making innovative technology purchases, has knowledge of e-textbooks technologies, and has time to participate in all three rounds of the Delphi questionnaire, which should be completed within a 5-week period.*

Participants will be asked to participate in a diffusion study using a Delphi method of inquiry to arrive at a consensus for the slow rate of adoption of e-textbooks in K-12 education. Currently, there are 22 states that have already adopted e-textbooks by introducing either definitional or funding flexibility, launched a digital textbook initiative, and/or launched an open educational resource (OER) initiative that was mandated by state legislature (Fletcher, Schaffhauser, & Levin, 2012). The objective is to determine the barriers and challenges being confronted by decision makers when introducing any innovative technology in a formal learning environment.

This study will consist of three rounds with the first round consisting of only one broad open-ended question. The second round will include a summary of the comments from the themes generated from the first round and one broad open-ended question relating to the late adoption of e-textbooks in K-12 education. The last and final round will conclude with a general consensus agreed upon by the participants. The questionnaire should take approximately 30 minutes or less to complete with the survey being conducted over a 5-week period. A second request e-mail will be sent to any participant who has not responded within the allocated 1- week period for each round in order to complete the study within the designated timeframe.

Your identity will remain anonymous to the other participants in this study and your anonymous participation in this study is confidential. If you decide to participate after reading this letter, you can access the survey from a link in this letter.

If you have any further questions, please contact me at sheila.cartwright@waldenu.edu or Dr. Abbie Brown, my faculty chair, at abbie.brown@waldenu.edu or Dr. Rob Foshay, my methodologist, at wellesley.foshay@waldenu.edu

Thank you for your consideration,
Sheila Cartwright
sheila.cartwright@waldenu.edu

Note: Adapted from Auburn University. (2013). Human subjects research sample documents: E-mail invitation for on-line survey. Retrieved from http://www.auburn.edu/research/vpr/ohs/sample.htm#recruitment

Appendix F: Round 1 Participants Responses

Why has your state not adopted e-textbooks as a replacement for traditional printed textbooks?

Respondent 1
There has been no focus on the important issue from the major decision-makers. Only the content coordinators, teacher, parents and students have pushed for e-textbooks.
Thursday, August 07, 2014 3:52:19 PM

Respondent 2
Currently, we do not have an educational technology department in our State Department of Education. Technology issues are being distributed throughout curriculum assessment. Technology plans are being developed and approved on the local level. This is a local control state with a Local Education Agency-Level Adoption policy. Textbook purchases whether they are traditional printed or e-textbook are handled at the district level and not at the state level. Wednesday, August 13, 2014 1:12:36 PM

Respondent 3
The State Department of Education allows the local districts to use textbook funding to purchase hardware to maintain electronic resources; however, it is at the local districts discretion to convert to digital content. We have not mandated the transition to e-textbooks at the state level because we do not know enough about them and how they will impact student success. We do not want to rush into this decision without seeing the impact they will have on the other states. Wednesday, August 13, 2014 3:16:01 PM

Respondent 4
The main reasons my state has not adopted e-textbooks are 1. School do not have the electronic devises to support e-textbooks, 2. The lack of state funds to purchase computers/e-readers and 3. Students of lower income do not have the resources to connect to the internet
Thursday, August 14, 2014 1:11:03 PM

Respondent 5
 We are on a rotation with subject and grade level during the last rotation e textbooks were not available. Each district is run separately and the state has not mandated textbooks yet.
Thursday, August 14, 2014 7:32:16 PM

Respondent 6
Too costly and control of equipment suspect to theft
Saturday, August 16, 2014 11:55:01 AM

Respondent 7

My state does not have a State Educational Technology Director to implement policies and procedures. We are a local control state and the decision to implement policies such as e-textbooks is decided by the local districts. The Department of Education does not implement policies for the local districts. The State Department of Education administers policies according to federal guidelines. E-textbooks would have to become a requirement issued at the federal level for it to be executed at the state level.
Saturday, August 16, 2014 5:47:35 PM

Respondent 8
Textbook adoption is currently a district level decision and not a state decision. While the state department of education does provide a list of approved vendors or programs, each district is then free to make a decision based on what they feel best meets their needs. I have participated in this process as we formed a committee of teacher leaders and participated in multiple reviews with a variety of lenses to evaluate each publisher's program. That being said, I believe that math has gone to somewhat of an e-textbook adoption. I don't believe it has replaced traditional textbooks outright, but that there is online support for textbooks. I know on the adoption committee that I was on, we did evaluate publishers based on a technology component and level of online support they provided.
Monday, August 18, 2014 9:01:37 AM

Respondent 9
The late adoption of e-textbooks as a replacement for traditional printed textbooks is due to the lack of enough computers, internet connectivity, and access to devices in each school and/or home.
Wednesday, August 20, 2014 12:54:57 PM

Respondent 10
Our state needs to develop a dependable network and Internet infrastructure to support a productive digital learning environment.
Thursday, August 21, 2014 3:21:09 PM

Respondent 11
There is insufficient broadband wireless or Wi-Fi connectivity available to operate digital devices in our schools.
Friday, August 22, 2014 2:09:18 PM

Respondent 12
There are several reasons why we have not adopted e-textbooks. First of all, we feel that there are many issues relating to copyright and digital rights restrictions that put limitations on how e-textbooks can be used. Second, standardization of file formats have not been solidified and prevents e-textbook usage across different platforms, which causes compatibility problems with our existing technological environment. Third, open educational resources are available, but there are still limited selections available. Fourth,

there are so many forms of licensing agreements to choose from and we are not convinced of which ones would satisfy our needs. Saturday, August 23, 2014 1:38:41 PM

Appendix G: Round 2 Participants Responses

Respondent 1
Q1: Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?
I think it is incredibly important that students have the devices in order to access e-textbooks if this is the direction that a district decides to move. It's one thing if a district is looking at BYOD options, but if they are adopting e-textbooks then devices would need to be provided for students for equity reasons.

Q2: Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?
I do not feel like this is the most important option. I worked at a Title I school for years and the majority of my students had access to the internet at home. Those that did not were able to go to a public library or some other location that offered internet or wireless services.

Q3 Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education?
I don't think this is the most important reason. I think these decisions should be left up to the district. A metropolitan school district is going to differ greatly from a rural school district. With greatly varying needs, it would not be wise to prescribe a solution for the masses.

Q4: Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education?
Respondent skipped this question

Q5: Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education?
I believe this is a huge reason for the late adoption of e-textbooks. If a program is being adopted that is strictly online, then we must be able to provide access for all students. While devices are not nearly as expensive as they used to be, our district has approximately 100,000 students and the budget does not currently allow for such a purchase.

Q6: Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?
Respondent skipped this question
Wednesday, September 10, 2014 9:57:49 PM

Respondent 2
Q1: Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?

Students from low income families can't provide the tools for e-textbooks, so it puts the burden back on the schools. Thus forcing the schools to provide equipment, that needs updating on a regular bases, and additional staff to maintain support the equipment. School have other needs that need addressing, such as increase in class sizes and a shortage of teachers. Therefore the resources are spread thin and the funds have to be used for "warm bodies" first.

Q2: Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?
Wi-Fi and connectivity is key. If the students do not have connectivity, then the system fails. My district has sufficient connectivity in the schools, but we fail in providing the students of financial needs proper connectivity at home. Because of this all of our students are put at a disadvantage. We cannot put a digital, e-textbook, program in place and not be able to provide all of our students' resources.

Q3: Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education?
I think the local school boards try to look at all of their students' needs. The boards make their adoptions based upon the needs of the communities. Again when there are communities that are not connected, then it is hard for the boards to make decisions to use tools that all students will not have access to use.

Q4: Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education?
In my opinion, the state and local leadership resist digital content because the authors can change the content anytime. Thus the leader, local and statewide, do not have the ability edit or sensor the content. Otherwise the leaders lose control of the subject content.

Q5: Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education?
Funding for electronic devices are never ending. One cannot make a one-time purchase and think it is sustainable. Devices, break down, need to be replaced on a regular bases and are sometimes lost. Therefore the state must always have an ongoing budget to fund devices and support for the devices.

Q6: Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?
I think the number licensing the system must keep up with can become overwhelming for the state librarians. Not only do they have to keep up with the contents for the districts, they will have to make sure the employees do not violate the copyrights laws of the content.
Friday, September 05, 2014 10:01:07 AM

Respondent 3

Q1: Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?
I'm not sure I agree with the statements above. So I'm not sure that is it the most important reason for late adoption.

Q2: Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?
I don't think Internet Connectivity is the most important reason. I think e-textbooks can work without the internet.

Q3: Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education?
I don't know enough about this to comment.

Q4: Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education?
I don't know about this

Q5: Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education?
This is probably the most important although schools with Title I funds tend to spent lots of money on devices.

Q6: Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?
I don't agree. If a school system purchases the licenses they are compliant.
Monday, September 08, 2014 8:55:52 AM

Respondent 4

Q1: Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?
Replacement of equipment would be even costlier and take valuable time from the course of study.

Q2: Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?
The reasons listed would prevent any out of school homework and detailed written reports.

Q3: Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education?
There doesn't seem to be sales representatives to "sell" the products to the school boards.

Q4: Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education?
Incomplete information and/or no information are being provided to these education departments.

Q5: Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education?
Money, money, money!

Q6: Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?
Copyright issues need to be addressed.
Monday, September 08, 2014 12:18:47 PM

Respondent 5
Q1: Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?
Even though the cost of devices have reduced considerably, this is still a major factor when a district is faced with providing these devices for both students and faculty.

Q2: Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?
Respondent skipped this question

Q3: Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education?
Respondent skipped this question

Q4: Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education?
If states are going to initiate a statewide e-textbook adoption policy then the decisions need to be made at the state level and legislature needs to be passed to bring the entire state in alignment with that policy. Unless a decision is made at the state level then districts will continue to make their own decisions and there will never be a unified state policy. The states need to enlist people will visionary and innovative philosophies in order for this movement to take place.

Q5: Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education?
Local districts need supportable funding from the state in order to purchase and sustain mobile devices to support e-textbook technologies.

Q6: Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?

Respondent skipped this question
Tuesday, September 09, 2014 5:15:23 PM

Respondent 6
Q1: Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?
I disagree with this statement. I think that if the states stopped buying expensive textbooks they would have the money that they need to buy the hardware that is needed to enhance and support the technological equipment.

Q2: Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?
Respondent skipped this question

Q3: Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education?
Respondent skipped this question

Q4: Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education?
If the states do not organize themselves so that they are in a position to promote e-textbook adoption, it will never happen. You will have what is going on right now each district doing their own thing with no real plan in place to transition to e-textbooks. Some districts have not even considered it as an alternative to expensive textbooks, in which case, e-textbooks would save them money in the long run.

Q5: Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education?
I think that if funding is redirected from the purchase of traditional textbooks, it can be directed towards the acquisition of e-readers, tablets, computers, and/or laptops.

Q6: Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?
Respondent skipped this question

Wednesday, September 10, 2014 4:12:43 PM

Respondent 7
Q1: Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?
Acquisition cost is a major cause for the adoption of e-textbooks. Acquiring the initial and sustainable funding to purchase the equipment and to maintain it.

Q2: Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?
Respondent skipped this question

Q3: Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education?
I think local control textbook policy is the major reason for the late adoption of e-textbooks because local control means that each district makes their own policies and there is no collaboration between other districts and the state. Everyone is doing it their way and on one is looking to the left or the right.

Q4: Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education?
Respondent skipped this question

Q5: Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education?
Respondent skipped this question

Q6: Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?
Respondent skipped this question
Wednesday, September 10, 2014 4:25:36 PM

Respondent 8
Q1: Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?
It would take money to buy the software and get it approved for the district.

Q2: Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?
You must have access to use e textbooks. If internet I'd not up to date you cannot get online to view them

Q3: Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education?
After books are selected. Community meetings are held and parents get to vote on which adoption they feel is best for the district.

Q4: Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education?
I would say parents hesitate when it comes to technology. If they don't have reliable internet access. It also depends on if levees have passed and money is available for a textbook adoption.

Q5: Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education?
Without funds you cannot purchase necessary supplies to make the program run.

Q6: Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?
It all boils down to cost. When our district adopts new books... The old books are sold to smaller districts for profit.
Wednesday, September 10, 2014 9:57:49 PM

Appendix H: Final Consensus Participant Responses

Respondent 1
Q1: Please specify your degree of agreement with the summaries mentioned above.

Cost and Equipment Management	Agree
Internet Connectivity	Agree
Local Control Textbook Adoption Policy	Neither Disagree nor Agree
State and Local Resistance to Digital Content	Disagree
Supportable Funding for Devices	Neither Disagree nor Agree
Other Themes and Responses	Neither Disagree nor Agree

Q2: Rank the following statements from most important to least important by dragging and dropping the choices. Please note: If you use the drop down arrow, the ranking choices order will physically change.

Cost and Equipment Management	2
Internet Connectivity	1
Local Control Textbook Adoption Policy	4
State and Local Resistance to Digital Content	6
Supportable Funding for Devices	3
Other Themes and Responses	5

Q3: Please leave any additional remarks associated with the summations.
Respondent skipped this question

Monday, September 29, 2014 10:09:26 AM

Respondent 2
Q1: Please specify your degree of agreement with the summaries mentioned above.

Cost and Equipment Management	Strongly Agree
Internet Connectivity	Strongly Agree
Local Control Textbook Adoption Policy	Strongly Agree
State and Local Resistance to Digital Content	Strongly Agree
Supportable Funding for Devices	Strongly Agree
Other Themes and Responses	Strongly Agree

Q2: Rank the following statements from most important to least important by dragging and dropping the choices. Please note: If you use the drop down arrow, the ranking choices order will physically change.

Cost and Equipment Management	1
Internet Connectivity	3
Local Control Textbook Adoption Policy	4
State and Local Resistance to Digital Content	5
Supportable Funding for Devices	2
Other Themes and Responses	6

Q3: Please leave any additional remarks associated with the summations.
Respondent skipped this question

Monday, September 29, 2014 7:20:04 PM

Respondent 3
Q1: Please specify your degree of agreement with the summaries mentioned above.
Cost and Equipment Management   Strongly Agree
Internet Connectivity   Agree
Local Control Textbook Adoption Policy   Agree
State and Local Resistance to Digital Content   Agree
Supportable Funding for Devices Strongly   Agree
Other Themes and Responses   Neither Disagree nor Agree

Q2: Rank the following statements from most important to least important by dragging
and dropping the choices. Please note: If you use the drop down arrow, the ranking
choices order will physically change.
Cost and Equipment Management   1
Internet Connectivity   3
Local Control Textbook Adoption Policy   4
State and Local Resistance to Digital Content   5
Supportable Funding for Devices   2
Other Themes and Responses   6

Q3: Please leave any additional remarks associated with the summations.
Respondent skipped this question

Tuesday, September 30, 2014 9:38:36 AM

Respondent 4
Q1: Please specify your degree of agreement with the summaries mentioned above.
Cost and Equipment Management   Strongly Agree
Internet Connectivity   Agree
Local Control Textbook Adoption Policy   Agree
State and Local Resistance to Digital Content   Agree
Supportable Funding for Devices   Strongly Agree
Other Themes and Responses   Neither Disagree nor Agree

Q2: Rank the following statements from most important to least important by dragging
and dropping the choices. Please note: If you use the drop down arrow, the ranking
choices order will physically change.
Cost and Equipment Management   1
Internet Connectivity   3

Local Control Textbook Adoption Policy   5
State and Local Resistance to Digital Content   4
Supportable Funding for Devices   2
Other Themes and Responses   6

Q3: Please leave any additional remarks associated with the summations.
Respondent skipped this question

Tuesday, September 30, 2014 9:45:31 AM

Respondent 5
Q1: Please specify your degree of agreement with the summaries mentioned above.
Cost and Equipment Management   Agree
Internet Connectivity   Agree
Local Control Textbook Adoption Policy   Strongly Agree
State and Local Resistance to Digital Content   Agree
Supportable Funding for Devices   Strongly Agree
Other Themes and Responses   Strongly Agree

Q2: Rank the following statements from most important to least important by dragging
and dropping the choices. Please note: If you use the drop down arrow, the ranking
choices order will physically change.
Cost and Equipment Management   1
Internet Connectivity   5
Local Control Textbook Adoption Policy   2
State and Local Resistance to Digital Content   4
Supportable Funding for Devices   3
Other Themes and Responses   6

Q3: Please leave any additional remarks associated with the summations.
Summaries seem to be on target. Good work!

Respondent 6
Q1: Please specify your degree of agreement with the summaries mentioned above.
Cost and Equipment Management   Strongly Agree
Internet Connectivity   Agree
Local Control Textbook Adoption Policy   Agree
State and Local Resistance to Digital Content   Agree
Supportable Funding for Devices   Strongly Agree
Other Themes and Responses   Agree

Q2: Rank the following statements from most important to least important by dragging
and dropping the choices. Please note: If you use the drop down arrow, the ranking
choices order will physically change.

Cost and Equipment Management	2
Internet Connectivity	5
Local Control Textbook Adoption Policy	3
State and Local Resistance to Digital Content	1
Supportable Funding for Devices	4
Other Themes and Responses	6

Q3: Please leave any additional remarks associated with the summations.
In regards to state and local leadership resistance to digital content, I do not think that the states are concerned about loss of control of digital content is a valid statement.

Respondent 7
Q1: Please specify your degree of agreement with the summaries mentioned above.

Cost and Equipment Management	Strongly Agree
Internet Connectivity	Agree
Local Control Textbook Adoption Policy	Agree
State and Local Resistance to Digital Content	Disagree
Supportable Funding for Devices	Strongly Agree
Other Themes and Responses	Agree

Q2: Rank the following statements from most important to least important by dragging and dropping the choices. Please note: If you use the drop down arrow, the ranking choices order will physically change.

Cost and Equipment Management	1
Internet Connectivity	2
Local Control Textbook Adoption Policy	6
State and Local Resistance to Digital Content	5
Supportable Funding for Devices	3
Other Themes and Responses	4

Q3: Please leave any additional remarks associated with the summations.
Internet connectivity may be a problem at home, but there is an effort in many communities to provide connectivity. They provide connectivity in public libraries, community centers and some local businesses are providing internet connectivity.

Appendix I: External Auditor's Comments

To: Ms. Sheila Cartwright

From: Dr. ████

Date: October 2, 2014

I reviewed your analysis and I am presenting my opinion as follows:
1. I am concerned about the small sample size of 12 people selected to participate in your study. In has been my experience to use a more sizeable sample population. However, the sample size that you selected has been adequately supported in your literature review.
2. I am concerned that this Delphi review is being used as a forecasting instrument that uses an expert panel to derive at a consensus. I understand that the predictions are contingent upon the reasons for the late adoption of e-textbooks in K-12 education. However, the literature review does disclose numerous variations and diverse applications of Delphi studies.
3. I concur that a forecasting instrument is useful in the decision-making process and that some research concentrate on developing a consensus with the intention of making a decision that could present itself at a future date. However, I feel that your sample size is too small to make any generalized statements because the participants only represent a specific audience and cannot represent a larger population.
4. I am concerned about the themes that were produced from your respondents' answers because some of the themes gathered during your data collection were previously stated in your literature review. However, upon careful examination, I expect that these participants are experts in their field and would be familiar with the current literature especially when being asked a direct broad open-ended question directed at the problem statement. I agree that using the 12 participants as diverse data sources will add confirmability, validity, and credibility to the study because they will be commenting on your summations after each round, which will assist you in accurately reporting their experiences.
5. It has been my experience with in a traditional quantitative or mixed methods study to determine the viewpoint of the panelists by ranking their responses, but as you explained this is a basic interpretive qualitative study and the participants' opinions will be determined in the final consensus round and this practice is consistent with other conventional Delphi studies that were presented in the literature.

Appendix J: Round 1 Participant Summations

Cost and equipment management. States do not have the electronic devices to support e-textbooks due to cost associated with equipment purchases. Also, policies are not in place that will enable the schools to manage the equipment making it problematic to deal with issues related to stolen devices.

Supportable funding for devices. State funding is not available to purchase computers/e-readers for local districts, which has hindered the adoption of e-textbooks on the local level. It is too costly for local districts to purchase e-readers, computers, and/or laptops without funding provided by the state.

Internet connectivity. Internet connectivity was cited as a reason for the late adoption of e-textbooks in K-12 education for the following reasons: states have not developed a dependable network and Internet infrastructure to support a productive digital learning environment, states have insufficient broadband wireless or Wi-Fi connectivity available to operate innovative digital devices, and/or students from lower income groups do not have the resources to connect to the Internet.

Local control textbook adoption policy. While some State Department of Education allows the local districts to use textbook funding to purchase hardware to maintain electronic resources, it is at the local districts discretion to convert to digital content. Other states provide a list of approved vendors or programs, but textbook adoption is currently a district level decision and not a state decision. Textbook rotation policies by subject and grade level is exercised in some states, but e-textbooks are not being selected as a viable alternative. Many of the non-adoptive states are local control

states and each district is run separately using a Local Education Agency-Level Adoption

policy. These states have not mandated local districts to adopt e-textbooks. Each district

is free to make textbook decisions based on what they feel best meets their needs.

Textbook purchases whether they are traditional printed or e-textbooks are handled at the

district level and not at the state level.

State and local leadership resistance to digital content. Non-adoptive states

have not organized themselves with a State Educational Technology Director to

implement policies and procedures and many have not established an Instructional

Technology Department on the state level. Technology issues are being distributed

throughout curriculum assessment. Technology plans are developed and approved on the

local level. State Departments of Education have not mandated the transition to e-

textbooks stating lack of knowledge regarding their impact on student success as reasons

for not adopting e-textbooks. There has been no focus on the adoption of e-textbooks

from the major decision-makers. Only the content coordinators, teachers, parents, and

students have pushed for e-textbooks. The Department of Education does not implement

policies for the local districts. The State Department of Education administers policies

according to federal guidelines. E-textbooks would have to become a requirement issued

at the federal level for it to be executed at the state level.

Other themes and responses. Issues relating to copyright and digital rights

restrictions that limit the use of e-textbooks has hindered e-textbook adoption.

Standardized file formats that prevents e-textbook access across various platforms, may

cause compatibility difficulties with existing technological environment. Limited open

educational resources as well as the numerous licensing agreements options available

hinders e-textbook adoption.

Appendix K: Round 2 Participant Summations

Cost and equipment management. Acquisition cost is a major cause for the late adoption of e-textbooks. Acquiring the initial and sustainable funding to purchase the equipment and to maintain it. It would take money to buy the software and get it approved for the district. It is incredibly important that students have the devices that they will need in order to access e-textbooks if this is the direction that a district decides to move. It's one thing if a district is looking at BYOD options, but if they are adopting e-textbooks then devices would need to be provided for students for equity reasons. Students from low income families can't provide the tools for e-textbooks, so it puts the burden back on the schools. Thus, forcing the schools to provide the equipment that will need to be updated on a regular bases. Also, additional staff will be required to maintain and support the equipment. Schools have other needs that need addressing, such as increase in class sizes and a shortage of teachers. Therefore, the resources are spread thin and the funds have to be used for "warm bodies" first. Even though the cost of devices have reduced considerably, this is still a major factor when a district is faced with providing these devices for both students and faculty. Replacement of equipment would be even costlier and take valuable time away from instruction.

Supportable funding for devices. This is probably the most important reason although schools with Title I funds tend to spent lots of money on devices. Funding for electronic devices are never ending. One cannot make a onetime purchase and think it is sustainable. Devices break down and need to be replaced on a regular bases and are sometimes lost. Therefore, the state must always have an ongoing budget to fund devices

and support for the devices. I believe this is a huge reason for the late adoption of e-textbooks. While devices are not nearly as expensive as they used to be, our district has approximately 100,000 students and the budget does not currently allow for such a purchase. Local districts need supportable funding from the state in order to purchase and sustain mobile devices to support e-textbook technologies. Without funds you cannot purchase necessary supplies to make the program run. Lack of money is a major concern to all stakeholders.

Internet connectivity. Wi-Fi and connectivity is key. If the students do not have connectivity, then the system fails. My district has sufficient connectivity in the schools, but we fail in providing the students of financial needs proper connectivity at home. Because of this all of our students are put at a disadvantage. We cannot put a digital, e-textbook, program in place and not be able to provide all of our students with these resources. You must have access to use e-textbooks. If the Internet is not up to date you cannot get online to view them. If a program is being adopted that is strictly online, then we must be able to provide access for all students. Without home Internet connectivity, students would not be able to do homework and prepare detailed written reports. Also, parents hesitate when it comes to technology. If they don't have reliable Internet access.

Local control textbook adoption policy. Local control textbook policy is the major reason for the late adoption of e-textbooks because local control means that each district makes their own policies and there is no collaboration between other districts and the state. Everyone is doing it their way and no one is looking to the left or to the right.

Local school boards try to look at all of their students' needs. The boards make their adoptions based upon the needs of the communities. After books are selected, community meetings are held and parents get to vote on which adoption they feel is best for the district. Again, when there are communities that are not connected, then it is hard for the boards to make decisions to use tools that all students will not have access to use. These decisions should be left up to the district. When looking at a metropolitan school district, it is going to differ greatly from a rural school district. With greatly varying needs, it would not be wise to prescribe a solution for the masses.

State and local leadership resistance to digital content. The state and local leadership resist digital content because the authors can change the content at any time. Thus, the leaders, local and statewide, do not have the ability to edit or sensor the content and the leadership would lose control of the subject content. If states are going to initiate a statewide e-textbook adoption policy then the decisions need to be made at the state level and legislature needs to be passed to bring the entire state in alignment with that policy. Unless a decision is made at the state level then districts will continue to make their own decisions and there will never be a unified state policy. The states need to enlist people with visionary and innovative philosophies in order for this movement to take place. Also, incomplete information and/or no information are being provided to these educational departments. It also depends on if levees have passed and money is available for an e-textbook adoption.

Other themes and responses. The number of licensing agreements that the system must keep up with, in addition to the changing digital contents, and avoiding

violating copyright laws can become overwhelming for the districts. Also, copyright

issues need to be addressed. It all boils down to cost. When a district adopts new books...

The old books are sold to smaller districts for profit.

Appendix L: Participant Response Round 1 Coding Process

Step 1: After the responses were collected from the first round of the Delphi questionnaire, I examined and evaluated the data.

Table L1

Round 1 Participant Responses

Participant	Response to Why have your state not adopted e-textbooks as a replacement for traditional printed textbooks?
1	There has been no focus on the important issue from the major decision-makers. Only the content coordinators, teacher, parents and students have pushed for e-textbooks.
2	Currently, we do not have an educational technology department in our State Department of Education. Technology issues are being distributed throughout curriculum assessment. Technology plans are being developed and approved on the local level. This is a local control state with a Local Education Agency-Level Adoption policy. Textbook purchases whether they are traditional printed or e-textbook are handled at the district level and not at the state level.
3	The State Department of Education allows the local districts to use textbook funding to purchase hardware to maintain electronic resources; however, it is at the local districts discretion to convert to digital content. We have not mandated the transition to e-textbooks at the state level because we do not know enough about them and how they will impact student success. We do not want to rush into this decision without seeing the impact they will have on the other states.
4	The main reasons my state has not adopted e-textbooks are 1. School do not have the electronic devises to support e-textbooks, 2. The lack of state funds to purchase computers/e-readers and 3. Students of lower income do not have the resources to connect to the internet
5	We are on a rotation with subject and grade level during the last rotation e textbooks were not available. Each district is run separately and the state has not mandated textbooks yet.
6	too costly and control of equipment suspect to theft
7	My state does not have a State Educational Technology Director to implement policies and procedures. We are a local control state and the decision to implement policies such as e-textbooks is decided by the local districts. The Department of Education does not implement policies for the local districts. The State Department of Education administers policies according to federal guidelines. E-textbooks would have to become a requirement issued at the federal level for it to be executed at the state level.

(table continues)

Participant	Response to Why have your state not adopted e-textbooks as a replacement for traditional printed textbooks?
8	We are on a rotation with subject and grade level during the last rotation e textbooks were not available. Each district is run separately and the state has not mandated textbooks yet.
9	The late adoption of e-textbooks as a replacement for traditional printed textbooks is due to the lack of enough computers, internet connectivity, and access to devices in each school and/or home.
10	Our state needs to develop a dependable network and Internet infrastructure to support a productive digital learning environment.
11	There is insufficient broadband wireless or Wi-Fi connectivity available to operate digital devices in our schools.
12	There are several reasons why we have not adopted e-textbooks. First of all, we feel that there are many issues relating to copyright and digital rights restrictions that put limitations on how e-textbooks can be used. Second, standardization of file formats have not been solidified and prevents e-textbook usage across different platforms, which causes compatibility problems with our existing technological environment. Third, open educational resources are available, but there are still limited selections available. Fourth, there are so many forms of licensing agreements to choose from and we are not convinced of which ones would satisfy our needs.

Step 2: I used the open coding approach to classify and develop categories that were associated with the particular ideas that were revealed from the comments made by the expert panelists to establish relationships and to assess the data from a different perspective. The purpose was to formulate new interpretations from the data.

Step 3: I devised a coding system that interpreted the information collected following each iteration of the Delphi questionnaire. The categories that was developed were cost and equipment management (CE), supportable funding for equipment (SF), Internet connectivity (IC), local control textbook adoption policy (LC), state and local leadership resistance to digital content (SL), and other themes and responses (OT).

Step 4: Next, I interpreted the data by reducing the data into significant sections and assigning names to the sections, merging the codes into larger categories or themes to establish relationships between the themes. The sections that was developed were cost and equipment management, supportable funding for equipment, Internet connectivity, local control textbook adoption policy, state and local leadership resistance to digital content, and other themes and responses.

Table L2

Round 1 Open Coding Process

Participant	Response	Category
1	There has been no focus on the important issue from the major decision-makers. Only the content coordinators, teacher, parents and students have pushed for e-textbooks.	SL
2	Currently, we do not have an educational technology department in our State Department of Education.	SL
2	Technology issues are being distributed throughout curriculum assessment.	SL
2	Technology plans are being developed and approved on the local level.	SL
2	This is a local control state with a Local Education Agency-Level Adoption policy.	LC
2	Textbook purchases whether they are traditional printed or e-textbook are handled at the district level and not at the state level.	LC
3	The State Department of Education allows the local districts to use textbook funding to purchase hardware to maintain electronic resources; however, it is at the local districts discretion to convert to digital content.	LC
3	We have not mandated the transition to e-textbooks at the state level because we do not know enough about them and how they will impact student success. We do not want to rush into this decision without seeing the impact they will have on the other states.	SL
4	The main reasons my state has not adopted e-textbooks are	
4	1. School do not have the electronic devises to support e-textbooks,	LC
4	2. The lack of state funds to purchase computers/e-readers and	CE
4	3. Students of lower income do not have the resources to connect to the internet.	IC
5	We are on a rotation with subject and grade level during the last rotation e textbooks were not available.	LC
5	Each district is run separately and the state has not mandated textbooks yet.	SL
6	Too costly and control of equipment suspect to theft	CE

(table continues)

Participant	Response	Category
7	My state does not have a State Educational Technology Director to implement policies and procedures.	SL
7	We are a local control state and the decision to implement policies such as e-textbooks is decided by the local districts	LC
7	The Department of Education does not implement policies for the local districts.	SL
7	The State Department of Education administers policies according to federal guidelines.	SL
7	E-textbooks would have to become a requirement issued at the federal level for it to be executed at the state level.	SL
8	Textbook adoption is currently a district level decision and not a state decision.	LC
8	While the state department of education does provide a list of approved vendors or programs, each district is then free to make a decision based on what they feel best meets their needs. I have participated in this process as we formed a committee of teacher leaders and participated in multiple reviews with a variety of lenses to evaluate each publisher's program. That being said, I believe that math has gone to somewhat of an e-textbook adoption. I don't believe it has replaced traditional textbooks outright, but that there is online support for textbooks. I know on the adoption committee that I was on, we did evaluate publishers based on a technology component and level of online support they provided.	LC
9	The late adoption of e-textbooks as a replacement for traditional printed textbooks is due to the lack of enough computers,	SF
9	Internet connectivity,	IC
9	Access to devices in each school and/or home.	CE
10	Our state needs to develop a dependable network and Internet infrastructure to support a productive digital learning environment.	IC
11	There is insufficient broadband wireless or Wi-Fi connectivity available to operate digital devices in our schools.	IC
12	There are several reasons why we have not adopted e-textbooks. First of all, we feel that there are many issues relating to copyright and digital rights restrictions that put limitations on how e-textbooks can be used.	OT

(table continues)

Participant	Response	Category
12	Second, standardization of file formats have not been solidified and prevents e-textbook usage across different platforms, which causes compatibility problems with our existing technological environment.	OT
12	Fourth, there are so many forms of licensing agreements to choose from and we are not convinced of which ones would satisfy our needs.	OT

Step 5: After the categories and subcategories were established, I used axial coding to put the components back together again to develop new categories.
Step 6: The results of the coding process resulted in the six thematic categories that clarified how the participants repeatedly handled the problem.
Step 7: The responses generated from the first round of the questionnaire determined themes that structured the questions in the second round of the Delphi questionnaire.

Table L3

Round 1 Axial Coding Process

Participant	Response	Category
6	Too costly and control of equipment suspect to theft	CE
9	Access to devices in each school and/or home.	IC
9	Internet connectivity,	IC
10	Our state needs to develop a dependable network and Internet infrastructure to support a productive digital learning environment.	IC
11	There is insufficient broadband wireless or Wi-Fi connectivity available to operate digital devices in our schools.	IC
4	3. Students of lower income do not have the resources to connect to the internet.	IC
2	This is a local control state with a Local Education Agency-Level Adoption policy.	LC
2	Textbook purchases whether they are traditional printed or e-textbook are handled at the district level and not at the state level.	LC
3	The State Department of Education allows the local districts to use textbook funding to purchase hardware to maintain electronic resources; however, it is at the local districts discretion to convert to digital content.	LC

(table continues)

Participant	Response	Category
4	The main reasons my state has not adopted e-textbooks are 1. School do not have the electronic devises to support e-textbooks,	CE
8	Textbook adoption is currently a district level decision and not a state decision.	LC
8	While the state department of education does provide a list of approved vendors or programs, each district is then free to make a decision based on what they feel best meets their needs. I have participated in this process as we formed a committee of teacher leaders and participated in multiple reviews with a variety of lenses to evaluate each publisher's program. That being said, I believe that math has gone to somewhat of an e-textbook adoption. I don't believe it has replaced traditional textbooks outright, but that there is online support for textbooks. I know on the adoption committee that I was on, we did evaluate publishers based on a technology component and level of online support they provided.	LC
7	We are a local control state and the decision to implement policies such as e-textbooks is decided by the local districts	LC
4	2. The lack of state funds to purchase computers/e-readers and	CE
2	Currently, we do not have an educational technology department in our State Department of Education.	SL
2	Technology issues are being distributed throughout curriculum assessment.	SL
2	Technology plans are being developed and approved on the local level.	SL
3	We have not mandated the transition to e-textbooks at the state level because we do not know enough about them and how they will impact student success. We do not want to rush into this decision without seeing the impact they will have on the other states.	SL
5	Each district is run separately and the state has not mandated textbooks yet.	SL
7	My state does not have a State Educational Technology Director to implement policies and procedures.	SL
7	The Department of Education does not implement policies for the local districts.	SL
7	The State Department of Education administers policies according to federal guidelines.	SL

(table continues)

Participant	Response	Category
7	E-textbooks would have to become a requirement issued at the federal level for it to be executed at the state level.	SL
		(table continues)
9	The late adoption of e-textbooks as a replacement for traditional printed textbooks is due to the lack of enough computers,	SF
12	There are several reasons why we have not adopted e-textbooks. First of all, we feel that there are many issues relating to copyright and digital rights restrictions that put limitations on how e-textbooks can be used.	OT
12	Second, standardization of file formats have not been solidified and prevents e-textbook usage across different platforms, which causes compatibility problems with our existing technological environment.	OT
12	Third, open educational resources are available, but there are still limited selections available.	OT
12	Fourth, there are so many forms of licensing agreements to choose from and we are not convinced of which ones would satisfy our needs.	OT

Step 8: After the first round, the participants received summations derived from the comments collected from the previous rounds from me, which helped to influence the participants' responses in the next iteration of the survey.

Cost and equipment management. States do not have the electronic devices to support e-textbooks due to cost associated with equipment purchases. Also, policies are not in place that will enable the schools to manage the equipment making it problematic to deal with issues related to stolen devices.

Supportable funding for devices. State funding is not available to purchase computers/e-readers for local districts, which has hindered the adoption of e-textbooks on the local level. It is too costly for local districts to purchase e-readers, computers, and/or laptops without funding provided by the state.

Internet connectivity. Internet connectivity was cited as a reason for the late adoption of e-textbooks in K-12 education for the following reasons: states have not developed a dependable network and Internet infrastructure to support a productive digital learning environment, states have insufficient broadband wireless or Wi-Fi connectivity available to operate innovative digital devices, and/or students from lower income groups do not have the resources to connect to the Internet.

Local control textbook adoption policy. While some State Department of Education allows the local districts to use textbook funding to purchase hardware to maintain electronic resources, it is at the local districts discretion to convert to digital content. Other states provide a list of approved vendors or programs, but textbook adoption is currently a district level decision and not a state decision. Textbook rotation

policies by subject and grade level is exercised in some states, but e-textbooks are not being selected as a viable alternative. Many of the non-adoptive states are local control states and each district is run separately using a Local Education Agency-Level Adoption policy. These states have not mandated local districts to adopt e-textbooks. Each district is free to make textbook decisions based on what they feel best meets their needs. Textbook purchases whether they are traditional printed or e-textbooks are handled at the district level and not at the state level.

   State and local leadership resistance to digital content. Non-adoptive states have not organized themselves with a State Educational Technology Director to implement policies and procedures and many have not established an Instructional Technology Department on the state level. Technology issues are being distributed throughout curriculum assessment. Technology plans are developed and approved on the local level. State Departments of Education have not mandated the transition to e-textbooks stating lack of knowledge regarding their impact on student success as reasons for not adopting e-textbooks. There has been no focus on the adoption of e-textbooks from the major decision-makers. Only the content coordinators, teachers, parents, and students have pushed for e-textbooks. The Department of Education does not implement policies for the local districts. The State Department of Education administers policies according to federal guidelines. E-textbooks would have to become a requirement issued at the federal level for it to be executed at the state level.

   Other themes and responses. Issues relating to copyright and digital rights restrictions that limit the use of e-textbooks has hindered e-textbook adoption. Standardized file formats that prevents e-textbook access across various platforms, may cause compatibility difficulties with existing technological environment. Limited open educational resources as well as the numerous licensing agreements options available hinders e-textbook adoption.

Appendix M: Participant Response Round 2 Coding Process

Step 1: After the responses were collected from the second round of the Delphi questionnaire, I examined and evaluated the data.

Table M1

Round 2 Participant Responses

Participant	Question
1	Q1: Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education? I think it is incredibly important that students have the devices in order to access e-textbooks if this is the direction that a district decides to move. It's one thing if a district is looking at BYOD options, but if they are adopting e-textbooks then devices would need to be provided for students for equity reasons. Q2: Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education? I do not feel like this is the most important option. I worked at a Title I school for years and the majority of my students had access to the internet at home. Those that did not were able to go to a public library or some other location that offered internet or wireless services. Q3 Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education? I don't think this is the most important reason. I think these decisions should be left up to the district. When just looking at Georgia, a metropolitan Atlanta school district is going to differ greatly from a rural school district in South Georgia. With greatly varying needs, it would not be wise to prescribe a solution for the masses. Q4: Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education? Respondent skipped this question Q5: Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education? I believe this is a huge reason for the late adoption of e-textbooks. If a program is being adopted that is strictly online, then we must be able to provide access for all students. While devices are not nearly as expensive as they used to be, our district has approximately 100,000 students and the budget does not currently allow for such a purchase. Q6: Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?

(table continues)

Participant	Question
	Respondent skipped this question
2	Q1: Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?

Students from low income families can't provide the tools for e-textbooks, so it puts the burden back on the schools. Thus forcing the schools to provide equipment, that needs updating on a regular bases, and additional staff to maintain support the equipment. School have other needs that need addressing, such as increase in class sizes and a shortage of teachers. Therefore the resources are spread thin and the funds have to be used for "warm bodies" first.

Q2: Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?

Wi-Fi and connectivity is key. If the students do not have connectivity, then the system fails. My district has sufficient connectivity in the schools, but we fail in providing the students of financial needs proper connectivity at home. Because of this all of our students are put at a disadvantage. We cannot put a digital, e-textbook, program in place and not be able to provide all of our students' resources.

Q3: Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education?

I think the local school boards try to look at all of their students' needs. The boards make their adoptions based upon the needs of the communities. Again when there are communities that are not connected, then it is hard for the boards to make decisions to use tools that all students will not have access to use.

Q4: Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education?

In my opinion, the state and local leadership resist digital content because the authors can change the content anytime. Thus the leader, local and statewide, do not have the ability edit or sensor the content. Otherwise the leaders lose control of the subject content.

Q5: Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education?

Funding for electronic devices are never ending. One cannot make a one-time purchase and think it is sustainable. Devices, break down, need to be replaced on a regular bases and are sometimes lost. Therefore the state must always have an ongoing budget to fund devices and support for the devices.

Q6: Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?

I think the number licensing the system must keep up with can become overwhelming for the state librarians. Not only do they have to keep up with

(table continues)

Participant	Question

the contents for the districts, they will have to make sure the employees do not violate the copyrights laws of the content.

3 Q1: Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?

I'm not sure I agree with the statements above. So I'm not sure that is it the most important reason for late adoption.

Q2: Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?

I don't think Internet Connectivity is the most important reason. I think e-textbooks can work without the internet.

Q3: Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education?

I don't know enough about this to comment.

Q4: Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education?

I don't know about this

Q5: Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education?

This is probably the most important although schools with Title I funds tend to spent lots of money on devices.

Q6: Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?

I don't agree. If a school system purchases the licenses they are compliant.

4 Q1: Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?

Replacement of equipment would be even costlier and take valuable time from the course of study.

Q2: Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?

The reasons listed would prevent any out of school homework and detailed written reports.

Q3: Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education?

There doesn't seem to be sales representatives to "sell" the products to the school boards.

Q4: Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education?

Incomplete information and/or no information are being provided to these education departments.

(table continues)

Participant	Question
	Q5: Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education?
	Money, money, money!
	Q6: Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?
	Copyright issues need to be addressed.
5	Q1: Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?
	Even though the cost of devices have reduced considerably, this is still a major factor when a district is faced with providing these devices for both students and faculty.
	Q2: Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?
	Respondent skipped this question
	Q3: Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education?
	Respondent skipped this question
	Q4: Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education?
	If states are going to initiate a statewide e-textbook adoption policy then the decisions need to be made at the state level and legislature needs to be passed to bring the entire state in alignment with that policy. Unless a decision is made at the state level then districts will continue to make their own decisions and there will never be a unified state policy. The states need to enlist people will visionary and innovative philosophies in order for this movement to take place.
	Q5: Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education?
	Local districts need supportable funding from the state in order to purchase and sustain mobile devices to support e-textbook technologies.
	Q6: Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?
	Respondent skipped this question
6	Q1: Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?
	States do not have the electronic devices to support e-textbooks due to cost associated with equipment purchases. Also, policies are not in place that will enable the schools to manage the equipment making it problematic to deal with issues related to stolen devices.

(table continues)

Participant	Question

I disagree with this statement. I think that if the states stopped buying expensive textbooks they would have the money that they need to buy the hardware that is needed to enhance and support the technological equipment.

Q2: Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?

Respondent skipped this question

Q3: Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education?

Respondent skipped this question

Q4: Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education?

If the states do not organize themselves so that they are in a position to promote e-textbook adoption, it will never happen. You will have what is going on right now each district doing their own thing with no real plan in place to transition to e-textbooks. Some districts have not even considered it as an alternative to expensive textbooks, in which case, e-textbooks would save them money in the long run.

Q5: Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education?

I think that if funding is redirected from the purchase of traditional textbooks, it can be directed towards the acquisition of e-readers, tablets, computers, and/or laptops.

Q6: Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?

Respondent skipped this question

7 Q1: Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?

Acquisition cost is a major cause for the adoption of e-textbooks. Acquiring the initial and sustainable funding to purchase the equipment and to maintain it.

Q2: Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?

Respondent skipped this question

Q3: Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education?

I think local control textbook policy is the major reason for the late adoption of e-textbooks because local control means that each district makes their own policies and there is no collaboration between other districts and the state. Everyone is doing it their way and on one is looking to the left or the right.

Participant	Question
	Q4: Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education? Respondent skipped this question Q5: Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education? Respondent skipped this question Q6: Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education? Respondent skipped this question
8	Q1: Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education? It would take money to buy the software and get it approved for the district. Q2: Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education? You must have access to use e textbooks. If internet I'd not up to date you cannot get online to view them Q3: Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education? After books are selected. Community meetings are held and parents get to vote on which adoption they feel is best for the district. Q4: Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education? I would say parents hesitate when it comes to technology. If they don't have reliable internet access. It also depends on if levees have passed and money is available for a textbook adoption. Q5: Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education? Without funds you cannot purchase necessary supplies to make the program run. Q6: Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education? It all boils down to cost. When our district adopts new books… The old books are sold to smaller districts for profit.

Step 2: I used the open coding approach to classify and develop categories that were associated with the particular ideas that were revealed from the comments made by the expert panelists to establish relationships and to assess the data from a different perspective. The purpose was to formulate new interpretations from the data.
Step 3: I devised a coding system that interpreted the information collected following each iteration of the Delphi questionnaire. The categories that was developed were cost and equipment management (CE), supportable funding for equipment (SF), Internet

connectivity (IC), local control textbook adoption policy (LC), state and local leadership resistance to digital content (SL), and other themes and responses (OT).

Step 4: Next, I interpreted the data by reducing the data into significant sections and assigning names to the sections, merging the codes into larger categories or themes to establish relationships between the themes. The sections that was developed were cost and equipment management, supportable funding for equipment, Internet connectivity, local control textbook adoption policy, state and local leadership resistance to digital content, and other themes and responses.

Step 5: After the categories and subcategories were established, I used axial coding to put the components back together again to develop new categories.

Step 6: The results of the coding process resulted in the six thematic categories that clarified how the participants repeatedly handled the problem.

Table M2

Round 2 Coding Process

Respondent	Participant Responses	Category
	Q1. Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?	
1	I think it is incredibly important that students have the devices in order to access e-textbooks if this is the direction that a district decides to move. It's one thing if a district is looking at BYOD options, but if they are adopting e-textbooks then devices would need to be provided for students for equity reasons.	CE
2	Students from low income families can't provide the tools for e-textbooks, so it puts the burden back on the schools. Thus forcing the schools to provide equipment, that needs updating on a regular bases, and additional staff to maintain support the equipment. School have other needs that need addressing, such as increase in class sizes and a shortage of teachers. Therefore the resources are spread thin and the funds have to be used for "warm bodies" first.	CE
3	I'm not sure I agree with the statements above. So I'm not sure that is it the most important reason for late adoption.	DR
4	Replacement of equipment would be even costlier and take valuable time from the course of study.	CE

(table continues)

Respondent	Participant Responses	Category
5	Even though the cost of devices have reduced considerably, this is still a major factor when a district is faced with providing these devices for both students and faculty.	CE
6	States do not have the electronic devices to support e-textbooks due to cost associated with equipment purchases. Also, policies are not in place that will enable the schools to manage the equipment making it problematic to deal with issues related to stolen devices.	CE
7	Acquisition cost is a major cause for the late adoption of e-textbooks. Acquiring the initial and sustainable funding to purchase the equipment and to maintain it.	CE
8	It would take money to buy the software and get it approved for the district.	CE
8	It all boils down to cost.	CE
	Q2. Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?	
1	I do not feel like this is the most important option. I worked at a Title I school for years and the majority of my students had access to the internet at home. Those that did not were able to go to a public library or some other location that offered internet or wireless services.	DR
2	Wi-Fi and connectivity is key. If the students do not have connectivity, then the system fails. My district has sufficient connectivity in the schools, but we fail in providing the students of financial needs proper connectivity at home. Because of this all of our students are put at a disadvantage. We cannot put a digital, e-textbook, program in place and not be able to provide all of our students' resources	IC
3	I don't think Internet Connectivity is the most important reason. I think e-textbooks can work without the internet.	DR
4	The reasons listed would prevent any out of school homework and detailed written reports.	IC
5	Participant did not answer this question.	
6	Participant did not answer this question.	
7	Participant did not answer this question.	

(table continues)

Respondent	Participant Responses	Category
8	You must have access to use e textbooks. If internet I'd not up to date you cannot get online to view them.	IC
8	I would say parents hesitate when it comes to technology. If they don't have reliable internet access.	IC
	Q3. Why is Local Control Textbook Adoption Policy the most important reason for the late adoption of e-textbooks in K-12 education?	
1	I think these decisions should be left up to the district. A metropolitan school district is going to differ greatly from a rural school district. With greatly varying needs, it would not be wise to prescribe a solution for the masses.	LC
2	I think the local school boards try to look at all of their students' needs. The boards make their adoptions based upon the needs of the communities. Again when there are communities that are not connected, then it is hard for the boards to make decisions to use tools that all students will not have access to use.	LC
3	I don't know enough about this to comment.	Discarded
4	There doesn't seem to be sales representatives to "sell" the products to the school boards	LC
5	Participant did not answer this question.	
6	Participant did not answer this question.	
7	I think local control textbook policy is the major reason for the late adoption of e-textbooks because local control means that each district makes their own policies and there is no collaboration between other districts and the state. Everyone is doing it their way and no one is looking to the left or to the right.	LC
8	After books are selected. Community meetings are held and parents get to vote on which adoption they feel is best for the district.	LC
	Q4. Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education?	
1	Participant did not answer this question.	

(table continues)

Respondent	Participant Responses	Category
2	In my opinion, the state and local leadership resist digital content because the authors can change the content anytime. Thus the leader, local and statewide, do not have the ability edit or sensor the content. Otherwise the leaders lose control of the subject content.	SL
3	I don't know about this	
4	Incomplete information and/or no information are being provided to these education departments.	SL
5	If states are going to initiate a statewide e-textbook adoption policy then the decisions need to be made at the state level and legislature needs to be passed to bring the entire state in alignment with that policy. Unless a decision is made at the state level then districts will continue to make their own decisions and there will never be a unified state policy. The states need to enlist people will visionary and innovative philosophies in order for this movement to take place.	SL
6	If the states do not organize themselves so that they are in a position to promote e-textbook adoption, it will never happen. You will have what is going on right now each district doing their own thing with no real plan in place to transition to e-textbooks. Some districts have not even considered it as an alternative to expensive textbooks, in which case, e-textbooks would save them money in the long run.	SL
7	Participant did not answer this question.	
8	It also depends on if levees have passed and money is available for a textbook adoption.	SL
	Q5. Why is Supportable Funding for Devices the most important reason for the late adoption of e-textbooks in K-12 education?	
1	I believe this is a huge reason for the late adoption of e-textbooks. If a program is being adopted that is strictly online, then we must be able to provide access for all students. While devices are not nearly as expensive as they used to be, our district has approximately 100,000 students and the budget does not currently allow for such a purchase.	SF

(table continues)

Respondent	Participant Responses	Category
2	Funding for electronic devices are never ending. One cannot make a onetime purchase and think it is sustainable. Devices, break down, need to be replaced on a regular bases and are sometimes lost. Therefore the state must always have an ongoing budget to fund devices and support for the devices.	SF
3	This is probably the most important although schools with Title I funds tend to spent lots of money on devices	SF
4	Money, money, money!	SF
5	Local districts need supportable funding from the state in order to purchase and sustain mobile devices to support e-textbook technologies.	SF
6	I think that if funding is redirected from the purchase of traditional textbooks, it can be directed towards the acquisition of e-readers, tablets, computers, and/or laptops.	DR
7	Participant did not answer this question.	
8	Without funds you cannot purchase necessary supplies to make the program run.	SF
6	Q6.Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?	
1	Participant did not answer this question.	
2	I think the number licensing the system must keep up with can become overwhelming for the state librarians. Not only do they have to keep up with the contents for the districts, they will have to make sure the employees do not violate the copyrights laws of the content.	OT
3	I don't agree. If a school system purchases the licenses they are compliant.	DR
4	Copyright issues need to be addressed.	OT
5	Participant did not answer this question.	
6	Participant did not answer this question.	
7	Participant did not answer this question.	
8	When our district adopts new books... The old books are sold to smaller districts for profit.	OT

Table M3

Responses Round 2 Coding Process Discrepant Remarks (DR)

Respondent	Participant Responses	Category
	Q1. Why is Cost and Equipment Management the most important reason for the late adoption of e-textbooks in K-12 education?	
3	I'm not sure I agree with the statements above. So I'm not sure that is it the most important reason for late adoption.	DR
6	I think that if funding is redirected from the purchase of traditional textbooks, it can be directed towards the acquisition of e-readers, tablets, computers, and/or laptops.	DR

This remark obviously did not have an impact on cost and equipment management because the final consensus rated cost and equipment management with the highest level of agreement.

	Q2. Why is Internet Connectivity the most important reason for the late adoption of e-textbooks in K-12 education?	
1	I do not feel like this is the most important option. I worked at a Title I school for years and the majority of my students had access to the internet at home. Those that did not were able to go to a public library or some other location that offered internet or wireless services.	DR
3	I don't think Internet Connectivity is the most important reason. I think e-textbooks can work without the internet.	DR

These comments may have influenced the rating on Internet connectivity because it was ranked the third most important reason for the late adoption of e-textbooks in K-12 education.

	Q4. Why is State and Local Leadership Resistance to Digital Content the most important reason for the late adoption of e-textbooks in K-12 education? Q6.Why is Other Themes and Responses the most important reason for the late adoption of e-textbooks in K-12 education?	
3	I don't agree. If a school system purchases the licenses they are compliant.	DR

These comments may have influenced the rating on other themes and responses because it was ranked the sixth major reason for the late adoption of e-textbooks in K-12 education.

Step 7: After the second round, the participants received summations derived from the comments collected from the previous rounds from me, which helped to influence the participants' responses in the next iteration of the survey.

Cost and equipment management. Acquisition cost is a major cause for the late adoption of e-textbooks. Acquiring the initial and sustainable funding to purchase the equipment and to maintain it. It would take money to buy the software and get it approved for the district. It is incredibly important that students have the devices that they will need in order to access e-textbooks if this is the direction that a district decides to move. It's one thing if a district is looking at BYOD options, but if they are adopting e-textbooks then devices would need to be provided for students for equity reasons. Students from low income families can't provide the tools for e-textbooks, so it puts the burden back on the schools. Thus, forcing the schools to provide the equipment that will need to be updated on a regular bases. Also, additional staff will be required to maintain and support the equipment. Schools have other needs that need addressing, such as increase in class sizes and a shortage of teachers. Therefore, the resources are spread thin and the funds have to be used for "warm bodies" first. Even though the cost of devices have reduced considerably, this is still a major factor when a district is faced with providing these devices for both students and faculty. Replacement of equipment would be even costlier and take valuable time away from instruction.

Supportable funding for devices. This is probably the most important reason although schools with Title I funds tend to spent lots of money on devices. Funding for electronic devices are never ending. One cannot make a onetime purchase and think it is sustainable. Devices break down and need to be replaced on a regular bases and are sometimes lost. Therefore, the state must always have an ongoing budget to fund devices and support for the devices. I believe this is a huge reason for the late adoption of e-textbooks. While devices are not nearly as expensive as they used to be, our district has approximately 100,000 students and the budget does not currently allow for such a purchase. Local districts need supportable funding from the state in order to purchase and sustain mobile devices to support e-textbook technologies. Without funds you cannot purchase necessary supplies to make the program run. Lack of money is a major concern to all stakeholders.

Internet connectivity. Wi-Fi and connectivity is key. If the students do not have connectivity, then the system fails. My district has sufficient connectivity in the schools, but we fail in providing the students of financial needs proper connectivity at home. Because of this all of our students are put at a disadvantage. We cannot put a digital, e-textbook, program in place and not be able to provide all of our students with these resources. You must have access to use e-textbooks. If the Internet is not up to date you cannot get online to view them. If a program is being adopted that is strictly online, then we must be able to provide access for all students. Without home Internet connectivity, students would not be able to do homework and prepare detailed written reports. Also, parents hesitate when it comes to technology. If they don't have reliable Internet access.

Local control textbook adoption policy. Local control textbook policy is the major reason for the late adoption of e-textbooks because local control means that each district makes their own policies and there is no collaboration between other districts and the state. Everyone is doing it their way and no one is looking to the left or to the right.

Local school boards try to look at all of their students' needs. The boards make their adoptions based upon the needs of the communities. After books are selected, community meetings are held and parents get to vote on which adoption they feel is best for the district. Again, when there are communities that are not connected, then it is hard for the boards to make decisions to use tools that all students will not have access to use. These decisions should be left up to the district. When looking at a metropolitan school district, it is going to differ greatly from a rural school district. With greatly varying needs, it would not be wise to prescribe a solution for the masses.

State and local leadership resistance to digital content. The state and local leadership resist digital content because the authors can change the content at any time. Thus, the leaders, local and statewide, do not have the ability to edit or sensor the content and the leadership would lose control of the subject content. If states are going to initiate a statewide e-textbook adoption policy then the decisions need to be made at the state level and legislature needs to be passed to bring the entire state in alignment with that policy. Unless a decision is made at the state level then districts will continue to make their own decisions and there will never be a unified state policy. The states need to enlist people with visionary and innovative philosophies in order for this movement to take place. Also, incomplete information and/or no information are being provided to these educational departments. It also depends on if levees have passed and money is available for an e-textbook adoption.

Other themes and responses. The number of licensing agreements that the system must keep up with, in addition to the changing digital contents, and avoiding violating copyright laws can become overwhelming for the districts. Also, copyright issues need to be addressed. It all boils down to cost. When a district adopts new books... The old books are sold to smaller districts for profit.

Appendix N: Final Consensus Round Coding Process

Step 1: After the responses were collected from the third round of the Delphi questionnaire, I examined and evaluated the data.

Step 2: The responses generated from the first round of the questionnaire determined themes that structured the questions in the second round of the Delphi questionnaire.

Step 3: After the first and second rounds, the participants received summations derived from the comments collected from the previous rounds from me, which helped to influence the participants' responses in the next iteration of the survey.

Step 4: Subsequently, the categories derived from the previous rounds of the Delphi progression were assessed to formulate the consensus that was developed by the expert panelists.

Step 5: At that point, I had a well-considered explanation for the late adoption of e-textbooks in K-12 education.

This table represents the participants rating of the themes to determine their degree of agreement of the final summaries.

Table N1

Final Consensus Rating by Participant

Participant	Response	
1	Cost and Equipment Management	Agree
	Internet Connectivity	Agree
	Local Control Textbook Adoption Policy	Neither Disagree Nor Agree
	State and Local Resistance to Digital Content	Disagree
	Supportable Funding for Devices	Neither Disagree Nor Agree
	Other Themes and Responses	Neither Disagree Nor Agree
2	Cost and Equipment Management	Strongly Agree
	Internet Connectivity	Strongly Agree
	Local Control Textbook Adoption Policy	Strongly Agree
	State and Local Resistance to Digital Content	Strongly Agree
	Supportable Funding for Devices	Strongly Agree
3	Cost and Equipment Management	Strongly Agree
	Internet Connectivity	Agree
	Local Control Textbook Adoption Policy	Agree
	State and Local Resistance to Digital Content	Agree
	Supportable Funding for Devices Strongly	Agree

Participant	Response	
	Other Themes and Responses	Neither Disagree Nor Agree
4	Cost and Equipment Management	Strongly Agree
	Internet Connectivity	Agree
	Local Control Textbook Adoption Policy	Agree
	State and Local Resistance to Digital Content	Agree
	Supportable Funding for Devices	Strongly Agree
	Other Themes and Responses	Neither Disagree Nor Agree
5	Cost and Equipment Management	Agree
	Internet Connectivity	Agree
	Local Control Textbook Adoption Policy	Strongly Agree
	State and Local Resistance to Digital Content	Agree
	Supportable Funding for Devices	Strongly Agree
	Other Themes and Responses	Strongly Agree
6	Cost and Equipment Management	Strongly Agree
	Internet Connectivity	Agree
	Local Control Textbook Adoption Policy	Agree
	State and Local Resistance to Digital Content	Agree
	Supportable Funding for Devices	Strongly Agree
	Other Themes and Responses	Agree
7	Cost and Equipment Management	Strongly Agree
	Internet Connectivity	Agree
	Local Control Textbook Adoption Policy	Agree
	State and Local Resistance to Digital Content	Disagree
	Supportable Funding for Devices	Strongly Agree
	Other Themes and Responses	Agree

Table N2

Ratings of the Summations for Late Adoption of E-textbooks

Reason	Respondents						
	1	2	3	4	5	6	7
Cost of Devices	A	SA	SA	SA	A	SA	SA
Internet Connectivity	A	SA	A	A	A	A	A
Local Textbooks Policy	N	SA	A	A	SA	A	A
State and Local Resistance	D	SA	A	A	A	A	D
Supportable Funding	N	SA	A	SA	SA	SA	SA
Other Themes	N	SA	N	N	SA	A	A

Note. This table illustrates the expert panelist's ratings of the summations that were generated in round 2, which formulates the consensus of the group as to the major reasons for the late adoption of e-textbooks in K-12 education; SA = strongly agree, A = agree, N = somewhat agree/disagree, and D = disagree. This table illustrates the participants' breakdown of their ratings for the summations for the late adoption of e-textbooks in K-12 education.

	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	Total	Average Rating
Cost and Equipment Management	0.00% 0	0.00% 0	0.00% 0	28.57% 2	71.43% 5	7	4.71
Internet Connectivity	0.00% 0	0.00% 0	0.00% 0	85.71% 6	14.29% 1	7	4.14
Local Control Textbook Adoption Policy	0.00% 0	0.00% 0	14.29% 1	57.14% 4	28.57% 2	7	4.14
State and Local Resistance to Digital Content	0.00% 0	28.57% 2	0.00% 0	57.14% 4	14.29% 1	7	3.57
Supportable Funding for Devices	0.00% 0	0.00% 0	14.29% 1	0.00% 0	85.71% 6	7	4.71
Other Themes and Responses	0.00% 0	0.00% 0	42.86% 3	28.57% 2	28.57% 2	7	3.86

Figure N1. Participants level of agreement with consensus table. This table was generated by SurveyMonkey.com's internal calculator. It shows the level of agreement that each participant had to the summations generated from the second round of the questionnaire. This table shows the final consensus of the expert panelists for the reasons for the late adoption of e-textbooks in K-12 education.

The rating table was sorted to determine the degree of consensus with the final summaries for the late adoption of e-textbooks in K-12 education

Table N3

Participants Agreement with Consensus Sorted by Average Rating

| Reason	Strongly Disagree	Disagree	Neither Disagree Nor Agree	Agree	Strongly Agree	Total	Average Rating
Cost and Equipment Management	0.00%	0.00%	0.00%	28.57% 2	71.43% 5	7	4.71
Supportable Funding for Devices	0.00%	0.00%	14.29% 1	0.00%	86.71% 6	7	4.71
Internet Connectivity	0.00%	0.00%	0.00%	85.71% 6	14.29% 1	7	4.14
Local Control Textbook Adoption Policy	0.00%	0.00%	14.28% 1	57.14% 4	28.57% 2	7	4.14
Other Themes and Responses	0.00%	0.00%	42.86% 3	28.57% 2	28.57% 2	7	3.86
Staten and Local Resistance to Digital Content	0.00%	28.57% 2	0.00%	57.14% 4	14.29% 1	7	3.57
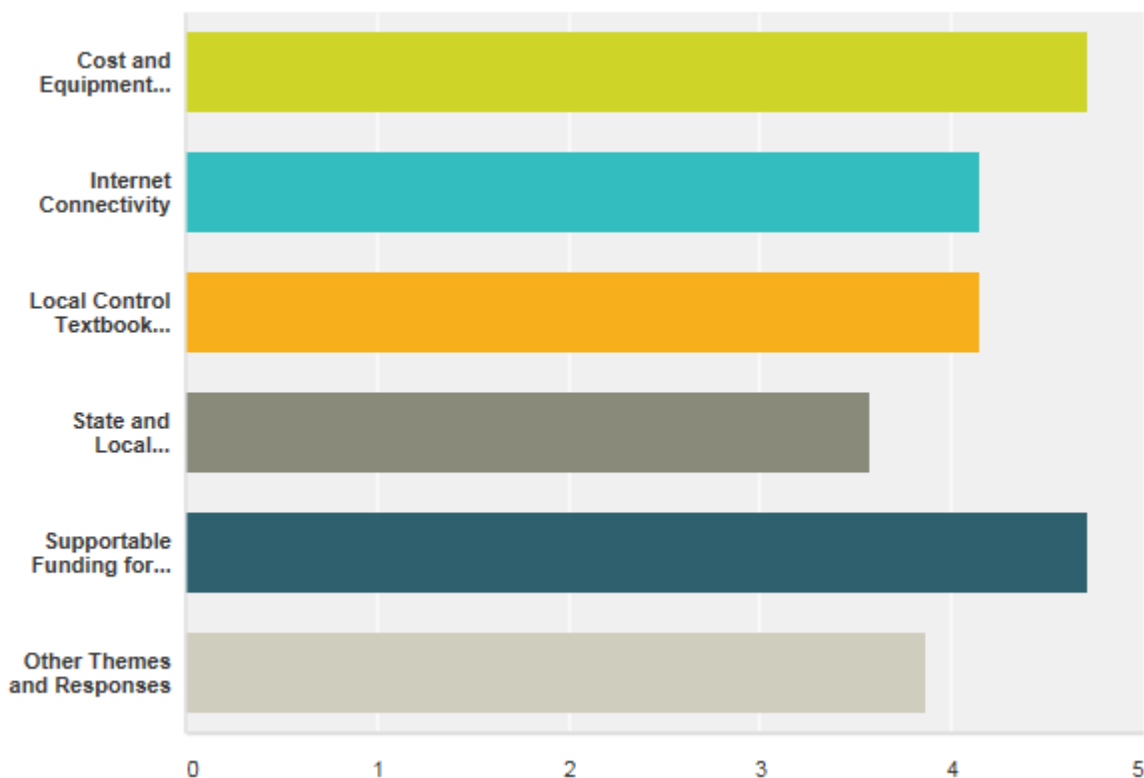
Figure N2. Level of agreement with consensus graph. This bar graph was generated by SurveyMonkey.com's internal calculator. It shows the level of agreement that each participant had to the summations generated from the second round of the questionnaire. This bar graph shows the final consensus of the expert panelists for the reasons for the late adoption of e-textbooks in K-12 education.

Step 2: Rankings of the Reasons for the Late Adoption of E-textbooks

This table represents the participants ranking of the themes to determine the most important to the least important reasons for the late adoption of e-textbooks in K-12 education

Table N4

Final Consensus Ranking by Participant

Participant	Answer	
1	Cost and Equipment Management	2
	Internet Connectivity	1
	Local Control Textbook Adoption Policy	4
	State and Local Resistance to Digital Content	6
	Supportable Funding for Devices	3
	Other Themes and Responses	5
2	Cost and Equipment Management	1
	Internet Connectivity	3
	Local Control Textbook Adoption Policy	4
	State and Local Resistance to Digital Content	5
	Supportable Funding for Devices	2
	Other Themes and Responses	6
3	Cost and Equipment Management	1
	Internet Connectivity	3
	Local Control Textbook Adoption Policy	4
	State and Local Resistance to Digital Content	5
	Supportable Funding for Devices	2
	Other Themes and Responses	6
4	Cost and Equipment Management	1
	Internet Connectivity	3
	Local Control Textbook Adoption Policy	5
	State and Local Resistance to Digital Content	4
	Supportable Funding for Devices	2
	Other Themes and Responses	6
5	Cost and Equipment Management	1
	Internet Connectivity	5
	Local Control Textbook Adoption Policy	2
	State and Local Resistance to Digital Content	4
	Supportable Funding for Devices	3
	Other Themes and Responses	6

(table continues)

Participant	Answer	
6	Cost and Equipment Management	2
	Internet Connectivity	5
	Local Control Textbook Adoption Policy	3
	State and Local Resistance to Digital Content	1
	Supportable Funding for Devices	4
	Other Themes and Responses	6
7	Cost and Equipment Management	1
	Internet Connectivity	2
	Local Control Textbook Adoption Policy	6
	State and Local Resistance to Digital Content	5
	Supportable Funding for Devices	3
	Other Themes and Responses	4

Note. This table illustrates the expert panelist's ranking of the themes, which the panelists considers to be the most important reasons to the least important reasons. These rankings filter into the consensus that was formulated by the group as to the major reasons for the late adoption of e-textbooks in K-12 education in order of importance.

Table N5

Rankings of the Reasons for the Late Adoption of E-textbooks

Reason	Respondents						
	1	2	3	4	5	6	7
Cost of Devices	2	1	1	1	1	2	1
Internet Connectivity	1	3	3	3	5	5	2
Local Textbooks Policy	4	4	4	5	2	3	6
State and Local Resistance	6	5	5	4	4	1	5
Supportable Funding	3	2	2	2	3	4	3
Other Themes	5	6	6	6	6	6	4

	1	2	3	4	5	6	Total	Average Ranking
Cost and Equipment Management	71.43% 5	28.57% 2	0.00% 0	0.00% 0	0.00% 0	0.00% 0	7	5.71
Internet Connectivity	14.29% 1	14.29% 1	42.86% 3	0.00% 0	28.57% 2	0.00% 0	7	3.86
Local Control Textbook Adoption Policy	0.00% 0	14.29% 1	14.29% 1	42.86% 3	14.29% 1	14.29% 1	7	3.00
State and Local Resistance to Digital Content	14.29% 1	0.00% 0	0.00% 0	28.57% 2	42.86% 3	14.29% 1	7	2.71
Supportable Funding for Devices	0.00% 0	42.86% 3	42.86% 3	14.29% 1	0.00% 0	0.00% 0	7	4.29
Other Themes and Responses	0.00% 0	0.00% 0	0.00% 0	14.29% 1	14.29% 1	71.43% 5	7	1.43

Figure N3. Ranking of reasons for the late adoption of e-textbooks. The ranking question was calculated by SurveyMonkey.com's internal calculator. The ranking average for each answer choice is calculated to determine, which answer choice was the most important reason to the least important reason for the late adoption of e-textbooks in K-12 education. The response with the highest ranking average was the most preferred reason selected by the respondents.

The Participants Ranking of Reasons for the Late Adoption of E-textbooks in K-12 Education

Table was sorted to determine the most important to the least important reasons for the late adoption of e-textbooks in K-12 education

Table N6

Ranking Reasons Sorted by Average Ranking

| Reason	1	2	3	4	5	6	Average Ranking
Cost and Equipment Management	71.43% 5	28.57% 2	0.00%	0.00%	0.00%	0.00%	5.71
Supportable Funding for Devices	0.00%	42.86% 3	42.86% 3	14.29% 1	0.00%	0.00%	4.29
Internet Connectivity	14.29% 1	14.29% 1	42.86% 3	0.00%	28.57%	0.00%	3.86
Local Control Textbook Policy	0.00%	14.29% 1	14.29% 1	42.86% 3	14.29% 1	14.29% 1	3.00
State and Local Resistance to Digital Content	14.29% 1	0.00%	0.00%	28.57% 2	42.86% 3	14.29% 1	2.71
Other Themes and Responses	0.00%	0.00%	0.00%	14.29% 1	14.29% 1	71.43% 5	1.43
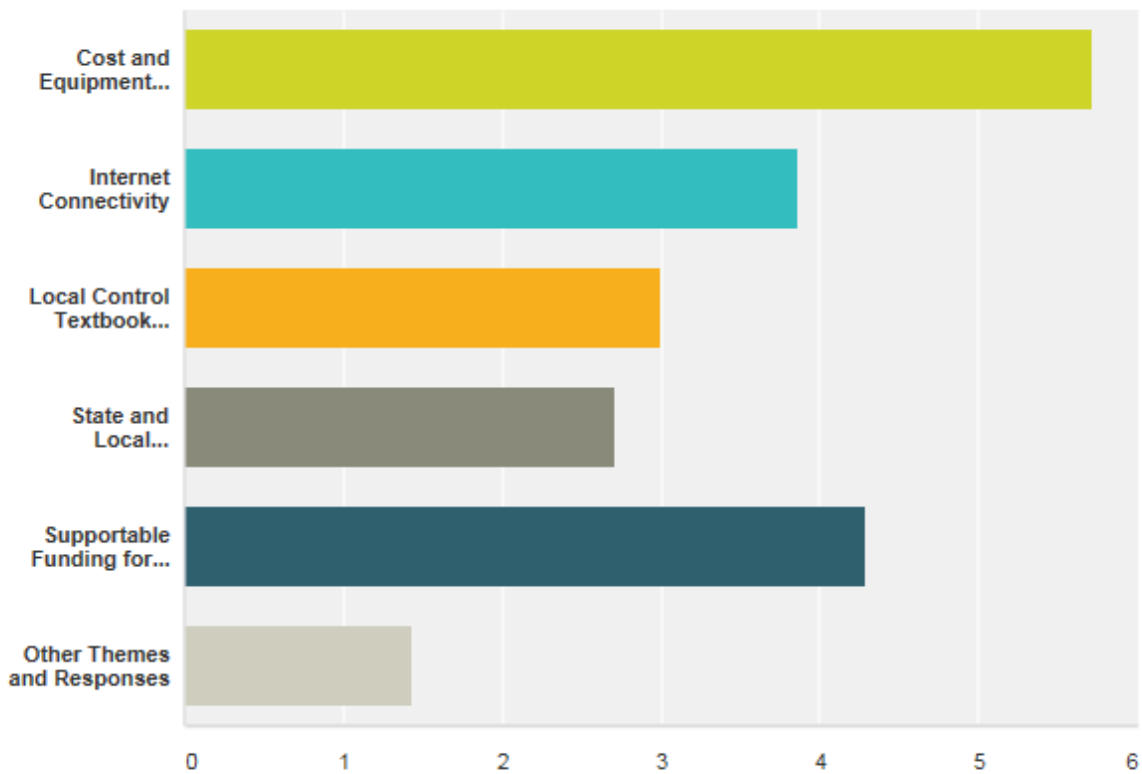
Figure N4. Ranking results for reasons for the late adoption of e-textbooks. This bar graph was generated by SurveyMonkey.com's internal calculator. It shows the participants preference from the most important reason to the least important reason for the late adoption of e-textbooks in K-12 education.

The additional remarks resulted in Discrepant Remarks (DR) in the final consensus round, which served as contributors in the determination of the major reasons for the late adoption of e-textbooks in K-12 education.

Table N7

Final Consensus Round Additional Remarks

Participant	Response	Category
1	Respondent skipped this question	
2	Respondent skipped this question	
3	Respondent skipped this question	
4	Respondent skipped this question	
5	Summaries seem to be on target. Good work!	Discarded
6	In regards to state and local leadership resistance to digital content, I do not think that the states are concerned about loss of control of digital content is a valid statement.	DR
7	Internet connectivity may be a problem at home, but there is an effort in many communities to provide connectivity. They provide connectivity in public libraries, community centers and some local businesses are providing internet connectivity.	DR

Appendix O: Analysis Plan

Steps	Analysis Process
1	After the responses had been collected from each of the three rounds of the Delphi questionnaire, I examined and evaluated the data.
2	I devised a coding system that interpreted the information being collected following each iteration of the Delphi questionnaire.
3	Next, I interpreted the data by reducing the data into significant sections and assigning names to the sections, merging the codes into larger categories or themes to establish relationships between the themes (Creswell, 2007).
4	After each of the three rounds, I used the open coding approach to classify and develop categories that were associated with particular ideas that were revealed from the comments made by the expert panelists to establish relationships and to assess the data from a different perspective. The purpose was to formulate new interpretations from the data.
5	After the categories and subcategories were established, I used axial coding to put the components back together again to develop new categories.
6	The results of the coding process resulted in thematic categories that clarified how the participants repeatedly handle the problem (Merriam, 2002).
7	The responses generated from the first round of the questionnaire determined themes that will structure the questions in the second round of the Delphi questionnaire.
8	After the first and second rounds, the participants received summations derived from the comments collected from the previous rounds from me, which helped to influence the participants' responses in the next iteration of the survey.
9	Subsequently, the categories derived from the third and final round of the questionnaire formulated the final consensus, which was assessed to formulate the basis for a substantive theory, which described "an interrelated set of categories grounded in the data that emerged from the constant comparative coding and analysis procedures" (Merriam, 2002, p. 151).
10	At that point, I had a "well-considered explanation for some phenomenon of interest" (Trochim, 2001, p. 160-161), which could be used to extract inferences about future developments, which is the objective of a Delphi study.
11	During the course of the study I used memoing "a process for recording your thoughts and ideas as they evolve throughout the study" (Trochim, 2001, p. 160). This was done by keeping of log of the key facets that materialized during the course of the study. This enabled me to supply rich descriptions and thorough explanations of the entire research process.

Curriculum Vitae

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January 2015

EDUCATION

2005-2015	Ph.D. in Educational Technology, Walden University, Minneapolis, MN
2005-2011	Ed.S. in Educational Technology, Walden University, Minneapolis, MN
2002-2003	Add-on Media Specialist Certification, State University of West Georgia, Carrollton, GA
2000-2002	M.Ed. in Media/Instructional Technology, State University of West Georgia, Carrollton, GA
1973-1975	B.S. in General Business, New York University, New York, NY
1971-1973	A.A.S. in Accounting, Borough of Manhattan Community College, New York, NY

EMPLOYMENT

2004-Present	Media Specialist
2000–2004	Substitute Teacher
1998–1999	Consultant for Metro Information Services
1992-1998	Programmer/Analyst Metropolitan Life Insurance Company

LICENSURE

Georgia Media Specialist License (S7) in Pre K-12

AWARD

Outstanding Masters of Education Student in Instructional Technology, State University
of West Georgia

GRANT RECIPIENT

Laura Bush Foundation for American Libraries Grant in 2012 for $4,000
Laura Bush Foundation for American Libraries Grant in 2007 for $5,000
Laura Bush Foundation for American Libraries Grant in 2006 for $5,000
CINS Grant 2007 for $1,200
CINS Grant 2006 for $1,200

CINS Grant 2005 for $1,200

Productivity Software
    Microsoft Office

Online Instructional Databases
    GALILEO, nettrekker, Georgia Public Broadcasting's Video Streaming, Renzulli,
    Accelerated Reader, Grolier Online, and Georgia Online Assessment System for
    CRCT preparation.

Course Management Software
    Blackboard, ECollege, GSAMS.

Associations
    International Society for Technology in Education (ISTE)