

Spring 5-1-2015

## Perceived Attributes and Factors Influencing Instructors' Using E-Textbooks in Higher Education

Sirui Wang  
*University of Southern Mississippi*

Follow this and additional works at: <https://aquila.usm.edu/dissertations>



Part of the [Curriculum and Instruction Commons](#), [Educational Methods Commons](#), and the [Instructional Media Design Commons](#)

---

### Recommended Citation

Wang, Sirui, "Perceived Attributes and Factors Influencing Instructors' Using E-Textbooks in Higher Education" (2015). *Dissertations*. 41.  
<https://aquila.usm.edu/dissertations/41>

This Dissertation is brought to you for free and open access by The Aquila Digital Community. It has been accepted for inclusion in Dissertations by an authorized administrator of The Aquila Digital Community. For more information, please contact [Joshua.Cromwell@usm.edu](mailto:Joshua.Cromwell@usm.edu).

The University of Southern Mississippi

PERCEIVED ATTRIBUTES AND FACTORS INFLUENCING INSTRUCTORS'  
USING E-TEXTBOOKS IN HIGHER EDUCATION

by

Sirui Wang

Abstract of a Dissertation  
Submitted to the Graduate School  
of The University of Southern Mississippi  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Philosophy

May 2015

## ABSTRACT

### PERCEIVED ATTRIBUTES AND FACTORS INFLUENCING INSTRUCTORS' USING E-TEXTBOOKS IN HIGHER EDUCATION

by Sirui Wang

May 2015

As digital content, e-Textbooks display text on the screen, integrate multimedia within textual components, and allow reading on portable devices, which make learning highly interactive, flexible, and immediately accessible. They also increase students' engagements in learning, and make learning content portable, transferrable, and searchable. Those advanced features did not bring a boom in using e-Textbooks in education. The adoption of using e-Textbooks in higher education is still far from its confirmation stage. The purpose of this study was to examine the relationship between the perceived attributes of using e-Textbooks by instructors and their actual use of e-Textbooks in higher educational settings, to discuss the factors that prevent instructors from using e-Textbooks in teaching, and to provide statistical evidence for promoting digital content and e-Textbooks in higher education in the future. A quantitative study was conducted to measure instructors who are from public universities in the college of education on how they perceived using e-Textbooks in higher education. Several factors emerged to explain the relationships between instructors and using e-Textbooks. With the findings, it suggests instructors, e-Textbooks publishers, institutions, and instructional designers need to work collaboratively to enhance the use of e-Textbooks in higher education.

*Keywords:* e-Textbooks, instructor, Diffusion of Innovation Theory, perceived attributes of innovation, digital learning, digital content.

COPYRIGHT BY

SIRUI WANG

2015

The University of Southern Mississippi

PERCEIVED ATTRIBUTES AND FACTORS INFLUENCING INSTRUCTORS'  
USING E-TEXTBOOKS IN HIGHER EDUCATION

by

Sirui Wang

A Dissertation  
Submitted to the Graduate School  
of The University of Southern Mississippi  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Philosophy

Approved:

Dr. Taralynn Hartsell  
Committee Chair

Dr. Shuyan Wang

Dr. Jonathan Beedle

Dr. Kyna Shelley

Dr. Karen S. Coats  
Dean of the Graduate School

May 2015

## ACKNOWLEDGMENTS

I would like to express the deepest appreciation to my research advisor Dr. Taralynn Hartsell. Without her supervision and constant help, this dissertation would not have been possible. Her knowledge, advice, and encouragement have been invaluable and her faith in me has made the accomplishment of this research possible.

Furthermore, my appreciation and gratitude go to my other committee members: Dr. Shuyan Wang, Dr. Jonathan Beedle, and Dr. Kyna Shelly. Their advice throughout the research process was indispensable.

I would also like to show my gratitude to the instructors who sincerely provided their suggestions and support on my research, in particular at the very beginning of my research.

Finally, I would like to express my thanks to my family, my parents, and my little baby Carina, for their support in my life and research.

## TABLE OF CONTENTS

ABSTRACT .....	ii
ACKNOWLEDGMENTS .....	iii
LIST OF TABLES .....	vi
CHAPTER	
I. INTRODUCTION .....	1
Overview	
Statement of the Problem	
Purpose of the Study	
Research Questions/Hypothesis	
Significance and Justification	
Delimitations and Assumptions	
Definition of Terms	
Summary	
II. REVIEW OF LITERATURE.....	12
Introduction	
Theoretical Framework	
Summary	
III. METHODOLOGY .....	47
Introduction	
Research Design	
Research Setting	
Participants	
Research Instrument	
Procedures for Conducting the Study	
Data Analysis Procedures	
Summary	
IV. DATA ANALYSIS .....	59
Introduction	
Survey Participation	
Data Preparation	
Analysis of Research Questions	
Summary of Findings	



V.	DISCUSSION .....	77
	Summary of Study	
	Conclusions and Discussion of Results	
	Implications and Recommendations	
	Limitations	
	Recommendations for Future Research	
	APPENDIXES .....	105
	REFERENCES .....	124

## LIST OF TABLES

### Table

1.	Frequency of How Often Instructors Use E-Textbooks in Teaching .....	62
2.	Frequency of Adopters and Non-Adopters of E-Textbooks .....	63
3.	Age Group Distribution .....	64
4.	Academic Rank of Participants.....	64
5.	Results of Chi-square Test and Descriptive Statistics for E-Textbook Adoption by State .....	65
6.	Results of Chi-square Test and Descriptive Statistics for E-Textbook Adoption by Gender.....	66
7.	Results of Chi-square Test and Descriptive Statistics for E-Textbook Adoption by Age.....	67
8.	Results of Chi-square Test and Descriptive Statistics for E-Textbook Adoption by Academic Rank.....	68
9.	Descriptive Statistics for E-Textbook Adoption by Study Field. ....	69
10.	Regression Analysis of the Eight Attributes Perceived by Instructors. ....	71
11.	Coefficients for Perceived Attributes by Instructors .....	71
12.	Summary of Stepwise Multiple Regression Analysis for Variables Predicting Instructors' Using of E-Textbooks.....	73

## CHAPTER I

### INTRODUCTION

#### Overview

According to Pearson Publishing (2013), digital content helps reduce student learning costs, improves flexibility of learning in terms of time and location, increases engagement in learning activities, and enhances the accessibility to learning materials. As digital content, the e-Textbooks, together with eLearning software and other educational technologies, promote the customized and diverse learning methods for education. They also provide a different solution for instructors and learners to personalize content, accommodate students' learning styles, and change instructors' teaching methods digitally.

Compared with printed textbooks, e-Textbooks display text on screen, integrate multimedia with textual components, allow reading on portable devices, and support hyperlinks to external resources (Educause, 2006). These features fulfill the diverse teaching and learning needs in education, and provide rich, interactive, and customized content for educators and learners (Foundation for Excellence in Education, 2010). Researchers believe e-Textbooks have great potential to increase students' interactions with the content for collaborative group work and access digital resources by highlighting, bookmarking, annotating, and collecting responses and comments between lecturers and students (Shiratuddin, Landoni, Gibb, & Hassan, 2006). Schools, colleges, and libraries are also in transitioning from printed textbooks to e-Textbooks. By integrating multimedia within textual components and adding hyperlinks to text for accessing external resources, e-Textbooks make learning content highly innovative, flexible, and

immediately accessible; this could increase students' participations in education and bring students more opportunities to learn in and outside textbooks (Educause, 2006; Pearson Publishing, 2013). For instance, narrated animations can be added to textual components in e-Textbooks to make reading more vivid and enhance young readers' reading experiences (Itzkovitch, 2012), audio files may be embedded within learning content as examples or explanations, and hyperlinks may be inserted as external resources to fulfill students' different learning necessities (Educause, 2006).

The features and advantages of e-Textbooks in education are also consistent with the National Educational Technology Standards (NETS) and can support the diverse learning needs of students, and communicate and collaborate within the digitalized educational environment in today's digital learning age (International Society for Technology and Education, 2000). By addressing such innovative ways of reading with interactive comments, media components, and external sources, e-Textbooks can be valuable for instructors and learners, and make the educational environments vivid, interactive, and self-directed (Educause, 2006).

E-Textbooks may change the future of teaching and learning by "increasing student engagement and deepening their understanding" (Educause, 2006, p. 2) of learning content with its "portable, transferable, and searchable" features (p. 1).

#### Statement of the Problem

According to Rogers' diffusion of innovation theory, the adoption process of an innovation usually is comprised of five stages. These stages include knowledge, persuasion, decision, implementation, and the final stage of confirmation of the innovation that may be influenced by the attributes of the innovation perceived by

adopters (Rogers, 2003). Only when the confirmation stage of adoption is fulfilled, the process of adoption is complete.

Using e-Textbooks in teaching in higher education is still far from its confirmation stage. Although the 2012 report of National Educational Technology Trend (Duffey & Fox, 2012) has included e-Textbooks as one of the elements of innovative learning model to ensure students' achievement, using e-Textbooks in education has not been accepted completely. The statistics provided by State Education Policy Center (SEPC) showed that from 2008 to 2012, there are 23 states in the U.S. that have been in the process of adopting digital content that includes e-Textbooks in education; 9 states have added digital content to the definition of textbooks, two of which are considering adopting digital content in education (SEPC, 2012). There are still 19 states that have neither proposed any policies or guidelines of adopting or using digital content in education, nor included digital content in learning materials. Such an incomplete adoption process of digital content and e-Textbooks in the U.S. conflicts with the demonstrated features of e-Textbooks in research and implies a need to examine the perceived attributes by instructors in teaching.

The adoption of an innovation is dependent upon various factors to move forward from the knowledge stage to the final confirmation stage (Rogers, 2003; Kissinger, 2011); thus, there is also a need to explore the reasons that prevent instructors' from using e-Textbooks in education. Research showed that students' higher expectations on using e-Textbooks for more interactive and collaborative learning opportunities in higher education (Center for Digital Education, 2011) were opposed by instructors displaying unsupportive attitudes and showing lower intentions of using e-Textbooks in teaching

(Kissinger, 2011). Such disconnections and contrary reactions between students and instructors to e-Textbooks indicate the need to explore and recognize the reasons that prevent instructors from using e-Textbooks in higher education.

In conclusion, due to the incomplete adoption of using e-Textbooks in higher education and the inconsistencies between students' higher expectations of e-Textbooks in learning and instructors' lower intentions of using e-Textbooks in teaching, it is necessary to examine the perceived attributes of using e-Textbooks in teaching and the factors that prevent instructors from using e-Textbooks in higher education. The investigation of the various contextual factors from instructors' perceptions may support the promotion of using e-Textbooks in teaching in higher educational settings.

#### Purpose of the Study

The purpose of this study is to examine the attributes perceived by instructors in using e-Textbooks in higher educational settings and explore the factors that affect instructors using e-Textbooks in teaching. Based on the literature review and the review of the theory of perceived attributes from Rogers' diffusion of innovation theory (2003), Technology Acceptance Model (TAM), and Moore and Benbasat's (1991) measurement on innovations, this study divides instructors into two groups: instructors who are using e-Textbooks (adopters) and those who are not using e-Textbooks (non-adopters) in teaching. The study also compares the demographic differences between adopters and non-adopters in higher education. The study investigates the relationships between the perceived attributes of using e-Textbooks by instructors and their (adopters) actual use of e-Textbooks in teaching. In addition, the factors that prevent instructors from using e-Textbooks in teaching in higher education are examined. Moreover, this study discusses

whether using e-Textbooks in teaching can create an interactive educational environment, inspire instructors' teaching, and enhance their teaching performance in higher education.

An additional purpose of this research is to provide statistical evidence for promoting digital content and e-Textbooks into higher education in the future. A study of e-Textbooks from the perspective of instructors in the adoption process helps examine instructors' attitudes towards digital content and e-Textbooks, and their preferences toward digital content in higher education. This examination could provide guidance for the transition from printed textbooks to e-Textbooks in higher education in the future.

#### Research Questions/Hypothesis

Based on the purpose of this study, the research questions include:

Research question 1:

How do demographics (state, gender, age, academic rank, and study field) differ between instructors using e-Textbooks (adopters) and those who are not using e-Textbooks (non-adopters) in teaching in higher education?

- Hypothesis 1: There is a difference between adopters and non-adopters of using e-Textbooks in terms of state of residence.
- Hypothesis 2: There is a difference between adopters and non-adopters of using e-Textbooks in terms of gender.
- Hypothesis 3: There is a difference between adopters and non-adopters of using e-Textbooks in terms of age group.
- Hypothesis 4: There is a difference between adopters and non-adopters of using e-Textbooks in terms of academic rank.

- Hypothesis 5: There is a difference between adopters and non-adopters of using e-Textbooks in terms of study fields.

Research question 2:

How do perceived attributes of using e-Textbooks relate to instructors' using e-Textbooks in teaching in higher education?

- Hypothesis 6: There is a relationship between the eight perceived attributes of using e-Textbooks and instructors' using e-Textbooks in teaching.

Research Question 3:

What are the factors that prevent instructors from using e-Textbooks in teaching?

#### Significance and Justification

This study has significance in the area of digital learning and the interactive education environment in several aspects. First, this study will support current research of using e-Textbooks from instructors' perspective in higher education. Currently, most research studies of e-Textbooks focus on students' experiences of using e-Textbooks and advanced features of e-Textbooks as learning tools in education (Cavanaugh & Cavanaugh, 2008; Kissinger, 2011; Lynch, 2013; Mardis, Everhart, Smith, Newsum, & Baker, 2010; Moody, 2010). Instructors' experiences of using e-Textbooks and their attitudes towards e-Textbooks should also be examined and considered (Kissinger, 2011) because their reactions to e-Textbooks in teaching will influence the future of using e-Textbooks in education. Thus, conducting a study of using e-Textbooks from instructors' perceptions is warranted.

Second, this study can assist in diversifying and stimulating instructors' teaching potentials by integrating various instructional tools. In order to create an effective and



interactive learning environment for learning, instructors need to acquire knowledge of emerging technologies and adopt advanced technological teaching tools to integrate within their teaching philosophy. With the desired digital format and features, e-Textbooks can help instructors design instructional materials digitally and interactively, support the diverse learning needs of students, and assist teaching and learning with a better planned and effectively designed educational environment (ISTE, 2000).

Moreover, by examining the relationships between perceived attributes of e-Textbooks and instructors' using e-Textbooks, this research enriches the literature of using e-Textbooks from the perspective of instructors. By building a rationale for exploring the factors influencing instructors' using and not using e-Textbooks in a digitalized higher educational setting, this study provides adequate evidence for promoting the use of e-Textbooks among instructors in the future.

Furthermore, this research will contribute to the development of digital learning in higher education. In higher education, digital learning promises education a completely new learning environment and platform. With digital content, educators can meet with students anytime and anywhere, customize and personalize teaching materials and content that they perceive useful, bring as much participation and engagement as possible into education, and create as many remote learning opportunities as possible for distance learners (Center for Digital Education, 2011).

With the advantages of delivering content digitally, providing multiple methods to make students interact with learning content, and personalizing teaching and learning experiences, e-Textbooks play a vital role in facilitating education digitally and collaboratively (Duffey & Fox, 2012; Young, 2009). An adoption research on e-

Textbooks like this will be beneficial to clarify and understand the importance of digital content and e-Textbooks in teaching and learning in higher education.

#### Delimitations and Assumptions

Currently, this study has the following delimitations. First, the results and their implications come from regional public universities in U.S. Results may not be generalizable to other educational levels (e.g., K-12 education) or to other regions in U.S.

Second, there may not be a large population of instructors who are using e-Textbooks in teaching in higher education. This might prevent the researcher from conducting follow-up inquiries and obtaining in-depth knowledge of the entire adoption process of e-Textbooks in higher education. In effect, the lack of participation may limit the depth of exploration of e-Textbook use in higher education.

Third, convenience sampling has the potential for bias and may not be generalizable to other institutions. The responses are based on participants' willingness to honestly self-report the data and rely upon their ability to recall information accurately. In addition, the adopted instrument for this research is from an existing instrument. Although reliability and validity have been tested and qualified to generalize to any other innovations, several items on the questionnaire need revision to fit the population and research setting in this study.

There are two assumptions of this research. First, in relation to this sampling of participants, the researcher assumes that all participants will respond to the survey questions accurately and truthfully. Because confidentiality will be assured, the researcher anticipates that participants will respond to the best of their knowledge.

Another assumption would be that the participants are responding to the questionnaire without any fear of being reprimanded or have a conflict of interest.

#### Definition of Terms

*Adoption:* Adoption is a decision of “full use of an innovation as the best course of action available” and rejection is a decision “not to adopt an innovation” (Rogers, 2003, p. 177).

*Diffusion of Innovation:* The process by which an innovation is “communicated through certain channels over time among the members of a social system” (Rogers, 2003, p. 6).

*Digital content:* In this research, this refers to all teaching and learning content that is in their digital formats, naturally or converted, to support curriculum, facilitate students learn, and collaborate with digital learning environment.

*E-Textbook:* In this research, this refers to a textbook in its digital form or textbook converted into certain digital format or in a computer file format to be displayed on a computer screen or read on a computer through a network or viewed on a dedicated portable device or read on all types of computers or formatted for display on eBook readers.

*Innovation:* An innovation is an idea, behavior, or object that is perceived as new by its audience (Rogers, 2003). In this study, e-Textbook is perceived as a new format of textbooks that is different from printed textbooks in education.

*Social system:* It is defined as “a set of interrelated units engaged in joint problem solving to accomplish a common goal” (Rogers, 2003, p. 23). In this research, it refers to institutions and universities where instructors use e-Textbooks in teaching.

## Summary

An effective digital learning environment allows students and teachers opportunities to interact with learning content, find more collaboration among groups, and improve students' mastery of knowledge. E-Textbooks, may change the future of teaching and learning by "increasing student engagement and deepen their understanding" of learning content (Educause, 2006, p. 2). The purpose of this study is to examine the attributes perceived by instructors in using e-Textbooks in higher educational setting and explore the factors that affect instructors using e-Textbooks in teaching. The study will compare the demographic differences between adopters and non-adopters of e-Textbooks in teaching, investigate the relationships between perceived attributes of using e-Textbooks by instructors and their using of e-Textbooks (adopters) in teaching, and discuss the factors that prevent instructors from using e-Textbooks in teaching in higher education.

Three research questions and their associated hypotheses have been designed and developed to ask among instructors for the stated research purposes that include: (1) How do demographics (state, gender, age, academic rank, and study field) differ between instructors using e-Textbooks (adopters) and those who are not using e-Textbooks (non-adopters) in teaching in higher education?, (2) How do perceived attributes of using e-Textbooks relate to instructors' using e-Textbooks in teaching in higher education?, and (3) What are the factors that prevent instructors from using e-Textbooks in teaching?

The following chapter presents the literature that supports these research questions for this study. The literature review discusses the major issues and relevant research studies, and has an overview of the theoretical foundation of this study which

includes the theory of diffusion of innovation and digital learning. With demonstrations of the features of digital learning and e-Textbooks in education, this review provides an understanding of the purposes behind the research study and why these research questions are being asked.

## CHAPTER II

### REVIEW OF LITERATURE

#### Introduction

This chapter provides an overview of the most important bodies of literature in digital learning and adoption of digital content in education, and establishes a foundation on which the researcher explores instructors using e-Textbooks in higher education. Specifically, this study investigates the relationship between perceived attributes of e-Textbooks by instructors and their use of e-Textbooks in teaching. The literature explores the factors that influence instructors' decisions of adopting e-Textbooks in higher education. The two main sections of literature, adoption of e-Textbooks in education and the influence of digital learning, frame the environment in which this study takes place. Within this framework an assembly of Rogers' perceived attributes theory, e-Textbooks in education, and the technology acceptance model was employed to create a stable triangle which guides the research design, data collection, and analysis of this study. The overall purpose of this triangle is to examine the attributes perceived by instructors in using e-Textbooks in higher educational settings and explore the factors that sway instructors away from using e-Textbooks in teaching. Before defining the stable triangle, the environment of the literature on diffusion innovation theory and digital learning is defined and established.

#### Theoretical Framework

Although e-Textbooks have been available for over decades, researchers and educators have begun to evaluate the quality, benefits, and possibilities of applying this form of reading in education and relative activities in recent years (Shamir & Korat,

2006). This means that using e-Textbooks to benefit education is still in its infancy. Appearing digitally, e-Textbooks are quite different from printed textbooks (Gardiner & Musto, 2012) and need to be examined whether they could be accepted by instructors and learners (Wejnert, 2002). Diffusion of innovation theory is applicable to this examination of using e-Textbooks in education. According to Robinson in his *A Summary of Diffusion of Innovations* (2009), diffusion of innovations theory in social science offers three valuable insights into the process of social change, included the qualities that make an innovation spread successfully, the importance of communication channel and network, and the different needs of users towards an innovation. In other words, applying diffusion of innovation theory to this study of e-Textbooks will help explore factors and features of using e-Textbooks in teaching and how those factors influence the adoption of e-Textbooks in higher education.

#### *Historical Foundation of Diffusion of Innovation Theory*

The concept of diffusion of innovation was first initiated in social science in Europe and developed by Gabriel Tarde (Kinnunen, 1996). Tarde's diffusion theory described diffusion as "a social process of interpersonal communication network" (Kinnunen, 1996, p. 431) and took *imitation* as the core of diffusion, which implies that individuals learn certain innovation by copying others' experience (Tarde & Parsons, 1903). The rate of adoption in Tarde's diffusion theory was controlled by the "laws of imitation" (Clark, 1969, p. 27), which meant that the more similarity between an innovation and adopters' previous adoption experiences, the easier the adoption process would be. In discussion of the rate of adoption, Tarde indicated the existing of *S-curve* shape among all innovations, which was considered as one of the most important and

notable ideas in innovation studies. According to Tarde, there were two stages of the adoption rate, slower rate (gradual slope) and faster rate (steep slope) (Couros, 2003; Tarde & Parsons, 1903). The two stages were evolved into three stages by Rogers (2003) later: (1) the lower slope appears as a few progressive individuals adopt an idea, action, or service, (2) the middle part of the slope exhibits a rapid adoption by larger numbers of moderates, and (3) the upper slope indicates the period at the end of the curve where acceptance by even the most skeptical individuals occurs (Rogers, 2003; Tarde & Parsons, 1903). However, Tarde's study was not able to trigger following researches on empirical studies of diffusion due to the lack of quantitative research (Kinnunen, 1996).

Then in 1940s, Ryan and Gross (1943) furthered the diffusion of innovation theory in their publication of a study on the diffusion of hybrid seed corn in two rural farming communities in Iowa. They used the term *diffusion* to replace Tarde's *imitation*, which popularized *diffusion* from spreading of social culture in the eyes of anthropologists to a wider social context. Besides, Ryan and Gross made their contributions to establish the methodology for diffusion study, which lacked in Tarde's theory. By asking adopters a number of questions, such as the date of adoption, their reasons for adoption, and consequences of their adoption, Ryan and Gross were able to develop the repeatable research framework of diffusion theory, and provided empirical evidence to explain the rate of adoption by using *S-curve shape* which was reported by Tarde (1903).

#### *Rogers' Diffusion of Innovation Theory*

After Tarde (1903) and Ryan and Gross (1943), the next step for greatly improving and developing the diffusion of innovation theory was undergone by Everett



Rogers. Everett Rogers published his book *Diffusion of Innovation* in 1962, advocating diffusion of innovations as a theory that seeks to explain how, why, and at what rate new ideas and technology spread through cultures (Rogers, 2003). He defined diffusion of innovation as a process by which an innovation is “communicated through certain channels over time among the members of a social system” (Rogers, 2003, p. 6). The innovation decision made by the members of certain social system passes several stages, included obtaining knowledge of an innovation, forming an attitude toward the innovation, making a decision to adopt or reject the innovation, implementing of the innovation, and confirming the decision.

*Five stages of adoption process.* According to Rogers’ (2003) diffusion of innovation theory, there are five stages across the entire innovation-decision process of an innovation, which are the stages of knowledge, persuasion, decision, implementation, and confirmation.

The stage of knowledge is the starting point in the innovation-decision process, in which basic knowledge of innovation is obtained including what the innovation is and how the innovation functions. Then, individuals may form their own attitudes towards the innovation, favorable or unfavorable, interested or uninterested, on the persuasion stage. At the persuasion stage, individuals’ attitudes towards the innovation may be influenced by various perceived attributes of using the innovation, such as relative advantage, complexity, compatibility, etc., which may lead individuals to adopt or reject the innovation. If individuals accept the innovation, in other words to use the innovation, they will move forward to the implementation stage as adopters; at the same time, change agents are seeking information to institutionalize and regularize the innovation. The last

stage of the innovation decision process is confirmation where individuals usually seek reinforcements of the decision they made on the implementation stage. However, reversions may also happen during the confirmation stage due to the exposure of conflicted messages about the innovation (Rogers, 2003).

Before any innovation comes into public's view, it has to experience the above five stages to be accepted or rejected by individuals in the social system; thus it is necessary to understand what e-Textbook is as an innovation in education, what benefits e-Textbook can provide to users, and how e-Textbooks will be perceived during the innovation-decision process before they are accepted or rejected by instructors in higher education.

*Perceived attributes of innovation.* As one of the four theories in Rogers' diffusion of innovation theory (2003), perceived attributes of innovation theory includes five attributes of innovations: relative advantage, compatibility, complexity, trialability, and observability. Perceptions of compatibility, complexity, and relative advantage have been found to play a significant role in several educational technology related adoption studies.

*Relative advantage.* Rogers defined relative advantage as the degree to which an innovation is perceived as being better than the idea it supersedes by a particular group of users. This includes, but not limited to, economic advantage, social prestige, convenience, or satisfaction. The greater the perceived relative advantage of an innovation, the more rapid its rate of adoption is likely. There are several studies in education support the positive relationship between relative advantages and users' adoption of innovations, such as Kebritchi (2010)'s study on educational computer games,

and Lai and Chen (2011)'s study on teachers adoption of teaching blogs in secondary school.

*Compatibility.* Compatibility means how much an innovation is perceived as being consistent with adopters' previous experiences, their values, or their needs. The less compatible an innovation is with adopters' existing needs, value, or experience, the slower the innovation is accepted (Robinson, 2009). For instance, in Aaltonen, Mannonen, S. Nieminen, and Nieminen's collaborative study of the usability and compatibility of e-book readers (2014), they found that the compatibility of e-books made e-materials easy to be redistributed among readers in library system.

*Complexity.* Complexity is the degree of an innovation perceived as being difficult to understand and use. The easier and simpler in understanding of new ideas, the more rapid the adoption rate is; the more difficulties users met when using an innovation, the harder and slower the innovation would be adopted (Kebritchi, 2010; Lai & Chen, 2011).

*Trialability.* Trialability is the degree to which an innovation can be experimented with on a limited basis. An innovation that is trialable represents less uncertainty to the individual who is considering accepting the innovation (Robinson, 2009). That is to say, if any trial could be offered for adopters before being adopted, individuals may accept the innovation easier.

*Observability.* Observability is about how much adopters can observe an innovation in action. Usually, the more adopters observe an innovation actually being used and implemented, the more likely the adopters accept the innovation. Visible results will lower the uncertainty of the innovation and escalate the rate of adoption.

Besides the five perceived attributes above, Rogers has also defined another few variables that may influence the rate of adoption of innovations, which are (a) the type of innovation decision including optional, collective, and authority; (b) the nature of communication channels diffusing the innovation at various stages in the innovation-decision process, for instance, mass media or interpersonal; (c) the nature of the social system in which the innovation is being diffused including the social norms, the degree of network interconnectedness, etc.; and (d) the extent of change agents' promotion efforts in diffusing the innovation can also affect the rate of adoption of an innovation. Those attributes and variables of certain innovations can together or separately affect the adoption process, leading users of e-Textbook to either accept or reject the integration of e-Textbooks in education.

This study of e-Textbooks in higher education takes the five attributes of e-Textbooks perceived by instructors in teaching as concerns. With an exploration of the attributes that influence adopters' using of e-Textbooks, it will be beneficial to improve the use of e-Textbooks by instructors in higher education, and provide adequate evidence for popularizing and integrating digital content into higher education in the future.

*Problems Instructors Facing in Higher Educational Environments When Adopting Innovation*

There are two forces that exist in educational environments to compel educators' adoption of educational innovations (Korres, 2011; Weidert, 2012). One is individual adoption as an upward force and the other is group adoption as a downward force. Individual adoption mainly occurs among college students, while group adoption is often from the college as an obligation; educators are always being in the middle of the two

different forces during certain adoption (Korres, 2011), which cause their innovation adoption in education to be full of pressure and intensiveness.

In Weidert's (2012) study of adult learners' adoption of mobile college community on campus in Florida, he provided evidence for the dilemma of educators that were being caught in the middle of an upward force and downward force when adopting innovation in higher educational settings. Instructors always faced with "ambiguous tension and uncertainty" due to the irregular rates of adoption pressure (Weidert, 2012, p. 51), which indicated a necessity to consider how instructors perceive using the innovations in educational environments and how to reduce their pressure and intensiveness for a better and easier adoption.

#### *Technology Acceptance Model (TAM)*

Due to the weak explanatory power of *diffusion of innovation theory* (Clarke, 2012), researchers of the diffusion of innovations are always taking the technology acceptance model (TAM) as a supplement to explain the issues that existing in users' attitudes and their intentions of using certain innovation (Davis, 1989). As a user-intention-based model, technology acceptance model (TAM) adopts both social and psychological perspectives to explain users' adoption behaviors, and has been developed and applied to explain and predict their acceptance of technology (Hu, Chau, Sheng, & Tam, 1999).

Being considered as one of the most parsimonious, robust, and notable technology acceptance theoretic models, TAM has been suggested to be one of most applied theoretical models in the field of instructional system (Lee, Kozar, & Larsen, 2003). Two fundamental constructs in TAM have been used to determine user's intention to use

technology: perceived usefulness (U) and perceived ease of use (E). Perceived usefulness (U) is the “degree to which a person believes that using a particular system would enhance his/her job performance” (Davis, 1989, p. 320), and perceived ease of use (E) is the “degree to which a person believes that using a particular system would be free of effort” (Davis, Bagozzi, & Warshaw, 1989, p. 990). In Davis’s technology acceptance model flow chart (1989), when an innovation enters into the innovation decision process, perceived usefulness is applied to examine the fact of whether an innovation has a positive or negative influence on users’ performance, while perceived ease of use examines users’ expectations on using an innovation. The benefit and advantages that users obtain from perceived ease of use (E) will influence their perceived usefulness (U) of the innovation. Perceived ease of use (E) and perceived usefulness (U) together affect users’ attitudes toward using the innovation, and at the same time perceived usefulness (U) of the innovation can also have certain effect on users’ behavioral intention to use the innovation, until users actually use the innovation.

#### *Digital Learning and Digital Content*

Costa (2012) has stated that in front of education is a new era in which learning is driven by creative ways that is benefited by technology. The times of learning by sitting in the classroom with papers and pens is dimming from the stage of education, “the future of learning and work is digital” (p. 54).

Statisticians estimated that there were approximate 73% Americans that were confident in the contributions of technologies in education to the success of the country (Markow, 2009). The federal government of U.S. addressed the digital educational content to blur the boundary of formal and informal learning, erase the distance between

classroom and home, and open education to the whole world regardless of learners' age, gender, country, or any other personal backgrounds (Levin, 2011). Instead of happening only in school or classrooms with hard-copied books, digital learning makes learning come along with digital content and can be any "instructional practice that effectively uses technology to strengthen a student's learning experience" (Alliance for Excellent Education, 2013, para. 1). In the article *Digital Learning NOW* released by the Foundation for Excellence in Education (2010), it emphasized the important role of digital learning in improving educational quality in today's technology learning environment. For learners' and educator's sake, it is necessary to clarify what digital learning is, why digital learning is desired in education, and how to apply digital learning to change and enhance education.

*Digital learning.* An effective digital learning environment is able to provide students and teachers more highly interactive communications, more collaboration among groups, and better mastery of knowledge and skills.

Digital learning adopts diverse content delivery methods, provides interactions, assessments, and flexible learning opportunities in and out of school setting, requires restrict selections of learning content and high-quality instruction, and explores individuals' learning potential (Alliance for Excellent Education, 2013), which promotes "organized, accessible, easy-to-distribute, and easy-to-use content and learning resources" (U.S. Department of Education, 2010, p. xxii). Within the digital learning environment, learners' interests have been increased, their diverse learning needs have been fulfilled, and flexible adjustments have been to applied to learning content based on both learners'

learning interests and learning needs (Brown & Adler 2008; Collins & Halverson 2009; National Science Foundation 2008).

Usually, features of an innovation can help understand the innovation (Rogers, 2003). According to a report released by the Alliance for Excellent Education (2013), digital learning possesses five features in creating a digital educational environment: “personal and flexible in learning, led by teachers with significant support, collaborative and aligned to a common vision, flexible and high-quality resources, and data driven, transparent, and ongoing” (para. 2).

First, digital learning concerns a personalized and flexible learning environment. Instead of teacher-centered and textbook-based learning style in a traditional learning setting, digital learning is learner-centered. It enables learning to happen anytime, anywhere, and even anyhow, triggers a transition from teacher to student, and provides “student-centered learning to ensure college and career readiness for all students” (Alliance for Excellent Education, 2013, para. 4). The technologies and digitalized content that involved in digital learning range from software to hardware, online to offline tools, resources, and any other supportive systems that “increase teaching opportunities and promote efficiency” (para. 5). So that learning goals are customized, students’ progress can be evaluated constantly, formally, and informally (Alliance for Excellent Education, 2013).

Second, digital learning respects teachers’ contributions in creating the flexible learning environment. Not conflicting with learner-centered learning, digital learning offers teachers more opportunities to select instructional resources, create teaching materials, and design curriculum activities to best fit learners’ diverse backgrounds such



as their learning ability, knowledge levels, learning needs, etc. Such elimination of the confines of learners' differences in learning does not mean the ignorance of students' diversity, but conversely, respect individuals' varieties, provide more learning opportunities, and bring equity to education by "expanding access to high-quality, ongoing, job-embedded resources to improve student success" (Alliance for Excellent Education, 2013, para. 6).

The third feature of digital learning is a collaborative common vision, which means "administrators, teachers, students, and parents must have a shared commitment to a personalized and collaborative learning" (Alliance for Excellent Education, 2013, para. 7). That is to say, learning in today's digital environment is not a one-party deal, but needs all those involved in education, such as instructors, students, parents, and administrators, to work collaboratively. Administrators have their responsibilities in offering executive policies to empower teachers and schools to apply their knowledge and skills in creating a technology friendly learning environment. Teachers have been recognized as educational designers to apply their "pedagogical knowledge, creativity, and data analysis skills to meet the needs of individual students" (para. 8). Only when all parts make their efforts and contributions in a collaborative way can students' learning outcomes be improved and promised.

Fourth, to provide and guarantee high-quality resources in a learning environment, digital learning requires learning resources to be a combination of "open educational resources (OER), state-created content, and curriculum with commercial offerings that more adequately address the ever-changing needs of a district" (Alliance for Excellent Education, 2013, para. 9). Such learning resources address students' role in learning,

focus on learners' learning styles, and also reflect a dynamic updating necessity of knowledge over time that offers students more open opportunities to personalize their learning process.

The last emphasized feature of digital learning is its data-driven and transparent feature in the entire learning process with which teachers can obtain timely feedback from learners to evaluate and assess their performances over time. Such timely feedback also drives teachers to make opportune decisions and proper adjustments in the learning objectives, and supervise students' progress along the way that is best suited for their learning objectives (Alliance for Excellent Education, 2013).

*Digital learning benefits education.* Digital learning redefines “public education to abilities,” which “personalizing education based on the needs of the child, rather than adults or the system” (Monson, 2013, para. 4), and promises a balance of high quality instructions for “every student across America, regardless of language, zip code, income levels, or special needs” (Center for Digital Education, 2013, p. 4). Featured with the five characteristics discussed above, digital learning saves learners who deserve a second chance to learn due to their disabilities, physical or psychological, advances learners who are reaching their academic heights, broaden learners' views in education, and increases learners who need further access to higher education (Center for Digital Education, 2013).

Digital learning has been applied to increase learners' learning opportunities from K-12 to higher education and broaden learners' learning experiences. For instance, by providing opportunities for learning anytime and anywhere, instructors individualize instruction to ensure all students reach their full potential to succeed in college or in a career (Foundation for Excellence in Education, 2010); children with disabilities or

family burdens can access education at their own pace; and students in one state can be accepted by other states who are in the same interstate reciprocity system in online courses, which expands learners' access to digital learning in higher-education setting no matter where they have the courses (Wood, Littleton, & Chera, 2005). In other words, the proper utilization of digital learning in education can benefit learners who have little opportunities of accessing the education that they deserve. As emphasized as one of the five features in digital learning, the key to making digital learning acceptable and beneficial to a wider range of learners and educators is its request of the high-qualified resources in the learning environment.

### *Digital Content*

Digital content is the answer to how to apply digital learning to change and enhance current education. In digital learning environment, it is necessary and vital to create, develop, and select high-qualified digital content to facilitate education and maximize the benefits that digital learning brings to education. Accelerating the development of education through digital content is no longer a blueprint on paper (Levin, 2011). The National Broadband Plan, which deals with the nation's technology infrastructure, takes actions to support and promote the expansion of educational digital content to enable and enhance education in decades (U.S. Department of Education, 2010).

*Definition of digital content.* Although there is not a universal definition of digital content, it usually includes all content that is "electronic in nature that supports or acts as the curriculum and helps students learn," and "delivering traditional content used in the classroom through a technology-based mechanism" (Center for Digital Education, 2013,

p. 5). This can be “as simple as an article scanned into a computer for one class,” and can be “as complex as all instructional materials being digital” (p. 5). By summarization of the above definitions of digital content, the researcher of this study refers digital content to all teaching and learning content that is in digital format, naturally or converted, to support curriculum, facilitate student learning, and collaborate with the digital learning environment.

Generally, there are six categories of digital content that have been accepted according to the Center for Digital Education (2013), which are videos, instructional games and simulations, Web 2.0 tools, digitalized textbooks and workbooks, reference books, and open educational resources. Among them, videos include films, podcast, educational TV programs, YouTube segments, etc.; instructional games and simulations can be Second Life, River City, etc.; Web 2.0 tools includes any tools that are collaborative for research, teaching, and learning online; digitalized textbooks and workbooks are any available digitally or online books from both large companies and more specialized publishers; reference books refers to encyclopedia sites and alike; and open educational resources include any instructional resource and items that are created and developed by both student and teacher. No matter what format the digital content appears in the instructional process, it enables learners to access learning with personalized experience that “aligns to different learning styles, educational goals and overall learning outcomes” (Levin, 2011, p. 5). That is to say, labeled by its flexibility in the above various formats, digital content impels a personalized, learner-centered, and easy-access learning process, enhances digitalized learning, and facilitates the transition from traditional learning to digital learning.

*Digital content in education.* Guided by the features of digital learning and its various formats, digital content benefits education in unique aspects. Center for Digital Education in its Digital Content Strategy Guide (2013) made a summary on how digital content influences education, in which digital content allows an efficient and timely update of information, enables learning to happen anywhere and anytime, facilitates a personalized learning experience, provides learners with free access to diverse and appropriate learning materials, and engages learners in a “personalized and productive manner with multiple digital assets and explorations” (p. 5).

To integrate digital content in education, the federal government developed the National Educational Technology Plan to increase the supply of digital educational content to online learning and educational infrastructure by “address digital content and open educational resources (OER)” (Levin, 2011, p. 35). Digital contents are crucial to educators and learners in digital learning; they enhance both traditional schools and non-traditional schools by “providing blended or hybrid educational opportunities for students, as well as teachers” (Center for Digital Education, 2013, p. 14).

#### *E-Textbooks as Digital Content*

As mentioned above, digitalized textbooks and workbooks are one of the digital content categories that need to be accepted and developed in digital learning. The concept of digitalized textbooks has been redefined as “not only books but also digital content and the computer software and equipment to run that digital content” (Levin, 2011, p. 32). There are 15 states in the U.S. that have already changed their laws or policies to broaden the range of textbooks to include digital content with support from computers and other technological devices on a state level (Levin, 2011). With the

increased spreading of technology and the Internet in education, e-Textbooks bring an “evolution to book publishing industry and education” (Connaway, 2003, p. 14).

*Definition of e-Textbook.* E-Textbooks, also known as digital textbooks, electronic textbooks, or E-textbook, have a variety in terms of its definition and format. They can easily be the digitally reproduced printed books, either in PDF, text, or other Web-compatible formats (Lamothe, 2011; Tripathi, & Jeevan, 2007). Most modern researchers prefer to define e-Textbook as an electronic form of a textbook with features that similar to those of a traditional print textbook including pages that “turn” (Moody, 2010, p. 27) and digital features that can assist readers, such as word pronunciations, text highlighting, text-to speech options, and hypermedia (e.g., video, animations, sound) (Chen, Crooks, & Ford, 2013; Dalton & Palincsar, 2013; Daniel & Woody, 2013; Gong, Chen, Wang, Zhang, & Huang, 2013). Larson (2009) defined e-Textbooks as electronic versions of traditional textbooks that can be viewed on devices like desktops or PDAs.

Different research purposes focus on different aspects of e-Textbooks. Some emphasize more on the technologies that carrying e-Textbooks, while some others limit e-Textbooks to digital forms in particular scenarios (Cox & Mohammed, 2001). Lynch (2001) expanded the definition of e-Textbooks to both hardware (the carrying devices) and software (components that perform functions). Armstrong, Edwards and Lonsdale (2002) in their research defined e-Textbooks more specifically to include electronic texts and hardware with a screen as the basic elements of e-Textbook, but excluded journal publications (Armstrong, Edwards, & Lonsdale, 2002). In Rao’s (2003) definition, e-Books include any text in its digital format including e-Textbooks, and encompass software and hardware as well as its content:

...text in digital form or books converted into digital form or digital reading material or book in a computer file format or electronic file of words and images to be displayed on a computer screen or read on a computer through a network or viewed on a desktop/notebook/dedicated portable device or read on all types of computers or formatted for display on eBook readers. (p. 86-87)

Because Rao's definition of e-Books has explicitly defined e-Textbooks (2003) as demonstrated above, it has become the most comprehensive and acceptable definition of e-Textbooks so far. In 2005, Cavanaugh imported the concept of media to further Rao's definition of e-Textbooks and defined e-Textbook as any other computer technology that displays "books" in formats of text, image, or sound. His definition inherited the two basic components of previous definitions, hardware and software, and also pulled together the element of media, which led e-Textbooks to a "completely new understanding and use" (Kissinger, 2011, p. 22).

Summarizing from the above different definitions of e-Textbooks, three basic elements of e-Textbooks are included: hardware, software, and the actual content. Hardware of e-Textbooks consist certain technology carriers or mobile devices that provide platforms to display the content of e-Textbooks, such as desktop, laptop, Smartphone, tablet, or dedicated e-Textbook readers like Amazon Kindle or Barnes & Noble Nook. Software of e-Textbooks is through which the e-Textbook content is loaded and operated, such as Mobipocket for e-Textbooks in mobi format and Microsoft Reader for e-Textbooks in .lit format. The actual content of e-Textbooks is the content that readers can access through hardware and software such as the words of a textbook that

readers can read. The three basic elements of e-Textbooks collaboratively make written material become digitalized in digital learning.

For research purposes, the researcher of this study defines e-Textbooks based on Rao's (2003) and Cavanaugh's (2005) definitions of e-Books and e-Textbooks; in this study of e-Textbooks in higher education setting, e-Textbooks refer to: Textbooks in its digital form or textbooks converted into a digital form or in a computer file format to be displayed on a computer screen or read on a computer through a network or viewed on a dedicated portable device or read on all types of computers or formatted for display on eBook readers.

*Formats of e-Textbooks and e-book readers.* With the knowledge of the basic elements of e-Textbooks, it is necessary to clarify the formats and devices that can be applied to access to the contents of e-Textbooks. Which hardware or software is needed to read an e-Textbook? Do learners need a laptop, a tablet, or an Amazon Kindle to read e-Textbooks? Can the desktop computer read e-Textbooks? Can e-Textbooks be read on handheld devices? These questions should be explained and answered by educators before distributing e-Textbooks to their classroom. With the knowledge of various formats of e-Textbooks and the devices that can display them, it would be convenient for educators' to have their selective options of the most suitable e-Textbooks.

*File formats of e-Textbooks.* With the development of technology, the file formats of e-Textbooks have also been increased and changed a lot since it first met the public in early twentieth century. Depending on the hardware and software that have been adopted and developed to display the actual content of e-Textbooks, there are a variety of e-Textbooks formats. In the early twenty-first century, Hawkins (2000) has



categorized e-Textbooks based on the devices that e-Textbooks can be displayed. For instance, Mobipocket is one example of the downloadable e-Textbooks that are mainly being used on personal computers (PC), laptops or other devices with software or digitally-encrypted client application; Barnes & Noble Nook or Amazon Kindle are examples of the e-Textbooks that could be distributed on dedicated e-Textbook readers; Kindle Cloud Reader, Google eBooks, and CourseSmart are the more recent innovations of the Web-based or browser-based e-Textbooks that usually require readers to be online and allow readers to search and upload e-Textbooks in the public domain.

In 2005, Cavanaugh furthered the categories of e-Textbooks file formats based on Hawkins' (2000) category and included plain text (.txt), Web (.html/.xml), portable document format (.pdf), Microsoft Reader (.lit), and eReader (.pdb) as the basic e-Textbooks formats. Plain text (.txt) is the most common and popular e-Textbooks format that appear in early times; it can be accessed and is compatible with any device with word proceeding programs such as Notepad, Microsoft Word, WPS in windows operating systems, and TextEdit on iOS operating system. The file format of Web (.html/.xml) is designed for texts on web pages and is accessible from almost all standard browsers such as Window's Internet Explorer, Mozilla Firefox, iOS Safari, Google Chrome, etc. The portable document format (.pdf) usually refers to the text that can be read by Adobe Reader which is a patent from Adobe Company for e-Textbooks and other text files. This portable document format can be accessed on most devices by installing Adobe Reader freely. The file formats of .lit and .pdb are very similar to .pdf; however, .lit is only designed for Microsoft Reader that runs on windows operating system, while .pdb is accessible with devices that have eReader installed, such as Tablet, Smartphone, Laptop,

etc. Besides the five basic file formats of e-Textbooks, electronic publication (.epub) is gaining popularity among readers and publishers of e-Textbooks in recent years (Kissinger, 2011). Compared with the other five common file formats of e-Textbooks, .epub file optimizes text for a particular display device and supports fixed layout content (Wikipedia, 2013).

*E-Book readers.* E-Textbooks need certain devices to display the content, which is known as e-Book readers. Traditionally, e-Book readers refer to the mobile electronic devices that are primarily designed for the purpose of reading e-Books and digital periodicals. In order to display the diverse e-Textbook file formats as discussed above, different devices and e-Book readers have been created and developed exponentially. From the first e-Textbook reader, a CD-ROM-based Sony Bookman released in 1992, to the dedicated e-Textbook reader from Amazon Kindle with e-ink unveiled by Amazon in 2007, the technology behind e-Textbooks have also experienced great changes and development (Lai & Change, 2011). In January 2011, over one hundred new mobile tablet devices, including e-Textbook readers, have been released in the Consumer Electronic Show (CES), all of which support the function of e-Textbooks reading (Collins, 2011). The introduction of e-ink technology in 1997 by Massachusetts Institution of Technology (MIT)'s media lab has tremendously enhanced the readers' experience of reading on electronic devices, which suspends microcapsules that contain positively charged white particles and negatively charged black particles in flimsy medium (Hidalgo, 2013). Currently, in the e-Textbook reader market, Amazon Kindle, Sony eReader, and Barnes & Nobel Nook are the most popular and notable examples that are using e-ink technology (Lai & Chang, 2011).

Similar to the categories of e-Textbooks file formats, the categories of e-Textbook readers also vary depending on the technology (Kissinger, 2011). This can be divided into dedicated e-Textbook readers and multi-functional/non-dedicated e-Textbook readers. Dedicated e-Textbook readers are the devices primarily designed for the purpose of reading e-Textbooks; while multi-functional/non-dedicated e-Textbook readers are the hardware devices with the function of e-Textbook reading. Sony reader and Amazon Kindle are the representatives of dedicated e-Textbook readers; while other mobile devices such as laptop, tablet and Smartphone can be examples of multi-functional e-Textbook readers.

Another acceptable category of e-Textbooks readers is distinguished by the hardware and software that they use. According to Embong, Noor, Ali, Bakar, and Amin (2012), hardware based e-Textbook readers are those mobile devices that have been designed primarily for reading of e-Textbooks or other digital readings that usually perform the functions of audio-visual, bookmarking, dictionary, and interactive touch or keyboard compatibility. The advantage of hardware-based e-Textbook readers is their storage of e-Textbooks in terms of capacity that frees reading from the limitations of space and time (Wilson, 2003). For instance, the first Amazon Kindle was released as a hardware-based e-Textbook reader in 2007, and had features with 250 MB of internal memory and a speaker and headphone jack for accessing audio files. In the following decades, Amazon fulfills its Kindle series with functions of download and open e-Textbook in Kindle using build-in dictionary, adding annotations (bookmarks, highlights, notes, and clippings), viewing popular highlights, uploading, sharing and downloading,

and syncing documents to that library that promotes Amazon Kindle series as a typical and popular e-Textbook reader (“Kindle paperwhite shines,” 2013).

Different from hardware-based e-Textbook readers, software-based e-Textbook readers have applications developed to display content of e-Textbooks on certain devices, which can be accessed on personal computers or other computer technologies depending on the compatibility of the software and the devices (Kissinger, 2011). Microsoft Reader and Adobe Acrobat e-Textbook Reader are examples of such software-based e-Textbook readers. Compared with hardware-based e-Textbook readers, software-based e-Textbook readers not only possess the functions of dedicated e-Textbook readers, but also obtain a wider display screen size through the keyboard or computer settings meaning users can access more information on the same screen (Lynch, 2001).

#### *E-Textbooks in Education*

The report of *National Educational Technology Trends 2012*, released by The State Educational Technology Directors Association (SETDA), has demonstrated that involving electronic books in higher education has the advantages of (a) delivering content digitally, which addresses the “diversity of students, geographic locations, underserved areas, the dropout rate and the achievement gap” (Alliance for Excellent Education, 2012, p. 11); (b) providing access to digital content through multiple methods that include digital textbooks, audio and video resources, apps, and interactive online content; (c) personalizing learning experiences based on learning styles, interests, abilities, and adaptive software; and (d) providing multiple learning platforms for delivering content and curriculum (Duffey & Fox, 2012). With the knowledge of what e-Textbooks are, the features they possess, and the categories of e-Textbooks and e-

Textbook readers, it is necessary to exam how e-Textbooks facilitate education by their perceived features according to Rogers' diffusion of innovation theory (2003), specifically the perceived attributes of innovation theory, and discuss the challenges and potential of adopting e-Textbooks in teaching in education. As discussed in the theoretical foundation of this research, Rogers (2003) defined five perceived attributes of an innovation that influencing users' attitudes towards the innovation and their use of the innovation in certain social systems. Reviewing the use of e-Textbooks in education in terms of their perceived attributes can provide evidences and guidelines for researchers, instructors, and educators to analyze and discuss the factors that make e-Textbooks successfully adoptable as an innovation in higher education.

*Desired features and highlights of e-Textbooks in education.* The introduction of e-Textbooks into the educational setting triggers users' awareness of the innovation in education. The desired features and highlights of e-Textbooks are being considered and emphasized when using e-Textbooks in education in the innovation decision process (Rogers, 2003). According to Rogers' (2003) perceived attributes theory, relative advantages, complexity, compatibility, observability, and trialability are the five perceived attributes that can influence users' decisions of a certain innovation, any of which could have certain effect on users' adoption decisions. E-Textbook, as one of the digital content required by high-qualified digital learning, contains several features that can benefit educators and learners in the educational setting.

Feature 1: Mardis et al. (2010) stated in their research that digital textbooks provide more learning opportunities. They found that applying digital textbooks in

teaching decreased the limitations on learners' accessing to instructional materials and increased instructions' efficiency through the digital formats of e-Textbooks.

Many universities and colleges in higher education foresee the convenience of e-Textbooks in higher education, some of which use e-Textbooks as adaptive and assistive tools (Mardis et al., 2010). Compared with the printed textbooks, the text-to-speech function of e-Textbooks allows readers to hear the text that helps increase learning opportunities for students who have disabilities in reading due to hearing or vision impairments (Cavanaugh & Cavanaugh, 2008). In Lynch's study of the promises of e-Textbooks in 2013, he stated that e-Textbooks allow the adjustment of text font size and style to benefit readers who are impaired in vision. Pattuelli and Rabina (2010) investigated Kindle use among library and information science students and found that the portability of the device and its convenience of use enhanced students' reading experience. E-storybooks have performed its role as assistive tools for students who have reading difficulties (Moody, 2010). The pictures in e-storybook can help readers to read visually and enhance readers' comprehension (Dickinson, Griffith, Golinkoof, & Hirsh-Pasek, 2012; Ihmeideh, 2014; Moody, Justice, & Cabell, 2010; Roskos, Burstein, Shang, & Gray, 2014), and the word pronunciation tools assist readers phonologically to correct language studies (Hao, 2013; Tsang, Yuen, Li, & Cheung, 2013).

Digital content can always be at hand, retrieved from the Internet, saved to learners' and instructors' devices, and be accessed through personal computers or any mobile devices. E-Textbook libraries are good examples of this feature of e-Textbooks in education. The e-Textbook libraries allow students to access instructional materials at any time and from anywhere (Kissinger, 2011), which eliminate the boundaries of

accessing learning materials and provide maximum learning opportunities. Without the limitation of time and space, students can distribute their learning based on their own schedule and learning habit without worry about losing their textbooks, missing classes, etc. The digital format of textbooks also decreases costs on purchasing learning materials and makes textbooks much more affordable and accessible; learners can obtain an equal learning opportunity regardless of their budget situation (Lynch, 2013). Some of the dedicated e-Textbook readers provide options of built-in dictionaries and hyperlinks that allow readers to access more knowledge and information easily and personally (Stone, 2008). Such easy and flexible access to learning materials increases learners' learning opportunities and speed up the distribution of knowledge than traditional books (Nelson & Hains, 2010; Rosen & Beck-Hill, 2012).

Compared with printed textbooks, another notable relative advantage of e-Textbooks can be its less weight and lower cost. Cavanaugh (2005) has stated that "technology now allows a student to carry many books, references, and resources in a single hardware device, which weighs as little as a pound" (p. 2), which means that e-Textbooks not only provide more learning opportunities for learners' that deserves learning, but also relieve learners who are burdened physically (Zoellner & Cavanaugh, 2013). Currently, in K-12 and higher education, students carry a heavy load of printed textbooks that is heavy in weight as well as in cost. In addition, printed textbooks can easily become out-of-date that make learning a burden (Cavanaugh, 2005). The technology of e-Textbooks makes carrying a large collection of books in its "light and compact portable form" possible (Lynch, 2013).

In other words, compared with printed textbooks, those mentioned advantages of e-Textbooks make reading electronically and conveniently, relieve learners' physical burden of carrying books, increase learning opportunities, and bring more interactions between learners and learning content.

Feature 2: Less complexity of the technology behind e-Textbook readers offers more chances of using e-Textbooks in education, and make the interactions between learners and teachers easier. Mardis et al. (2010) have found in their research that teachers can deliver instructional materials in a more interactive way through the digital format of e-Textbooks, and customize the teaching and learning process that motivate students more easily than traditional books. Another study from Larson (2010) recently found that e-Textbooks "may support students' comprehension and strengthen both aesthetic and efferent reader response" (p. 15).

Feature 3: According to Rogers' (2003), the more compatibility an innovation possesses, the easier it can be accepted among users. In Cavanaugh's study, the digital format of e-Textbooks allows teachers to easily modify their teaching materials to adapt to different needs and standards (Cavanaugh, 2005), which means using e-Textbooks as instructional materials is compatible with the existing teaching needs or standards. For example, Mardis et al. (2010) have demonstrated the compatibility of e-Textbooks between local needs and state's standards. Usually, traditional textbooks have been developed to support the standards of a certain school district or state (Schachter, 2009). This means that teachers have to analyze and decide which parts are proper for their school districts instead of being applicable to multi-school districts or states. The example of *interstate reciprocity* system (Wood, Littleton, & Chera, 2005) shows the



compatibility of e-Textbooks in education, in which online course credit students obtained in one state can be accepted among other states who agree with the system. These set-up standards for online courses across states, in which expand learners' access to digital learning in higher-education setting no matter where they have the courses. At the same time, with the help of e-Textbooks, teachers can easily customize their textbooks without worrying about not meeting standards outside of their states (Mardis et al., 2010).

Feature 4: Digital textbooks promote and improve technology integration in education, and vice versa, which means that when instructors and students have their proficiency in operating educational technologies, their interest of using e-Textbook in teaching and learning can be increased as well. This is consistent with the trialability of e-Textbooks in Rogers' (2003) perceived attributes theory. According Lewin (2009), digital textbooks help schools demonstrate their needs for more and better technology and the Internet connectivity. For instance, the embedded hyperlinks in e-Textbooks allow students and teachers to access external resources as supplement to textbook, which to certain extent, requires the Internet connection (Mardis et al., 2010). Besides, Brumley in his article *My Hugely Successful Technology Integration Strategy* has stated that digital books provides the presentation tool in the classroom, which replaces the traditional PowerPoint presentation with digital books (Brumley, 2013).

Feature 5: Among the United States, pilot studies, programs, and research on e-Textbooks have been conducted and granted in over twenty states. These are aimed at transitioning from traditional print textbooks to digital content as a means to increase student achievement in pre K-12 education and higher education to provide observable

evidence for users in making their decision of using e-Textbooks in education. One of the most successful digital content programs is the e-textbook program in Georgia from 2010-2011. Setting Thomasville High School as the testing-site, Georgia shares two goals for promoting e-textbook programs: (1) to move away from traditional textbooks to its digital content, and (2) to help increase student achievement by engaging students and differentiating instruction from grades 8 to 12 (eTextbook, 2012). After facilitating the program through a school year, the percentage of 9th and 10th grade students with proficient or advanced 21st century skills levels has increased by “12 percent in one school year based on standardized assessments” (Duffey & Fox, 2012, para. 6). Such results support the effects of e-textbook in improving students’ mastery of technological skills.

In summary, e-Textbooks have its advantages in increasing learning opportunities for learners who have difficulties in reading and learning through its designed functions such as text-to-speech, hyperlink, built-in dictionary, etc. The less complexity of using e-Textbooks has been supported through advanced technologies. The compatibility of e-Textbooks makes learning customizable and fulfills local needs without disobeying state standards. The increased successful evidence of adopting e-Textbooks in education brings more confidence to advocators of e-Textbooks. All those features possessed by e-Textbooks in its digital format “represent potentially important determinants of user willingness” in higher education (Lai & Chang, 2011, p. 559).

#### *Potential of Using E-Textbooks in Education*

Mardis et al. (2010) have stated that, “Digital textbooks will soon be part of every classroom in the United States” (p. 3, para. 1). From the first knowledge of e-Textbooks

in the project Gutenberg that was funded by the University of Illinois in 1971 to today, e-Textbooks have experienced an explosive growth because of the benefits they bring to education (Brown, 2009; Princeton University, 2009; Sannier, 2009; Shieh, 2009).

Many projects, research, and studies have been conducted in schools, colleges, and universities to provide evidences of the potential in promoting e-Textbooks in education.

As an innovation being introduced into education, e-Textbooks took decades to be known by educators and students. Far from today, the project Gutenberg, as one of the earliest e-Textbook projects in the educational setting funded by the University of Illinois in 1971, supported by many researchers' efforts for free access to thousands of books online, which helped many educators and learners aware of digital books and learn to make learning become rapidly digitalized (Kissinger, 2011). With an access to over 33,000 free ebooks, the project Gutenberg made educators and technologists consider the involvement of ebooks in learning as "a realistic, potentiality effective medium" (Embong et al., 2012, p. 20).

In Gil-Rodriguez and Planella-Ribera's study of students' e-Textbook use in a virtual university scenario (2008), students have been provided e-Textbooks and e-Textbook readers in Amazon Kindle DX with the course materials already loaded. During this study, students were provided knowledge of how to read course materials in its digital format, how to use those materials as learning materials, and how to finish their learning activities with the assistance of devices; all were examined and described by the researchers. By analyzing students' self-process of acquiring digital literacy in relation to the e-Text, it testified that when students were provided adequate knowledge of e-Textbooks, their awareness of e-Textbooks would be more intensified.

In Larson's study of implementation of e-Textbooks in K-12 education, he observed 10 fifth-grade students using e-Textbooks as reading material in class. Because e-Textbooks were an innovation to the traditional class in this case, none of the students had any prior experience of using e-Textbooks; yet, all of the students had highly interactive reading experience with e-Textbooks that included highlighting information and taking notes in e-Textbooks (Larson, 2009). The result of this implementation of e-Textbooks in education indicated students' preference to e-Textbooks than traditional books; students even described their experiences of using e-Textbooks as boundless, "I would rather read an e-Textbook [than a regular book] because there are so many cool tools to use and choose from. I still haven't used them all, and I'm done with the book" (p. 257).

As stated by Larson (2009), this implementation result of using e-Textbooks can be explained by Rosenblatt's (1995) transactional theory, in which readers are seeking certain interactions and individual experiences when reading that can be fulfilled by e-Textbooks. With the interactive tools and functions of e-Textbooks and e-Textbook readers, readers obtained new opportunities and maximized their access to personalized reading experiences (Hancock, 2008; Larson, 2009).

In predicting the growth of e-Textbooks in education, Embong et al. (2012) have stated that digital technology of e-Textbooks make instructional materials and activities rich, and somehow the use of e-Textbooks is "rapidly gaining ground in education" during the advancement of technology, and even "slowly replacing the conventional textbooks" (p. 581).

The e-Textbook project at Clearwater High School with Amazon Kindle in 2010 is one of the examples that successfully replace print textbooks with e-Textbooks (Embong et al., 2012). Amazon Kindle provided e-Textbook readers to all 2,100 students and 100 teachers with all subjects materials taught loaded. Students and instructors at Clearwater High School realized that what they normally did with printed textbooks such as bookmarking pages, making notes, as well as searching for word definition and highlighting text were the same process as with e-Textbooks. The population and dedicated designed materials of this e-Textbook project made the results a successful example of reinforcement of e-Textbooks in education.

Another similar project of successfully adopting e-Textbooks in education is found in Malaysia. An e-Textbook project initiated by the Ministry of Education in 2001 involved applying 50,000 e-Textbook readers in 35 schools to assist instructors to facilitate teaching and learning in classroom (Embong et al., 2012). With support from the government, the project was much easier to promote e-Textbook use in the classroom nationwide. Other countries have also shown their support in reinforcing the implementation of e-Textbooks in education. For instance, Portugal has allocated 500,000 e-Textbooks to students; Venezuela has provided a million files of e-Textbooks to their schools (Lebert, 2009).

#### *Challenges of Using E-Textbooks in Education*

Even if e-Textbooks have the desired features in higher education as demonstrated above, and with great potential of being introduced into education to replace printed textbooks, there are still some challenges of using e-Textbooks in education.

In Wilson's research of e-Textbooks in academic environment, 50% of the participants expressed their interest in using e-Textbooks, while the other 50% denied the usage of e-Textbooks in their work (Wilson, 2003). The researcher then collected data from those participants and analyzed the elements leading to their decision of using e-Textbooks. According to Wilson (2003), the portability and the digital format of e-Textbooks were the two main factors explained for participants' tendency in accepting e-Textbooks; while the complexity of e-Textbook readers was the main reason for participants' rejection of using e-Textbooks. With the development of technology, e-Textbook readers have the features of "convenience, compatibility, and media richness," which promote significantly the acceptance of e-Textbooks in education (Lai & Chang, 2011, p. 559).

When teachers and learners make their decision to accept or reject e-Textbooks in education, they should consider seriously whether they really need e-Textbooks. Although the innovation decision is among individuals (Rogers, 2003), it does not mean that the decision is completely random. When making their decisions of accepting using e-Textbooks in education, teachers and learners need to consider several things (Burk, 2001; Giacornini, Wallis, Lylo, Haaland, Davis, & Comden, 2013):

- Is the e-Textbook being adopted adjustable in its format and text size?
- Does the e-Textbook have the function of searching external resources with hyperlink?
- Is the procedure of purchase complicated?
- Is there a built-in dictionary of the e-Textbook reader to support connection with other information?

- Does the e-Textbook support marking and editing functions, such as bookmarking, making notes?
- Does the e-Textbook serve as assistive tool in education, such as with text-to-speech functions or adjustable backlighting?
- Is the e-Textbook with high portability?

In words, when using e-Textbooks in education, it is necessary for instructors to understand the challenges they might encounter, and consider whether they really need e-Textbooks in education or not.

### Summary

This chapter first demonstrated the theoretical framework of diffusion of innovation theory by Rogers (2003) and its supplement technology acceptance model (TAM) (Davis, 1989) which are being applied to provide statistical evidence for innovation adoption in education. The concept of digital learning and digital content are introduced, which is the contextual environment for this e-Textbook adoption study. Researchers have indicated that digital learning has advantages in strengthening learners' learning experience by providing opportunities for learning anytime and anywhere and individualizing instruction to ensure all students reach their full potential to succeed in college and in a career (Foundation for Excellence in Education, 2010).

As digital content, e-Textbooks are the research focus of this study. In this chapter, the researcher presented the relevant information of e-Textbooks, including definition of e-Textbooks, its features, and examples of how e-Textbooks facilitate education by the perceived features according to Rogers' perceived attributes of innovation theory, and discussed the challenges and potential of adopting e-Textbooks in

education. This overview established a solid foundation of the digital learning environment and e-Textbooks for this study and provided the background to explain the purpose behind this research and why the research questions were being asked.

The following chapter discusses the research method and design used for this research study on e-Textbooks in higher education. Participants included instructional faculty at various higher education institutions who teach in the Colleges of Education. The instrument of data collection consisted of an online survey to help answer the research questions introduced.



## CHAPTER III

### METHODOLOGY

#### Introduction

This chapter will describe the methodology of this study of the attributes perceived by instructors in using e-Textbooks in high education and the factors that affect instructors using e-Textbooks in teaching. To carefully investigate the relationships between the perceived attributes of using e-Textbooks by instructors and their actual use of e-Textbooks in teaching, and examine the factors that influencing instructors' adoption of e-Textbooks as digital content in higher education, which is important in promoting digital learning, the research method, research setting, participants, research design, instrument of data collection, procedures for conducting the study, and data analysis procedure will be described in the following sections.

#### Research Design

This research study adopted a quantitative research method to collect data to examine three areas relating to e-Textbooks and higher education. As demonstrated by Muijs (2004), "quantitative research explains phenomena by collecting numerical data that are analyzed using mathematically based methods (in particular statistics)" (p. 1). The approach is usually applied to determine the relationship between variables in a population (Hopkins, 2008). First, demographic information (e.g., state of residence, gender, age group, academic rank, study field) between instructors who are using e-Textbooks (adopters) and who are not using e-Textbooks (non-adopters) in teaching in higher education courses are examined using quantitative measures. In addition, this study examined how the perceived attributes of e-Textbooks (voluntariness, relative

advantages, comparability, image, ease of use, result demonstrability, visibility, and trialability) relate to instructors' willingness to use e-Textbooks in higher education. Finally, the factors that prevent instructors from using e-Textbooks in higher education is studied. So, implementing a quantitative research method for a study like this is reasonable because the variables under investigation require statistical reasoning. Specifically, a regression approach design is applied in this study to assess the relationship between the perceived attributes and instructors' using e-Textbooks in higher education. Further, categorical data analysis (Chi-Square test of independence) and descriptive research are also involved to test the demographic hypotheses concerning the difference between adopters and non-adopters of e-Textbooks.

#### Research Setting

This study originally intended to address the population of instructors in the United States to its broadest range. Due to the limited time and budget, the study targeted the research to higher education institutions in the east south central (division 6) of the south region; samples were drawn from the public universities in the east south central in terms of digital learning and other related variables.

According to the U.S. Census Bureau's regions and divisions (2013), the east south central in the U.S. includes states of Alabama, Kentucky, Mississippi, and Tennessee. Tennessee and Kentucky are the two states among the twenty states that have already adopted e-Textbooks and digital content in education; Alabama is the state among the nine states that has plans to digitalize the learning content, and Mississippi is the only state in the east south central region that has taken no action in this process. Based on the statistics provided by the State Education Policy Center (SEPC), these four

states could be representatives of the current adoption map in the United States: (a) states that have adopted e-Textbooks and digital content in higher education (Tennessee and Kentucky), (b) states planning on the process of adoption (Alabama), and (c) states that have not taken any action on digital content (Mississippi) (SEPC, 2012). Since most public universities are funded by state government and the adoption of e-Textbooks might be influenced by state policies (Peterson's staff, 2014), data are collected only from public universities in those four states in the east south central region.

This selected research setting provides a sample of instructors within a confined geographic area, which is convenient for data collection and meet the grouping differences as noted in the research purpose and literature review. Moreover, a study of e-Textbooks from instructors' perspective among public universities in those states have valuable meanings in examining the current situation of adopting e-Textbooks in the east south central region and investigating the factors that affect instructors' adoption decision of using e-Textbooks in the east south central region U.S.

### Participants

The participants of this research were limited to the instructors in public universities in the east south central region in the U.S. According to the 2012 report *Digital Textbook Playbook*, which was released by the Federal Communications Commission (FCC) and the Education Department, the nation intended to "encourage collaboration, accelerate the development of digital textbooks, and improve the quality and penetration of digital learning in K-12 public education" (FCC, 2012, para. 2), which provided a "blueprint for schools to make the shift" (Davis, 2013, para. 4) from traditional learning to digital learning and digital contents, and "guide[d] K-12 educators

and administrators to begin building rich digital learning experiences for students in districts across the country” (FCC, 2012, para. 1). Thus, it is important to include instructors who had primary responsibilities in training K-12 teachers in their use of digital content in higher education. Results from the study could provide a better service to the national process in shifting from traditional learning to digital learning in the next few years. Instructors in this research setting referred to those who were teaching in educational-related programs in the college of education at public universities in the east south central region in the United States. This population included all lecturers, assistant professors, associate professors, full professors, and other instructors who were teaching face-to-face classes, hybrid programs, or online programs in colleges of education where they had access to both e-Textbooks and printed textbooks. In order to obtain a detailed demography for the study, instructors were asked to self-report their age, gender, academic rank, study field, and ethnicity. No name or contact information of participants were required to report during the survey. All demographic information was known only to the researcher and kept confidential for this study’s purposes only.

There was minimum risk to the participants in this research project. After the research proposal was approved by the dissertation committee members, the researcher completed a Request for Human Approval Form (IRB) (see Appendix A) and obtained authorization from the university before proceeding to collect data from any human subjects. An informed consent document (see Appendix B) would be presented to each participant before starting the survey. Any information that was collected and stored for research purposes in the Qualtrics.com server account will be deleted completely one year later after the research.

## Research Instrument

Questionnaires were used to collect data. As stated by Hannan (2007) in *Questionnaires in Education Research*, questionnaires enabled researchers to collect people's opinions and provide amenable data to research (Hannan, 2007). The questionnaire of this research (see Appendix C) is based on and developed from Moore and Benbasat's (1991) instrument, which mainly consists of three sections. The first section of the questionnaire (Section 1: e-Textbooks usage) concerns the frequency of instructors using e-Textbooks in teaching. The second section (Section 2: reasons to use e-Textbooks) includes questions related to instructors' perception of using e-Textbooks in teaching regarding the eight attributes of using e-Textbooks. In this section, a five-point (1-5) Likert scale is applied to evaluate and assess perceived attributes of e-Textbooks. The third section (Section 3: demographics) concerns demographic information including gender, age, academic rank, ethnicity, and study field, which are analyzed for exploring: (a) the demographic differences between adopters of e-Textbooks in higher education and non-adopters, (b) the factors that prevent instructors from using e-Textbooks, and (c) instructors' comments and opinions in using or not using e-Textbooks in teaching with open-ended questions, which reduced the "possibility of being influenced by limited answers or given facts on the questionnaire" (Almobarraz, 2007, p.59).

In this quantitative research design, instructors using e-Textbooks in higher educational settings is the dependent variable, while demographics (state, gender, age, academic rank, and study field) and the eight perceived attributes of using e-Textbooks (voluntariness, relative advantage, compatibility, image, demonstrability, visibility, ease

of use, and trialability) are the independent variables. Following are the defined attributes of e-Textbooks perceived by instructors as independent variables in this study:

- *Voluntariness* is to what extent instructors perceive using e-Textbook to be voluntary or at their free will.
- *Relative advantage* is how much e-Textbooks can be perceived by instructors to be better than printed textbooks such as cost, weight, instructiveness, etc.
- *Compatibility* means how much an e-Textbook is perceived as being consistent with instructors' previous teaching experiences or teaching needs.
- *Ease of Use* is the "degree to which a person believes that using a particular system would be free of effort" (Davis, Bagozzi, & Warshaw, 1989, p. 990).
- *Demonstrability* is the "tangibility of the results of using the innovation, including their Observability and Communicability" (Moore & Benbasat, 1991, p. 203).
- *Visibility* is how much the instructors can observe their colleagues using e-Textbooks in teaching.
- *Image* is "the degree to which use of an innovation is perceived to enhance one's image or status in one's social system" (Moore & Benbasat, 1991, p. 195).
- *Trialability* is how much e-Textbooks can be experimented with before instructors use them in teaching.

#### *Moore & Benbasat's Scale Measurement and Cronbach's Coefficient Alpha*

The instrument used for data collection in this study was based on and had been developed from Moore and Benbasat's (1991) scale measurements of personal work station (PWS). This instrument has been tested with a high reliability and validity, and applied to a diversity of innovations such as e-learning adoption among educational

leaders (Jebeile & Reeve, 2003) and the Internet adoption among faculty members (Almobarraz, 2007). Thus, a pilot study was not performed prior to the distribution of the instrument.

*Moore and Benbasat's scale of measurement.* Based on Rogers' derived five characteristics of innovation and Technology Acceptance Model (TAM), Moore and Benbasat (1991) developed a general instrument to measure the perceived attributes of using an innovation, which included eight perceived attributes (voluntariness, relative advantage, compatibility, image, ease of use, result demonstrability, visibility, and trialability) in the context of the adoption of Personal Work Stations (PWS) by individuals.

Moore and Benbasat's instrument measured users' perceptions of adopting an innovation within individuals in organizations. The 34-item instrument of their measurement comprised of scales that had acceptable levels of reliability and a high degree of confidence in the content and construct validity. The target level of minimum reliability was set in the range of 0.7 to 0.8, which were analyzed using Guttman's GLB measure of reliability, and also highlighted Cronbach's Alpha for discussion of reliability of the items. Factor analysis was used as to assess the construct validity. The results indicated that a seven-factor accounted for approximately 63% of the variance in the data set. Then, a rotated factor matrix was applied to examine items that either did not influence strongly on any factor ( $< 0.4$ ), or were too complex. VARIMAX rotation again showed that the seven factors captured 63% of the variance.

This instrument had been tested to be general enough to be applied to any particular innovation (Moore & Benbasat, 1991), and could be used to investigate how

perceptions affect individuals' actual uses of innovations. As concluded by Moore and Benbasat (1991), their instrument provided a general measurement for initial adoption and diffusion of innovations, which had been applied in different types of innovation, such as e-learning adoption among educational leaders (Jebeile & Reeve, 2003), the Internet adoption among faculty members (Almobarraz, 2007), and adopting capacitive switch technology in industrially designed user interface controls (Stachewicz, 2011), etc. This study of adopting e-Textbooks among instructors in higher education is also compatible with Moore and Benbasat's instrument; both aimed at addressing the perceived attributes of using an innovation rather than the innovation itself.

*Cronbach's coefficient alpha.* To fit the present study, the researcher for this study slightly modified the original instrument which was developed by Moore and Benbasat (1991). Four items in relative advantage, two items in image, three items in ease of use, two items in visibility, and two items in trialability were removed from Moore and Benbasat's instrument pool, because they were thought to be repeated items in the instrument for this study of using e-Textbooks in teaching among the population. For instance, in relative advantage, both the questions "using e-Textbooks improves my job performance" and "using e-Textbooks enhances my effectiveness on the job" concern the quality of teaching performance with e-Textbooks. To make the survey as simple and concise as possible, the researcher kept the items that required by Moore and Benbasat for maintaining acceptable reliability and validity (see Appendix C). The deleted items were among the thirteen items that "would not have had a significant negative effect on ALPH level and should not affect the content validity of the scales" (Moore & Benbasat, 1991, p.210).



To guarantee a reliable data analysis for this study, reliability test was executed to evaluate the internal consistency and assess the reliability of instructors' perceptions on each construct (voluntariness, relative advantages, comparability, image, ease of use, result demonstrability, visibility, and trialability) in the instrument before data analysis. The overall alpha values obtained from the test was .805 across 28 items in the questionnaire, which showed an acceptable internal consistency (above 0.8 level) for the entire scale measurement in this study. For the internal consistency reliability of the constructs, please see Appendix D.

#### Procedures for Conducting the Study

Collecting data for the study employed an online questionnaire method. Invitations for completing the questionnaires were distributed via email. Therefore, the first step of data collection was contacting the secretaries and deans/chairs in Colleges of Education at public universities in the east south central region to seek assistance to distribute the questionnaire to their instructors. The researcher then located instructors' contact information (e-mails) from their Colleges' websites to send invitations for this survey. Research purposes, procedures, and benefits were attached with the survey as an explanation of the conduction of this research. The survey was distributed and collected through Qualtrics.com (associated with the researcher's University) online data collection server account. From the first initiation of the distribution of surveys, the data collection process lasted one semester for those universities who used the semester system or one quarter for those who used the quarter system before closing the survey. After two rounds invitations as recorded by the researcher's Qualtrics server account, only the completed surveys were considered for data analysis. If the return rate was too low, the

researcher would send out personal invitations to increase participations. After data was collected, the researcher transcribed all data into Microsoft Excel® and IBM® SPSS statistics software for analysis. The data is stored in the Qualtrics.com server account and will be deleted one year after the research.

#### Data Analysis Procedures

Collected data was analyzed using Microsoft Excel® and IBM® SPSS statistical software. IBM® SPSS provided comprehensive statistical analyses for data ranging from basic to in-depth descriptive statistics.

The first research question examines whether there are significant differences between adopters and non-adopters relating to the demographics (state, gender, age, academic rank, and study field). According to instructors' responses to question 1 in section 1 of the survey, they are categorized into two groups: adopters of e-Textbooks (who have using e-Textbooks *always, very often, often, fairly many times, and occasionally*) and non-adopters of e-Textbooks (who have *Never* used e-Textbooks). Five associated hypotheses have been developed relating to instructors' demographics. Chi-Square tests of independence are performed to examine the relationships between adopters and non-adopters associating with their demographics regarding to state, gender, age group, academic rank, and study field (see Section 3, questions 1 to 5).

The second research question examines whether the eight perceived attributes of using e-Textbooks relate to instructors' (adopters) use of e-Textbook in teaching and how. Only instructors who are using e-Textbooks in teaching (adopters) were included in research question 2. Multiple regression (standard and stepwise) analysis is used to analyze the answers, which includes the independent variables of voluntariness (survey

Section 2, question 1-2), relative advantages (survey Section 2, question 3-7), compatibility (survey Section 2, question 8-10), image (survey Section 2, question 11-13), ease of use (survey Section 2, question 14-18), result demonstrability (survey Section 2, question 19-22), visibility (survey Section 2, question 23-25), and trialability (survey Section 2, question 26-28) (see Appendix C), and the dependent variable instructors' using e-Textbooks. For the 28 items in the questionnaire that represent each independent variable (the eight perceived attributes of using e-Textbooks in teaching) in the instrument, it calculated the overall Cronbach's alpha to assess the internal consistency reliability (Appendix D).

The third research question discusses the factors that prevented instructors from using e-Textbooks. Analysis for this question adopts a descriptive analysis such as percentage and frequency calculation, and is organized by themes based on instructors' specifications and comments of using e-Textbooks in teaching. No hypothesis was associated with research question 3.

### Summary

This chapter offered a review of the research design, research setting, participants, instrument, procedures of data collecting, and data analysis procedures. Various elements of the data collection and data analysis were presented. Quantitative research is applied to this adoption research, specifically in the form of descriptive and correlational research methods. Moore and Benbasat's (1991) instrument was selected for this study with slight modifications to address the perceived attributes of using e-Textbooks in teaching rather than e-Textbook itself. Qualtrics.com was used to distribute

questionnaires to the population, while Microsoft Excel® and IBM® SPSS were the main software packages used for data analysis.

The next chapter analyzes the data collected from the participants by applying the research methods that been demonstrated in this chapter. Findings are organized according to the three research questions and their associated hypotheses, if any, proposed by this study. The findings offer a better insight into how the perceived attributes of e-Textbooks relate to instructors using e-Textbooks in teaching and the reasons that lead instructors to either use or not use e-Textbooks in higher education.

## CHAPTER IV

### DATA ANALYSIS

#### Introduction

This chapter analyzes the data collected for the study of the attributes perceived by instructors in using e-Textbooks in higher education and the factors that prevent instructors from using e-Textbooks in teaching as demonstrated in Chapter I. With data collected through an online survey, the analysis compares demographic information (state, gender, age group, academic rank, and study field) between instructors who are using e-Textbooks (adopters) and who are not using e-Textbooks (non-adopters) in teaching in higher education. The analysis also explores how the perceived attributes of e-Textbooks (voluntariness, relative advantages, comparability, image, ease of use, result demonstrability, visibility, and trialability) relate with instructors' using e-Textbooks in higher education. Finally, it discusses the factors that prevent instructors from using e-Textbooks in teaching.

This analysis is presented in three sections. The first section, *Survey Participation*, describes survey participation, response rate, and data demographics. The second section, *Data Preparation*, presents the exportation of data for analysis. The third section, *Analysis of Research Questions*, presents the descriptive demographics of participants, analyzes the results of the tests that were performed for each research question and their associated hypotheses, and summarizes the findings.

#### Survey Participation

Participants were invited to complete the questionnaires through email invitations that delivered by the researcher. Prior to the deployment of the email invitations, the

Institutional Review Board of The University of Southern Mississippi reviewed and approved the methods and instrument (No. IRB-14010201) used in this study, which confirmed that minimal risk, if any, existed to participants (see Appendix A). The informed consent document (see Appendix B) was presented to each participant before they started the survey, and was automatically and electronically signed when participants agreed to continue the survey (Appendix C). The survey was completely voluntary and participants could quit the survey any time by closing the web browser window.

### *Response Rate*

This survey was conducted among a total of 39 public universities in the east south central region of the U.S. and included the states of Mississippi, Alabama, Kentucky, and Tennessee. The university lists were obtained from the websites of each state's Department of Education, and included 8 public universities from Mississippi, 14 public universities from Alabama, 8 public universities from Kentucky, and 9 public universities from Tennessee. All instructors who were listed on the webpages of the college of education at each university constituted the target population. Two rounds of email invitations were conducted: the first round was delivered to each department chair and secretary in college of education, and the second round was delivered to instructors in the departments in college of education. All email accounts of the department chairs, secretaries, and instructors were subjected to those on the departments' websites. After the first round, there were four department chairs responded to spread the survey to their instructors; in the second round email invitations were sent to instructors in education except those who were in the four departments. In total, there were 2309 survey email

invitations delivered by the researcher, and 366 survey responses were recorded through Qualtrics.com, among which 70 responses were from Mississippi, 118 responses were from Alabama, 85 responses were from Kentucky, and 93 responses were from Tennessee.

### Data Preparation

Analysis of the collected data included descriptive statistics of the population and the inferential statistics of the independent and dependent variables. The independent variables included demographics (state, gender, age group, academic rank, and study field) and the perceived attributes of e-Textbooks (voluntariness, relative advantages, comparability, image, ease of use, result demonstrability, visibility, and trialability). The dependent variables included adoption of e-Textbooks in higher education (adopters and non-adopters) and instructors' use of e-Textbooks in teaching (adopters).

Data analysis addressed each research question and its associated hypothesis (if applicable). The results of all hypotheses testing were collected and reported in a summary of findings in the third section in this chapter. The purpose of this chapter was to present and discuss the findings for each research question and provide a more conceptual and integrated analysis of the overall results, including a discussion of the results' significance for past and future researches to Chapter V.

Prior to analysis, the data were exported from the Qualtrics.com server account to Microsoft<sup>®</sup> Excel<sup>®</sup> and IBM<sup>®</sup> SPSS<sup>®</sup>. IBM<sup>®</sup> SPSS<sup>®</sup> is the main software applied to sort, merge, and combine variables for all the responded cases. For statistical convenience, the two variables, *state* and *adoption*, were merged and combined technically in IBM<sup>®</sup> SPSS<sup>®</sup>. The values of the variable *state* were inputted by the researcher in IBM<sup>®</sup> SPSS<sup>®</sup>.

accordingly; the values of variable *adoption* were sorted by the function of *Split Cases* in IBM® SPSS®, which functionally divided all the responded instructors into two groups: one group was those who used e-Textbooks (adopters) while the other group was those who did not use e-Textbooks (non-adopters) in their teaching.

#### Analysis of Research Questions

Based on the collected data, the following sections performed several Chi-Square tests, multiple regression, and descriptive analysis to answer the research questions and their associated hypotheses, and presented the findings from the results of those tests. All the hypotheses were tested using  $p < .05$ .

#### *Descriptive Statistics of Demographics*

The frequency of how often instructors use e-Textbooks in teaching was taken from participants' answers to questions 1 in section 1 from the questionnaire and was applied to answer the research question 1 and research question 2, which demonstrated the information of how often instructors use e-Textbooks in their teaching. Table 1 showed that the majority of participants had no or limited experiences in using e-Textbooks.

Table 1

#### *Frequency of How Often Instructors Use E-Textbooks in Teaching*

		Frequency	Percent	Cumulative Percent
Valid	Always	7	1.9	2.0
	Very Often	27	7.4	9.8
	Fairly Many Times	16	4.4	14.4
	Occasionally	109	29.8	45.8



Table 1 (continued).

		Frequency	Percent	Cumulative Percent
Valid	Never	188	51.4	100.0
	Total	347	94.8	
Missing	System	19	5.2	
Total		366	100.0	

For research convenience, as stated in the *Data Preparation* section, the researcher categorized all responded instructors from Table 1 into two groups: one group was those who used e-Textbooks (adopters), while the other group was those who did not use e-Textbooks (non-adopters) in their teaching (see Table 2). Instructors who indicated their frequency of using e-Textbooks as often, often, fairly many time, and occasionally were categorized into the group of adopters, which would also be applied to answer research question 2 to examine the attributes of e-Textbooks that perceived by instructors in their teaching.

Table 2

*Frequency of Adopters and Non-Adopters of E-Textbooks*

		Frequency	Percent	Cumulative Percent
Valid	Adopters	159	43.4	45.8
	Non-adopters	188	51.4	100.0
	Total	347	94.8	
Missing	System	19	5.2	
Total		366	100.0	

Among the participants (N = 319), 52.7% were female and 34.4% were male. The age group 50-59 had the most participants, and the second age group was 40-49; while the age group 20-29 had the least participants, as shown in Table 3.

Table 3

*Age Group Distribution*

		Frequency	Percent	Cumulative Percent
Valid	20-29	12	3.3	3.8
	30-39	64	17.5	23.8
	40-49	81	22.1	49.2
	50-59	85	23.2	75.9
	60 or above	77	21.0	100.0
	Total	319	87.2	
Missing	System	47	12.8	
	Total	366	100.0	

Most participants (N = 319) had their academic rank as an assistant professor, and the second place was associate professor, as shown in Table 4. The group of *Others* included clinical assistant professor, adjunct faculty, and senior lecturer, as self-reported by participants.

Table 4

*Academic Rank of Participants*

		Frequency	Percent	Cumulative Percent
Valid	Instructor	29	7.9	9.1
	Assistant Professor	128	35.0	49.2
	Associate Professor	82	22.4	74.9
	Professor	67	18.3	95.9
	Others	13	3.6	100
	Total	319	87.2	
Missing	System	47	12.8	
	Total	366	100.0	

Among the 323 completed responses to their ethnicity (an optional question in the questionnaire), 78.9% identified themselves as White, 12.1% identified them as Black, 5.3% identified themselves as Asian, 0.6 % as Latin, 0.3% as Native-American, and 1.2% identified their ethnicity as others.

*Research question 1.* How do demographics (state, gender, age, academic rank, and study field) differ between instructors using e-Textbooks (adopters) and those who are not using e-Textbooks (non-adopters) in teaching in higher education?

Hypothesis 1: There is a difference between adopters and non-adopters of using e-Textbooks in terms of state.

A Chi-Square test of independence was performed to compare the differences between adopters and non-adopters associating with state. There was no statistically significant difference between adopters and non-adopters of using e-Textbooks in higher

education related to state,  $\chi^2 (3, N = 347) = .843, p = .839$  (see Table 5). There was insufficient evidence to conclude that state influenced instructors' use of e-Textbooks in their teaching.

Table 5

*Results of Chi-square Test and Descriptive Statistics for E-Textbook Adoption by State*

e-Textbook Adoption	State			
	MS	KY	TN	AL
Adopters	32 (20.1%)	37 (23.3%)	41 (25.8%)	49 (30.8%)
Non-adopters	31 (16.5%)	44 (23.4%)	50 (26.6%)	63 (33.5%)

Note.  $\chi^2 = 0.843, df = 3$ . Numbers in parentheses indicate column percentages.

\* $p < .05$

Hypothesis 2: There is a difference between adopters and non-adopters of e-Textbooks in terms of gender.

A Chi-Square test of independence was performed to compare the frequency between adopters and non-adopters in terms of gender. No statistically significant relationship existed between adopters and non-adopters of using e-Textbooks in teaching in higher education relates to gender,  $\chi^2 (1, N = 319) = 0.006, p = .940$  (see Table 6). There was insufficient evidence to conclude that gender influenced instructors' use of e-Textbooks in their teaching; both male and female instructors had similar preferences regarding using or not using e-Textbooks in teaching.

Table 6

*Results of Chi-square Test and Descriptive Statistics for E-Textbook Adoption by Gender*

e-Textbook Adoption	Gender	
	Male	Female
Adopters	53 (39.3%)	82 (60.7%)
Non-adopters	73 (39.7%)	111(60.3%)

Note.  $\chi^2 = 0.006$ ,  $df = 1$ . Numbers in parentheses indicate column percentages.

\* $p < .05$

Hypothesis 3: There is a difference between adopters and non-adopters of e-Textbooks in terms of age group.

A Chi-Square test of independence was performed to compare the differences between adopters and non-adopters of using e-Textbooks associated with their age group. There was no statistically significant difference between adopters and non-adopters of using e-Textbooks in teaching related to age,  $\chi^2 (4, N = 319) = 2.797$ ,  $p = .592$  (see Table 7). There was insufficient evidence to conclude that age influenced instructors' use of e-Textbooks in their teaching; there were young instructors who are using e-Textbooks, while instructors who were older are also using e-Textbooks in teaching.

Table 7

*Results of Chi-square Test and Descriptive Statistics for E-Textbook Adoption by Age*

e-Textbook Adoption	Age Group				
	20-29	30-39	40-49	50-59	60 or above
Adopters	6 (4.4%)	22 (16.3%)	38 (28.1%)	35 (25.9%)	34 (25.2%)

Table 7 (continued).

e-Textbook Adoption	Age Group				
	20-29	30-39	40-49	50-59	60 or above
Non-adopters	6 (3.3%)	42 (22.8%)	43 (23.4%)	50 (27.2%)	43 (23.4%)

Note.  $\chi^2 = 2.797$ ,  $df = 4$ . Numbers in parentheses indicate column percentages.

\* $p < .05$

Hypothesis 4: There is a difference between adopters and non-adopters of using e-Textbooks in terms of academic rank.

A Chi-Square test of independence was performed to compare the differences between adopters and non-adopters regarding to their academic rank. No significant relationship existed between adopters and non-adopters of using e-Textbooks in teaching relating to their academic rank,  $\chi^2(4, N = 319) = 1.919$ ,  $p = .751$  (see Table 8). There was insufficient evidence to conclude that academic rank influenced instructors' use of e-Textbooks in their teaching. Instructors at any academic level might have preference in using or not using e-Textbooks in teaching.

Table 8

*Results of Chi-square Test and Descriptive Statistics for E-Textbook Adoption by Academic Rank*

e-Textbook Adoption	Academic Rank				
	Instructor	Assistant Professor	Associate Professor	Professor	Other
Adopters	11 (8.1%)	54 (40.0%)	39 (28.9%)	25 (18.5%)	6 (4.4%)

Table 8 (continued).

e-Textbook Adoption	Academic Rank				
	Instructor	Assistant Professor	Associate Professor	Professor	Other
Non-adopters	18 (9.8%)	74 (40.2%)	43 (23.4%)	42 (22.8%)	7 (3.8%)

Note.  $\chi^2 = 1.919$ ,  $df = 4$ . Numbers in parentheses indicate column percentages.

\* $p < .05$

Hypothesis 5: There is a difference between adopters and non-adopters of using e-Textbooks in terms of study field.

A crosstabulation was performed to compare adopters and non-adopters of e-Textbooks relating to their study fields in education. Among the 319 responses ( $N = 319$ ), 135 were adopters and 184 were non-adopters. *Curriculum and Instruction* was the most common study field by adopters of e-Textbooks, followed by the study field of *Other* (which included such as Literacy Education, Physical Education, Elementary Education, Educational Psychology, etc., as reported by instructors). *Educational Leadership and Administration* were in the third place. However, *Curriculum and Instruction*, *Other*, and *Educational Leadership and Administration* were also in the top three study fields with non-adopters as well (see Table 9). Thus, most instructors (both adopters and non-adopters of e-Textbooks) in this study had their study fields in *Curriculum and Instruction* and *Educational Leadership and Administration*.

Table 9

*Descriptive Statistics for E-Textbook Adoption by Study Field (N =319)*

Study field in Education	E-Textbook Adoption	
	Adopters	Non-Adopters
Child and Family Studies	2 (1.3%)	8 (3.8%)
School Counselling	2 (1.3%)	8 (3.8%)
Curriculum and Instruction	36 (22.8%)	44 (20.7%)
Educational Leadership and Administration	27 (17.1%)	23 (10.8%)
Educational Studies and Research	12 (7.6%)	20 (9.4%)
Instructional Technology and Design	12 (7.6%)	9 (4.2%)
Library and Information Science	9 (5.7%)	1 (0.5%)
Music Education	0 (0.0%)	1 (0.5%)
Psychology	8 (5.1%)	16 (7.5%)
Special Education	13 (8.2%)	19 (8.9%)
Sports Education	5 (3.2%)	9 (4.2%)
Other	32 (20.3%)	55 (25.8%)

*Research question 2.* How do perceived attributes of using e-Textbooks relate to instructors using e-Textbooks in teaching in higher education?

The second research question examined whether the eight perceived attributes of using e-Textbooks related to instructors (adopters) using e-Textbook in teaching and in what way. Multiple regression (standard and stepwise) tests were applied to explore whether the perceived attributes could predict instructors using e-Textbooks, how much each attributes uniquely contributed to that relationship, and what is (are) the best



predicator(s) of the eight perceived attributes that can predict instructors' using e-Textbooks in teaching. The independent variables included voluntariness (survey Section 2, question 1-2), relative advantages (survey Section 2, question 3-7), compatibility (survey Section 2, question 8-10), image (survey Section 2, question 11-13), ease of use (survey Section 2, question 14-18), result demonstrability (survey Section 2, question 19-22), visibility (survey Section 2, question 23-25), and trialability (survey Section 2, question 26-28). The dependent variable was instructors' using e-Textbooks in teaching (see Appendix C). One hypothesis had been developed associating with instructors using e-Textbooks. Only instructors who were using e-Textbooks in teaching ( $N = 137$ ) were considered for this research question.

Hypothesis 6: There is a relationship between the eight perceived attributes of using e-Textbooks and instructors using e-Textbooks.

First, a standard multiple regression analysis was applied to all the eight perceived innovation attributes to evaluate how well the perceived attributes predicted instructors using e-Textbook. As shown in Table 10, the linear combination of the eight perceived attributes was statistically significant related to instructors using e-Textbooks in teaching at the level of .05,  $F(8, 127) = 3.478$ ,  $p < .05$ . The multiple correlation coefficient was .424, indicating that approximately 18.0% of the variance of instructors' using e-Textbooks can be accounted for by the linear combination of the eight perceived attributes.

Table 10

*Regression Analysis of the Eight Attributes Perceived by Instructors*

	Sum of Squares	df	Mean Square	F	P	R <sup>2</sup>
Regression	21.626	8	2.703	3.478	.001*	.180
Residual	98.719	127	.777			
Total	120.346	135				

Note. \*p < .05

Table 11 showed that only the attribute ease of use ( $p = .041$ ) was a statistically significant predictor at the .05 level in this model. The other seven variables, voluntariness, relative advantage, compatibility, image, result demonstrability, visibility, and trialability appeared not to influence instructors' use of e-Textbooks in teaching significantly. The b weight for ease of use was  $-.091$ , which meant that as this variable increased one unit, the frequency of instructors' using e-Textbooks decreased by  $.091$  when holding the other seven variables constant.

Table 11

*Coefficients for Perceived Attributes by Instructors*

	B	SE B	$\beta$	P
(Constant)	35.666	3.592		< .000
Voluntariness	.010	.048	.018	.833

Table 11 (continued).

	B	SE B	$\beta$	P
Relative advantage	-.016	.028	-.058	.570
Compatibility	.009	.044	.023	.844
Image	-.039	.031	-.108	.209
Ease of use	-.091	.044	-.227	.041*
Result demonstrability	-.083	.050	-.151	.101
Visibility	.030	.059	.045	.608
Trialability	-.055	.032	-.150	.091

Note. \* $p < .05$

A stepwise multiple regression analysis was conducted to evaluate the best combination of the eight attributes to predict instructors' using e-Textbooks in teaching. Each step of the stepwise multiple regression analysis would have one attribute that contributed the most to the prediction equation in terms of increasing the multiple correlation entered. Table 12 shows that, ease of use entered into the regression equation at step 1 of the analysis and was significantly related to instructors' using e-Textbooks,  $F(1,134) = 17.524, p < .05$ . The multiple correlation coefficient was .340, indicating approximately 11.6% of the variance of instructors' using e-Textbooks could be accounted for by the attribute of ease of use. At step 2 of the analysis, different from the value in the standard multiple regression, trialability entered into the regression equation

and was significantly related to instructors' using e-Textbooks,  $F(2, 133) = 11.237$ ,  $p < .05$ . The multiple correlation coefficient was .380, indicating approximately 14.5% of the variance of instructors' using e-Textbooks could be accounted for by the attribute of trialability. The other six attributes (voluntariness, relative advantage, compatibility, image, result demonstrability, and visibility) did not enter into the equation at step 2 of the analysis ( $p > .05$ ).

Table 12

*Summary of Stepwise Multiple Regression Analysis for Variables Predicting Instructors' Using of E-Textbooks*

Variable	<i>B</i>	<i>SE (B)</i>	$\beta$	$R^2$
Step 1				
Ease of use	-.137	.033	-.340*	.116
Step 2				
Ease of use	-.122	.033	-.304*	.116
Trialability	-.064	.030	-.174*	.145

Note: \* $p < .05$

Ease of use and trialability were the better combined predictors of instructors' using e-Textbooks in teaching than the other six predictors in this study of adoption of e-Textbooks.

*Research question 3.* What are the factors that prevent instructors from using e-Textbooks in teaching?

Descriptive analysis was deployed to explore the factors that prevent instructors from using e-Textbooks in teaching in higher education. According to the participants'

responses to question 8 in Section 3 (see Appendix C), 54% of the participants from Mississippi chose “*preference to printed textbooks*” as their reasons for not using e-Textbooks in teaching (see Appendix E), and commented with “no interest” of e-Textbooks (see Appendix F). 39% percent from Alabama selected “*I don't have e-Readers to distribute e-Textbooks in my class(es)*” as their reasons for not using e-Textbooks (see Appendix E), and a few instructors even said that they “received minimal support from the institution for existing technology” (see Appendix F) . Meanwhile, 35% from Tennessee and 45% from Kentucky chose “*Others*” as the reasons that prevented them from using e-Textbooks in teaching (see Appendix E), such as “students are non-traditional (older) students,” “no e-textbooks with the content I prefer,” “not practical,” etc. Other valuable factors indicated by instructors’ voluntarily were such as “e-Textbooks are more expensive than printed textbooks” and descriptions of their frustrating experiences in using e-Textbooks for teaching. Instructors’ comments and suggestions complemented the factors that prevent instructors from using e-Textbooks, and provided recommendations for promoting using e-Textbooks in education in further studies.

Generally, there were five main factors that prevented and even stopped instructors from using e-Textbooks in teaching. These were (1) instructors’ preference for printed textbook, which included the primary role of printed textbooks in teaching; (2) less support from the institutions, both economically and technically; (3) concerns about students’ learning, which included students’ preference for printed textbooks and their different learning styles, and the balance between users of e-Textbooks and non-users of e-Textbooks in the same class; (4) availability of e-Textbooks, which included the lack

of availability of e-Textbooks in the subject area, not having qualified e-Textbooks in the market, the limited life time of e-Textbooks, and inadequate knowledge of e-Textbooks; and (5) e-Textbooks as not being helpful, which included instructors' frustrated experience of using e-Textbooks and not appropriate for their teaching needs (see Appendix F). Detailed explanations on those factors that prevent instructors from using e-Textbooks in teaching will be discussed in Chapter V.

### Summary of Findings

This chapter provided an analysis of the data collected. With 2309 invitation emails distributed to 39 public universities in the east south central region in U.S, 366 surveys were completed in Qualtrics.com, which included 70 responses from Mississippi, 85 responses from Kentucky, 93 responses from Tennessee, and 118 responses from Alabama.

Three research questions and their associated hypotheses were analyzed. Chi-Square tests of independence had been applied to research question1, *how do demographics (state, gender, age, academic rank, and study field) differ between instructors using e-Textbooks (adopters) and those who are not using e-Textbooks (non-adopters) in teaching in higher education*, which included five associated hypotheses. There were no significant differences found in the first four hypotheses that related to instructors' state, gender, age group, and academic rank. Frequency calculated for hypothesis 5 showed that *Curriculum and Instruction* and *Educational Leadership and Administration* were the most often study fields by instructors in this study of adoption of e-Textbooks.

Standard and stepwise multiple regression tests were conducted to research question 2, *How do perceived attributes of using e-Textbooks relate to instructors' using e-Textbooks in teaching in higher education*, which had one hypothesis. The linear combination of the eight perceived attributes had been tested to well predict instructors using e-Textbooks in teaching at the level of .05, with the attribute ease of use ( $p = .041$ ) as the only significant predictor in this model. Ease of use and trialability were the two attributes that emerged to effectively predict instructors' using e-Textbooks as a combination.

Descriptive analysis was applied to answer research question 3, *What are the factors that prevent instructors from using e-Textbooks in teaching*. The reason “*Preference to printed textbooks*” at 54%, was the most common reason that prevented instructors using/not use e-Textbooks in teaching in Mississippi; while the reason “*I don't have e-Readers to distribute e-Textbooks in my class(es)*” at 39%, was the most common reason that prevented instructors from using e-Textbooks in Alabama. Meanwhile, 35% responses in Tennessee and 45% responses in Kentucky listed “*Others*” as the reason that prevented them from using e-Textbooks in teaching. In the specified reasons and instructors' comments, five main factors emerged which were instructors' preference to printed textbook, limited support from institutions, concerns about students' learning preferences, availability of e-Textbooks, and e-Textbooks as not being helpful.

In the next Chapter, findings are explained in greater details in terms of the implications for adoption of e-Textbooks in higher education. Recommendations for future research and study to promote instructors to use e-Textbooks in teaching in higher

education are offered. Limitations of this study also are also discussed in Chapter V to assist future researchers in their examination of e-Textbooks.



## CHAPTER V

### DISCUSSION

The purpose of this chapter is to explain and discuss the findings from Chapter IV, address the benefits of the study, acknowledge the limitations of the research, and provide possible recommendations for improvements and further research. Discussions in this chapter are organized in relationship to the three research questions. The first research question compared the demographic differences between instructors who were using e-Textbooks (adopters) and those who were not using e-Textbooks (non-adopters) in teaching. The second research question investigated the relationships between perceived attributes of using e-Textbooks by instructors and their using of e-Textbooks (adopters) in teaching. The third research question explored the factors that prevent instructors from using e-Textbooks when teaching in higher education. With detailed discussions of the findings obtained from the three research questions and comments provided by the participants, this chapter provides a general picture of instructors using e-Textbooks in higher education, and clarify factors that may prevent instructors from using e-Textbooks in the east south central region in the U.S.

#### Summary of Study

In general, 366 participants from the four states in the east south central region in the U.S. responded to the questionnaires, which consisted of 52.7% female instructors and 34.4% male instructors. Participants included in this study were assistant professors (35%), associate professors (22.4%), professors (18.3%), and instructors (7.9 %). 23.2% of the participants were in the age group of 50–59, 22.1% were in the age group of 40–49, 21% were in the age group of 60 or above, 17.5% were in the age group of 30–39,

and only 3.3% were in the age group of 20-29. Participants' ethnicity consisted of 78.9% White, 12.1% Black, 5.3% Asian, 0.6 % Latin, 0.3% Native-American, and 1.2% others that were reported by participants themselves. The collected demographic information assured a diversity of the sample population, a confined geographic area, and consisted of the grouping differences as noted in the research purposes in Chapter I and Chapter III of this study.

Among the participants, 43.4% were adopters of e-Textbooks in teaching, while 51.4% were non-adopters of e-Textbooks, which indicated that adopters of e-Textbooks in education were not the majority. This result was consistent with previous researches that adopting of e-Textbooks in teaching was not that positive even with e-Textbooks' advantages in education (Duffey & Fox, 2012).

The results of several Chi-Square tests of independence indicated that there were no significant differences between adopters and non-adopters of e-Textbooks associating with demographics (state, gender, age group, and academic rank). Instructors in this study of adoption of e-Textbooks worked most often in the field of *Curriculum and Instruction* and *Educational Leadership and Administration*. Multiple regression tests showed that the linear combination of all the eight perceived attributes of using e-Textbooks by instructors, which were voluntariness, relative advantage, compatibility, ease of use, image, result demonstrability, visibility, and trialability, was significantly related to and predicted instructors' using e-Textbooks in teaching in higher education. Ease of use and trialability were the two perceived attributes that could better predicted instructors' use of e-Textbooks than the other six perceived attributes in this study.

Descriptive analysis in research question 3 showed that instructors' "*preference to printed textbooks*" and less supports they obtained to "*distribute e-Textbooks in class(es)*" were the most selected reasons that prevented them from using e-Textbooks in teaching in higher education. Five main factors had emerged to explain why instructors were prevented from using e-Textbooks in teaching, which were (1) instructors' preference to printed textbooks, (2) less supports from their institutions, (3) concerns about students' learning styles, (4) availability of e-Textbooks, and (5) using e-Textbooks were not helpful.

### Conclusions and Discussion of Results

This quantitative study explored and discussed the perceived attributes of using e-Textbooks and factors that influenced instructors' use of e-Textbooks in teaching in higher education. The theoretical framework proposed that Rogers' (2003) diffusion of innovation theory could be applied to adopters' use of e-Textbooks pertaining to the perceived attributes and other factors in their social system. The literature review implied that adopting of e-Textbooks as an innovation in higher education had not reached the stage of confirmation, and there were also external factors that influenced the adoption of e-Textbooks in teaching in higher education. The following discussions are based- upon Rogers' diffusion of innovation theory (2003) and the reviewed literature in Chapter II, and pertain to the three research questions.

#### *Demographics and Using E-Textbooks in Teaching*

The first research question examined the differences between adopters and non-adopters of e-Textbooks in teaching in terms of demographics (state, gender, age group, academic rank, and study field). Although none significant differences been found

between adopters and non-adopters of e-Textbook in teaching relating to demographics, there still were some valuable findings.

*State.* The first finding from research question 1 relates to state policies; it is conflicted with the assumption that instructor' using e-Textbooks could be influenced by states' various policies and rules of adopting digital content and e-Textbooks. Instructors from any state in the east south central region in the U.S. might or might not use e-Textbooks in teaching in higher education. For instance, according to the statistics provided by State Education Policy Center (SEPC) (2012), Alabama was one of the states that had already included digital content and digital textbooks in education; however, no statistical evidence from this research supported that instructors from Alabama had a higher preference to using e-Textbooks in teaching than instructors from Mississippi which was one of the states that excluded digital content in education.

Such confliction might be caused by the inconsecutiveness between pre K-12 education and higher education. In the SEPC's report of state policies of digital content, it explicitly mentioned pre K-12 education in the process of adopting digital content and e-Textbooks, but did not clearly demonstrated higher education was also in that process, which might lead to a higher preference of using e-Textbooks in pre K-12 education than in higher education on the state level.

*Age group and academic rank.* The data analyzed in research question 1 showed neither a significant difference between adopters and non-adopters relating to their ages nor to the academic ranks, which were inconsistent with Rogers' demonstrations that younger people or people with higher social status and prestige are easier to accept certain innovation than older people or people with lower social status in a social system.

Younger instructors did not express a higher tendency in using e-Textbooks in teaching than older instructors; instructors who were with higher academic ranks did not play as a pioneer in using e-Textbooks in teaching.

Such inconsistencies are caused by several reasons. For instance, most instructors mentioned that there was “no e-Textbook available” in their teaching subject areas; such unavailability of e-Textbooks makes it impossible for instructors to use e-Textbooks, even if instructors are young or with higher social prestige. Besides, students’ unresponsiveness to e-Textbook is another reason that caused instructors’ unwillingness to use e-Textbooks in teaching. If instructors’ intention of using e-Textbooks could not be supported by their students or e-Textbooks publishers in the social system, they would decline the using of e-Textbooks in teaching no matter they are young or old, with higher social status or common people.

*Study field.* According to Rogers’ diffusion theory (2003), the communication channel can influence the adoption rate of an innovation. Data showed that *Curriculum and Instruction* and *Educational Leadership and Administration* were the most often study fields of instructors who adopted e-Textbooks, which indicated that promoting using e-Textbooks may be easier among instructors from these two study fields in education. If more instructors from the mentioned study fields use e-Textbooks in their teaching, the interpersonal communication channel could be broadened in higher education, which can help increase the adoption rate of using e-Textbooks in other areas in teaching; which also suggests a direction for those colleges and institutions that have their intentions to use e-Textbooks but still wondering where to start the adoption process.

### *Perceived Attributes of Using E-Textbooks in Higher Education*

The second research question, *How do attributes of e-Textbooks perceived by instructors (adopters) relate with their using of e-Textbooks in teaching*, explored whether the eight perceived attributes of using e-Textbooks (voluntariness, relative advantages, compatibility, image, ease of use, result demonstrability, visibility, and trialability) can predict instructors using e-Textbooks, how much each of the attributes contributed to that relationship, and what the best combination of the eight perceived attributes would be to predict instructors using e-Textbooks in teaching.

Data analysis showed that the linear combination of the eight attributes of using e-Textbooks was able to predict instructors' using e-Textbooks, which was consistent with Rogers' perceived attributes theory in the diffusion of innovation theory (2003), supported the generalization of Moore and Benbasat's scale measurement to other innovations, specifically e-Textbooks for this study, and provided ideas for how to effectively increase the possibility of using of e-Textbooks in teaching in higher education.

*Ease of use.* Emerged as a statistically significant predictor of instructors using e-Textbooks in higher education, ease of use is recognized as the degree to which instructors believe that using e-Textbooks is free from effort in teaching. The less efforts instructors need in using e-Textbooks, the more uses of e-Textbooks might happen among instructors in teaching. When considering using e-Textbooks in teaching, instructors have concerns on such as how much efforts they need to make on learning eReaders, how many difficulties they might meet to switch from printed textbooks to e-Textbooks, how easy it is to integrate e-Textbooks into classrooms, etc. For instance,

some instructors rejected using e-Textbooks in teaching due to too much efforts they had to dedicate on using e-Textbooks compared with using printed textbooks, as commented by an instructor from Alabama, the “search took longer than using a book”. The more efforts and energies instructors need to devote to e-Textbooks, the less favorable attitudes they would have on using e-Textbooks, which is also consistent with the perceived attributes of relative advantages and compatibility of e-Textbooks.

The purpose of introducing and promoting e-Textbooks in teaching is not to bring heavier burdens to instructors’ instructional activities, but to make their instructions easier and more flexible. Instructors have the most concerns on how easy it could be to use e-Textbooks. However, the current studies and researches of e-Textbooks placed too much emphasis on the advantages of e-Textbooks over printed textbooks, such as the flexibility, higher interactivity, customization of learning content (Alliance for Excellent Education, 2012; Duffey & Fox, 2012; Mardis et al., 2010), but seldom considered how to integrate those advantages of e-Textbooks within instructors’ instructional activities to its best. If instructors did not perceive those advantages of e-Textbooks in their teaching activities, it would be hard to promote and exert using e-Textbooks to its broadest range. That is the reason why ease of use could emerge as the most important and valued predictor of using e-Textbooks in higher education. So, when promoting e-Textbooks in education, institutions should not only consider the features of e-Textbooks, but also need to premeditate how much effort that instructors can devote to this innovation, and then provide relative supports such as training and technical support to ease their use.

*Trialability.* Together with ease of use, trialability is another perceived attribute that can effectively predict instructors’ using e-Textbooks in teaching. The more trials of

using e-Textbooks could be provided in teaching before instructors integrate them into classroom, the more using of e-Textbooks would happen in teaching. According to Rogers (2003), only early adopters would like to try innovation before its maturity. Like most adopters in the diffusion of innovation process, instructors need the opportunities to try out the basic and advanced features of e-Textbooks, test the performance of e-Textbooks in education, and on a trial base to understand what they can do with e-Textbooks in actual teaching activities. Evidences of the importance of trialability have also been obtained from non-adopters of e-Textbooks such as, “(I) did not resist using e-Textbooks in teaching” but just “not familiar with them”. Instructors also indicated their feeling when technology not working and “(I am) looking like a fool in a class.” If there could be a chance for instructors to “review all features before to make sure they work” (see Appendix F), or a trial version of e-Textbooks to help instructors become familiar with the innovative educational tool, instructors may consider using e-Textbooks more often in teaching.

Introducing e-Textbooks into education is beneficial not only because of their desired and advanced features, but also because of the digital learning experience that can be brought by e-Textbooks. A comprehensive and correct understanding of how to effectively use e-Textbooks in education is far more important than just knowing what e-Textbooks are.

*Relative advantage.* Instructors prefer to e-Textbooks in higher education when they perceive e-Textbooks to surpass too much over printed textbooks. The relative advantages of e-Textbooks, which were recorded from instructors’ comments and suggestions on using e-Textbooks in the questionnaire, include but are not limited to: (a)



being “cheaper,” “easier,” and “lighter to carry” than traditional textbooks, (b) providing “participatory learning experiences for students”, (c) working with the interactivity brought by e-Textbooks “is a natural process for gaining information and transforming it into problem-solving and project-based learning”, (d) providing “student opportunities for interaction with built-in resources in the e-text such as videos, etc.”, (e) the project related feature helps the instructor to “develop activities related to course topics”, and (f) accessibility of e-Textbooks to “all materials I might need in one place/device--no more lugging around my body weight in text books” (see Appendix E & Appendix F). Those feedbacks from instructors support the positive relationship between relative advantages and certain innovation that had been demonstrated by Rogers (2003). When switching from printed textbooks to e-Textbooks, instructors consider those relative advantages for their students as mentioned above, such as lower cost, easier access, and more convenience. In other words, the more relative advantages of e-Textbooks are explored by instructors compared to printed textbooks, the more uses of e-Textbooks would be considered in teaching.

*Compatibility.* This refers to the degree that an innovation can be compatible with adopters’ previous experience, needs, etc. Compatibility of e-Textbooks is positively related to instructors’ use of e-Textbooks in teaching (Moore & Benbasat, 1991; Rogers, 2003); thus, the higher compatibility e-Textbooks with instructors’ previous teaching experiences and needs, the easier for instructors to use e-Textbooks in teaching. In this study, quite a few instructors mentioned compatibility is the reason that they choose e-Textbooks, especially for the online learning environment. As the distance education and learning management system (LMS) becomes more popular, more instructors need to

deliver courses materials online. The compatibility of e-Textbooks with online learning management systems (LMS) such as Blackboard, Moodle, and Desire2Learn, can help instructors “be able to make them (content) available inside the LMS, so students would have the material readily available by content module,” and e-Textbooks make it “easy to show or refer to pages in the text” in LMS environment (see Appendix E).

Another concern of e-Textbooks in teaching is the compatibility of e-Textbooks with students’ studying for “their comps, Praxis, and National Counselor Exams” (see Appendix F). Making textbooks compatible with exams, state standards, and national education policies (such as common core) is practical. If an institution wants to promote e-Textbooks in instruction, it has to consider the current situation and make e-Textbooks compatible to existing learning environments and standards, rather than over emphasizing its features.

*Image.* This is a perceived attribute of an innovation that can enhance adopters’ social status or prestige in their social system as defined by Moore and Benbasat (1991). There is a positive relationship between image and using e-Textbooks in teaching in higher education according to Rogers’ perceived attributes of innovation theory (2003). However, there were no relative comments related to the changing of social status perceived by instructors, which means that even if the data indicated that instructors agree upon the positive influence of image on using e-Textbooks in education, they would not take image as the primary reason when considering e-Textbooks in teaching.

*Result demonstrability.* Derived and developed by Moore and Benbasat (1991) from Rogers’ observability of an innovation, result demonstrability emphasizes the observability and communicability of using an innovation. There should be a positive

relationship between result demonstrability and instructors using e-Textbooks in teaching; the more demonstrable results of using e-Textbooks is in teaching, the more use of e-Textbooks is possible for instructors. Some instructors, who rejected e-Textbooks or were still hesitating on using e-Textbooks, gave their supports to the importance of demonstrating the result of using e-Textbooks in teaching. If certain benefits or results of using e-Textbooks could be demonstrated for instructors, they will have more confidence in adopting e-Textbooks as an innovation to replace traditional textbooks.

*Visibility.* According to Moore and Benbasat (1991), visibility of an innovation, developed from Rogers' demonstrability, refers to how much others can see an innovation being used. Similar to reliability in Moore and Benbasat's measurement, visibility did not emerge as one of not the main attributes perceived by instructors when using e-Textbooks. Non-adopters in this study mentioned that "(e-Textbooks) are not popular options among my colleagues" (see Appendix F) and so they did not use e-Textbooks by themselves, which could be counted as a support for the positive relationship between visibility of e-Textbooks and instructors using e-Textbooks in teaching.

*Voluntariness.* Referring to the free will of using an innovation, voluntariness is perceived by some instructors as a predictor of using e-Textbooks in teaching activities, "I am researching opportunities to utilize e-textbooks in more of my classes. I think the use of the e-textbooks is a positive movement and I am looking forward to getting smarter" (see Appendix F). Allowing instructors adequate time and space to experiment on using e-Textbooks in teaching would increase their confidence of promoting e-Textbooks in education. Although there were not adequate support from instructors to

support the significantly influence of voluntariness and visibility of e-Textbooks using e-Textbooks in teaching, it is still worthy of considering voluntariness as a perceived attributes in influencing e-Textbooks in education in a future study.

#### *Factors Prevent Instructors from Using E-Textbooks in Teaching*

In research question 3, several factors were discovered to prevent instructors from using e-Textbooks in higher education. In the questionnaire, the researcher of this study included the most possible and commonly existed factors in higher education that prevented instructors from using e-Textbooks based upon the literature review. The most often mentioned factors were instructors' "*preference to printed textbooks*" and less support from institutions to "*distribute e-Textbooks in class(es)*". Instructors had also specified a few reasons concerning to students' preference to printed textbooks and students' different learning styles. Reasons were also referred to the lack of availability of e-Textbooks and inadequate knowledge of e-Textbooks in relative teaching subjects. Other factors on the instructors' side included instructors' discouraging experience of using e-Textbooks and in meeting their teaching needs. Those factors that emerged from the questionnaire, instructors' specified reasons, and their comments assemble the factors that prevented instructors from using e-Textbooks, and provided recommendations for promoting e-Textbooks in education in further studies.

*Instructors' preference to printed textbooks.* Most instructors thought that printed textbooks still played a primary role in teaching, which is the primary reason that prevented them from using e-Textbooks. Even when there is a choice on the different formats of textbook, instructors would still prefer printed textbooks as a premier option for teaching. "Unfortunately, the printed ones are the natural default," commented by an

instructor from Tennessee. An instructor from Kentucky stated that “I have no problem with this (using e-Textbooks), (just) thought I prefer a print copy for my use.” Although there are so many relative advantages of using e-Textbooks in teaching as demonstrated in the literature review such as lower cost, more interactive activities, and flexible learning experience, e-Textbooks still cannot replace printed textbooks.

Instructors who have been using printed textbooks for years usually are those who have much difficulty switching to e-Textbooks within a short-time period. Just as an instructor from Alabama said, “Holding a pen in my hand to write notes in the margin is comfortable for me.” There were even instructors that expressed “No interest” in using e-Textbooks. Rogers defined relative advantage as the degree to which an innovation was perceived as being better than the idea it superseded by a particular group of users; in other words, if e-Textbooks were not perceived to be better than printed textbooks by instructors, there was no need for instructors to adopt e-Textbooks. Even for those instructors who are open to various formats of textbooks, they would still keep printed textbooks on hands, as specified by an instructor from Tennessee that “I still like to write on the pages of my books.” As a result, the “preference to printed textbooks,” to the greatest extent has prevented and even stopped instructors’ from using e-Textbooks in higher education.

*Less support from the institutions.* Less support from the institutions (not only technically, but also economically) makes instructors dare to adopt e-Textbooks in teaching. Instructors described a few situations of not being able to use e-Textbooks due to institutional unsupportiveness, such as “my university does not allow required e-text at this point,” “I have limited experience with e-books and it is not anything that our college

has discussed collectively,” “I would love to use an e-textbook but Educational Leadership has not caught up to this. Perhaps this is because our numbers are too small and thus not profitable,” and “Any new technology requires institutional support for effective implementation. Faculty at USM received minimal support from the institution for existing technology.”

As mentioned by Rogers, the diffusion of an innovation needs to occur in a certain social system that might be the whole society or an organization (Rogers, 2003). For adoption of e-Textbooks in teaching among instructors, the institution where the teaching activities happen is the social system. Thus, the policies and attitudes of the institution towards e-Textbooks will influence the adoption process. Less support from institutions makes instructors feel discouraged and restrained in their intentions and interests in using e-Textbooks, which negatively affect the future adoption of e-Textbooks.

*Concerns on students' learning experience.* Before adopting any innovative educational tool in a class, instructors always take students' needs into consideration first. Instructors would “just require the appropriate book for the class. It doesn't matter if a student uses an e-textbook or hard copy,” and “provide them (*e-Textbooks*) as an option for my students, but not requiring them... students should use the format they are most comfortable,” as commented by instructors from Alabama and Tennessee.

As reported by several instructors, students' indifference to e-Textbooks made it impossible to continue using e-Textbooks in teaching. However, this finding was adverse with Kissinger's study on e-Textbooks library (2011), which demonstrated that students' higher interest in using e-Textbooks in learning controverted with instructors' lower

intention of using e-Textbooks in teaching that resulted in the lower rate of using e-Textbooks on the instructors' side. In this study, instructors mentioned several times that their intention to use e-Textbooks in teaching had been prevented or even stopped by students' indifference to e-Textbooks, such as students' less interest in e-Textbooks and preference to printed textbooks, their unsupportive attitude towards e-Textbooks, their lack of devices to read e-Textbooks, their dislike on the semester-based availability of purchased e-Textbooks, and them "not converted to their use in this region," especially for those who already attempted to distribute teaching materials in e-Textbooks in teaching activities.

Applying e-Textbooks to the classes whose students have no or little knowledge of computers is a poor idea. An instructor from Mississippi commented that "students are non-traditional (older) students that are not as technologically savvy as I would like (different from the younger, traditional college-aged students) and do not always have reliable access to a computer, and therefore I do not incorporate e-textbooks very often in my courses." So, even if e-Textbooks had hundreds of relative advantages than printed textbooks as demonstrated by previous research, the less compatibility of them with students' previous knowledge and experience makes the adoption process more difficult to move forward. As agreed by several instructors from the four states, the primary concern of instructors who are planning to use e-Textbooks should be whether the innovation is suitable and acceptable for students' learning, and it has nothing to do with what format the textbooks are. Instructors could be open to e-Textbooks as an option, but they "would want (their) students to have the choice of using whichever version they prefer" and "not exclude those who may not want to read on their computer."

Moreover, balancing between students who use e-Textbooks and those who do not use e-Textbooks in the same class is difficult. Some instructors “recognize that (they) will run into problems regarding students who have access and prefer e-textbooks vs. those who do not,” as specified by one of the instructors from Mississippi. Instructors need to find a solution of using e-Textbooks in a class that has students who either use e-Textbooks or do not. Because there are increased numbers of instructors who provide e-Textbooks as an option for their students in class, it is necessary for them to treat this dilemma properly by designing proper learning materials, assigning different tasks to balance the usage, and evaluating the results of using e-Textbooks among students.

*Availability of e-Textbooks.* The availability of e-Textbooks in this study includes the availability of e-Textbooks in certain areas, the availability of qualified e-Textbooks, and the availability of basic knowledge of e-Textbooks. The lack of availability of e-Textbooks in certain subjects is a factor that prevents instructors from considering using e-Textbooks in teaching and cannot be controlled by instructors. There were a few instructors had mentioned the lacked availability of e-Textbooks in their study fields, such as, “Textbooks that I use are not available as e-texts (specified by an instructor from Alabama),” “So far, I have not found e-textbooks with the content I prefer (specified by an instructor from Kentucky),” and “there are no ebooks in the subject areas I teach, or there are no adequate texts in the area (specified by an instructor from Tennessee).” Not all available textbooks have both printed and electronic versions, which make adoption of e-Textbooks difficult.

Also, most publishers make e-Textbooks available with a limited life time. For instance, an instructor from Kentucky mentioned that “several of the titles I have used are



only available for 6 months, thus the learner cannot have access after the time is up and are not available after the end of the semester.” In this case, it is impossible for instructors to choose an e-Textbook that is not in the market, no matter whether instructors have their intentions to adopt e-Textbooks in teaching or not. The limited life of e-Textbooks assigned by publishers makes it impossible for the e-Textbooks to be owned like printed textbooks, even if it had been purchased. If publishers of e-Textbooks could open up a new or more practical methods for users to keep e-Textbooks longer, this might increase the use of e-Textbooks in education. The lack of availability also refers to the quality of e-Textbooks (e.g., its content, design, and value for teaching). To adopt an e-Textbook that with low quality is meaningless and not comfortable for instructors, as specified by an instructor from Mississippi, “the graphic-intense subject material needs quality illustrations, but most e-versions just have text.” No matter what format the textbook has, the quality of content should be considered seriously, as commented by an instructor from Kentucky, “I will eventually use e-textbooks when the technology improves to the point where it seems to eliminate, rather than create more, barriers, and when enough e-textbooks are available to accommodate the content I require.” There was an instructor, who had expressed the interest in using only qualified e-Textbooks:

(T)here are two main companies for books in my field that I respect and have found a lack of quality from other companies on the whole. If one of these two companies offered e-textbooks and provided substantial benefits not found in a print text, I would consider switching to an e-textbook.

The case above indicated that only qualified e-Textbooks can compete with printed textbooks in higher education. The e-Textbooks’ editors and publishers are

responsible to supervise and maintain a high quality of e-Textbooks for the possible future of e-Textbooks in education. Those ideas expressed from the instructors indicate strong concerns about the quality of e-Textbooks. Instructors' willingness to fully adopt e-Textbooks may become frustrated if they cannot locate e-Textbooks with desired quality from publishers. As a result, such an experience would decrease their intentions or interests to re-consider using e-Textbooks in the future. In this case, it is important for e-Textbooks' publishers to consider improving the quality of e-Textbooks to increase and attract more adopters of e-Textbooks in teaching.

Rogers (2003) defined the knowledge stage as the beginning point of an innovation adoption that brings knowledge of what the innovation is, how the innovation works, and why the innovation is needed. However, instructors' inadequate knowledge of e-Textbooks means the unprepared adoption process of using e-Textbooks. In higher education, the knowledge stage of adopting e-Textbook in teaching is not that positive. When being asked to provide any comments on using e-Textbooks in teaching, there was an instructor from Alabama who said "I think you are assuming everyone knows a great deal about e-textbooks," which indicated instructors' lack of knowledge of e-Textbooks. Instructors might have their potential interests in trying e-Textbooks, but without the proper knowledge it is hard for them to prepare for this process. There were instructors mentioning that "I think students simply don't know enough about e-texts"; and "I don't know enough about e-textbooks to know if they'd be a good option for students."

With the knowledge of e-Textbooks such as what e-Textbooks are, what e-Textbooks can do, how e-Textbooks work, etc., instructors are able to obtain a general idea of e-Textbooks, form attitudes towards e-Textbooks, and then move forward to the

next adoption stage. Without adequate knowledge of e-Textbooks on the knowledge stage, it would be difficult for instructors to grasp the advantages of using e-Textbooks in education or developing their own judgments on using e-Textbooks in teaching or continue their adoption experience of using e-Textbook smoothly, so that which predicts an urgent dissemination of knowledge of e-Textbooks among instructors if any institution would like to attempt e-Textbooks in teaching and learning.

*Using e-Textbooks is not special, helpful, or practical.* “There is nothing magical about E-textbooks. I allow my students to use the textbook format they prefer to use. The content is identical,” as commented by an instructor from Kentucky that pointed to the less competitiveness of e-Textbooks compared with printed textbooks in this instructor’s opinion. If instructors cannot be “convinced of the benefits of using e-Textbooks” or “aware of e-textbooks that can replace the textbooks (that) currently use,” stated by an instructor from Mississippi, using e-Textbooks was just like reading printed textbooks, and there was no need to adopt e-Textbooks for instructors.

If using e-Textbooks were not helpful or have “limited options” (specified by an instructor from Kentucky) for teaching activities, instructors will always take their teaching task in the first place without consideration of the advantages of e-Textbooks. A few instructors commented that they did not use e-Textbooks due to the unattractive content of e-Textbooks in their subject areas, for instance, “I’ve not found one in my subject area I like yet” (specified by an instructor from Alabama)” and “I have not found an e-text I am happy with for a class,” specified by an instructor from Alabama.

From the above comments of instructors, it is easy to tell that only when e-Textbooks match and assist with teaching and learning activities, could it be accepted by

instructors. To use or not use e-Textbooks is not dependent on how many advantageous features an e-Textbook possesses, but dependent on how much it can meet teaching and learning needs.

Different from those who had little or even blank experience of using e-Textbooks in teaching, some instructors had attempted e-Textbooks in their teaching, but with unhappy or even frustrated experiences. Here are three cases from instructors' real experience of using e-Textbooks:

Case 1: "I had two classes set up through myeducationlab and they changed the platform two days before class. Nothing online worked and I already sent out the syllabi. I hate technology not working and looking like a fool in a class." (Instructor from Alabama)

Case 2: "I asked my students to choose whichever format they want, they use a lot of online resources. I also attempted to use online tools provided by e-textbooks and it was a frustrating experience..." (Instructor from Alabama)

Case 3: "e\_textbooks are harder to use for me personally although I read a lot of ebooks for pleasure. Navigation is easier with printed books (i.e., flip to section needed, identify text needed, etc.)" (Instructor from Mississippi)

As indicated in the cases above, among the non-adopters of e-Textbooks, not all of them have blank experience with e-Textbooks; they were even adopters of e-Textbooks before giving up using e-Textbooks in teaching. As stated by Rogers' diffusion of innovation theory (2003), on the persuasive stage of the adoption process, there might be adopters who interrupt their adoption of innovation due to the perceived shortages of the innovation, which leads to the termination of the adoption process. A

frustrating experience with e-Textbooks may negatively affect instructors' judgments on using e-Textbooks in teaching, and even stop using e-Textbooks in teaching activities altogether, as described by the instructors.

Even if a positive relationship between e-Textbooks' perceived attributes and using e-Textbooks in teaching exists, as demonstrated previously, there are instructors who thought using e-Textbooks in teaching as something not practical, and stopped using e-Textbooks. An instructor from Kentucky commented that "They (e-Textbooks) cannot be shared with other students. I do not think they are practical," which was consistent with instructors' experience from Tennessee that "I find it inappropriate to use any form of textbook in a University setting and prefer research articles; I currently have not had the time to explore the use of e-textbooks." If using e-Textbooks is not something practical in teaching, there is no reason to adopt.

Other than the five factors discussed, there are other factors that emerged and should also be considered when adopting e-Textbooks in teaching. Some instructors mentioned that for them "e-textbooks are hard to use." An instructor from Tennessee shared the experience of using e-Textbooks:

"I keep watching them but they do not yet provide the ease of use. I survey my students and print still has more votes. (Interestingly, the pro-print has gotten stronger now that they've tried ebooks). They tell me ebooks are hard to read, to mark to do comparison of pages and the content just doesn't stick with them like print. Plus their eyes get tired faster."

The flexibility of using e-Textbooks for teaching and learning had also been questioned. "Flexibility of use is not a strength that I see in e-texts," as commented by an instructor

from Tennessee. In the literature reviews, a lot of researches and studies demonstrated that there were numerous advantages of e-Textbooks that made them supersede printed textbooks. In reality, the actual usages of e-Textbooks in teaching is not as advantageous as illustrated by e-Textbooks publishers and previous researches, which might be caused by instructors' inadequate knowledge of e-Textbooks or the not enough supports they obtained from institutions.

The expense of purchasing e-Textbooks is another factor that make instructors dislike using e-Textbooks. For some instructors, "E-textbooks are more expensive than printed textbooks," and "the prices on textbooks have risen to an outrageous level", which is especially true if taking the limited life time of e-Textbooks into consideration.

There are also a number of instructors that seldom or never used textbooks in teaching, which naturally prevent them from using any textbooks regardless of the format. For instance, an instructor from Alabama specified that "I use few textbooks of any kind," which was similar to instructors from Tennessee that "I generally prefer not to use textbooks at all." Further, open-source materials are on its way to compete with textbooks, just as an instructor from Kentucky commented "I don't use, I don't use textbooks at all, and I prefer to use and create Open materials."

Those explored factors that prevented instructors from using e-Textbooks in teaching indicate that to increase using of e-Textbooks in teaching in higher education is not only dependent on instructors' interest and their teaching responsibility, but also dependent on students learning style, publishers of e-Textbooks, teaching and learning goals, support from social systems, etc. Keeping those factors in mind will help and improve the adoption of e-Textbooks in teaching in higher education.

### Implications and Recommendations

Based upon discussions of the results of this study, the adoption of e-Textbooks in teaching is related closely with the instructors, e-Textbooks publishers, and institutions. Instructors make their own decisions of using or not using e-Textbooks in teaching depending upon their knowledge of e-Textbooks, their teaching purposes, and the perceived attributes of e-Textbooks. This perception can also be influenced by various policies of their institutions and e-Textbooks publishers.

Recommendations invite instructors, institutions, e-Textbooks publishers, and instructional designers to come together and promote the adoption of e-Textbooks in higher education based on the discussion of data analysis. Providing supports to adopters of e-Textbooks and creating friendly environments for current non-adopters of e-Textbooks can help the diffusion of e-Textbooks. Further research has also been suggested to conduct follow-up interviews with adopters and non-adopters of e-Textbooks to acquire a more comprehensive understanding of using e-Textbooks in higher education and make proper adjustments for the current adoption of e-Textbooks in teaching.

Although not all research questions in this study have significant findings, and the acceptance rate of e-Textbooks are still uneven, the situation does have a promising future of in promoting e-Textbooks in higher education with their perceived attributes by instructors. The factors that have been explored in this study have also provided valuable perspectives for instructors, institutions, e-Textbooks publishers, researchers of online learning, and instructional designers to consider any possible improvements of using e-Textbooks in higher education.

First, before introducing e-Textbooks into teaching, instructors need to fully consider the eight perceived attributes of e-Textbooks to completely evaluate the pros and cons of using e-Textbooks in teaching. They also need to examine how these can help balance between the technology and course content when using e-Textbooks, and provide sufficient support for students' using e-Textbooks in learning. Only with a comprehensive understanding and full preparation of using e-Textbooks in teaching, can instructors have a successful, or at least, not frustrating experience with e-Textbooks. At the same time, the advantages of e-Textbooks can be fully demonstrated in education, which will also help eliminate any misunderstandings of e-Textbooks such as e-Textbooks being hard to use that might be caused by inadequate knowledge of e-Textbooks. If an institution wants to promote e-Textbooks in instruction, it has to consider the current situation of using e-Textbooks and make e-Textbooks compatible to the existing learning environment and standards, rather than over emphasizing e-Textbooks' advantageous features regardless of where and how to use e-Textbooks in education.

Second, institutions have responsibilities to assist instructors to adopt and spread any innovation in education, technically and economically. Without support from the entire social system, which can be the whole society, a school, an organization, or community, the adoption of any innovation is truly an individual action and impossible to move forward. If possible, institutions should (a) propagate the knowledge of e-Textbooks, which includes an overview of the knowledge of e-Textbooks (what they are, what features they possess, etc) and a clear explanation of the advantages of e-Textbooks with simple examples, and exemplify how to work with e-Textbooks in education; (b)



provide relative devices such as e-Book readers, the Internet, Laptop, etc., and adequate technical support to instructors; and (c) assist instructors in using e-Textbooks' demonstrated features to improve their teaching, especially for those who have strong intention of adopting e-Textbooks in education. The decision to adopt an innovation should not only be made on a personal level, but also be supported by other entities that can help create a collaborative environment. If only pockets of individuals adopted e-Textbooks in colleges and universities without any external support, the adoption of e-Textbooks cannot take place on a larger level.

Third, compared with traditional textbooks, e-Textbooks have advantages in many aspects such as lower cost, lighter to carry, interactivity between teaching and learning, etc. But, its limited availability restricts instructors, students, and even institutions to use using e-Textbooks with a longer term. Currently, it only allows users to purchase an e-Textbook with a 6-month license. E-Textbook publishers should not only contribute to develop new features of e-Textbooks, but also consider a proper method to extend the life of e-Textbooks for users. Moreover, if e-Textbook publisher can consider integrating e-Textbooks within digital learning and link e-Textbooks to other digital learning platforms such as learning management systems, it will increase the possibility of using e-Textbooks in a digital learning environment, just as an instructor from Tennessee commented, "I would like to be able to make them available inside the LMS (Desire2Learn) so students would have the material readily available by content module."

Fourth, with a better understanding of the perceived attributes of using e-Textbooks in teaching and the factors that prevent instructors from using e-Textbooks,

instructional technologists and designers should work with faculty collaboratively on course design. Instructional designers can help with the design, development, and delivery of courses in a more efficient way using those attributes and factors of e-Textbooks that have shown promise. Adapting the full array of features and functions of e-Textbooks to help meet the requirements of different course content, instructors can then integrate e-Textbooks with ease in the classroom.

#### Limitations

There are some limitations of this study. First, the results and related findings come from regional public universities. Results may not be generalizable to other educational levels or other regions in the U.S. Only states in the east south central region were included, which limits the ability of this study to be generalized to the general population. Further investigations need to be conducted to broaden the scope of universities included.

Second, this study focused on instructors from Colleges of Education, which naturally connect with teaching and learning. Instructors from these colleges are generally concerned with student learning and may be more likely to adopt any form of educational tool to help with the learning process. Thus, teaching-oriented innovations may be more acceptable in this case with Colleges of Education as compared to others.

Third, a pilot study was not conducted to test the instrument. The Cronbach's Coefficient Alpha test of reliability had been applied before data analysis in Chapter IV and showed an acceptable internal consistency (above 0.8) for the scale measurement. However, the instrument needed modifications on the questionnaire to fit the entire population of instructors in higher education in the east south central region. Some of the

statements and questions on the instruments could have been reworded, others added, and some removed.

Fourth, the responses were limited by the participants' willingness to honestly self-report the data and this depended upon their ability to recall information accurately. The comments provided by instructors were all voluntarily and individual, which could supply ideas to improve e-Textbooks use in teaching. However, their recollection may not be able to represent participants as a whole.

Fifth, the statistical analysis is conducted based on the non-normal distribution of the dependent and independent variable data. The use of non-parametric analyses allows the identification of a relationship, but limits the power of the results.

#### Recommendations for Further Research

There are a number of suggestions that can help guide further research into this area. First, an in-depth qualitative research study can help present a deeper and more precise understanding of the adoption process of e-Textbooks in higher education. One recommendation is to conduct in-depth interviews with participants who had responded to this study of using e-Textbooks in higher education. In-depth interviews with those instructors can provide more detailed information of their experiences with e-Textbooks, especially with those who rejected e-Textbooks in teaching. Obtaining facts of participants' positive and negative experiences could be explored further to help clarify information given on a survey instrument.

Case studies in which someone follows a person through the process of integrating e-Textbooks is also recommended by the researcher. A few instructors provided comments based on their own situation of using e-Textbooks. Following up on

these instructors and performing case studies could be helpful to examine the environments where these instructors are using e-Textbooks and how the integration process is being conducted over a longer period of time. Such case studies could establish a foundation of why e-Textbooks may not have been adopted, or vice versa.

In this study, only public universities in the east south central region have been examined. Thus, another recommendation would be to generalize the scales measurement to a larger population, for instance, the entire southern region or all types of universities in the east south central region such as public, private, online, etc. The adoption of e-Textbooks in public universities might be different from private universities or colleges and community schools. Findings from a wider range of data analysis of the adoption process of using e-Textbooks among all types of universities could be more beneficial and comprehensive for teaching and learning in higher education.

The third recommendation is to conduct several possible analyses of variance (ANOVA) to examine the internal and external relationship between demographic information and using e-Textbooks based on a larger population. For instance, does age and academic rank together influence instructors using e-Textbooks in teaching. In this study, only Chi-square tests of independence have been performed with no significant findings. Thus, trying to discover reasons behind these findings is necessary to develop a more well-designed study.

## APPENDIX A

## INSTITUTIONAL REVIEW BOARD APPROVAL



THE UNIVERSITY OF  
SOUTHERN MISSISSIPPI

---

**INSTITUTIONAL REVIEW BOARD**

118 College Drive #5147 | Hattiesburg, MS 39406-0001

Phone: 601.266.5997 | Fax: 601.266.4377 | [www.usm.edu/research/institutional-review-board](http://www.usm.edu/research/institutional-review-board)

**NOTICE OF COMMITTEE ACTION**

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months. Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: **14010201**

PROJECT TITLE: **Perceived Attributes Influencing Instructors' Adoption of Electronic Textbooks in Higher Education**

PROJECT TYPE: **New Project**

RESEARCHER(S): **Sirui Wang**

COLLEGE/DIVISION: **College of Education and Psychology**

DEPARTMENT: **Curriculum, Instruction and Special Education**

FUNDING AGENCY/SPONSOR: **N/A**

IRB COMMITTEE ACTION: **Expedited Review Approval**

PERIOD OF APPROVAL: **02/10/2014 to 02/09/2015**

**Michael Madson, Ph.D.**  
**Institutional Review Board**

APPENDIX B

THE UNIVERSITY OF SOUTHERN MISSISSIPPI CONSENT FORM FOR

PARTICIPANTS

**THE UNIVERSITY OF SOUTHERN MISSISSIPPI  
AUTHORIZATION TO PARTICIPATE IN RESEARCH PROJECT**

Participant's Name \_\_\_\_\_

Consent is hereby given to participate in the research project entitled  
PERCEIVED ATTRIBUTES INFLUENCING INSTRUCTORS' ADOPTION OF ELECTRONIC  
TEXTBOOKS IN HIGHER EDUCATION. All procedures and/or  
investigations to be followed and their purpose, including any experimental procedures, were explained  
by

by Sirui Wang. Information was given about all benefits, risks, inconveniences, or  
discomforts that might be expected.

The opportunity to ask questions regarding the research and procedures was given. Participation in the  
project is completely voluntary, and participants may withdraw at any time without penalty, prejudice, or loss  
of benefits. All personal information is strictly confidential, and no names will be disclosed. Any new  
information that develops during the project will be provided if that information may affect the willingness to  
continue participation in the project.

Questions concerning the research, at any time during or after the project, should be directed  
to Sirui Wang at (601)-620-3285. This project and this consent form have been reviewed by the Institutional  
Review Board, which ensures that research projects involving human subjects follow federal regulations.  
Any questions or concerns about rights as a research participant should be directed to the Chair of the  
Institutional Review Board, The University of Southern Mississippi, 118 College Drive  
#5147, Hattiesburg, MS 39406-0001, (601) 266-5997.

*Use the following only if applicable.* The University of Southern Mississippi has no mechanism to provide  
compensation for participants who may incur injuries as a result of participation in research projects. However,  
efforts will be made to make available the facilities and professional skills at the University. Information  
regarding treatment or the absence of treatment has been given. In the event of injury in this project, contact  
treatment provider's name(s) at telephone number(s).

A copy of this form will be given to the participant.

\_\_\_\_\_  
Signature of participant

\_\_\_\_\_  
Date

Sirui Wang  
\_\_\_\_\_  
Signature of person explaining the study

December 10, 2013  
\_\_\_\_\_  
Date

APPENDIX C  
QUESTIONNAIRE OF THE STUDY  
(SCREEN CAPTURED FROM QUALTRICS WEBSITE)

Qualtrics Survey Software

Page 1 of 5

## Consent Form

Standard research disclaimer and consent

**THE UNIVERSITY OF SOUTHERN MISSISSIPPI AUTHORIZATION  
TO PARTICIPATE IN RESEARCH PROJECT**

Consent is hereby given to participate in the research project entitled:

**Perceived Attributes Influencing Instructors' Adoption of e-Textbooks in Higher Education**

All procedures and/or investigations to be followed and their purpose, including any experimental procedures, were explained by SIRUI WANG. Information was given about all benefits, risks, inconveniences, or discomforts that might be expected.

- Purpose

This study investigates factors instructors perceive as impacting their decisions to adopt e-Textbooks in higher education settings, and collects demographic information regarding instructors who have decided to adopt e-Textbooks in higher education (adopters) and those that have not made their decision or even rejected e-textbooks (non-adopters). Results will provide quantitative evidence for promoting the integration of digital content in higher education.

- Procedures

You will be asked to complete a questionnaire about the perceived attributes of using e-Textbooks in higher education. The questionnaire will take approximately 10-15 minutes. Questions are designed to determine the reasons affecting your decisions to use, or not to use, e-Textbooks in the higher educational setting. This questionnaire will be conducted with an online Qualtrics-created survey. Any information you provide will be kept confidential and neither your identity nor your institution will be revealed.

- Benefits

While there might not be immediate direct benefit to you for participating in this study, it is hoped that the results of this study will provide information to higher educational settings concerning facilitating education digitally and collaboratively by delivering content digitally, providing multiple methods to make students interact more with the learning content, and personalizing learning experiences. Furthermore, the results and findings of this study will provide statistical evidence for instructors who may consider using involving e-Textbooks in their classrooms in the future.

- Risks

There is no anticipated or potential risk for participants because of the nature of this study. The study does not intend to impose any type of treatment upon the participants or change their points of view. Instead, the research tries to explore perceived attributes by the participants best as possible without influencing participants' behavior or participants' opinions.

- Confidentiality

Confidentiality will be maintained throughout the study in that participants' responses to the survey will not be disclosed to anyone outside the study during the research. Data collected will remain in the possession of the researcher herself. Only the researcher of this study will access participants' information to assure confidentiality. After the study has been completed, data collected from participants will be shredded by the researcher one year after the research complete to ensure confidentiality.

- Participation

The opportunity to ask questions regarding the research and procedures have been given. Participation in the project is completely voluntary, and participants may withdraw at any time without penalty, prejudice, or loss of benefits. All personal information is strictly confidential, and no names will be disclosed. Any new information that develops during the project will be provided if that information may affect the willingness to continue participation in the project.

- Questions about the Research

Questions concerning the research, at any time during or after the project, should be directed to Sirui Wang at (601)-620-3285. This project and consent form have been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, (601) 266-5997.

Completion of the following questionnaire indicates your consent to participate in the research and for the anonymous and confidential data collected from the survey to be used for the purposes described above.

### Survey

In this research, "**e-Textbook**" refers to a "textbook in its digital form or textbooks converted into a digital form or in a computer file format to be displayed on a computer screen or read on a computer through a network or viewed on a dedicated portable device or read on all types of computers or formatted for display on eBook readers".

### Section 1: e-Textbook Usage

How often do you use e-Textbooks in your teaching?

- Always
- Very Often
- Fairly Many Times
- Occasionally
- Never

### Section 2: Reasons for Using e-Textbooks

Read the following statements and rate your opinion.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
My use of e-Textbooks in my teaching is voluntary.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My administrator does not require me to use e-Textbooks in my teaching.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using e-Textbooks makes my teaching easier.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Using the e-Textbooks improves the quality of my teaching.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using e-Textbooks helps me accomplish teaching tasks more quickly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using e-Textbooks enhances my efficiency in accomplishing academic tasks except teaching, such as research.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using the e-Textbooks gives me greater control over my academic career.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Using e-Textbooks is compatible with all academic aspects of my work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I think using e-Textbooks fits well with the way I like to work.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using e-Textbooks fits into my teaching style.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In my department, people who use e-Textbooks have more prestige than those who do not.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People who use e-Textbooks in my institution have a high profile.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using e-Textbooks in teaching activities is a status symbol in my department.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using e-Textbooks is often frustrating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Overall, I believe that e-Textbooks is easy to use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My interaction with e-Textbooks in teaching is clear and understandable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning to use an e-Textbook is easy for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It is easy for me to have an e-Textbooks do what I want them to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The results of using e-Textbooks are apparent to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe I could communicate to others the consequences of using e-Textbooks in teaching.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would have no difficulty telling others about the results of using an e-Textbook.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I would have difficulty explaining why using e-Textbook may or may not be beneficial.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
E-Textbooks are not very visible in my college.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In my department, one sees e-Textbooks being used in many classes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have seen what others do with e-Textbooks in teaching activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have had a great deal of opportunity to try various e-Textbooks formats, such as .txt, .pdf, .chm, .epub, .html, .ibooks.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Before deciding whether to use any specific e-Textbooks or e-Readers, I am first given the opportunity to properly try them out.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I am permitted to use e-Textbooks on a trial basis long enough to see what they do.



### Section 3: Demographics

What is your gender?

- Male
- Female

How would you describe your ethnic/cultural/racial background (e.g., White, Black, Asian, Latin, Hispanic, Native-American, Middle-Eastern)?

- White
- Black
- Asian
- Latin
- Hispanic
- Native-American
- Middle-Eastern
- Other, please specify

What is your age group?

- 20-29
- 30-39
- 40-49
- 50-59
- 60 or above

What is your academic rank?

- Instructor
- Assistant Professor
- Associate Professor
- Professor
- Other (please specify)

**What is your field of study? (Multiple Answer)**

- |  |  |
|--|--|
| <input type="checkbox"/> Child and Family Studies                  | <input type="checkbox"/> Music Education                             |
| <input type="checkbox"/> Curriculum and Instruction                | <input type="checkbox"/> Psychology                                  |
| <input type="checkbox"/> Educational Leadership and Administration | <input type="checkbox"/> School Counseling                           |
| <input type="checkbox"/> Educational Studies and Research          | <input type="checkbox"/> Special Education                           |
| <input type="checkbox"/> Instructional Technology and Design       | <input type="checkbox"/> Sports Education                            |
| <input type="checkbox"/> Library and Information Science           | <input type="checkbox"/> Other (Please specify) <input type="text"/> |

**Which of the following barriers prevent you from using e-Textbooks for teaching? (Please select all that apply.)**

- I am not interested in e-textbooks.
- I prefer printed textbooks.
- There is limited technological support in my department regarding integrating e-textbooks.
- E-textbooks are hard to use.
- E-textbooks are more expensive than printed textbooks.
- I don't have e-Readers to distribute e-Textbooks in my class(es).
- Other (Please specify)

Please provide any additional comments regarding your reasons for using or not using e-textbooks in education.

## APPENDIX D

## INTERNAL CONSISTENCY RELIABILITY OF THE CONSTRUCTS

Construct	Item	Alpha
Voluntariness	2	.796
Relative advantage	5	.863
Compatibility	3	.845
Image	3	.933
Ease of use	5	.429
Result demonstrability	4	.793
Visibility	3	.568
Trialability	3	.729

## APPENDIX E

TABLES OF DESCRIPTIVE ANALYSIS OF FACTORS PREVENTING  
INSTRUCTORS FROM USING E-TEXTBOOKS IN TEACHING

State	Factors	Response	Percentage
MS	I am not interested in e-textbooks.	11	19%
	I prefer printed textbooks.	31	54%
	There is limited technological support in my department regarding integrating e-textbooks.	10	18%
	E-textbooks are hard to use.	6	11%
	E-textbooks are more expensive than printed textbooks.	2	4%
	I don't have e-Readers to distribute e-Textbooks in my class(es).	25	44%
			17
Other (Please specify)	No barriers		
	e_textbooks are harder to use for me personally although I read a lot of ebooks for pleasure. Navigation is easier with printed books (i.e. flip to section needed, identify text needed, etc. availability of appropriate text in e-format		
	students are not as receptive to ebooks and request hard copy books		
	none of the above		
	The graphic-intense subject material needs quality illustrations. Most e-versions just have text.		
	students don't purchase them		
	I am not aware of e-textbooks that can replace the textbooks I currently use.		
	I am interested in using e-texts to a greater extent, but there always seems to be a mismatch between when I have the time to review their features and when they can be made available to me or when a rep can help.		
	some of my texts are not available in etexts at this point		
	My classes are online and most of the books we use do not have an e-Textbook options.		
	Process		
	It depends on the availability of ebooks. Students have the option of e-text or traditional print text. It's completely up to them.		
No barriers			
I am not convinced of the benefits of using e-Textbooks.			
I prefer to give students the option of print OR e-books. Their			

	preferences are important and I don't believe everyone is comfortable with e-books yet.		
TN	I am not interested in e-textbooks.	14	17%
	I prefer printed textbooks.	27	32%
	There is limited technological support in my department regarding integrating e-textbooks.	20	24%
	E-textbooks are hard to use.	5	6%
	E-textbooks are more expensive than printed textbooks.	3	4%
	I don't have e-Readers to distribute e-Textbooks in my class(es).	27	32%
		29	35%
Other (Please specify)	<p>none in subject area</p> <p>no barriers</p> <p>I generally prefer not to use textbooks at all. I'd rather use readers that incorporate material from various sources.</p> <p>Less options than printed textbooks availability in the text I want to adopt</p> <p>I am open to textbooks, but I like to take notes and highlight key information to use in class--I am unsure how to organize notes electronically that are just as effective at highlighting (and, being able to quickly) find the information</p> <hr/> <p>We have set texts and I am not sure if they are available in e format.</p> <p>Finding good E-textbooks to use</p> <p>haven't had the opportunity to utilize them</p> <p>No experience with them, especially flexibility of use for notating, dog-earing, etc.</p> <p>I haven't really thought about it</p> <p>The ones available for my courses are weak (or there aren't any available) in content. Plus ebooks are poor for science--tables, graphs are often difficult to read and one cannot easily compare two pages, often necessary for dense material.</p> <p>I still like to write on the pages of my books.</p> <p>Unsure of students platform</p> <p>N/A</p> <p>I have no preference</p> <p>Students lack the technology to support e-textbooks</p> <p>Have not found any that apply to my field of study</p> <p>I do not use textbooks and prefer research articles</p> <p>None</p> <p>My textbooks are not available as etexts</p> <p>None of these</p> <p>not all students have tablet access for use of stats texts and</p>		

	<p>tables in the classroom</p> <p>I am an Administrator and teach only one course a year and up to this point e-texts were unavailable for the courses I have taught.</p> <p>No immediate need or availability.</p> <p>I would like to use e-textbooks, but I am not the Professor of Record for the courses I teach.</p> <p>Text not available</p> <p>none</p>		
	Students prefer printed textbooks		
AL	I am not interested in e-textbooks.	18	17%
	I prefer printed textbooks.	40	38%
	There is limited technological support in my department regarding integrating e-textbooks.	21	20%
	E-textbooks are hard to use.	6	6%
	E-textbooks are more expensive than printed textbooks.	4	4%
	I don't have e-Readers to distribute e-Textbooks in my class(es).	41	39%
		39	37%
Other (Please specify)	<p>students' choice to use printed textbooks</p> <p>There are no barriers that prevent my using e-Textbooks for teaching.</p> <p>Availability</p> <p>Quality of etexts</p> <p>Print is too small on my screen</p> <p>i give students a choice when they have both</p> <p>Not all of my students seem ready for ebooks.</p> <p>Never considered it</p> <p>e-readers are sometime limited during day classes</p> <p>I am open to the learning style in which my student feel comfortable with in reference to the device in which he/she use in the classroom to complete assignments.</p> <p>I just require the appropriate book for the class. It doesn't matter to me if a student uses an e-textbook or hard copy.</p> <p>I just havent had time to read them and view all the videos. I want to though.</p> <p>Never thought about it.</p>		
	see comment below		
	<p>I do not use publisher created textbooks</p> <p>I am not familiar with e-textbooks</p> <p>It is difficult to find a methods book in social science education that provides quality examples.</p>		

	<p>The publishers I use don't always have e-textbooks available</p> <p>None</p> <p>See below</p> <p>I don't know of any for science education</p> <p>Selection of textbooks will vary based on learning outcomes.</p> <p>Not opposed, just haven't been teaching very long to see about other possible ways to distribute reading materials</p> <p>I don't use textbooks</p> <p>availability of books</p> <p>I allow students to use texts in any form available at the least expense to them. I do not specify printed or e-textbook.</p> <p>No barriers.</p>		
	<p>just have never thought about or investigated using them in my classes</p> <p>I have no knowledge of e-textbooks and their usage.</p> <p>no barriers just never considered before</p> <p>In my experience, I haven't had barriers. If I'm not able to assist students if they have technical difficulties, I direct them to my book representative...</p> <p>I've not found one in my subject area I like yet.</p> <p>not available for texts I use</p> <p>I use few textbooks of any kind.</p> <p>Students appear to prefer printed books; technology tend to make them uneasy; i have nontraditional students</p> <p>Students who are not ready for eText books.</p>		
	<p>We give our students the choice for E texts or Print texts and most like print, I am open either way</p> <p>None</p> <p>I haven't considered it before but am very open to it.</p>		
KY	I am not interested in e-textbooks.	9	12%
	I prefer printed textbooks.	26	36%
	There is limited technological support in my department regarding integrating e-textbooks.	12	16%
	E-textbooks are hard to use.	3	4%
	E-textbooks are more expensive than printed textbooks.	1	1%
	I don't have e-Readers to distribute e-Textbooks in my class(es).	11	15%
		33	45%
Other	<p>I don't use textbooks at all. I'm a HUGE proponent of Open Education, and I can no longer in good conscience ask my students to buy textbooks.</p> <p>So far, I have not found e-textbooks with the content I prefer</p>		



(Please  
specify)

Materials not available

The use of e-textbooks is up to the students and so far they haven't chosen to use them. They prefer printed versions.

Limited titles

adoption presents problem for bookstore

Not all students have access to e-readers

None

No barriers

No barriers

I have not seen applicable texts in my field.

availability

I am forced to provide an answer, but the truth is that there are no barriers

There are no particular barriers.

no Barriers

I have not previously considered e-Textbooks.

Unfamiliar on how to access for students

I prefer students having the printed AND online access

Have not yet explored all the e-textbook options.

I am willing to do so, but simply have not done so

I haven't really seen the option available for the textbooks I use.

comfort and personal preference

the challenges to shift and depend on failing technology

I don't mind if students use electronic versions of the text, but I do not require them to.

student resistance

Not all texts I need are available as ebooks, and sometimes the technology fails in class when I need the book

none - i don't have a problem

i use etextbooks when the publisher makes them available to me

I will be adopting one next semester for an online marketing course.

No reason

limited options

Not all students are interested in using them.

## APPENDIX F

TABLES OF COMMENTS FROM INSTRUCTORS OF USING E-TEXTBOOKS IN  
TEACHING

State	Comments on using e-Textbooks in teaching
MS	<p>I love ebooks. I think they are easier to lighter to carry</p> <p>I feel indifferent to e-textbooks. The textbooks I use for some of my undergraduate classes are available for purchase by students in an electronic format (which is acceptable) but I don't emphasize or do anything different in regards to some students choosing to purchase an e-textbook.</p> <p>I allow my students to use them if they are available. I do not like to read electronically because of migraines/eye strain and like to write in the books. I choose books according to the content, what is most appropriate for the course, not if it is electronic or not.</p> <p>my online students tend to prefer e-textbooks</p> <p>I am not against them; I just haven't explored that option yet.</p> <p>All of the textbooks that I use in my courses have an e-textbook option, but students rarely purchase them and instead by books in print</p> <p>I am not opposed to using e-textbooks, I am just not familiar with them.</p> <p>Any new technology requires institutional support for effective implementation. Faculty at USM receive minimal support from the institution for existing technology.</p> <p>My students have the option to purchase hard copies or e-textbooks, and some have purchased e-textbooks. I like being able to pull up e-textbook pates in class. Some tables that appear in hardback texts to not appear the e-textbook versions.</p> <p>I teach online classes so using e-textbooks makes it easy to show or refer to pages in the text.</p> <p>They are not popular options among my colleagues.</p> <p>Many of my students are non-traditional (older) students that are not as technologically savvy as I would like (different from the younger, traditional college-aged students) and do not always have reliable access to a computer, and therefore I do not incorporate e-textbooks very often in my courses.</p> <p>I recognize that I will run into problems regarding students who have access and prefer e-textbooks vs. those who do not</p>
TN	<p>there are no ebooks in the subject areas I teach, or there are no adequate texts in the area</p> <p>I like providing them as an option for my students, but not requiring them. I think students should use the format they are most comfortable.</p> <p>My students can purchase the books via e-textbooks, but I personally don't use them. This is a student decision.</p>

---

I keep watching them but they do not yet provide the ease of use. I survey my students and print still has more votes. (Interestingly, the pro-print has gotten stronger now that they've tried ebooks. They tell me ebooks are hard to read, to mark to do comparison of pages and the content just doesn't stick with them like print. Plus their eyes get tired faster.

I do not intentionally use or not use e-textbooks; I simply allow students to use an e-text version if it is available for the book I am using.

Lack of experience and exposure

I have not found an e-text I am happy with for a class. I would produce my own but am unsure of a product that would produce a cross platform e-text other than HTML and CSS so why not just do a web page?

I find it inappropriate to use any form of textbook in a University setting and prefer research articles as these are more timely and peer reviewed

I really don't have any experience with them and I am concerned about the students having problems with technology.

I currently have not had the time to explore the use of e-textbooks.

Unfortunately, the printed ones are the natural default:( There will be a learning curve and I am going to need additional time and interest from my students before making that happen.

I would like to be able to make them available inside the LMS (Desire2Learn) so students would have the material readily available by content module.

E-textbooks will soon dominate the college market. They are cheaper, easier to update, and provide participatory learning experiences for students. College students are largely digital natives. To them working with interactive e-textbooks is a natural process for gaining information and transforming it into problem-solving and project-based learning.

I simply don't know enough about E-textbooks to speak with any authority, but I prefer face-to-face discussions in class over on-line classes, so that bias carries over to textbooks.

I used an on-line text because it was free for students and better than anything I could buy.

Flexibility of use is not a strength that i see in e-texts

My classes are project based. I pull up to date information from a variety of Internet sources. These resources are relevant and free.

---

- 
- AL I'm sure many students would prefer e-textbooks. However, I also have many seasoned students who would prefer a printed copy just as I do. Holding a pen in my hand to write notes in the margin is comfortable for me.
- All the information for my courses are on Blackboard. I have modules and they have the information for the class objectives. I do not use printed text except for APA 6th ed.
- I have used one e-textbook for class prep. There was no real advantage and search took longer than using a book. I can see students begin happier using an iPad or the like to read
- As a Professional Educator, I am flexible in my teaching strategy because of

the ever changing format required in teaching student in today's world.

I think you are assuming everyone knows a great deal about e-textbooks.

I feel like I should review all features before to make sure they work. I had two classes set up through myeducationlab and they changed the platform two days before class. Nothing online worked and I already set out the syllabi. I hate technology not working and looking like a fool in a class.

I teach all graduate courses on line. The information needed to succeed is on line in Blackboard.

Because I do not teach online, nor have I ever used an e-textbook myself, I do not consider e-textbooks when planning for a class. If I choose a textbook that offers an electronic version, then the student is welcome to purchase that instead of the paper copy. Until now, I have not written that option in my syllabus, but after taking this survey, I will. Students need options.

It is difficult to find a methods book in social science education that provides quality examples. I have also not seen anything that an e-textbook offers that would induce me to switch. There are two main companies for books in my field that I respect and have found a lack of quality from other companies on the whole. If one of these two companies offered e-textbooks and provided substantial benefits not found in a print text, I would consider switching to an e-textbook.

I use mostly peer-reviewed journal articles in my courses that are taken from electronic databases offered through our Library. Textbooks are adjunctive material and do not comprise the bulk of our reading assignments.

No interest

Student opportunities for interaction with built-in resources in the e-text such as videos, etc. are a strong influence in my decision to use an e-text

Some of our faculty have gone to e-books, but they are based in another building. I have thought about incorporating them so maybe this is my push.

I like for students to keep textbooks that would help them study for their comps, Praxis, and National Counselor Exams

I prefer to teach using a seminar format as opposed to showing power point and lecturing. I develop e-books because I can develop activities related to course topics. projects related

My students are free to use e-text if they prefer. My university does not allow required e-text at this point

I'm not opposed to e-textbooks; I'm still figuring out my courses and how I want to teach them, so the topic of e-textbooks hasn't crossed my mind. Also, I don't usually assign 'textbooks' in the sense of a very expensive hardcover book. When I assign books -- in addition to articles -- I go for 'tradebooks' written by practitioners. I'm happy to talk with you more about how I conceptualize the difference between tradebooks and textbooks. This may not be the best format.

I may not understand exactly what you mean by e-textbooks. I adopted an e-textbook one semester, because the publisher rep said it has all these great online supplemental features like videos, case studies, etc. It was designed more like a whole online course that came with the e-text. I felt it was too "canned" and prescriptive, and even too elemental for what I wanted to include

in this course in Ed. Leadership. It was for someone who wanted to go off and leave a course to the students to do independently, really. Now, on the other hand, I have had students buy the kindle version of texts I have adopted and I have no problem with them doing that, but certainly don't require it. I don't know if that is what you mean by e-text or not.

My students are free to purchase e-books if they exist for the texts we use, but I do not promote it.

Some of my students probably have them, but I do not personally use them for class.

The texts that I use are not available in e-format yet.

Students are allowed to purchase e-texts, but they are not required to do so.

I prefer used textbooks that do not cost as much for my students. The prices on textbooks has risen to an outrageous level.

The use of e-Textbooks has enhanced the quality of my teaching and given students the opportunity to integrate technology into their lives as they pursue their education.

I have limited experience with e-books and it is not anything that our college has discussed collectively.

I'm open to using e-textbooks but have always used traditional textbooks because of lack of information.

Have not considered e-textbooks before

I am provided with print copies of the textbook in courses that I teach. Some of my students use e-books which is fine with me...

Textbooks that I use are not available as e-texts.

We give our students the choice for E texts or Print texts and most like print, I am open either way

Although I may not use e-textbooks, my students have the choice to purchase either the printed textbook or the e-textbooks.

E-textbooks are less expensive for students -- THIS is the primary reason I offer them as alternative to print textbooks.

It is up to the student which format they use. I really don't care. I prefer printed, for me, because I write in the text book.

I am not really familiar with them.

Haven't really ever tried one so not sure of the experience

---

KY Faculty need to be made aware of the benefits and then trained on how to use any new technology....and then supported.

No comments

See above comment--it's not just e-textbooks I don't use, I don't use textbooks at all. I prefer to use and create Open materials.

I will eventually use e-textbooks when the technology improves to the point where it seems to eliminate, rather than create more, barriers, and when enough e-textbooks are available to accommodate the content I require.

I think students simply don't know enough about e-texts. Some of my undergrads have tried them, but didn't like having to haul their technology with

them in order to look something up in the textbook. They found the printed version more convenient to use.

E-textbooks have a limited life for students and they cannot be read everywhere. They cannot be shared with other students. I do not think they are practical. I think they are ok for the moment, but I want my students to have access to their text books anywhere they go. If the textbooks were recorded, then maybe I would be more interested in using them.

Several of the titles I have used are only available for 6 months, thus the learner cannot have access after the time is up.

I use e-texts because it's convenient to have access to all materials I might need in one place/device--no more lugging around my body weight in text books!

none

I do not use e-readers for personal reading and would need much support to use e-texts. My students have not expressed interest in e-texts; therefore, I have not looked into using them.

Some of my students purchase e-textbook edition of the textbooks I adopt. I have no problem with this, though I prefer a print copy for my use.

I would love to use an e-textbook but Educational Leadership has not caught up to this. Perhaps this is because our numbers are too small and thus not profitable.

My primary reason for using e-texts is cost and easy accessibility. Most of the books I require are cheaper as ebooks and students get them immediately. My students are comfortable reading ebooks. I don't use traditional textbooks much, but when I do, I like the linking capacity of e-texts. More often, I assign multiple books--i.e. a historical monograph or a novel as well as a textbook--and I try to select books that are available via kindle or similar program. students have not converted to their use in this region.

There is nothing magical about E-textbooks. I allow my students to use the textbook format they prefer to use. The content is identical. Some students prefer the ability to search a large volume of text, to cut and paste blocks of text and they prefer E-texts. Others like the ability to mark in a textbook, flag pages and are more comfortable with a traditional textbook.

e-texts are the future. Students like the lower costs and the ability to have them all on an iPad or other reader. The downside is that most of the texts now available via electronic format are not available after the end of the semester. The information is not easily at hand for the student when they become a practitioner.

I have not considered e-Textbooks as I have had very little (if any) suggestions from publishers or students for their use.

My answer is: "it depends". It depends very much on the course. I do appreciate online quizzes and online automatic grading of quizzes. If the e-book uses universal design for learning it is worthwhile--with multiple means of access and representation, tools, etc. An example is Cengage "Teaching in Today's Inclusive Classrooms"

If the e-textbooks were available for the textbooks I use, I would definitely be open to them. I would want my students to have the choice of using whichever

version they prefer so I am not excluding those who may not want to read on their computer.

I asked my students to choose whichever format they want, they use a lot of online resources. I also attempted to use online tools provided by e-textbooks and it was a frustrating experience...

I don't know enough about e-textbooks to know if they'd be a good option for students. Plus, I believe that some texts come in electronic version and students can choose to buy them on their own.

The books are available electronically and I've considered using e-texts if they're customizable, just haven't done it yet

I personally find them very convenient to use. When available for my course content I make etexts available but optional as a replacement for the bound text Pearson, for example, urges that all the texts that one uses are from their company in order to obtain the full cost benefit for students.

book not fully available

It would be great to use e-textbooks, assuming the costs were lower for students and we had the tech support to deploy or integrate e-texts into our classes.

I am researching opportunities to utilize e-textbooks in more of my classes. I think the use of the e-textbooks is a positive movement and I am looking forward to getting smarter.

---

## REFERENCES

- Aaltonen, M., Mannonen, P., Nieminen, S., & Nieminen, M. (2014). Usability and compatibility of e-book readers in an academic environment: A collaborative study. *International Federation of Library Associations and Institutions*, 37(1), 16-27.  
Retrieved from <http://ifl.sagepub.com/content/37/1/16.full.pdf+html>
- Alliance for Excellent Education. (2013). *What is digital learning?* Retrieved from <http://www.all4ed.org/digitallearning/what-is-digital-learning>
- Almobarraz, A. (2007). Perceived attributes of diffusion of innovation theory as predictors of internet adoption among the faculty members of Imam Mohammed Bin Saud University. Dissertation for University of North Texas.
- Armstrong, C., Edwards, L., & Lonsdale, R. (2002). Virtually there? E-books in UK academic libraries. *Program: Electronic Library and Information Systems*, 36(4), 216-227.
- Brown, A. (2009, March 4). *Northwest, McGraw-Hill e-book trial garners national media coverage.* Retrieved from <http://www.nwmissouri.edu/UniversityRelations/news/newsreleases/090304mcgrawhill.htm>
- Brown, J. S., & Adler, R. P. (2008). Minds on fire: Open education, the long tail, and learning 2.0. *Educause Review*, 17-32.
- Brumley, M. (2013). My hugely successful technology integration strategy. Retrieved from <http://teachamazing.com/my-hugely-successful-tech-integration-strategy/>
- Burk, R. (2001). E-book devices and the marketplace: in search of customers. *Library Hi Tech*, 19(4), 325-331.



- Cavanaugh, T. (2005). *The digital reader: using ebooks in k-12 education*. Eugene, OR: International Society for Technology in Education (ITSE).
- Cavanaugh, T., & Cavanaugh, C. (2008). *EBook libraries (the whole list)*. Retrieved from [http://drscavanaugh.org/ebooks/libraries/ebook\\_libraries\\_list.htm](http://drscavanaugh.org/ebooks/libraries/ebook_libraries_list.htm)
- Center for Digital Education. (2011). Preparing for the demands of digital learning environment in higher education: how to reduce costs and complexity with an efficient infrastructure. Retrieved from <http://static.pseupdate.mior.ca.s3.amazonaws.com/media/links/Demands%20of%20Digital%20Learning%20Environments.pdf>
- Center for Digital Education. (2013). *Digital Content Strategy Guide*, Microsoft & Dell. Retrieved from [http://marketing.dell.com/Global/FileLib/Connected\\_Classroom/DigitalContentStrategyGuide.pdf](http://marketing.dell.com/Global/FileLib/Connected_Classroom/DigitalContentStrategyGuide.pdf)
- Chen, X., Crooks, S., & Ford, S. (2013, March). Note Taking on eText with Digital Note Taking Tools. In *Society for Information Technology & Teacher Education International Conference, 2013(1)*, 303-308.
- Clarke, R. (2012). A Primer in Diffusion of Innovations Theory. In *Roger Clarke's Website*. Retrieved from <http://www.rogerclarke.com/SOS/InnDiff.html>
- Clark, T. N. (Ed.). (1969). *Gabriel tarde on communication and social influence*. Chicago: University of Chicago Press.
- Collins, A., & Halverson, R. (2009). *Rethinking education in the age of technology: The digital revolution and schooling in America*. New York: Teachers College Press.

- Collins, B. (2011, January 4). Computing in the real world. *PC Pro*. Retrieved from <http://www.pcpro.co.uk/news/364015/over-100-tablets-to-launch-at-ces>
- Connaway, L.S. (2003). Electronic books (ebooks): current trends and future directions. *DESIDOC Bulletin of Information Technology*, 23(1), January 2003, 13-18.
- Costa, J.P., Sr. (2012, September). Digital learning for all. Now. *Principal Leadership*, 13(1), 54-58.
- Couros, A. (2003, November). Innovation, Change Theory and the Acceptance of New Technologies: A Literature Review. Retrieved from [http://www.educationaltechnology.ca/couros/publication\\_files/unpublishedpapers/change\\_theory.pdf](http://www.educationaltechnology.ca/couros/publication_files/unpublishedpapers/change_theory.pdf).
- Cox, A., & Mohammed, H. (2001). *E-books*. FreePint80. doi:10.1108/07378830310467427
- Dalton, B., & Palincsar, A. S. (2013). Investigating Text–Reader Interactions in the Context of Supported etext. In *International Handbook of Metacognition and Learning Technologies* (pp. 533-544). New York: Springer.
- Daniel, D. B., & Woody, W. D. (2013). E-textbooks at what cost? Performance and use of electronic v. print texts. *Computers & Education*, 62, 18-23.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319 -340.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 35(8), 982-1003.

- Davis, M. R. (2013, February). 'Big Three' Publishers Rethink K-12 Strategies. In *Education Week Website*. Retrieved from <http://www.edweek.org/dd/articles/2013/02/06/02textbooks.h06.html?cmp=ENL-DD-MOSTPOP>
- Dickinson, D. K., Griffith, J. A., Golinkoff, R. M., & Hirsh-Pasek, K. (2012). How reading books fosters language development around the world. *Child Development Research, 2012*. Retrieved from <http://www.hindawi.com/journals/cdr/2012/602807/>
- Duffey, D., & Fox, C. (2012). National educational technology trends 2012: state leadership empowers educators, transforms teaching and learning. Washington, DC: State Educational Technology Directors Association (SETDA).
- Educause. (2006, November). 7 things you should know about e-books. In *ELI Website*. Retrieved from <http://net.educause.edu/ir/library/pdf/eli7020.pdf>
- Embong, A.M., Noor, A.M., Ali, R.M.M., Bakar, Z.A., & Amin, A.R.M. (2012). Teachers' perceptions on the use of e-books as textbooks in the classroom. *World Academy of Science, Engineering and Technology* 70, 580-586.
- eTextbook. (2012). In *Thomasville city schools website*. Retrieved from <http://tinyurl.com/thomasvilledigital>
- Federal Communications Commission (FCC). (2012). *Digital Textbook Playbook*. Retrieved from <http://www.fcc.gov/encyclopedia/digital-textbook-playbook>
- Foundation for Excellence in Education. (2010, December 1). *Digital learning now*. Retrieved from <http://digitallearningnow.com/>

- Gardiner, E., & Musto, R. G. (2012) "The Electronic Book." In Suarez, Michael Felix, and H. R. Woudhuysen. *The Oxford Companion to the Book*. Oxford, UK: Oxford University Press.
- Giacornini, C., Wallis, P., Lylo, H., Haaland, W., Davis, K., & Comden, D. (2013). Exploring eTextbooks at the University of Washington: What we learned and what is next. *UW Information Technology*. University of Washington. Retrieved from <https://www.washington.edu/itconnect/wp-content/uploads/2013/10/UWeTextCampusReport.pdf>
- Gil-Rodriguez, E. P., & Planella-Ribera, J. (2008). *Educational uses of the e-book: An experience in a virtual university context*. In A. Holzinger (Ed.), *HCI and usability for education and work*. 4th Symposium of the Workgroup Human-Computer Interaction and Usability Engineering of the Austrian Computer Society (p. 55-62). Graz, Austria: USAB. doi:10.1007/978-3-540-89350-9
- Gong, C., Chen, G., Wang, X., Zhang, X., & Huang, R. (2013, July). The Functions of E-Textbooks for Utilizing in K-12 Classes: A Case Study in Beijing. In *Advanced Learning Technologies (ICALT), 2013 IEEE 13th International Conference on* (pp. 479-480). IEEE.
- Hancock, M.R. (2008). *The status of reader response research: Sustaining the reader's voice in challenging times*. In S. Lehr (Ed.), *Shattering the looking glass: Challenge, risk, and controversy in children's literature* (pp. 97-116). Norwood, MA: Christopher-Gordon.

- Hannan, A. (2007). Questionnaires in Education Research. *Research in Education*. University of Plymouth. Retrieved from <http://www.edu.plymouth.ac.uk/resined/resedhme.htm>
- Hao, Y. (2013, March). Effects of E-Textbooks on Student Mental Effort in an ESL Middle School Classroom. In *Society for Information Technology & Teacher Education International Conference, 2013*(1), 2118-2121.
- Hawkins, D.T. (2000). Electronic books: a major publishing revolution. Part 1: General considerations and issues. *Online*, 24(4), 14-28.
- Hidalgo, J. (2013). What is E ink? Portable electronics. Retrieved from <http://portables.about.com/od/newsandviews/f/E-Ink-FAQ.htm>
- Hopkins, W.G. (2008). *Quantitative research design*. Retrieved from <http://sportsci.org/jour/0001/wghdesign.html>
- Hu, P.J., Chau, P.Y.K., Sheng, O.R.L., & Tam, K.Y. (1999). Examining the technology acceptance model using physical acceptance of telemedicine technology. *Journal of Management Information System*, 16(2), 91-112.
- Ihmeideh, F. M. (2014). The effect of electronic books on enhancing emergent literacy skills of pre-school children. *Computers & Education*, 79, 40-48.
- International Society for Technology and Education (ISTE). (2000). NETS for teachers. *ISTE website*. Retrieved March, 2013, from <http://www.iste.org/standards/nets-for-teachers>
- Itzkovitch, A. (2012, April 12). Interactive ebook apps: the reinvention of reading and interactivity. *UX Magazine*, 816. Retrieved from

<http://uxmag.com/articles/interactive-ebook-apps-the-reinvention-of-reading-and-interactivity>

- Jebeile, S. & Reeve, R. (2003). The diffusion of e-learning innovations in an Australian secondary college: strategies and tactics for educational leaders. *The Innovation Journal*, 8(4), 2003. Retrieved from <http://www.innovation.cc/scholarly-style/jebeile-reeve-elearning.pdf>
- Kebritchi, M. (2010). Factors affecting teachers' adoption of educational computer games: A case study. *British Journal of Education Technology*, 41(2), 256-270.
- Kindle paperwhite shines. (2013, September 5). Retrieved September 16, 2014, from <http://www.cnet.com/products/amazon-kindle-paperwhite/>
- Kinnunen, J. (1996). Gabriel Tarde as a founding father of innovation diffusion research. *ACTA Sociologica*, 39(4), 431-442.
- Kissinger, J. S. (2011, January). *A Collective Case Study of Mobile E-book Learning Experiences*. (Doctoral Dissertation). *UNF Theses and Dissertations*. paper127. <http://digitalcommons.unf.edu/etd/127>
- Korres, G. M. (2011). *Handbook of innovation economics*. Hauppauge, NY: Nova Science
- Lai, H.M., & Chen, C.P. (2011, May). Factors influencing secondary schools teachers' adoption of teaching blogs. *Computers & Education*, 56(4), 948-960.
- Lai, J.Y., & Chang, C.Y. (2011, October). User attitudes toward dedicated e-book readers for reading: The effects of convenience, compatibility and media richness. *Online Information Review*, 35(4), 558-580.

- Lamothe, A.R. (2011). Factors influencing the usage of an electronic book collection: Size of the e-book collection, student population, and faculty population. *College & Research Libraries*, 74(1), 39-59.
- Larson, L.C. (2009). e-Reading and e-Responding: New Tools for the Next Generation of Readers. *Journal of Adolescent & Adult Literacy*, 53(3), 255-258.  
doi:10.1598/JAAL.53.3.7
- Larson, L.C. (2010). Reader response meets new literacies: Empowering readers in online learning communities. *The Reading Teacher*, 62(8), 638–648.  
doi:10.1598/RT.62.8.2
- Lebert, M. (2009). *A short history of ebooks*. Toronto, Canada: University of Toronto.
- Lee, Y., Kozar, K. A., & Larsen, K. R. T. (2003). The technology acceptance model: past, present, and future. *Communications of the Association for Information Systems*, 12(50). Retrieved from <http://aisel.aisnet.org/cais/vol12/iss1/50>
- Levin, D.A. (2011, September). Digital content: making learning relevant. *Principal Leadership*, 12(1), 32-36.
- Lewin, T. (2009). In a digital future, textbooks are history. *The New York Times*. Retrieved from [http://www.nytimes.com/2009/08/09/education/09textbook.html?pagewanted=all&\\_r=0](http://www.nytimes.com/2009/08/09/education/09textbook.html?pagewanted=all&_r=0)
- Lynch, C. (2001, May 28). The battle to define the future of the book in the digital world. *First Monday*, 6(6). Retrieved from <http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/issue/view/134>
- Lynch, C.A. (2013). EBooks in 2013. *E-content Supplement to June 2013. ALA*, 12 -16.

- Mardis, M., Everhart, N., Smith, D., Newsum, J., & Baker, S. (2010, July). From paper to pixel: digital textbooks and Florida's schools: a white paper. *The Florida State University PALM Center*. Retrieved June 2, 2013 from <http://www.eric.ed.gov/PDFS/ED522907.pdf>
- Markow, D. (2009, May). A generation of change in American public education. *Harrison Interactive: Trend & Tudes*, 8(2), 1-4.
- Moody, A.K. (2010). Using electronic books in the classroom to enhance emergent literacy skills in young children. *Journal of Literacy and Technology*, 11(4), 23-52.
- Moody, A.K., Justice, L.M., & Cabell, S.Q. (2010). Electronic versus traditional storybooks: relative influence on preschool children's engagement and communication. *Journal of Early Childhood Literacy*, 10(3), 294-313.
- Moore, G.C & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information System Research* 2(3), 192-222.
- Monson, D. (2013, May 16). How digital learning can save a student's education. *Sutherland Daily: News and views on Utah public policy*. Retrieved from <http://sutherlandinstitute.org/news/2013/05/16/how-digital-learning-can-save-a-students-education/>
- Muijs, D. (2004). *Doing quantitative research in education with SPSS*. London, UK: Sage Publications.
- National Science Foundation. (2008). Fostering learning in the networked world: The cyberlearning opportunity and challenge. *Report of the NSF Task Force on Cyberlearning*. Arlington, VA: NSF.



- Nelson, M. R., & Hains, E. (2010). E-books in Higher Education: Are we there yet? *ECAR Research Bulletin 2*. EDUCASUE.
- Pattuelli, C. M. & Rabina, D. (2010). Forms, effects, function: LIS students' attitudes towards portable e-book readers. *Aslib Proceedings: New information Perspectives*, 62(3), 228-244.
- Pearson Publishing. (2013). Digital. *Pearson Online Learning Solutions*. Retrieved from <http://www.pearsonlearningsolutions.com/academic-executives/digital.php>
- Peterson's staff. (2014, September 10). Public university vs private college. *Peterson's website*. Retrieved September 24, 2014 from <http://www.petersons.com/college-search/public-university-vs-private.aspx>
- Princeton University. (2009). E-reader pilot program. Retrieved from <http://www.princeton.edu/ereaderpilot/>
- Rao, S. S. (2003). Electronic books: A review and evaluation. *Library Hi Tech*, 21(1), 85-93.
- Rogers, E. M (2003). *Diffusion of innovations*, Fifth ed. New York: Free Press.
- Robinson, L. (2009). A summary of diffusion of innovation. *Enabling change*. Retrieved from [http://www.enablingchange.com.au/Summary\\_Diffusion\\_Theory.pdf](http://www.enablingchange.com.au/Summary_Diffusion_Theory.pdf)
- Rosen, Y., & Beck-Hill, D. (2012). Intertwining Digital Content and a One-To-One Laptop Environment in Teaching and Learning: Lessons from the Time To Know Program. *Journal of Research on Technology in Education (JRTE)*, 44(3), 225-241.
- Rosenblatt, L.M. (1995). *Literature as exploration* (5th ed.). New York: Appleton-Century-Crofts Modern Language Association. (Original work published 1938)

- Roskos, K., Burstein, K., Shang, Y., & Gray, E. (2014). Young Children's Engagement With E-Books at School. *SAGE Open*, 4(1). Retrieved from <http://sgo.sagepub.com/content/4/1/2158244013517244.full-text.pdf+html>
- Ryan, B., & Gross, N. (1943). The diffusion of hybrid seed corn in two Iowa communities. *Rural Sociology*, 8(1), 15-24.
- Sannier, A. (2009, May 6). Please welcome ASU's newest freshman to campus: the Kindle [Web blog post]. Retrieved from <https://uto.asu.edu/blog/2009/05/06/please-welcome-asus-newest-freshman-to-campus-the-kindle/>
- Schachter, R. (2009). Get ready for nextgen science: new national standards promise to revolutionize the content area. *District Administration*, <http://www.districtadministration.com/article/get-ready-nextgen-science>
- Shamir, A., & Korat, O. (2006). How to select CD-ROM storybooks for young children: The teacher's role. *The Reading Teacher*, 59(6), 532-543. doi:10.1598/RT.59.6.3
- Shieh, D. (2009, January). Northwest Missouri State University tries e-book readers, with mixed results. [Web blog post]. Retrieved from <http://chronicle.com/blogPost/Northwest-Missouri-State-U/4469/>.
- Shiratuddin, N., Landoni, M., Gibb, F., & Hassan, S. (2006). E-book technology and its potential applications in distance education. *Journal of Digital Information*, 3(4). Retrieved from <http://journals.tdl.org/jodi/index.php/jodi/article/view/90/89>
- Stachewicz, A.B (2011). *Measuring the perceived attributes of innovation: A study of capacity switch technology in industrially designed user interface controls* (Master's Theses and Doctoral Dissertations). Retrieved from <http://commons.emich.edu/cgi/viewcontent.cgi?article=1359&context=theses>

- State Education Policy Center (SEPC). (2012). Database: <http://sepc.setda.org/>, 2008-2010.
- Stone, N. (2008). The e-reader industry: replacing the book or enhancing the reader experience? Retrieved from <http://jps.library.utoronto.ca/index.php/fdt/article/viewArticle/4912/1778>.
- Tarde, G. D., & Parsons, E. W. C. (1903). *The laws of imitation*. New York: H. Holt and Company.
- Tripathi M. & Jeevan, V.K.J. (2007). E-book subscription in a distance education institution: a case of indira gandhi national open university, India, 104-114.
- Tsang, E. Y. M., Yuen, K. S., Li, K. C., & Cheung, S. K. (2013). Designing Open Textbooks for Effective Teaching and Learning. In *Knowledge Sharing through Technology* (pp. 43-55). Heidelberg, Germany: Springer.
- U.S. Census Bureau. (2013). Census Bureau Regions and Divisions with State FIPS Codes. Retrieved October 20, 2013 from [http://www.census.gov/geo/maps-data/maps/pdfs/reference/us\\_regdiv.pdf](http://www.census.gov/geo/maps-data/maps/pdfs/reference/us_regdiv.pdf)
- U.S. Department of Education. (2010). Transforming American education: learning powered by technology. Retrieved from [www.ed.gov/sites/default/files/netp2010.pdf](http://www.ed.gov/sites/default/files/netp2010.pdf)
- Wejnert, B. (2002). Integrating models of diffusion of innovations: a conceptual framework. *Annual Review of Sociology (Annual Reviews)*, 28, 297–306. doi:10.1146/annurev.soc.28.110601.141051. JSTOR 3069244.
- Weidert, J.W. (2012). *The mobile college community: a study of adult learners' adoption and use of digital communication technologies on the campuses of Florida's*

*community colleges*. A Dissertation Submitted By John William Weidert to  
Fielding Graduate University. UMI Number: 3494860.

Wikipedia. (2013). E-book format. *Wikipedia website*. Retrieved October 20, 2013 from  
<http://en.wikipedia.org/wiki/E-book#Formats>.

Wilson, R. (2003). Ebook readers in higher education. *Educational Technology &  
Society*, 6(4), 8-17, Available at [http://ifets.ieee.org/periodical/6\\_4/3.pdf](http://ifets.ieee.org/periodical/6_4/3.pdf)

Wood, C., Littleton, K., & Chera, P. (2005). Beginning readers' use of talking books:  
Styles of working. *Literacy*, 39, 135-141.

Young, J. (2009, September 7). This could be the year of e-textbooks. *Chronicle of  
Higher Education*. Retrieved October 30, 2013 from  
<http://chronicle.com/article/The-Year-of-E-Textbooks-/48305/>

Zoellner, B., & Cavanaugh, T. (2013, March). Empowering Pre-Service Science  
Teachers to Be Active Users of Etext Resources. In *Society for Information  
Technology & Teacher Education International Conference, 2013(1)*, 4085-4091.