FACTORS AFFECTING ADOPTION AND DIFFUSION OF DISTANCE EDUCATION AMONG HEALTH EDUCATION FACULTY

By

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A Dissertation
Submitted in Partial Fulfillment of the Requirements for the
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DISSERTATION APPROVAL

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A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of
Doctor of Philosophy
in the field of Health Education

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AN ABSTRACT FOR THE DISSERTATION OF

JAMES W. BALL, for the Doctor of Philosophy degree in HEALTH EDUCATION, presented on March 19th, 2013 at Southern Illinois University Carbondale.

TITLE: FACTORS AFFECTING ADOPTION AND DIFFUSION OF DISTANCE EDUCATION AMONG HEALTH EDUCATION FACULTY

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Background: In the past decade, distance education enrollment has become more common in colleges and universities, increasing from 1.6 million students in 1998 to an estimated 6.7 million in 2012. The purpose of this study was to identify which constructs in Rogers' (2003) diffusion of innovation theory are more likely to contribute to adoption and diffusion of distance education in health education. Health education instructors and faculty can use the information obtained from the results of this study if they want to implement distance education.

Methods: A quantitative, cross-sectional, descriptive, and correlational survey design was used in this study. An instrument designed to measure constructs and factors affecting the adoption and diffusion of distance education in health education were developed for the study. Health educators employed by health education departments listed in the AAHE (2011) Directory (N=498) were contacted by email and asked to participate in this study. The survey was distributed through SurveyMonkey™ survey software that was activated December 2012 - January 2013.

Results and Conclusions: A total of 245 health education faculty completed the instrument, but 21 participants were omitted because they did not complete at least 95% of the survey instrument. A total of 224 survey instruments were retained and included in the analysis, providing a 44.9% response rate. Based on the Pearsons correlation and multiple linear regression it can be concluded that the likelihood of distance education adoption by health

education faculty is highly dependent on the communication channels and characteristics of the innovation (distance education) constructs of the diffusion of innovation theory. There was a large majority of participants in the early majority adopter category and this is because of two reasons. The first reason is that participants had not decided whether to accept or reject distance education. The other reason is that distance education is a relatively new innovation and it has not fully diffused through the health education profession. Experience with distance education was not shown to increase the likelihood of distance education adoption because the majority of participants have not yet decided whether to accept or reject distance education. The social system construct was the least predictive of distance education adoption. If distance education has not yet fully diffused through the health education profession then it is hard for the social system to impact the likelihood of distance education adoption.

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INTRODUCTION

Distance education has been a part of the United States educational system since the 1800's. The United States Postal Service (USPS) provided long distance communication capabilities in the United States, leading to the beginning of distance education (Casey, 2008). Casey (2008) explained that the first correspondence course classified as a distance education course was developed in 1852. Since this course, distance education has evolved along with advances in technology in our society. Advances in technology that followed the USPS include radio, television, satellite, and Internet. Distance education courses and programs have been created to educate people using all of these systems (Casey, 2008).

Background of the Problem

Distance education is quickly becoming an alternative option for people to receive an education in the United States. In the Fall of 2007, 28 states offered high school distance education programs (Tucker, 2007). In 2008, 97% of all public schools had a local area network connection for Internet access (Gary & Lewis, 2009). It was reported that 55% of public schools had students enrolled in distance education courses in 2009-2010 (Queen & Lewis, 2011). "Among those districts, 96% reported having students enrolled in distance education courses at the high school level, 19% at the middle or junior high school level, and six percent at the elementary school level" (Queen & Lewis, 2011, p. 3).

At the post secondary level, in 2006-2007, 66% of postsecondary institutions reported using some form of distance education with their students (Parsad, Lewis, & Tice, 2008). In the past decade, distance education enrollment has become more common in colleges and universities, increasing from 1.6 million students in 1998 to an estimated 6.7 million in 2012

(Allen & Seaman, 2012; Doyle, 2009; Harasim, 2000; Lei & Gupta, 2010). Distance education provides universities an opportunity to maximize their educational resources to meet the needs of diverse students by reducing overcrowded classrooms and providing students with the flexibility to complete lessons, discussions, and class work at their convenience (Gould, 2003). Allen and Seaman (2010) found that 74% of administrators at public institutions of higher education believed that distance education was critical to include in their long term plans.

Increases in technological capabilities are not the only reason why distance education in the United States has evolved. "Three-quarters of institutions reported that the economic downturn has increased demand for online courses and programs" (Allen & Seaman, 2010, p. 3). In addition, the next generation of "tech-savvy" students will be entering university systems across the United States. Simonson (2010) called this group of students the millennial generation, and explained that distance educators needed to establish a level of understanding about millennial learners so that distance education courses and programs could capitalize on this generation's interests and abilities.

With increases in distance education enrollment from 1.6 million students to 6.1 million students and demand from administrators to implement distance education to remain competitive, it will be essential for institutions of higher education to offer distance education courses and programs of the same quality as face-to-face courses (Allen & Seaman, 2011; Doyle, 2009; Harasim, 2000; Lei & Gupta, 2010). More importantly, it is crucial for the health education profession to increase quality distance education programs, so that it can attract those individuals who are being affected by the economic downturn as well as the millennial generation of technologically savvy students. To help implement distance education in the health education profession, it is important to identify characteristics of people who adopt and

reject distance education, their perceptions about distance education, and the constructs effecting adoption and diffusion of distance education within the health education profession. For the purpose of this study, the definition of distance education is as follows: institution-based formal education where the learning group is separated, and where interactive telecommunications systems are used to connect learners, resources, and instructors (Schlosser & Simonson, 2009). Hybrid courses are courses that combine face-to-face classroom instruction with educational technologies, often using the Internet (Simonson et al., 2012). For the purpose of this dissertation, "blended learning" is considered a hybrid course.

Theoretical Framework

The diffusion of innovation theory explained how a new idea, product, or innovation disperses through society (Rogers, 1962). "Diffusion is a process in which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 2003, p. 5). The main constructs of diffusion of innovation theory are characteristics of the innovation, communication channels, social system, and time (Rogers, 2003).

An innovation is an idea, practice, or object that is perceived as new by individuals or a social system (Rogers, 2003). There are five factors that affect the characteristics of an innovation. *Relative advantage* is the degree to which the innovation is better than what it is replacing. *Compatibility* is the degree to which the innovation is consistent with the values and needs of the potential adopters. *Complexity* is the degree to which the innovation is perceived as difficult or easy to adopt. *Trialability* is the degree to which the innovation can be experimented before being adopted. *Observability* is the degree to which results of adopting the innovation are observable to the adopters (Rogers, 2003).

The social system is the boundaries within which an innovation diffuses (Roger, 2003). The university and educational department setting are elements of the social system. The communication channels are how messages about the innovation get from one individual to another (Rogers, 2003). The processes by which health educators create and share information about distance education are relevant to the communication channels. Multiple channels exist, for example, email, phone conversations, face-to-face conversations, health education faculty meetings, university administrator meetings, conversations with colleagues in other departments, etc.

Time refers to the length of time it takes an innovation to diffuse through society (Rogers, 2003). Three factors that affect the time dimension are the innovation-decision process, characteristics of the adopters, and adopter categories. The innovation-decision process is the process by which a person passes from the initial knowledge of the innovation to adoption or rejection. Characteristics of adopters include peoples' socioeconomic status, personality values, and communication behavior. Adopter categories include innovators, early adopters, early majority adopters, late majority adopters, and laggards (Rogers, 2003).

Many studies on the diffusion of innovation have been conducted to create the theoretical framework behind the diffusion of innovations. In Rogers' (2003) newest edition, he explained that there have been numerous studies on how an innovation has been diffused through society and that there is no need to have more of these types of studies conducted. "The challenge for diffusion scholars of the future is to move beyond the proven methods and models of the past, to recognize their shortcomings and limitations, and to broaden their concepts of the diffusion of innovations" (Rogers, 2003, p. xxi).

A criticism of research using Rogers' (2003) theory is when Dearing (2004) explained that most researchers used the theory to explain why adoption occurred. He believed this use of the theory did not do it justice. Diffusion of innovation studies used to increase diffusion could be more helpful to the world of practice (Dearing, 2004). Using Rogers' (2003) theory for this type of research could help to implement and possibly increase adoption and diffusion of distance education in the health education profession. In other words, this study reported on the state of adoption of distance education in health education and identified the necessary constructs to use to help implement distance education in health education. This study is not using Rogers (2003) diffusion of innovation theory to explain why distance education adoption has occurred. This study uses the theory to identify the constructs of the theory that are influencing adoption and diffusion of distance education. If health education professionals want to implement distance education then they can use the information to help them.

Need for the Study

In a study, on distance education in health education it was found that instructors teaching health-related face-to-face courses are slow to adopt distance education because they are concerned with courses rewarding sedentary behavior, effectiveness of health-related distance education courses, and decreases in learner motivation within distance education courses (Buschner, 2006). In another study, instructors also indicated concern about the lack of teacher contact within distance education courses and a focus on the computer rather than learning content and skills (Ransdell, Rice, Snelson, & Decola, 2008). Instructors of health-related face-to-face courses also questioned how distance education courses could meet the national standards for health-related courses (Ransdell et al., 2008). Essential learning strategies, such as role playing, debating, working in groups, case studies, and applying coursework to real-

life situations are some of the strategies used to help achieve course objective in health education courses. Instructors questioned how these learning strategies could be implemented effectively in health-related distance education courses if students couldn't get immediate feedback (Ransdell et al., 2008).

Distance education requires instructors to use different strategies to achieve course objectives. It is essential that instructors who plan to teach distance education courses develop new skills and techniques to deliver courses effectively (Varvel, 2007). Instructors need to be provided with up-to-date resources and training to successfully transfer their instructional strategies from traditional classrooms to the online environment (Ko & Rossen, 2004; Taylor & McQuiggan, 2008). Researchers have found that quality professional development programs in distance education for instructors could increase acceptance and preparation of distance education courses (Almala, 2006; Wolf, 2006). In particular, distance education professional development programs should teach proper facilitation skills and address pedagogical and technical aspects (Ascough, 2002; Gibbons & Wentworth, 2001; Lawler & King, 2001). Professional development programs need to be taught by an instructor who was already trained to teach online (Wolf, 2006). Participants in these training programs should use the software or system they will be using to teach the course (ex. blackboard), participants should have institutional support throughout the entire course, and participants should be motivated to teach distance education courses (Wolf, 2006).

The literature on distance education can provide instructors with general recommendations about why to implement distance education, limitations that exist when implementing distance education, and general recommendations on training procedures. However, it is necessary to provide instructors with the proper technological resources and

specific training within each educational discipline to implement distance education effectively. Research needs to be conducted within the health education discipline so that faculty in health education departments understand the constructs of diffusion of diffusion of innovation theory that affect the adoption and diffusion of distance education within the health education profession. This information can be used to enhance training programs for distance education in health education.

Purpose of the Study

The primary purpose of this study was to identify which constructs in Rogers' (2003) diffusion of innovation theory are more likely to contribute to adoption and diffusion of distance education in health education. The main constructs of Rogers' (2003) diffusion of innovation theory include characteristics of the innovation (distance education), social system (surrounding health education faculty), communication channels (used by health education faculty), and time (characteristics of health education faculty and adopter category).

Significance to Health Education

With the current movement toward increasing distance education enrollment across the country, it is critical that health educators and administrators explore characteristics of people who adopt and who don't adopt distance education in health education. Results from this study will inform the health education profession about the constructs and factors that need to be addressed to implement distance education in the profession. This information can be used to create effective professional development opportunities that increase the probability of adoption and diffusion of distance education.

Health education departments will be able to use the identified characteristics of people who adopt distance education, the factors affecting adoption and diffusion of distance education,

and the perceptions of health educators about distance education to design more effective trainings to increase implementation of distance education. As part of their professional preparation programs, health educators could use the findings from this research to educate their students about the implementation of distance education, the characteristics of people who adopt and who choose not to adopt distance education, and the perceptions of health educators about distance education. Results will inform health education professionals about the state of adoption and diffusion of distance education within the health education profession.

Research Questions

The following research questions were addressed in this study:

1) What are the self-reported levels of knowledge and experience with distance education based on perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty) among the participants in this study?
2) To what extent do differences exists among participants' total construct scores (items 1-82) based on demographic variables such as gender, age, highest degree, type of institution (public or private), teaching or research oriented type of institution, and experience?
3) To what extent do differences exist among participants' adopter categories based on independent variables such as perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty)?
4) What is the relationship between perception of need, characteristics of the innovation (distance education), social system, communication channels, characteristics of

adopters (health education faculty), and participants' total construct score (items 1-82) and participants' experience with distance education (items 92-97)?

5) How much variance in the participants' experience with distance education (items 92-97) can be attributed to the perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty)?

Research Design

A quantitative, cross-sectional, descriptive, correlational survey design was used in this study. According to Isaac and Michael (1995), descriptive studies are conducted "to describe systematically a situation or area of interest factually and accurately" (p. 46). Cross-sectional studies are "based on observations representing a single point in time" (Babbie, 2007, p. 102). In this study, an instrument developed to measure factors affecting adoption and diffusion of distance education in the health education profession was used. This instrument addresses the main constructs of the diffusion of innovation theory by Rogers (2003). Guidelines used by the researcher to develop the instrument come from *Health Education Evaluation and Measurement* (McDermott & Sarvela, 1999).

Study Participants

The sample was identified from the American Association of Health Education (AAHE) Directory (2011). The population from which the sample was drawn included health education faculty and instructors currently employed by the health education and promotion departments listed in the AAHE directory (2011).

Data Collection

An instrument designed to measure constructs and factors affecting the adoption and diffusion of distance education in health education were developed for the study. Face and content validity of the instrument were established by an expert panel that was comprised of five professors from various universities across the United States in Health Education, Workforce Education and Development, and Business Administration Technology. After revisions were made to the instrument and approval was obtained from the university's Institutional Review Board, data were collected for the pilot study (n= 99) to establish internal consistency reliability. Internal consistency reliability was established by calculating Cronbach alphas and Kuder-Richardson tests on the instrument.

For the main study, participants (N=498) were emailed and asked to complete the instrument. If participants agreed to participate, they read the cover letter and then completed the survey on *Survey Monkey*. If participants didn't respond, they were emailed two more times to see if they would like to participate in the study. If the participants responded in any way, they were not emailed again. Participation was anonymous and voluntary.

Data Analysis

Data were analyzed by using the Statistical Package for the Social Sciences, SPSS 19.0 (SPSS Inc., 2010). All items were totaled and measures of central tendency and dispersion were calculated to report the scores. Independent T-Tests and Analysis of Variances (ANOVA) were used to determine the extent of differences that existed among participants' total construct scores (items 1-82) based on demographic variables such as gender, age, highest degree, type of institution (public or private), teaching or research oriented type of institution, and experience. ANOVAs were used to determine the extent of differences that existed among participants'

adopter categories based on independent variables such as perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty). Pearson correlations were calculated to determine the relationships between perception of need, characteristics of the innovation (distance education), social system, communication channels, characteristics of adopters (health education faculty), and participants' total construct score (items 1-82) and participants' experience with distance education (items 92-97). Multiple linear regression analysis was calculated to determine how much variance in the participants' experience with distance education (items 92-97) can be attributed to the perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty). Lastly, Cronbach alphas were calculated to determine the internal consistency reliability for all questions. An alpha level of .05 was be used to determine statistical significance.

Assumptions

Assumptions are facts as concerned with the study, but can't necessarily be proven true (Neutens & Rubinson, 2010).

The assumptions in this study were as follows:

1. Participation was voluntary.
2. Participants were honest in their responses.
3. Participants expected and received anonymity.
4. Participants responded to items based on their current distance education practices and beliefs.
5. The quantitative research design was appropriate for this study.
6. The data collection instrument was valid and reliable.

7. The diffusion of innovation constructs were measurable concepts.

Limitations

"Limitations are the boundaries of the problem established by factors or people other than the researcher" (Neutens & Rubinson, 2002, p. 20).

Limitations in this study were as follows:

1. Due to the use of nonprobality sampling, the ability to generalize may be limited because of self-selection bias.
2. The researcher can't be sure if the participant carefully responded to each survey item.
3. Some faculty, included in the American Association of Health Education Directory (2011) may have relocated or retired.
4. The AAHE (2011) directory does not include all health education programs in the United States.
5. There are health education departments listed in the AAHE (2011) directory that contained the incorrect contact information.
6. The participants might have given socially desirable answers based on their knowledge of distance education implementation.

Delimitations

Delimitations are parameters on the study, which are set by the researcher to limit and clarify the study (Cottrell & McKenzie, 2005).

The delimitations of this study were as follows:

1. Participants were health education instructors listed in the AAHE Directory.
2. The survey instrument was distributed via *Survey Monkey*.

3. The study explored distance education in health education within the theoretical framework of the diffusion of innovation.
4. To assure manageability of the collected data, the survey instrument included only multiple choice, dichotomized-choices items, and Likert scale items.

Definitions

Adopter Categories:

- **Innovator:** The salient value of the innovator is venturesomeness, due to a desire for the rash, the daring, and the risky (Rogers, 2003, pg. 282).
- **Early adopter:** The early adopter is the embodiment of successful, discrete use of new ideas (Rogers, 2003, pg. 283).
- **Early majority adopter:** The early majority may deliberate for some time before completely adopting a new idea (Rogers, 2003, pg. 283).
- **Late majority adopter:** Innovations are approached with a skeptical and cautious air, and the late majority do not adopt until most others in their system have already done so (Rogers, 2003, pg. 284).
- **Laggard:** Laggards tend to be suspicious of innovations and of change agents. Their innovation-decision process is relatively lengthy, with adoption and use lagging far behind awareness-knowledge of a new idea (Rogers, 2003, pg. 284).

Asynchronous learning: Web-based courses that offer students the ability to access course materials anytime and anyplace (Simonson, Smaldino, Albright, and Zvacek, 2012).

Compatibility: The degree to which the innovation is consistent with the values and needs of the potential adopters (Rogers, 2003).

Complexity: The degree to which the innovation is perceived as difficult or easy to adopt (Rogers, 2003).

Cronbach's alpha: Statistical method assessing reliability of the instrument which "relates the variance of each item with the variance of total score for all items on the test. This method allows comparison among the items on the test to determine the relative contribution of each item to reliability" (Dignan, 1995, p.56). "Reliability coefficient of 0.70 or higher is considered "acceptable" in most social science research situations" (University of California, Los Angeles, n.d., p.4).

Diffusion of Innovation theory: This theory explains how a new product, idea, or innovation disperses through society. Diffusion begins when the "innovators" first use this new product, idea, or creation, and extends all the way to the last people to adopt it, called the "laggards" (Rogers, 1962).

Distance education: Institution-based formal education where the learning group is separated, and where interactive telecommunications systems are used to connect learners, resources, and instructors (Schlosser & Simonson, 2009). For the purpose of this dissertation, online courses are considered distance education.

Health Education Faculty: For the purpose of this dissertation, health education instructors include all higher education faculty members employed by health education and promotion departments listed in the AAHE directory (2011).

Hybrid Course: Courses that combine face-to-face classroom instruction with educational technologies, often using the Internet (Simonson et al., 2012). For the purpose of this dissertation, "blended learning" is considered a hybrid course.

Likert-type scale: A type of attitude scale that "asks participants to respond to a series of statements by indicating whether they strongly agree (SA), agree (A), are undecided (U), disagree (D), or strongly disagree (SD). Each response is associated with a point value, and an individual's score is determined by summing the point values of each statement" (Gay & Airasian, 2003, p. 131).

Millennial Generation: A person born between 1982-2005; the latest generation to enter schools and colleges (Simonson et al., 2012).

Observability: The degree to which the results of adopting the innovation are observable to the adopters (Rogers, 2003).

Perception: Insight, intuition, or knowledge gained by the recognition and interpretation of sensory stimuli (distance education) based chiefly on memory (thefreedictionary.com, 2012).

Relative advantage: The degree to which the innovation is better than what it is replacing (Rogers, 2003).

Social Networking Sites: Online sites, services, or platforms, where users construct public or semi-public profiles that focus on reflecting and building social relations within those who share the same activities or interests (Boyd & Ellison, 2007).

Synchronous learning: Face-to-face instruction that occurs at the same time either over the Internet or in the classroom (Simonson et al., 2012).

Trialability: The degree to which the innovation can be experimented with before adopted (Rogers, 2003).

Summary

Distance education enrollment has increased from 1.6 million students to 6.1 million students in the last ten years (Allen & Seaman, 2011). This study identifies constructs of the

diffusion of innovation theory to help health education faculty if they want to implement distance education in their health education departments. It has been stated that studies using the diffusion of innovation theory in this nature are more helpful to the world of practice than using the theory to explain why an innovation has been adopted (Dearing, 2004). It is important to understand factors affecting adoption and diffusion of distance education, characteristics of health educators who adopt and who don't adopt distance education, and perceptions of health educators about distance education so that the health education profession understands how to create effective professional development opportunities to implement distance education.

CHAPTER 2

LITERATURE REVIEW

Introduction

In this chapter, a review of relevant literature will be presented. Sections addressing the evolution of distance education, current state of distance education, advantages of distance education in education and health education, disadvantages of distance education in education and health education, diffusion of innovation theory, and diffusion of innovation theory in health education will be included within this review.

The Evolution of Distance Education

According to Casey (2008) and Moore (2003), the first correspondence course started by the Phonographic Institute, was called the Pittman Shorthand training program and was developed in 1852. During this course, secretaries would use the United States Postal Service to mail in their completed stenographic shorthand educational exercises (Casey, 2008). After all coursework was completed, the Phonographic Institute would mail a certificate of expertise in stenographic shorthand skills to the individual (Matthews, 1999). In 1881, the Chautauqua Correspondent College was founded and it awarded diplomas in the liberal arts field (Moore, 2003). In 1890, the mine industry began teaching mine safety using distance education; and in 1892, the University of Chicago provided the first college-level distance education program (Casey, 2008; Moore, 2003). All of these correspondence courses were completed through the use of the U.S. Postal Service.

In the early 1900's, distance education expanded to the radio (Moore, 2003). Between 1819 and 1946, educational radio licenses were granted to over 200 universities across the United States with the first educational radio licenses being granted to the University of Salt

Lake City, the University of Wisconsin, and the University of Minnesota (Casey, 2008). Distance education over the radio failed because of the lack of investment by university faculty (Pittman, 1986). Faculty didn't want to invest their time into courses that might not meet the same standards as courses on campus (Pittman, 1986). "Nevertheless, correspondence courses and instructional radio paved the way for distance learning opportunities through television technology" (Casey, 2008, p. 46).

Television was the next influence on distance education, which began broadcasting courses in 1934 with one of the first college courses offered by the University of Iowa (Casey, 2008; Moore, 2003). In 1963, the Federal Communications Commission created the Instructional Television Fixed Service (ITFS). The ITFS was a band of 20 television stations that were made available to universities/colleges at a low cost to increase the distribution of these courses (Casey, 2008). These courses delivered on television were more integrated and included text books, study guides, and faculty guides (Moore, 2003). In 1970, Coastline Community College became the first college to offer students televised college courses without having to physically attend courses at the actual campus (Casey, 2008).

"The satellite television systems that had been created in the 1960s became cost-effective in the 1980s and reduced the cost of employee training by providing 'on location' instruction. Prior to satellite technology, either employees or instructors were required to travel. Now, large corporations and the military quickly took advantage of satellite transmission" (Casey, 2008, p. 47). By 1987, up to half of Fortune 500 companies, including IBM, Federal Express, and Dominos, used videoconferencing for their corporate training programs (Moore, 2003). "In 1985, the National Technological University (NTU), located in Fort Collins, CO, offered online degree courses in both continuing and graduate education using satellite transmission to access

course materials from other universities and then download and redistribute course materials by satellite" (Casey, 2008, p. 48).

The invention of the computer and then the World Wide Web in 1991, provided people the opportunity to stay connected with each other all over the world at anytime of the day (Casey, 2008). High-speed broadband transmission allowed distance learning over the Internet to become the next instructional frontier (Casey, 2008). "One of the first examples of distance education by computer conferencing was the Electronic University Network, in which an undergraduate degree could be earned independently by taking courses designed at 19 universities and the undergraduate degree was awarded by Thomas Edison College in New Jersey" (Moore, 2003, p. 14). A similar program also was offered in New York (Bear, 1998). Since the development of the programs in New Jersey and New York, the World Wide Web has increased the possibilities of distance education and it is still evolving today (Casey, 2008). By the end of the 1990s, 83% of public universities and 74% of community colleges offered a distance education course (Moore, 2003).

Distance education has evolved from using the United States Postal Service to the Internet. Currently, there are a variety of technological tools in use to achieve instructors' desired course objectives. The variety of options that instructors could use to communicate with students to achieve course objectives includes: email, prerecorded audio or video, two-way audio, two-way audio with graphics, one-way live video, two-way audio, two-way audio and video, and desktop two-way audio and video (Simonson, Smaldino, Albright, & Zvacek, 2012). Research has shown that the most commonly used technological tools are the Internet for lecture notes and assignments, emails, web-based discussions, chat rooms, two-way live video and audio, and one-way live video and audio (Zhao, Perreault, Waldman, & Truell, 2009).

Telephone, videotapes, television-based, and faxes were all ranked lower by instructors, than Internet-based tools as a way to communicate and achieve course objectives (Zhao et al., 2009). Distance education has come a long way since its inception and the next section will explain where distance education is today in the United States.

The Current State of Distance Education

In 2008, the United States Department of Education reported that 97% of all public schools, elementary and secondary, had a local area network (LAN) to connect to the Internet (Gary & Lewis, 2009). Of these public schools that have Internet access, 92% of them had written policies on student Internet use and 95% of the public schools that had Internet access offered professional development for educators about topics related to technology integration in the classroom (Gary & Lewis, 2009). The most recent numbers reported by the United Stated Department of Education (USDOE, 2011) indicated that 50% of public schools had students enrolled in distance education courses in 2009-2010 (Queen & Lewis, 2011). "Among those districts, 96% reported having students enrolled in distance education courses at the high school level, 19% at the middle or junior high school level, and six percent at the elementary school level" (Queen & Lewis, 2011, p. 3).

In December 2008, the USDOE published a detailed document about distance education at universities in the United States. Key findings from this research on approximately 1,600 2- and 4-year degree granting postsecondary institutions within the 50 States were:

- Sixty-six percent of 2-and 4-year degree granting postsecondary institutions reported offering online, hybrid/blended online, or other distance education courses for various levels or audiences;

- An estimated 12.2 million enrollments (or registrations) in college-level credit-granting distance education courses were recorded and of these distance education enrollments, 77% were reported in online courses, 12% were reported in hybrid/blended online courses, and 10% were reported in other types of distance education courses;
- Thirty-two percent of all 2-and 4-year institutions reported offering college-level degree or certificate programs that were designed to be completed totally through distance education in 2006–2007;
- In 2006-2007, 11,200 college-level programs were designed to be delivered and completed entirely through distance education. Of these 11,200 college-level programs, 66% were reported as degree-granting programs while the remaining 34% were reported as certificate-granting programs; and
- The most common and influential factors cited by faculty and administrators in this study, as affecting distance education decisions were meeting student demand for flexible schedules (68%), providing access to college for students who would otherwise not have access (67%), making more courses available (46%), and seeking to increase student enrollment (45%) (Parsad et al., 2008).

Distance education provides universities an opportunity to maximize their educational resources to meet the needs of diverse students (Gould, 2003). The USDOE (2011) found that a higher percentage of nontraditional undergraduate students took distance education courses (Aud, Hussar, Kena, Bianco, Frohlich, Kemp, & Tahan, 2011). Other key findings from this study include:

- "In 2007–08, 30% of students 30 years old and over took distance education courses, compared to 26% of students 24 to 29 years of age, and 15% of students 15 to 23 years of age";
- "A higher percentage of undergraduates who had a job took distance education courses (22%) than those who had no job (16%)"; and
- "A higher percentage of students attending classes exclusively part time took distance education courses (25%) more than those attending classes exclusively full time (17%)".

Besides the USDOE, the Sloan Consortium published an annual report on the current state of distance education in the United States. In November 2010, the consortium published its eighth annual report based on responses from approximately 2,500 colleges and universities in the United States (Allen & Seaman, 2010). Key findings from this report were:

- Sixty-three percent of all reporting institutions said that online learning was a critical part of their institution's long term strategy;
- Over 5.6 million students were taking at least one online course during the fall 2009 term;
- A 21% growth rate for online enrollments far exceeded the less than two percent growth of the overall higher education student population;
- Thirty percent of higher education students had taken at least one course online;
- Seventy-five percent of academic leaders/administrators at public institutions reported that online instruction was as good as face-to-face instruction; and
- Seventy-five percent of institutions reported that the economic downturn had increased demand for online courses and programs to meet the needs of diverse and nontraditional students (Allen & Seaman, 2010).

The Sloan Consortium report was published in November 2011 and there were not many differences in the reported numbers from 2010. Key findings from this report included:

- An increase in enrollment to over 6.1 million students;
- Thirty-one percent of students reported having taken at least one online course; and
- Fifty-seven percent of academic leaders/administrators reported that they believe the learning outcomes in distance education are superior or just as good as face-to-face (Allen & Seaman, 2011).

The 2012 Sloan Consortium report was published in January (2013). Key findings from this report included:

- An increase in enrollment to over 6.7 million students;
- Sixty-nine percent of all reporting institutions said that online learning was a critical part of their institution's long term strategy;
- Thirty-two percent of students reported having taken at least one online course; and
- Seventy-seven percent of academic leaders/administrators reported that they believe the learning outcomes in distance education are superior or just as good as face-to-face (Allen & Seaman, 2013).

Lastly, the Sloan Consortium reported findings on faculty perceptions of online education (Allen, Seaman, Lederman, & Jaschik, 2012). Key findings from this publication included:

- Faculty reported being more pessimistic than optimistic about online learning;
- Academic leaders/administrators were extremely optimistic about distance education, with over 80% reporting that they view it with "more excitement than fear";
- Nearly two-thirds of faculty believed that the learning outcomes for a distance education course were inferior or somewhat inferior to those for a comparable face-to-face course;

- About one-third of faculty members reported they thought that their institution was pushing too much for distance education; and
- Even with all this resistance, nearly one half of the faculty who believed that learning outcomes in distance education were inferior to those for face-to-face still recommended distance education courses for some of their students (Allen et al., 2012).

Besides the meeting the needs of diverse and nontraditional students, there is a new generation of "tech-savvy" students entering universities all over and this generation has been referred to as the Millennial Generation (Simonson, 2010). Millennials are current learners in K-12 and college-level courses that have been experiencing the Internet along with their coursework (Simonson et al., 2012). Specific insights into the Millennial generation include:

- The importance for distance education instructors to learn about this generation and provide learning environments that challenge them in relevant ways;
- The Millennial Generation brings a wealth of knowledge and experience with email and surfing the web, but instructors need to ensure students understand how to use the technology needed for distance education purposes; and
- To help create less confusion for the students, the distance education instructor needs to know how to use the web-based course tools, such as the dropbox, online chat, postings, and other features of distance education (Simonson et al., 2012).

The next sections will explain the advantages and disadvantages of distance education and more specifically, how it relates to health-related colleges courses.

Advantages of Distance Education in Education and Health

Empirical research has shown that students in university distance education courses have similar learning outcomes and performance outcomes (Beare, 1989; McCleary & Egan, 1989;

Sonner, 1999); have similar achievement outcomes; and score just as well on standardized tests as students enrolled in face-to-face courses (Lim, 2002; Neuhauser, 2002; Ngu, 2002). A review of literature completed in 2006 revealed that distance education was as effective as traditional education (Tallent-Runnels, Thomas, Lan, Cooper, Ahern, & Shaw, 2006). It also was revealed that a competent instructor increased the effectiveness of a distance education course (Tallent-Runnels et al., 2006). The USDOE conducted an extensive meta-analysis of all research studies from 1996 to 2008 comparing distance education to traditional courses (Means, Toyama, Murphy, Bakia, & Jones, 2010). "Analysts screened these studies to find those that (a) contrasted an online to a face-to-face condition, (b) measured student learning outcomes, (c) used a rigorous research design, and (d) provided adequate information to calculate an effect size" (Means et al., 2010, p. ix). Findings from this meta-analysis confirmed that distance education was as effective as face to face methods (Means et al., 2010).

Within Chapter 2 the researcher cites articles that the USDOE analyzed and used for their meta-analysis. Research articles from the USDOE meta-analysis that aren't mentioned in this chapter compared online, face-to-face and blended/hybrid courses. Some studies compared blended/hybrid courses and online courses of the same subject and these studies concluded that there was no difference in student success (Campbell et al., 2008; Caldwell, 2006; Gaddis et al., 2000; Ruchti & Odell, 2002). Other studies compared online, face-to-face, and blended/hybrid courses of the same subject and found no difference in success among the students who were enrolled. (Beile & Boote, 2002; Davis et al., 1999; McNamara et al., 2008; Scoville & Buskirk, 2007)

Research has been conducted on how to increase the quality of distance education to ensure that these courses could be as effective as face-to-face courses. Administrative, faculty,

and student support have all been mentioned as important factors to increase the success of distance education (Abel, 2005; Baker & Schihl, 2005; Bounds, McCormick, & Brynteson, 2008). Abel (2005) explained that administrative support should always be present and constantly be improved. Support should include a highly developed website, a helpdesk, faculty training, orientation for students, clear policies for ownership of online materials, and student feedback assessments (Abel, 2005). Bounds et al. (2008) also emphasized that the university as a whole must have a commitment to distance education and an established infrastructure for technological support and faculty development.

Instructors should get institutional support in the form of specific training to teach distance education and continual professional development opportunities to stay up-to-date with technology (Bounds et al., 2008). Faculty should assemble a team to help develop and teach distance education courses (Bounds et al., 2008). To properly implement a distance education course or program, it is important that faculty advocate for the involvement of all instructors (Menchaca & Bekele, 2008). Faculty must have IT emails and phone numbers so they know where to seek help when technical issues arise (Reader, 2010). Distance education instructors must provide clear syllabi, instructions, and grading rubrics to the students and let sound pedagogy guide the course development and not the technology (Temple, Miller, Morrow, & Keyser, 2002; Glacken & Baylen, 2001). Study guides, projects/assignments, online examples, and interactive skill-building are good materials and activities to include in distance education courses (Carr-Chellman & Duchastel, 2000). To help ensure the best design of an online course, the instructor must have prior computer literacy and be trained on developing applications for the online course (Erlich, Erlich-Philip, & Gal-Ezer, 2005; Shih, Muñoz, & Sanchez, 2006; Yan, 2006).

During the course, instructors should promote deep critical thinking within online discussion boards, model appropriate discussion posts, focus discussions on specific issues, and apply learning activities within courses to real-life situations (Anderson, 2009). Instructors should encourage student participation, provide timely and explicit feedback to students by evaluating and elaborating on all student posts, and encourage students to ask for help when they are confused (Reeder, 2010). Instructors should always add information where topics are not understood (Sugar, Martindale, Crawley, 2007). Instructors need to keep students motivated throughout the entire course by using several subject themes, social interactions, support services, and promoting classroom interaction; each is important to help with student and teacher motivation (Lammintakanen & Rissanen, 2005; Gilbert, Morton, & Rowley, 2007; Martz & Reddy, 2005).

It has been found that student success can be increased if the instructor uses various online interaction methods and activities that achieve a high level of interaction (Novitzki, 2005; Anderson, 2009). Courses should have structure and encourage a daily social presence to help ensure the involvement and success of all students (Ostlund, 2008). Instructors can encourage a social presence by promoting interactivity among students and by using multiple learning activities on the computer to increase the Internet experience (Pituch & Lee, 2006). Teacher presence and involvement, communication between teachers and learners, and the cultural issues related to managing change, motivation, and technology platform are important factors for an instructor to be aware of when implementing a quality distance education course (Soong Chan, Chua, & Loh, 2001). Instructors should reinforce positive perceptions about technology and experience with technology to keep students motivated (Salter, 2005). Instructors should always

use relevant learning resources, provide timely feedback, and have weekly if not daily interactions with students (Weaver, 2008; Reader, 2010).

Quality Indicators for Distance Education in Health Education

A comprehensive literature review of the quality indicators of distance education was completed by Chaney, Eddy, Dorman, Glessner, Green, & Lara-Alecio, (2009). A search of 10 electronic databases was conducted and 15 categories of commonly cited quality indicators of distance education were identified. After identifying the quality indicators of distance education, the authors discussed how these indicators could be used to increase the quality of distance education in health education. The 15 categories are student–teacher interaction; active learning techniques; prompt feedback; respect for diverse ways of learning; student support services; faculty support services; program evaluation and assessment; strong rationale for distance education that correlates to the mission of the institution; clear analysis of audience; appropriate tools and media; documented technology plan; reliability of technology; institutional support and institutional resources; implementation of guidelines for course development and review of instructional materials; and course structure guidelines (Chaney et al., 2009).

Student–Teacher Interaction

There are many ways of interacting and communicating in distance education and they consist of: student–student interaction, student–content interaction, teacher– content interaction, teacher–teacher interaction, content–content interaction, and student–teacher interaction (Anderson, 2003). The type of interaction most often cited as a quality indicator in the systematic literature review was student–teacher interaction (Chaney et al., 2009). There are many benefits of the teacher-student interaction and it has been concluded that those related to motivation and feedback are extremely important in both classroom-based and distance

education (Anderson, 2003; Laurillard, 1997; Laurillard; 2000; Wlodkowski, 1985). Based on the literature review Chaney et al. (2009) suggested that, "course and program developers should design distance education courses to promote and facilitate healthy interactions between the learner and the teacher" (p. 225).

Active Learning Techniques

Active learning techniques involve the student's ability to engage in activities that create excitement for learning in the distance education class and achievement beyond the course (Hannafin, Hill, Oliver, Glazer, & Sharma 2003). Suggested active learning techniques for health education might include behavior change log books, healthier people risk appraisals, and tailored messages on stress (Hensleigh, Eddy, Wang, Dennison, & Chaney 2004). Active learning strategies are particularly important in health education and need to be done in distance education courses as well (Chaney et al., 2009).

Prompt Feedback

Prompt feedback to students is a very important part of quality distance education programs (Chaney et al., 2009). "Communications from faculty that directly engages students and offers timely feedback may contribute to interchanges and the students' subsequent success in the course" (Sherry, 2003, p. 454). It is important to define feedback time because students who grow up in this age of technology may expect feedback within hours and instructors think of feedback as something that will come in the following days (Chaney et al., 2009). An example of defining prompt feedback time would include returning all student emails and posts within 24 hours and all assignments, quizzes, and tests within seven days.

Respect Diverse Ways of Learning

Students need to understand how to respect the ways that other students learn and the instructor should help guide this. Respecting different ways of learning involves helping students learn to become better prepared and more flexible in how they learn in the variety of learning settings they will encounter (Dillon & Greene, 2003). Instructors also must provide students with different opportunities to explore learning on the Internet. "When developing distance education courses and programs, it is important to incorporate different distance education activities and opportunities, such as chat rooms, discussion boards, Internet search activities, and to provide flexibility in approaches to learning" (Chaney et al., 2009, p. 226).

Student Support Services

It is important to provide the same student support services available to face-to-face students to distance education students (Chaney et al., 2009). Student support services should meet the cognitive, affective, and administrative needs of the student and should include admission services, library access and services, financial aid, and advisement (Daniel & Mackintosh, 2003; Berge, 2003). These services are vital to the success of any distance education program.

Faculty Support Services

Faculty support systems must be identified when implementing distance education because teaching at a distance is becoming an expectation for new faculty (Wolcott, 2003). The Institute for Higher Education Policy (2000) is committed to improving college access and success in higher education for all students. They developed faculty support expectations that included technical assistance for course development, resources to address any problems with student access to electronic data, continual training opportunities, and assistance in the transition

from traditional to distance education (The Institute for Higher Education Policy, 2000). It is very important to provide the faculty with sufficient support materials and training to help increase the quality of distance education (Chaney et al., 2009).

Program Evaluation and Assessment

Evaluation and assessment of distance education courses and programs are critical in improving and ensuring quality (Chaney et al., 2009). The purpose of the Council of Regional Accrediting Commissions (2000) is to set standards for the quality of post-secondary education and validate schools against these standards. They stated that "institutions offering distance education courses or programs should conduct sustained, evidence-based and participatory inquiry as to whether distance learning programs are achieving objectives" (Council of Regional Accrediting Commissions, 2000, p. 433). The results of such inquiry should be used to guide curriculum design, delivery, pedagogy, and educational processes, and may affect future policy and budgets perhaps having implications for the institution's role and mission (Council of Regional Accrediting Commissions, 2000).

Strong Rationale for Distance Education that Correlates to the Mission of the Institution

Institutions and educational departments that choose to design and implement distance education must align programs and courses with the mission of the institution (Chaney et al., 2009). Distance education programs that do not articulate the overall mission and vision of the institution do more harm than good (Watkins & Kaufman, 2003). Identifying where distance education fits in the overall mission and vision should be one of the first tasks (Chaney et al., 2009).

Clear Analysis of Audience

When deciding to implement a distance education course or program it is important for the faculty have a meeting to identify the need and objectives of the course or program. More specifically, the clear analysis of the audience should contain the following: "the characteristics of the learners, faculty and staff, geographic location, available technologies, and goals of the learner must be identified, along with the goals and missions of the learning organization, the costs that must be recovered, the costs of delivery, the political environment at the time for the learning organization, the faculty compensation, and the market competition" (Shearer, 2003, p. 275). Some examples that educational departments could use to help them develop a comprehensive analysis of their audience include the five levels of institutional assessment and planning by Watkins & Kaufman (2003) and the ecological perspective by Eddy, Donahue, & Chaney (2001).

Appropriate Tools and Media

The most appropriate way to deliver instruction to students via distance education does not necessarily mean the newest and most expensive technology available (Chaney et al., 2009). There is no one best technology, and it is usually a combination of technologies that produces the best course (Shearer, 2003). Examples include Audacity, Screenr, YouTube, Google Plus, Moddle, Big Marker, Oovoo, Skype, Iphone, Blogger, Facebook, Second Life, Blackboard, Desire to Learn, Mind Tap, and many more. Designers of distance education courses need to understand the strengths and weaknesses of many technologies and how the older technologies can be used as well as newer ones (Shearer, 2003).

Documented Technology Plan to Ensure Quality and Reliability of Technology

Reliability of technology and documented technology plans are essential when implementing a quality distance education program (Chaney et al., 2009). Technology doesn't always work like it is supposed to and instructors should outline procedures in the syllabus so that students know what to do or who to contact when they are having problems with technology. In the documented plan instructors should have the IT email addresses and phone numbers of people to contact. The university also should have "A documented technology plan that includes electronic security measures (i.e. password protection, encryption, back-up systems) should be in place and operational to ensure both quality standards and the integrity and validity of information" (The Institute for Higher Education Policy, 2000, p. 2).

Institutional Support and Institutional Resources

Institutional support and institutional resources are an important part of quality distance education and the core values of the institution should be incorporated and considered in the development of distance education programming and courses (Sherry, 2003). Technology is always evolving and it is important that universities offer continual professional development and up-to-date resources to help implement distance education effectively. It also is critical to consider the financial resources for distance education activities and materials, such as: funding for technology support, training faculty, faculty incentives and compensation, instructional resources, and evaluation research (Sherry, 2003).

Implementation of Guidelines for Course Development and Review of Instructional Materials

It is important for course designers to have guidelines to follow for developing a distance education course, because course development involves a great deal of work at the front end of

the process (Chaney et al., 2009). Each university and educational department should develop their own instructional materials for distance education and guidelines to implementing distance education. They also must review these guidelines and instructional materials on a continual basis to keep up with the growth of technology. The Institute for Higher Education Policy (2000) recommended that institutions of higher education create guidelines for course development, design, and delivery and review instructional materials that are developed to ensure they meet program standards. Rigorous assessment, review, and evaluation will improve the overall quality of distance education instruction (Chaney et al., 2009).

Course Structure Guidelines

The last quality indicator that appeared frequently in distance education literature involved the overall course structure (Chaney et al., 2009). According to the Institute for Higher Education Policy (2000), before the start of a distance education course, students should be informed and "advised about the program to determine (1) if they possess the self-motivation and commitment to learn at a distance and (2) if they have access to the minimal technology required by the course design" (p. 3). "Faculty also should establish an agreement with the students regarding expectations, such as deadlines for assignments and faculty response" (Chaney et al., 2009, p. 229).

The Sloan Consortium

The Sloan Consortium (2011) is an institutional and professional organization dedicated to integrating distance education into the mainstream of higher education, helping institutions and individual educators improve the quality, scale, and breadth of online education. The Consortium is a non-profit, member sustained, organization and members include private and public universities and colleges, community colleges and other accredited course and degree

providers. The Consortium supports the collaborative sharing of knowledge and effective practices to improve distance education by hosting conferences and workshops to help implement and improve distance education programs, publishing the Journal of Asynchronous Learning Networks (JALN), and conducting research to report annual trends on the implementation and growth of distance education.

Since 1997, the Sloan Consortium has been using the Five Pillars of Quality Online Education to provide support for successful distance education (Sloan Consortium, 2011). The website states, "The intent of the quality framework, which is always a work in progress, is to help institutions identify goals and measure progress towards them" (Sloan Consortium, 2011). The five pillars are learning effectiveness, student satisfaction, faculty satisfaction, cost effectiveness, and access. To see the most recent and detailed publication of the Five Pillars of Quality Online Education refer to Appendix A.

These pillars were developed to help educational institutions achieve capacity, access, and affordability for both learners and providers (Jorgenson, 2003). The Five Pillars of Quality Online Education is one of the most comprehensive documents to use when trying to implement an effective distance education course or program (Stover, 2005). The pillars were created using principles of continuous quality improvement, which is the idea of using feedback from customers, partners, and employers to continuously improve processes (Jorgenson, 2003). These pillars could help answer some of the most pressing questions that educators can have when starting a distance education course or program. These questions include: how to make a successful course, how to measure if the course was successful, and what are the most important concepts to developing an online course (Jorgenson, 2003).

Disadvantages of Distance Education in Education and Health

Empirical studies from 1997 to 2010 document disadvantages of distance education and found that instructors were concerned with the lack of time to develop distance education courses (Bonk, 2001; Chizmar & Williams, 2001; Jones & Moller, 2002; O'Quinn & Corry, 2002; Parisot, 1997; Rockwell, Schauer, Fritz, & Marx, 1999; Wilson, 1998); lack of technical support offered to the students and staff (Berge, 1998; Betts, 1998; Bonk, 2001; Chizmar & Williams, 2001; Dooley & Murphrey, 2000; Jones & Moller, 2002; Lee, 2001; Pariston, 1997; Rockwell et al., 1999; Schifter, 2000; Wilson, 1998); lack of training to support quality instruction of a distance education course (Betts, 1998; Bonk, 2001; Jones & Moller 2002; Rockwell et al., 1999; Schifter, 2000); risk of cheating by students (Harmon, Lambrinos, & Buffolino, 2010); problems of student retention (Hayman, 2010); resistance to change by professors within face-to-face programs; and lack of social and mental interaction that occurs among all people involved in the distance education process (Adams, 2007).

A fear of many instructors is that distance education programs will be created without the administrative, faculty, technological, student, or monetary support that is necessary for success (Betts, 1998; Lee, 2002; O'Quinn & Corry, 2002; Schifter, 2000; Wilson, 1998). Career and job security concerns by faculty are issues with distance education, as well (Dooley & Murphrey, 2000). Instructors fear being replaced because distance education can reach many people at the same time and less staff might be needed to instruct all the courses at a university (Dooley & Murphrey, 2000). Instructors also could be replaced if they have a lack of understanding of what will work at a distance or if they are resistant to innovation (Berge, 1998; Parisot, 1997). Instructors fear that it will be hard to determine who has the property and intellectual rights of an online course or program (Dooley & Murphrey, 2000; O'Quinn & Corry, 2002).

There also are many concerns about course quality. Jones and Moller (2002) explained that distance education courses may lack student interaction and interaction is an important part of learning. Dooley and Murphrey (2000) had concerns about the Internet's misinformation and students not understanding how to differentiate between good information and false information. Faculty need adequate time to prepare these courses, as well, and if they are not given enough time to design the courses, then the courses are going to lack the rigor that is necessary for students to learn (Betts, 1998; Bonk, 2001; Chizmar & Williams, 2001).

The quality of the course requires getting the proper equipment and hardware to create courses and train faculty proper was another issue (Betts, 1998; Bonk, 2001; Jones & Moller, 2002; Rockwell et al., 1999; Schifter, 2000. Administrators need to consider how they are training faculty to ensure the best results because faculty can be resistant to distance education if there is ineffective or no training being offered (Betts, 1998; Bonk, 2001). Faculty should be aware of the most current trends in technology so they can suggest to administrators what programs are becoming available to increase course quality (Rockwell et al., 1999).

It can be difficult to recruit faculty who have experience with distance education to implement a quality course (Berge, 1998). Implementing quality distance education courses is not possible with inadequate hardware, software, and technology infrastructure (Berge, 1998; Bonk, 2001; Dooley & Murphrey, 2000; O'Quinn & Corry, 2002. The amount of time and effort it takes to implement a quality distance education course is time taken away from research (Rockwell et al., 1999). A course might not be created effectively if there is a lack of time to develop and maintain course material (Bonk, 2001; Chizmar & Williams, 2001; Jones & Moller, 2002; O'Quinn & Corry, 2002; Parisot, 1997; Rockwell et al., 1999; Wilson, 1998). There is competition from private and public institutions to increase the number of distance education

courses offered and this could lead to a decrease in the quality of courses (Dooley & Murphrey, 2000). The increase in faculty workload could lead to the implementation of ineffective courses (Betts, 1998; O'Quinn & Corry, 2002; Schifter, 2000).

Employers of college graduates have concerns about distance education degree programs. They were concerned with: lack of rigor; lack of face to face interactions; increased potential for academic dishonesty; association with being diploma mills; and concerns about online students' commitment that might be lost by not having the responsibility to physically go to school or a classroom on a weekly basis (Columbaro & Monaghan, 2009). While all of these concerns have been documented as disadvantages of distance education, more specific disadvantages in health education have been researched.

Health-related distance education could potentially reward students for sitting in front of a computer (Buschner, 2006). Some health education instructors are concerned with the effectiveness of health-related distance education courses and decreases in learner motivation within distance education courses (Buschner, 2006). It has been stated that lack of teacher contact within distance education courses and focus put on the computer rather than learning the content and skills is an area of concern in health-related distance education courses (Ransdell, Rice, Snelson, & Decola, 2008). Reeves and Reeves (2008) explained that a major disadvantage of health and social work distance education courses included an increased time to develop these courses. This increased time is due to "the greater degree of individualized pedagogy afforded by the technology" and the time it takes to figure out the proper instructional methods to meet the needs of their curriculum and students (Reeves & Reeves, 2008, p. 54).

Essential learning strategies, such as role playing, debating, working in groups, case studies, and applying coursework to real-life situations are strategies used to help achieve health

education course objectives. Some health education professionals wonder how these learning strategies can be implemented effectively in health-related distance education courses if students can't get immediate feedback while completing these learning strategies (Ransdell et al., 2008). Lastly, it has been reported that health education professionals who might not advocate for distance education courses are concerned that employers could hire instructors who do not hold the proper health certifications for the position (Ransdell et al., 2008).

Effective Implementation Practices in Distance Education

There are many components that go into the creation of an effective distance education course. One of the most important factors of an effective distance education course is the instructor (Tallent-Runnels et al., 2006). In distance education, the quality of the course is highly dependent on the instructor's ability to use technology properly and the dedication he/she puts into creating and instructing an online course (Abel, 2005; Varvel, 2007). A major disadvantage to distance education is the lack of training and resources provided to instructors and because of this deficiency, they are unprepared to instruct an online course (Varvel, 2007; Wilson, 2001). It is essential that instructors who plan to teach distance education courses develop new skills, roles, strategies, and techniques to deliver the course effectively (Varvel, 2007). Instructors need to be aware of these essential elements so they can successfully transfer from the traditional classroom to the online environment (Ko & Rossen, 2004; Taylor & McQuiggan, 2008).

Five features of a successful training program for faculty were identified in Wolf's (2006) meta-analysis of the literature on faculty training. These features included: that the instructor who taught the training was already trained to teach online; participants had computing skills; participants used the software or system they would be using to teach the course (ex.

Blackboard); participants had institutional support throughout the entire course; and participants were motivated to teach distance education courses (Wolf, 2006). The development of quality in-depth training programs has increased the acceptance and preparation of quality distance education courses (Almala, 2006; Wolf, 2006). Factors of an effective training program are that they should be delivered online, teach proper facilitation skills, include pedagogical and technical aspects specific to the educational department that is being trained (Ascough, 2002; Gibbons & Wentworth, 2001; Lawler & King, 2001). An effective training program should evaluate participants' training needs prior to the training and provide ongoing resources and support mechanisms after the training (Roman, Kelsey, & Lin, 2010).

Training programs are different depending on the needs of participants within the training program and the institution (Wolf, 2006). Several articles provided suggestions for health educators beyond what has been stated above. Research has indicated that health education courses delivered over the Internet need to be developed by instructors who are experts in that content area (Bounds et al., 2008). The instructors, faculty, administration, and student needs in health education should be assessed and distance education courses and programs should meet these needs (Chaney et al., 2008). Institutions must continue to provide support and training for health education instructors even after they have started their distance education courses (Perry-Casler, Srinivasan, Perrin, & Liller, 2008). Continued training should help instructors adopt standards for online instruction, be creative in their development of online courses, and update their technological capabilities (Perry-Casler et al., 2008). Taking a constructivist approach when instructing distance education courses in health education can be important and this approach should be included in the training of health educators (Oomen-Early, 2008).

Diffusion of Innovation

Rogers (2003) defined diffusion of innovation theory as "the process in which an innovation is communicated through certain channels over time among the members of a social system…a special type of communication in which the messages are about a new idea" (pp. 5-6). He explained that this process occurs when a new product, idea, or innovation is introduced to society and people choose to adopt the innovation or not to adopt it (Rogers, 1962). The innovation adoption cycle ranges from the first people to adopt it, called the "innovators", to the last people who adopt it, called the "laggards". The people in the middle are called early adopters, early majority adopters, and late majority adopters (Rogers, 1962).

In Rogers' (2003) book on diffusion of innovations he summarized the first example of diffusion research based on the innovation adoption cycle that was analyzed by Mosteller (1981). This research by Mosteller (1981) helped explained how the British Navy learned how to control scurvy. Many people believe an innovation that has obvious benefits will be widely realized and diffuse rapidly (Rogers, 2003). However, most innovations diffuse at a very slow rate (Rogers, 2003). The cure for scurvy in the British Navy example is a very good example of how long it takes an innovation to diffuse. Before 1601, scurvy killed more people than anything else during voyages at sea. In 1601, an individual realized that citrus fruits cured scurvy when he saw that the sailors who were fed lemon juice stayed alive while the ones who didn't get lemon juice died. It took about 200 years for the British Board of Trade to finally adopt a policy that called for the use of citrus fruits to prevent scurvy (Rogers, 2003).

The innovation adoption cycle is a key contribution to the diffusion of innovation theory (Collins, 1996). Over the years, scholars in a variety of disciplines have contributed to, expanded on, and modified the diffusion of innovation theory first proposed by Rogers (Fahey &

Burbridge, 2008). Rogers also has modified his theory and published newer editions of the diffusion of innovation theory. In his most recent edition, Rogers (2003) described four main constructs affecting the diffusion of innovations, which include characteristics of the innovation, the social system, the communication channels, and the time it takes for diffusion to take place. Rogers (2003) also outlined characteristics and factors in each of these four constructs.

The innovation is an idea, practice, or object that is perceived as new by individuals or a social system (Rogers, 2003). The five factors that affect the characteristics of the innovation construct include relative advantage, which is the degree to which the innovation is better than what it is replacing; compatibility, which is the degree to which the innovation is consistent with the values and needs of the potential adopters; complexity, which is the degree to which the innovation is perceived as difficult or easy to adopt; trialability, which is the degree to which the innovation can be experimented with before being adopted; and observability, which is the degree to which results of adopting the innovation are observable to the adopters (Rogers, 2003).

"The social system constitutes the boundary within which an innovation diffuses" (Roger, 2003, p. 24). Characteristics of the social system construct include the social structure, the social norms, opinion leaders, change agents, and current and past conditions of the social system. Opinion leaders are people who exert their influence on others and change agents are people who can influence others to adopt an innovation (Rogers, 2003).

The communication channel is how a message gets from one individual to another (Rogers, 2003). Characteristics of the communication channel construct include how people are sharing information about the new innovation, how the media is informing people, and the degree of heterophily or homophily of an individuals' interactions. Homophily occurs when the

transfer of ideas occurs between individuals who are similar and heterophily occurs when the transfer of ideas occurs between individuals who are different (Rogers, 2003).

Time refers to the length of time it takes an innovation to diffuse through society (Rogers, 2003). Three factors that affect the time construct are the innovation-decision process, characteristics of adopters, and adopter categories. The innovation-decision process is the process by which a person passes from the initial knowledge of the innovation to adoption or rejection. The five steps in the innovation-decision process are: knowledge (when a person initially learns about the innovation); persuasion (when a person forms an opinion about the innovation); decision (when a person accepts or rejects innovation); implementation (when a person puts an innovation to use); and confirmation (when a person seeks reinforcement on the use of the innovation). A person can reverse the innovation-decision process if exposed to negative responses toward the innovation (Rogers, 2003). Figure 1 provides a diagram of how the innovation-decision process is used within this study.

Characteristics of adopters are another factor that affects the time construct. Rogers (2003) summarizes the diffusion research on characteristics of adopters into three categories that include socioeconomic characteristics, personality values, and communication behavior. In the socioeconomic characteristic category, early adopters are no different in age, have more years of formal education, have a higher social status, greater degree of upward social mobility, and are wealthier. In the personality values category, early adopters have greater empathy, may be less dogmatic, have a greater ability to deal with abstractions, have greater rationality, have a more favorable attitude toward change, are better able to cope with uncertainty, and have higher aspirations. In the communication behavior category, early adopters have more social participation, are more interconnected through interpersonal networks, have more contact with

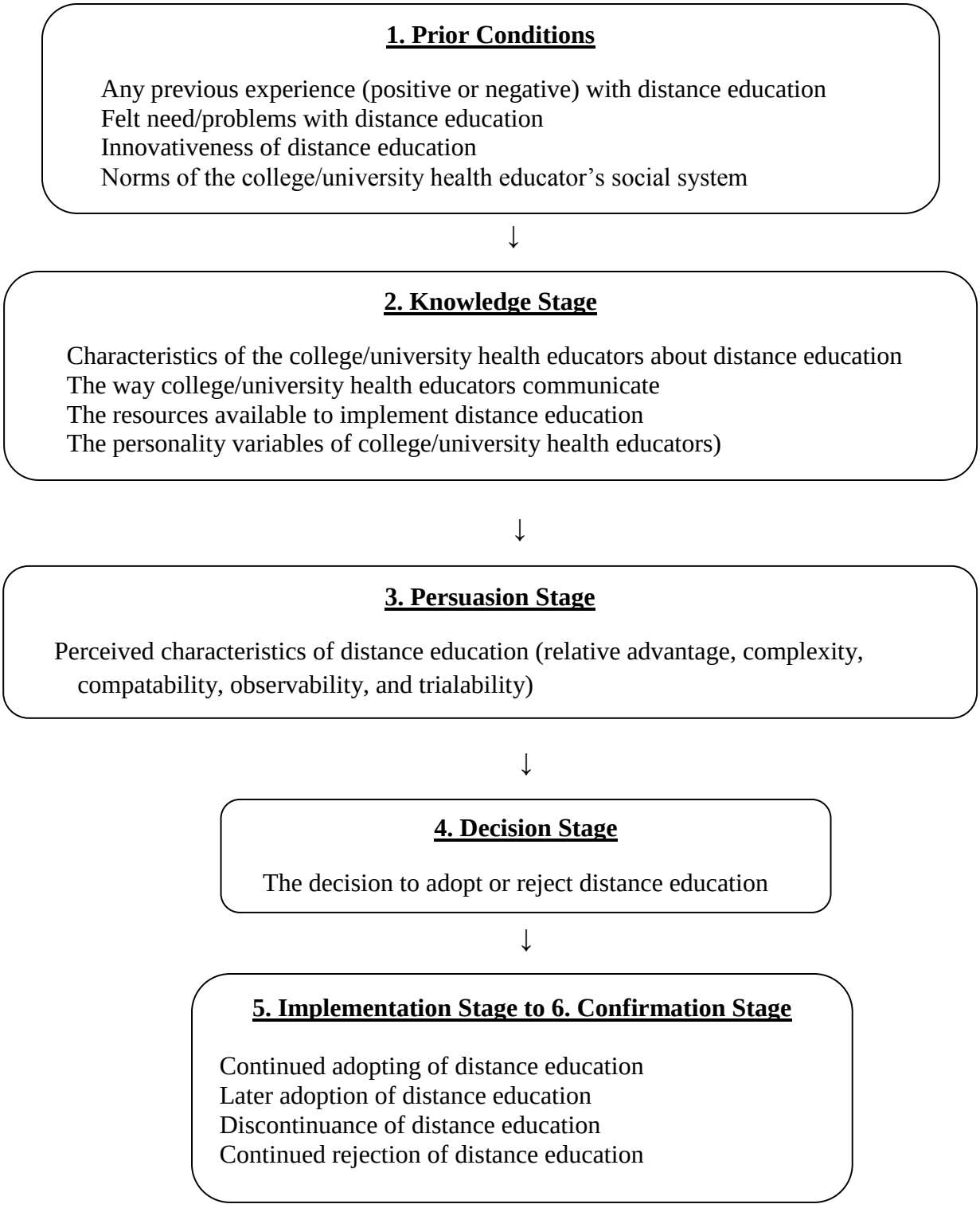

Figure 1

Model of Innovation-Decision Process for this Study

change agents, have more exposure to mass communication, and they seek information about innovations more actively (Rogers, 2003).

The last factor that affects the time construct is adopter categories. There are five adopter categories that include innovators, early adopters, early majority adopters, late majority adopters, and laggards (Rogers, 2003). "Innovators" were venturesome almost to the point of obsession. These innovators understood complex innovations and can cope with uncertainty. "Early adopters" were integrated in local social systems, had high degrees of opinion leadership, and advised others about suitability of ideas. Early adopters served as change agents, role models, and can trigger others to adopt new innovations.

"Early majority adopters" adopted ideas right before the rest of society. They serve as important links for interconnectedness in interpersonal networks. "Late majority adopters" are skeptical and wait to adopt new innovations after the majority of society has adopted it. People in this group adopt innovations in response to peer and economic pressures and would be skeptical even after others have accepted the innovation. "Laggards" are the last to adopt ideas and are usually isolated in their social systems. They tended to be suspicious of change agents and this could be because of their socioeconomic status, societal values, or lack of communication with the rest of society (Rogers, 2003).

Most companies and agencies that are trying to sell products are more interested in the innovators and early adopters, and there are few studies conducted on the late majority and laggards (Rogers, 2003). Rogers (2003) explained a study in Hong Kong on cell phone laggards by Wei (2001). Rogers (2003) pointed out that the people who were first to adopt the cell phone were the business people who were well educated, had a higher income, and of higher socioeconomic status. Once the phone cost decreased then the rest of the Hong Kong society

started to adopt the cell phone. When interviewed the late majority and laggards explained that they didn't adopt the cell phone because of "its complexity (cell phone services were confusing), incompatibility with their values (public phones were everywhere and inexpensive), and relative advantage (they had no need for a cell phone and it had poor transmission)" (Rogers, 2003, pg. 295).

One of the most influential studies of all time on the diffusion of an innovation was the diffusion of hybrid corn by Ryan and Gross (1943) (Rogers, 2003). The study included all four of the main elements in the diffusion of innovation theory. Hybrid corn was a better product (characteristics of the innovation), it was easy to implement, others had tried it, and the success could be seen by all farmers (Rogers, 2003). The salesmen (communication channels) of hybrid corn were the first people to introduce farmers to hybrid corn. However, neighbors and the close network of the farmers (social system) was an important reason why hybrid corn was adopted. It took about 15 years (time) for hybrid corn to be adopted by all but 2 of the 259 farmers. The data showed how an innovation is diffused over time and based on the data of the diffusion rate farmers could be put into their adopter categories (Rogers, 2003).

Criticism of Research Using Diffusion of Innovation Theory

In Rogers' (2003) newest edition, he explained that there have been numerous studies on how an innovation has been diffused through society and that there is no need to have more of these types of studies conducted. "The challenge for diffusion scholars of the future is to move beyond the proven methods and models of the past, to recognize their shortcomings and limitations, and to broaden their concepts of the diffusion of innovations" (Rogers, 2003, p. xxi). A different method of using the diffusion of innovations theory is to study how the innovation is being dispersed through society to help implement and amplify the diffusion of an innovation.

An article by Dearing (2004) explained that in Rogers' (1995) 4th edition of his diffusion of innovation book, he stated that most people were using the theory to explain why adoption occurred. Dearing (2004) explained that using the theory to explain why an innovation has been adopted does not doing the theory justice because it is less helpful in the world of practice.

People tend to piece together programs by borrowing components from what has worked in the past rather than use the diffusion of innovation theory to study what is currently working and adopting those working parts into their program (Dearing, Rogers, Meyer, Casey, Rao, Campo, & Henderson, 1996). People act out of convenience rather than exploring what is working to implement a program effectively (Johnson, 1996). Without conducting the proper research, even groups within the same organization lack the proper information to implement a program effectively in order to implement and amplify the diffusion of a program or product (O'Dell & Grayson, 1998). When only one or a small amount of people know how to implement a program successfully and this knowledge is not diffused to the rest of the group, it is a disadvantage (Wittenbaum & Park, 2001).

Diffusion of Innovation studies used to explain how to amplify diffusion are more helpful to the world of practice (Dearing, 2004). Findings from these studies can be very beneficial because they can help increase the process of adoption across all sectors of society. Dearing (2004) explained that this approach to purposive social change allows for:

1. A focus on social programs with demonstrated advantages over other, comparable programs. If we have a choice of what to propel into broader use, we have a responsibility to focus on those innovations that have been shown to be most effective and efficient.
2. Targeting intermediaries for adoption who serve clients at greatest need, rather

than a passive diffusion approach which commonly results in widening knowledge and income disparities, since early adopters are often the least likely to need the innovation in question, but most likely to have the necessary resources to adopt.

3. Advocacy of a set of solutions, rather than just one. Offering a choice of effective alternatives to potential adopters heightens the likelihood that they may find an ideal fit between their local circumstances and needs, on the one hand, and from among the best practices in the cluster, on the other.

4. A broadening of effect, by focusing on intermediaries as adopters, who in turn create, adopt, and adapt programs for citizens and clients.

5. Pre-test as well as post-test measurement, comparison of rates of diffusion across best practice programs in the cluster, and multiple design conditions for assessing the efficacy and efficiency of purposive diffusion treatments that vary by expense (Dearing, 2004, pp. 25-26).

Research that has been conducted to amplify the diffusion of a program or product has been shown to be beneficial. In numerous studies it has been proven that the opinions of the leadership can positively or negatively influence the amplification of a program or product. (Kelly, Lawrence, Diaz, Stevenson, Hauth, Brasfield, Kalichman, Smith, & Andrew, 1991; Kelly, Lawrence, Stevenson, Hauth, Kalichman, & Murphy, 1992; Kelly, Murphy, Sikkema, McAuliffe, Roffman, Solomon, Winett, & Kalichman, 1997; & Lomas, 1991). Agarwal and Prasad (1997) demonstrated how to predict the attributes of an innovation that can lead to an increase in consumer product purchase. Computer simulation studies have demonstrated that a positive intervention at different points within social networks can increase the amplification of a program or product (Abrahamson & Rosenkepf, 1997; Valente & Davis, 1999). Dearing (2004)

stated that "it is reasonable to conclude, along with Anderson and Jay (1985), that combinations of these validated concepts, designed and implemented in concert, may produce even more impressive diffusion results" (p. 25).

Diffusion of Innovation in Education and Health

The diffusion of innovation theory has been used to study the diffusion of distance education in postsecondary schools. Tabata and Johnsrud (2008) conducted a study using the diffusion of innovation theory. One dimension of their study specifically looked at the adoption of distance education among instructors in 10 postsecondary schools in the western part of the United States (Tabata & Johnsrud, 2008). Results revealed that instructors were more likely to adopt distance education if distance education fit with their work style, they were able to see the results of distance education, and if they could try it before they had to commit to doing it (Tabata & Johnsrud, 2008).

Carswell and Venkatesh (2002) studied the adoption of distance education among graduate students using the diffusion of innovation theory. Themes from the open-ended responses suggested that distance education courses are more easily adopted if there is a standard format to the course, if the instructor is highly involved in the course, and if the students learn better by reading than with classroom discussion (Carswell & Venkatesh, 2002). Nichols (2007) interviewed the primary contact for distance learning at 14 institutions. He found that the success of diffusion of distance education depended on the institutions readiness for distance education, the systems and policies already were in place to implement distance education, and professional development was used to correct the misconceptions of distance education (Nichols, 2007).

Atkinson (2007) conducted a study to test the validity and reliability of a survey instrument using items based on the diffusion of innovation framework and a new distance education program in health education called *HealthQuest*. The instrument was given to students in twelve personal health course and results indicated that *HealthQuest* was perceived to achieve relative advantage, complexity, observability, and trialability, but not compatibility (Atkinson, 2007). In healthcare, Fahey and Burbridge (2008) concluded that leadership, culture, and risk-taking increased the adoption of new technologies in hospitals. A longitudinal case study in healthcare concluded that the adoption of health counseling by the outpatient clinic was successful because of the positive physician perceptions and having one physician in charge to help centralize the implementation of counseling (Harting, Assema, Ruland, Limpt, Gorgels, & Ree, 2005).

The diffusion of innovation theory has been helpful to the practical applications in the field of health education and a better understanding of behavior change (Haider & Kreps, 2004). The practical applications include the variation in rates of behavior change and can be applied to the spread of the Internet (Haider & Kreps, 2004). However, no studies were found in the literature that used all of the main constructs presented in the newest edition of Rogers (2003) diffusion of innovation theory to study factors affecting adoption and diffusion of distance education within the health education profession. The results of this study could amplify the diffusion of distance education in health education.

Summary

Numerous studies explored the advantages and disadvantages of distance education in education and, more specifically, in health education and promotion. Chaney et al. (2009) summarized the most significant information found in the literature that related to this study.

General recommendations for distance education courses in health education were made, but there is no specific mention of factors affecting adoption and diffusion of distance education in health education. Further research on distance education is critical, so the profession of health education can increase the quality and quantity of distance education courses being offered to students in health education.

CHAPTER 3

METHODOLOGY

Introduction

When a new idea, product, or innovation is diffused through society, some people will adopt it right away (innovators, early adopters), some people will reject adoption (laggards, late majority), and some will be in the middle (early majority) (Rogers, 1962). This process of diffusion is occurring with distance education within the health education profession. The literature review confirmed that, in general, distance education can achieve the same course objectives as face-to-face courses, but critics question how these teaching and learning strategies can address course objectives and national standards (Tallent-Runnels et al., 2006; Ransdell et al., 2008; U.S. Dept. of Ed., 2008). This chapter provides a detailed overview of the methodological protocol that was used for this study. Sections include the purpose, research questions, instrument development, research design, study participants, data collection, and data analysis.

Purpose of the Study

The primary purpose of this study was to identify which constructs in Rogers' (2003) diffusion of innovation theory are more likely to contribute to adoption and diffusion of distance education in health education. The main constructs of Rogers' (2003) diffusion of innovation theory include characteristics of the innovation (distance education), social system (surrounding health education faculty), communication channels (used by health education faculty), and time (characteristics of health education faculty and adopter category).

Research Questions

The following research questions were addressed in this study:

1) What are the self-reported levels of knowledge and experience with distance education based on perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty) among the participants in this study?
2) To what extent do differences exists among participants' total construct scores based on demographic variables such as gender, age, highest degree, type of institution (public or private), teaching or research oriented type of institution, and experience?
3) To what extent do differences exist among participants' adopter categories based on independent variables such as perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty)?
4) What is the relationship between perception of need, characteristics of the innovation (distance education), social system, communication channels, characteristics of adopters (health education faculty), and participants' total construct score and participants' experience with distance education?
5) How much variance in the participants' experience with distance education can be attributed to the perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty)?

Instrument Development

After completion of a comprehensive literature review, no instruments were found that measured the four constructs and factors of these constructs affecting adoption and diffusion of distance education among health education faculty and instructors. The four constructs and factors are: Characteristics of distance education (factors: relative advantage, complexity, compatibility, observability, trialability), social system of health education faculty, communication channels of health education faculty, and time (factors: characteristics of health education faulty and adopter categories). To accomplish the purpose of this study, an instrument was designed to measure constructs and factors affecting adoption and diffusion of distance education among health education university faculty. The guidelines used by the researcher to develop the instrument were drawn from *Health Education Evaluation and Measurement* (McDermott & Sarvela, 1999).

Item Creation

To generate a pool of items for the instrument, the researcher used past studies conducted on the adoption and diffusion of distance education, advantages and disadvantages of the adoption and diffusion of distance education, and information from Rogers' (2003) book on the diffusion of innovation theory. These studies provided sample items for the instrument. Studies on the adoption and diffusion of distance education in health education by Atkinson (2007) and Tabata and Johnsrud (2008), studies on the advantages and disadvantages of the adoption and diffusion of distance education by Allen and Seaman (2011), Ransdell et al. (2008), and Varvel (2007), and conclusions drawn from Rogers' (2003) book on the diffusion of innovation theory were used to generate items for the instrument.

Based on information from past studies and the literature, the researcher developed an instrument that contained 91 items. There were 42 items based on the characteristics of the innovation (distance education) construct (16 items for relative advantage, 7 for compatibility, 9 for complexity, 6 for observability, and 4 for trialability). The social system construct contained 16 items. The communication channels construct had 11 items. There were 18 items in the time construct based on the characteristics of adopters (health education faculty) factor, and four demographic questions that included: age, gender, how many years they have been teaching at the university level, and if they had ever taught an online course.

Expert Panel Review

McDermott and Sarvela (1999) recommended that researchers' colleagues should serve as an expert panel to conduct an initial review of an instrument to check for ease of use, understandability, relevance, wording, grammar, spelling, readability, and flow. The expert panel for review of the instrument consisted of five professors from multiple universities and various departments including Health Education, Workforce Education and Development, and Business Administration Technology. They were selected because of their knowledge about instrument development, distance education, or health education. See Appendix B for background information on each panel member. Each panel member reviewed the instrument for face and content validity. Based on their recommendations, changes were made with wording and items were added or deleted to ensure that the instrument was valid and clear. See Appendix C for expert panel comments.

The researcher made revisions to the instrument based on the following criteria: If all expert panel members agreed to retain an item, it was kept without any modifications. If at least two expert panel members recommended to "delete" an item, it was eliminated. If at least two

expert panel members proposed that the item needed revisions, it was revised according to the experts' comments pertaining to that item. Final changes to the instrument were made after reviewing comments from experts and receiving feedback from the dissertation committee chair.

There were not many questions that were deleted, but a couple questions that were deleted were "I respond to all student emails within 24 hours" and "I believe that I have the ability to control my future". The wording in most questions had to be revised. A few examples were "I strongly believe that health education courses should be taught with face-to-face instructional strategies" was replaced with "I believe health education courses should be taught with face-to-face instructional strategies", "I know how to use social networking sites on the Internet" was replaced with "I spend more time on social networking sites than my colleagues", and "Distance education will incur additional monetary costs" was replaced with "At your university, implementing distance education will incur additional monetary costs". After all revisions were made, the revised instrument was formatted for the pilot study. See Appendix D for the instrument used in the pilot study.

Instrument Pilot Study

The next step was to pilot test the instrument to establish internal consistency reliability (McDermott & Sarvela, 1999). After receiving approval from the university's Institutional Review Board, the researcher conducted a pilot study. The researcher requested and was granted access to all faculty emails by the Freedom of Information Act Officer at the university. For the pilot study, the instrument was emailed to all faculty at the university during the last two weeks of June 2012. Participants completed the survey by clicking on a link in the email that directed them to *Survey Monkey.* Completion and return of this survey indicated voluntary consent to participate in this study. Data from the pilot study responses (n = 99) were compiled for analysis

in Statistical Package for the Social Sciences (SPSS®) program version 19.0 (SPSS, Inc., 2010) spreadsheet. Internal consistency reliability was established by calculating Cronbach alphas for diffusion of innovation constructs and factors. Nunnally (1978) explained that a minimum Cronbach alpha level of .70 is used to establish internal consistency reliability.

Nunnally (1978) suggested that items should be removed to increase Cronbach alpha scores above .70. During review of the items it was determined that certain items should be deleted to increase the reliability of the instrument. The Cronbach alpha for the characteristics of distance education construct was .77. However, within each factor of the characteristics of distance education construct, items were deleted to increase the Cronbach alpha value. One item (pilot testing distance education before implementation is not possible) was deleted from the trialability factor. Two items ("For distance education to remain relevant, ongoing training is necessary" and "Increasing distance education is not part of my university's strategic plan") were deleted from the compatibility factor. Two items ("It takes more time to design distance education courses than face-to-face courses" and "By using the Internet, I can find valid and reliable health information to use in my courses") were deleted from the complexity factor.

Items also were deleted from the other three constructs. One item ("Information from others on distance education is rarely communicated face to face") was deleted from the communication channels construct. One item ("Distance education will not increase the enrollment at my university") was deleted from the social system construct, and one item ("I spend more time on social networking sites than my colleagues") was deleted from the characteristics of the adopter factor. The Cronbach alpha levels for all constructs were above .70 and according to Nunnally (1978) this helps establish internal consistency reliability.

Finalized Instrument for Study

The final instrument for the primary research contained 97 items: 15 demographic items and 82 items measured by a 5-point Likert-type scale. The 82 items measured by the Likert scale addressed the main constructs of diffusion of innovation theory (participant's total construct score). The largest number of items was present in the characteristics of the innovation (distance education) because it has five factors that affect the construct. There were 37 items to measure the characteristics of the innovation (distance education) construct (16 items for relative advantage, 5 for compatibility, 7 for complexity, 6 for observability, 3 for trialability). There were 15 items to measure the social system construct, 10 items to measure the communication channel construct, and 17 items to measure the characteristics of the adopters (health education faculty) factor that affects the time construct. Based on recommendations from the researcher's committee, the researcher added additional demographic questions and another construct "perception of need" with 3 questions in that construct.

See Table 1 for a list of the Cronbach alphas for constructs and factors of the final instrument used for the primary study. See Table 2 for sample items within in each construct and factor. The format of the actual survey was created in *Survey Monkey*. See Appendices E and F for the final instrument in *Survey Monkey* format and the items in each construct and factor.

Research Design

A quantitative, cross-sectional, descriptive, correlational survey design was used in this study. Babbie (2008) defined cross-sectional studies as those that "involve observations of a sample, or cross-section, of a population or phenomenon that are made at one point in time" (p. 11). Descriptive research systematically, factually, and accurately describes the facts and characteristics of a given population (Alreck & Settle, 2004; Isaac & Michael, 1995).

Table 1

Reliability of the Final Instrument as Measured by Cronbach Alphas

Construct and Factor	Number of items	Cronbach alpha
Characteristics of the Innovation	37	.77
Relative Advantage	16	.92
Compatibility	5	.72
Complexity	7	.80
Observability	6	.74
Trialability	3	.57
Social System	15	.78
Communication Channels	10	.82
Time	17	.85
Characteristics of the Adopters	17	.85

Correlation is an empirical relationship between two variables such that changes in one variable are associated with changes in another or particular attributes of one variable are associated with particular attributes of another (Babbie, 2008). Correlation research is appropriate for this study as it will measure the relationship among factors affecting adoption and diffusion of distance education in the health education profession and adopter category of the participants. The findings were analyzed, generalized to the relevant population, and reported to answer research questions and met purpose of the study (Alreck & Settle, 2004).

Study Participants

The American Association of Health Education (AAHE) Directory (2011) was used to identify potential participants for this study. Potential participants (n=498) included health education instructors currently employed by health education departments listed in the AAHE directory (2011). Only health education departments that responded to an email from AAHE

Table 2

Sample Items from the Survey Instrument to Illustrate Constructs and Factors

Construct and Factor Sample Items
Characteristics of the Innovation
Relative Advantage Sample Items
Distance education can't replace face-to-face instructional strategies.
Distance education instructional strategies will enhance my courses
Compatibility Sample Items
The strategies used in distance education are not consistent with my teaching style.
Distance education is not consistent with the goals and objectives of my profession.
Complexity Sample Items
Distance education courses are difficult to implement into my courses.
Learning to implement distance education is not difficult.
Observability Sample Items
It is difficult to observe distance education at the university where I am currently employed.
I have not observed students enjoying distance education courses.
Trialability Sample Items
Distance education instructional strategies are difficult to try in health education courses.
Opportunities to try distance education instructional strategies before I adopt them are available.
Social System Sample Items
My department chair supports the implementation of distance education.
Distance education will result in a reduction of staff at my university.
Communication Channels Sample Items
I communicate regularly with people who advocate for distance education.
I don't advocate for distance education at my university.
Time
Characteristics of Adopters Sample Items
I have difficulty helping students with technological issues.
I believe that my courses should all be taught face-to-face.

directors are listed in the AAHE (2011) directory (AAHE Directory, 2011). A power analysis revealed that a minimum number of 218 participants were needed to detect statistically significant differences (Alreck & Settle, 2004; Raosoft, 2004**).** All health education faculty (N = 498), employed at universities listed in the AAHE directory (2011) were emailed the survey to ensure that the minimum sample was achieved.

The following general standards of sample size determination for the health sciences were used to identify the sample size for the proposed study:

1. Alpha-level of significance (probability level) is set at 0.05 which means the confidence level was set at 95% (5% chance of making type I error or false positive result);
2. Power of statistical test (1-β) was set at 0.80 which means 20% chance of making type II error or false negative result;
3. Effect size range was set between 0.20 to 0.40 (measure of the strength of the relationship between two variables) (Alreck & Settle, 2004; Raosoft, 2004)

Data Collection

Data collection for the study began after approvals were granted by the dissertation committee and the Institutional Review Board (IRB) of Southern Illinois University Carbondale (See Appendix I for IRB Approval). Health educators employed by health education departments listed in the AAHE (2011) Directory (N=498) were contacted by email and asked to participate in this study on Monday December 17, 2012. See Appendices G and H for the email solicitation and cover letter forms. Participants had the choice to reply "no" to emails or simply just ignore the three emails if they didn't want to participate in the study. If health educators chose to participate, they clicked on the link in the email and were directed to an electronic

survey administered through *Survey Monkey*. Completion and return of this survey indicated voluntary consent to participate in this study. Two follow-up emails were sent on Monday December 31, 2012 and Tuesday January 15, 2013 to remind participants about the survey.

A total of 112 (22.49%) participants responded to the first email notification between Monday December 17, 2012 and Monday December 31, 2012. Ninety-four (18.88%) participants responded to the second email notification between Monday December 31, 2012 and Tuesday January 15, 2013. Thirty-nine (7.83%) participants responded to the third email notification between Tuesday January 15, 2013 and Tuesday January 22, 2013. No other email notifications occurred. A total of 245 participants were used for the data analysis. Data were electronically gathered and organized through *Survey Monkey*. Data were stored as a SPSS program version 19.0 (SPSS, Inc., 2010) spreadsheet.

Data Analysis

Data were analyzed using the SPSS program version 19.0 (SPSS, Inc., 2010). The following coding procedures were applied for data analysis. For descriptive statistic analysis, responses for Likert-type scale questions were coded as follows: *strongly agree* = 4, *agree* = 3, *disagree* = 2, *strongly disagree* = 1, and *don't know* = 0. Rogers (2003) stated that "the innovation-decision process begins with the knowledge stage, which commences when an individual (or other decision making unit) is exposed to an innovation's existence and gains an understanding of how it functions" (p. 171). Thus, it was determined by the researcher and committee chair to code "*don't know*" as zero. This will impact the mean and standard deviation of all items. Items also were recoded, if necessary when inputed into SPSS.

Descriptive statistics were computed for each item including frequencies, percentages, means, and standard deviations. Items within each of the diffusion of innovation constructs and

factors were summed to create total scores so that frequencies, percentages, measures of central tendency, and measures of dispersion could be calculated. Independent T-Tests were used to determine if differences existed among participants' total construct scores based on demographic variables such as gender, highest degree (Masters or PhD), type of institution (public or private), and experience with distance education (no experience or experience). Analysis of Variances (ANOVA) were used to determine if differences existed among participants' total construct scores based on demographic variables such as age and type of institution (research, teaching, or both).

ANOVAs along with Tukey's Post Hocs were used to determine if differences existed among participants' adopter categories based on independent variables such as perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty). Participants were put into an adopter category based on the percentages presented in Rogers (2003) diffusion of innovation theory and total score of the instrument. Rogers (2003) explained that 2.5% of adopters are innovators, 13.5% are early adopters, 34% are early majority adopters, 34% are late majority adopters, and 16% are laggards. The researcher calculated the total score by taking the 82 items (from all diffusion of innovation constructs) and multiplying it by 4 (the highest score on the Likert scale) to get a possible total score of 328. Participants who scored between 319.8 and 328 were in the innovator category, scores between 275.52 and 319.8 were in the early adopter category, scores between 164 and 275.52 were in the early majority category, scores between 52.48 and 164 were in the late majority category, and scores between 0 and 52.48 were in the laggard category.

Pearson correlations were calculated to determine the relationship between perception of need, characteristics of the innovation (distance education), social system, communication channels, characteristics of adopters (health education faculty), participants' total construct score and participants' experience with distance education. Multiple linear regression was calculated to determine how much variance in participants' experience with distance education can be attributed to the perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty).

Participants' experience with distance education was reccommended by the committee chair to be used as a dependent variable and it was determined by using the following items: what year did you start teaching hybrid courses, how many hybrid courses did you teach in that academic year, what year did you start teaching courses that were delivered entirely online, how many courses did you teach entirely online in that academic year, during the fall semester of 2011, spring semester 2012, and fall semester of 2012 how many hybrid courses did you teach, and during the fall semester of 2011, spring semester 2012, and fall semester of 2012 how many courses did you teach entirely online.

The statistical analyses were chosen to identify the constructs that effect the adoption and diffusion of distance education among health education faculty. Surveys missing more than five percent of data were not included in data analysis. If a survey was missing less than five percent of data, the mean score for items with missing data was used. An alpha level of .05 was used to determine statistical significance. Table 3 presents a summary of the data analysis procedures congruent with research questions.

Table 3

Data Analysis Summary

Research Questions	Items	Independent Variables	Dependent Variables	Data Analysis
1. What are the self-reported levels of knowledge and experience with distance education based on perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty) among the participants in this study?	**Perception of Need Items**: 6, 33, 41 **Characteristics of Innovation Items**: 2, 3, 4, 5, 10, 12, 14, 15, 16, 17, 22, 26, 27, 31, 32, 34, 38, 40, 42, 46, 48, 50, 51, 52, 53, 57, 60, 65, 66, 67, 68, 70, 74, 76, 77, 78, 81 **Social System Items**: 7, 11, 19, 23, 28, 35, 43, 54, 58, 61, 63, 69, 71, 73, 82 **Communication Channel Items**: 8, 18, 20, 24, 29, 36, 44, 55, 72, 79 **Characteristics of Adopter Items**: 1, 9, 13, 21, 25, 30, 37, 39, 45, 47, 49, 56, 59, 62, 64, 75, 80.	Perception Of Need Characteristics Of The Innovation Social System Communication Channels Characteristics Of the Adopters	N/A	Frequencies Percentages Means Standard Deviations

Table 3 Continued

Data Analysis Summary

Research Questions	Items	Independent Variables	Dependent Variables	Data Analysis
2. To what extent do differences exists among participants' total construct scores based on demographic variables such as gender, age, highest degree,type of institution (public or private), teaching or research oriented type of institution, and experience?	**Participants' Total Construct Score Items:** Total of all items from RQ1	**Gender** Male Female	Participants' Total Construct Score	Independent T-Test
		Degree Masters PhD	Participants' Total Construct Score	Independent T-Test
		Institution Private Public	Participants' Total Construct Score	Independent T-Test
		Experience No Experience Experience	Participants' Total Construct Score	Independent T-Test
		Institution Research Teaching Both	Participants' Total Construct Score	ANOVA
		Age 25-34 35-44 45-54 55 and over	Participants' Total Construct Score	ANOVA

Table 3 Continued

Data Analysis Summary

Research Questions	Items	Independent Variables	Dependent Variables	Data Analysis
3. To what extent do differences exist among participants' adopter categories based on independent variables such as perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty)?	Refer to RQ1 for each of the items in the diffusion of innovation constructs	Adopter Categories: Late Majority Early Majority Early Adopter	Mean Perception of Need construct scores	ANOVA Tukey's Post Hoc
		Adopter Categories: Late Majority Early Majority Early Adopter	Mean Characteristics of the Innovation Construct Scores	ANOVA Tukey's Post Hoc
		Adopter Categories: Late Majority Early Majority Early Adopter	Mean Social System Construct Scores	ANOVA Tukey's Post Hoc
		Adopter Categories: Late Majority Early Majority Early Adopter	Mean Communication Channels Construct Scores	ANOVA Tukey's Post Hoc
		Adopter Categories: Late Majority Early Majority Early Adopter	Mean Characteristics of Adopter Construct Scores	ANOVA Tukey's Post Hoc

Table 3 Continued

Data Analysis Summary

Research Questions	Items	Independent Variables	Dependent Variables	Data Analysis
4. What is the relationship between perception of need, characteristics of the innovation (distance education), social system, communication channels, characteristics of adopters (health education faculty), and participants' total construct score and participants' experience with distance education?	Refer to RQ1 for each of the items in the diffusion of innovation constructs **Participants' experience with distance education Items:** 92-97	Perception of Need Characteristics of the Innovation Social System Communication Channels Characteristics of Adopters Participants' total construct score Participants' experience with distance education	N/A	Pearsons Correlation

Table 3 Continued

Data Analysis Summary

Research Questions	Items	Independent Variables	Dependent Variables	Data Analysis
5. How much variance in the participants' experience with distance education can be attributed to the perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty)?	**Participants' experience with distance education Items**: 92-97	Perception of Need Characteristics of the Innovation Social System Communication Channels Characteristics of Adopters	Participants' experience with distance education	Multiple Linear Regression

Summary

This chapter explained how the study was to be conducted. There were five research questions pertaining to the purpose of the study. The research design, sample, data collection and data analysis procedures were described. By following the strict guidelines presented in this section, the researcher is confident that he has conducted a valid and reliable study.

CHAPTER 4

RESULTS

Introduction

This chapter provides a detailed review of the sample demographics and study results based on the research questions. Information related to perception of need, characteristics of the innovation (distance education), social system, communication channels, characteristics of the adopters (health education faculty), participants' adopter category, participants' total construct score, and participants' experience with distance education were gathered from 224 participants who completed the survey. This chapter will summarize results of this study.

Purpose of the Study

The primary purpose of this study was to identify which constructs in Rogers' (2003) diffusion of innovation theory are more likely to contribute to adoption and diffusion of distance education in health education. The main constructs of Rogers' (2003) diffusion of innovation theory include characteristics of the innovation (distance education), social system (surrounding health education faculty), communication channels (used by health education faculty), and time (characteristics of health education faculty and adopter category).

Research Questions

The following research questions were addressed in this study:

1) What are the self-reported levels of knowledge and experience with distance education based on perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty) among the participants in this study?

2) To what extent do differences exists among participants' total construct scores based on demographic variables such as gender, age, highest degree, type of institution (public or private), teaching or research oriented type of institution, and experience?
3) To what extent do differences exist among participants' adopter categories based on independent variables such as perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty?
4) What is the relationship between perception of need, characteristics of the innovation (distance education), social system, communication channels, characteristics of adopters (health education faculty), and participants' total construct score and participants' experience with distance education?
5) How much variance in the participants' experience with distance education can be attributed to the perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty)?

Sample Demographics

Participants were recruited from the AAHE directory (2011). Emails soliciting participation in this study were sent on Monday December 17, 2012, Monday December 31, 2012, and Tuesday January 15, 2013. Four hundred ninety-eight health education faculty were invited to complete the instrument. A total of 112 (22.49%) participants responded to the first email notification. Ninety-four (18.88%) participants responded to the second email notification and 39 (7.83%) participants responded to the third email notification. No other email notifications occurred. A total of 245 health education faculty responded the instrument, but 21

participants were omitted because they did not complete at least 95% of the survey instrument. A total of 224 survey instruments were retained and included in the analysis, providing a 44.9% response rate.

The sample contained 147 (65.6%) females and 77 (34.4%) males. There was a wide age range among participants, ranging from 27 to 71 years old. There also was a wide range of years of experience teaching at a university, ranging from 1 to 42 years. The majority of participants had a PhD (n=197; 87.9%) and worked for a public university (n=201; 89.7%). See Table 4 for more detailed information on the demographics.

It was reccommended to the researcher that items 92-97 be used to calculate the participants' experience with distance education dependent variable. After all data were collected, the participants' experience with distance education dependent variable was determined by summing the scores of these items. There were a total of 76 participants who had no experience with distance education and 148 of the participants had experience with distance education. See Table 5 for the items and an example of how this was calculated.

After all data were collected, adopter category was determined. Rogers (2003) explained that over time adoption will occur at these percentages: 2.5% of adopters are innovators, 13.5% are early adopters, 34% are early majority adopters, 34% are late majority adopters, and 16% are laggards. Participants were put into an adopter category based on these percentages and the total score of the instrument. The researcher calculated the participants' total score by taking the 82 items (from all diffusion of innovation constructs) and multiplying it by 4 (the highest score on the Likert scale) to get a possible total score of 328. Participants who scored between 319.8 and 328 were in the innovator category, scores between 275.52 and 319.8 were in the early adopter category, scores between 164 and 275.52 were in the early majority category, scores between

Table 4

Demographic Characteristics of Study Participants (n=224)

Demographic Items	Frequency (n)	Percentage (%)
Gender		
Female	147	65.6
Male	77	34.4
Age		
25-34	24	10.7
35-44	26	11.6
45-54	57	25.4
55 and over	117	52.3
Highest Degree		
Master's	27	12.1
PhD	197	87.9
Type of Institution		
Public	201	89.7
Private	22	9.8
Other	1	.4
Teaching or Research Oriented		
Teaching	72	32.1
Research	55	24.6
Both	96	42.9
Other	1	.4
Experience		
No Experience	76	33.9
Experience	148	66.1

52.48 and 164 were in the late majority category, and scores between 0 and 52.48 were in the laggard category. The majority of the participants (82.6%) were in the early majority adopter category and there were no participants in the innovator or laggard adopter categories. See Table 6 for the total number of participants in each adopter category.

Table 5

An Example of How Experience with Distance Education Variable was Calculated

Items 92-97	Answer
What year did you start teaching hybrid courses?	2008 (2008-2013=5)
How many hybrid courses did you teach in that academic year?	2
What year did you start teaching courses that were delivered entirely online?	2010 (2010-2013=3)
How many courses did you teach entirely online in that academic year?	1
During the fall semester of 2011, spring semester 2012, and fall semester of 2012 how many hybrid courses did you teach?	6
During the fall semester of 2011, spring semester 2012, and fall semester of 2012 how many courses did you teach entirely online?	3
Total Score	20

Table 6

Total Number of Participants in each Adopter Category

Adopter Category	Participants in Each
Laggard	0
Late Majority	30
Early Majority	185
Early Adopter	9
Innovator	0

The researcher retested for internal consistency reliability by calculating Cronbach alphas. Results showed that there was minimal change in overall Cronbach alpha scores as compared to the pilot test. Characteristics of the innovation (distance education) had the biggest

increase in Cronbach Alpha, increasing from .77 to .92. The social system increased from .78 to .80. The communication channels and time constructs both decreased, but still remained over .75. Nunnally (1978) explained that a Cronbach alpha above .70 is an adequate measure for internal consistency reliability. However, a factor analysis should be conducted to further justify the validity and reliability of this instrument. See Table 7 for more detailed information on the Cronbach alphas.

Analysis of Research Questions

All data were analyzed using SPSS 19.0 (SPSS Inc, 2010). To address the research questions means, standard deviations, frequencies, percentages, independent sample t-tests, analysis of variances (ANOVA), Pearson correlation, and multiple linear regression analysis were conducted with appropriate data variables. An alpha level of .05 was used to determine statistical significance. See Table 8 for the means and standard deviations for all items.

Research Question #1: What are the self-reported levels of knowledge and experience with distance education based on perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty) among the participants in this study?

Perception of Need

Overall, health education faculty perceived that an increase in distance education will attract more nontraditional students and help universities stay competitive, but might not influence the total enrollment of universities. The majority of participants (83.1%) "agreed" or "strongly agreed" that more nontraditional students will be attracted to higher education if universities offer more distance education courses. The majority of participants (76.8%)

Table 7

Cronbach Alphas of Developed Instrument

Construct	Number of items	Cronbach alpha
Characteristics of the Innovation	37	.92
Relative Advantage	16	.86
Compatibility	5	.53
Complexity	7	.83
Observability	6	.68
Trialability	3	.60
Social System	15	.80
Communication Channels	10	.74
Time	17	.77
Characteristics of the Adopters	17	.77
Perception of Need	3	.59

"agreed" or "strongly agreed" that universities need to offer more distance education courses to stay competitive. However, most of the participants (74.6%) "agreed" or "strongly agreed" that increases in distance education will not increase the student enrollment. See Table 9 for more detailed information on the perceptions of need.

Characteristics of the Innovation (Distance Education)

The five factors that effect the characteristics of the innovation (distance education) are relative advantage, compatibility, complexity, trialability, and observability (Rogers, 2003). Regarding relative advantage, most faculty (62.5%) "agreed" or "strongly agreed" that they will be delivering a lower quality of education if they implement distance education. Most faculty (79.9%) "agreed" or "strongly agreed" that distance education will replace some face-to-face

Table 8

Mean and Standard Deviation for All Items

Item	Mean	Std. Deviation
At my university, implementing distance education will incur additional monetary costs.	1.8884	1.24600
The strategies used in distance education are not consistent with my teaching style.	2.5446	.93164
Distance education courses are difficult to implement within my courses.	2.6473	.86574
There is ample evidence in the literature to support the effectiveness of distance education.	2.1964	1.41953
To stay competitive in higher education, more distance education courses should be offered in health education.	2.8437	1.17051
Distance education will result in a reduction of staff at my university.	2.4554	1.35520
I communicate regularly with people who advocate for distance education.	2.5223	.97477
I have difficulty helping students with technological issues.	2.7187	.89663
Distance education will become an educational norm in the future.	2.8125	1.02901
My university has adequate professional development programs related to distance education.	2.7054	.93883
Distance education instructional strategies are difficult to try in health education courses.	2.7991	.93262
I can not record a lecture for students to access on the Internet.	3.1875	.94732
Educational fads have come and gone and so will distance education.	3.1830	.87182
I search the Internet for ideas to incorporate within my courses.	3.2054	.73525
Learning to implement distance education is not difficult.	2.5045	.98417
It is difficult to observe distance education at the university where I am currently employed.	2.5357	1.21595
I do not advocate for distance education at my university.	2.7545	.93150
Training faculty how to implement the “best practices” in distance education will be expensive.	2.4286	1.16922
Few faculty at my university advocate for distance education.	2.1339	1.15207
I can not create a power point presentation for students to access on the Internet.	3.7009	.56410
Distance education can not replace face-to-face instructional strategies.	2.0848	.95970

Table 8 Cont.

Mean and Standard Deviation for all Items

Item	Mean	Std. Deviation
The technical support for distance education at my university is inadequate.	2.7277	1.07643
Faculty approaches me for advice on distance education.	2.4196	.86939
I communicate more often with my students through email than face-to-face.	2.6741	.97780
Distance education instructional strategies will enhance my courses.	2.5402	1.16303
I can implement distance education within my current course with my existing knowledge in technology.	2.9063	.88087
Faculty at my university are intimidated by distance education.	1.9821	1.11639
I help other faculty at my university implement distance education effectively.	2.2545	.91450
I can create timed exams and quizzes for distance education.	1.1518	.70218
Courses delivered through distance education can be as effective as face-to-face courses.	2.5268	1.14006
I search the Internet for new technology to use in my courses.	2.7589	.86533
Increases in distance education will not increase student enrollment at your university.	2.6652	1.23820
My interest in distance education has encouraged other instructors to become involved in engaging in distance education delivery.	1.9598	1.14946
Property rights in distance education are an area of concern for faculty.	1.6652	1.07955
I have no difficulty telling other faculty how distance education improves my courses.	2.4018	1.10002
I do not know how to use a webcam.	3.0625	.86570
Distance education will meet the educational needs of students in college courses.	2.3304	1.18955
I do not know how to use a headset and microphone.	3.3795	.69187
There is a lack of interaction between the student and the instructor within distance education courses.	2.4821	.92772
To reach more nontraditional students in higher education, more distance education courses should be offered.	2.9464	.86111
It is difficult to find distance education instructional strategies to use in my courses.	2.5714	1.10615

Table 8 Cont.

Mean and Standard Deviation for all Items

Item	Mean	Std. Deviation
My department chair supports implementation of distance education.	2.9420	1.05509
My university doesn't offer a course management system (Blackboard, D2L, etc..) to implement distance education.	3.6562	.78817
I do not keep up with current trends in technology.	3.0536	.70665
Instructional strategies that are recommended for distance education can make learning just as interesting as face-to-face courses.	2.5759	1.18796
I am open to understanding other people's perspectives on distance education (pro or con).	3.3438	.65108
Distance education will replace some face-to-face instruction in the future.	2.9330	1.01114
I believe that my courses should all be taught face-to-face.	2.5714	1.02186
Distance education will give more students an opportunity at higher education.	2.9196	1.00794
I understand how to implement distance education effectively.	2.7455	.94346
I have not observed students enjoying distance education courses.	2.4732	1.19760
Opportunities to use distance education instructional strategies before I adopt them are available.	2.2857	1.36535
My department chair advocates for the implementation of distance education.	2.6964	1.15862
Faculty at my university will help me locate valid and reliable health information on the Internet.	2.5402	1.17454
I believe that I don't have control over how I teach my courses (whether face-to-face or online).	3.2857	.87751
Teaching distance education is just as enjoyable as teaching face-to-face.	1.9420	1.12502
At my university there is a higher demand for distance education than in the past.	3.0313	1.13403
I have trouble getting technology to work in my courses.	2.9107	.81525
Students do not enjoy taking distance education courses.	2.1920	1.39626
Administrators at my university understand the best practices of distance education.	1.8661	1.37234
I am more likely than my colleagues to try new technologies in my courses.	2.5357	1.08333

Table 8 Cont.

Mean and Standard Deviation for all Items

Item	Mean	Std. Deviation
Incentives are offered at my university to implement distance education.	2.1027	1.14946
I am more likely than my colleagues to take risks.	2.2723	1.29225
The benefits of face-to-face interaction can be accomplished in distance education courses.	2.2009	1.03733
Distance education is not consistent with the goals and objectives of my profession.	2.6205	1.11803
When trying to adopt distance education, I do not understand how to implement the best practices of distance education.	2.6250	1.03850
Opportunities to observe quality distance education are available.	2.4196	1.24301
There is minimal I.T. (information technology) support at my university.	3.0179	.88315
I feel I will be delivering a lower quality education if I implement distance education.	2.5938	1.07984
There are no monetary incentives to implement distance education at my university.	2.1786	1.19576
I do not communicate with faculty at other universities to increase my knowledge of distance education.	2.2455	.76790
Release time to develop distance education courses and programs is not provided at my university.	1.7768	1.10206
Students have told me they do not learn as much in distance education courses.	2.0446	1.24121
I am more likely than my colleagues to implement new instructional strategies in my courses.	2.4911	1.26346
There is a steep learning curve when trying to implement distance education.	2.0402	.89502
I have not observed instructors' satisfaction with distance education courses.	2.2723	1.19489
Professional development related to implementing effective distance education strategies is offered, so I can try them before I adopt them.	2.4598	1.21949
I rarely communicate with others about distance education.	2.6518	.74821
I communicate with my colleagues through email more often than face-to-face.	2.7054	.89481

Table 8 Cont.

Mean and Standard Deviation for all Items

Item	Mean	Std. Deviation
People that I have spoken with (students, colleagues, friends, etc..), who have taken distance education courses have told me that the course was not effective.	2.3929	1.12738
My university's distance education program has a policy they employ regarding responding to students within a timely fashion.	1.5223	1.43918

*"0" was used in the calculations for Means and Standard Deviations

Table 9

Frequencies and Percentages of Perception of Need Responses

Item	DK n(%)	SD n(%)	D n(%)	A n(%)	SA n(%)
To stay competitive in higher education, more distance education courses should be offered in health education.	23 (10.3)	3 (1.3)	26 (11.6)	106 (47.3)	66 (29.5)
To reach more nontraditional students in higher education, more distance education courses should be offered.	9 (4)	3 (1.3)	26 (11.6)	139 (62.1)	47 (21)
Increases in distance education will not increase student enrollment at your university*.	30 (13.4)	7 (3.1)	20 (8.9)	118 (52.7)	49 (21.9)

*Items reverse coded when computing scores
(DK=don't know, SD=strongly disagree, D=disagree, A=agree, SA=strongly agree)

instruction. Most faculty (74.6%) also "agreed" or "strongly agreed" that distance education will become a norm in the future. However, most faculty (90.6%) "agreed" or "strongly agreed" that distance education is a fad that will come and go. In the compatibility factor, most faculty (73.2%) "agreed" or "strongly agreed" that distance education is not consistent with the goals and objectives of the health education profession. Most faculty (85.3%) "agreed" or "strongly agreed" that distance education will give more students a chance at higher education.

In the complexity factor, most faculty (63.8%) "agreed" or "strongly agreed" that they understand how to implement distance education into their courses. However, most faculty (69.6%) "agreed" or "strongly agreed" that it is difficult to find distance education instructional strategies to implement in their courses. In the observability factor, most faculty (63%) "agreed" or "strongly agreed" that they have not observed student enjoyment with distance education. In the trialability factor, most faculty (76.8%) "agreed" or "strongly agreed" that distance education is difficult to try in health education courses. See Table 10 for more detailed information on factors influencing characteristics of the innovation (distance education) construct.

Social System

A large majority of health education faculty (83.9%) participants "agreed" or "strongly agreed" that there is a high demand for distance education at their university. A large majority of health education faculty (72.3%) "agreed" or "strongly agreed" that their department chair advocates for distance education. A large majority of health education faculty (80%) "agreed" or "strongly agreed" that their chair supports the implementation of distance education.

A majority of participants (66.1%) "agreed" or "strongly agreed" that their university has adequate professional development for the implementation of distance education. However, most participants (76.6%) "agreed" or "strongly agreed" that there is minimal information technology (I.T.) support on campus and (66.6%) "agreed" or "strongly agreed" that the technical support at their university is inadequate. See Table 11 for more detailed information on social system responses.

Table 10

Frequencies and Percentages of Characteristics of Innovation Responses

Item	DK n(%)	SD n(%)	D n(%)	A n(%)	SA n(%)
Relative Advantage					
At my university, implementing distance education will incur additional monetary costs*.	45 (20.1)	32 (14.3)	70 (31.3)	57 (25.4)	20 (8.9)
People that I have spoken with (students, colleagues, friends, etc..), who have taken distance education courses have told me that the course was not effective*.	27 (12.1)	9 (4)	62 (27.7)	101 (45.1)	25 (11.2)
Students have told me they do not learn as much in distance education courses*.	43 (19.2)	20 (8.9)	63 (28.1)	80 (35.7)	18 (8)
I feel I will be delivering a lower quality education if I implement distance education*.	16 (17.1)	15 (6.7)	53 (23.7)	100 (44.6)	40 (17.9)
The benefits of face-to-face interaction can be accomplished in distance education courses.	25 (11.2)	13 (5.8)	92 (41.1)	80 (35.7)	14 (6.3)
Students do not enjoy taking distance education courses*.	54 (24.1)	9 (4)	30 (13.4)	102 (45.5)	29 (12.9)
Teaching distance education is just as enjoyable as teaching face-to-face.	29 (12.9)	44 (19.6)	79 (35.3)	55 (24.6)	17 (7.6)
Distance education will replace some face-to-face instruction in the future.	13 (5.8)	6 (2.7)	26 (11.6)	117 (52.2)	62 (27.7)
Instructional strategies that are recommended for distance education can make learning just as interesting as face-to-face courses.	27 (12.1)	6 (2.7)	45 (20.1)	103 (46)	43 (19.2)
There is a lack of interaction between the student and the instructor within distance education courses*.	8 (3.6)	18 (8)	82 (36.6)	90 (40.2)	26 (11.6)
Distance education will meet the educational needs of students in college courses.	33 (14.7)	11 (4.9)	52 (23.2)	105 (46.9)	23 (10.3)
Courses delivered through distance education can be as effective as face-to-face courses.	19 (8.5)	19 (8.5)	52 (23.2)	93 (41.5)	41 (18.3)
Distance education instructional strategies will enhance my courses.	28 (12.5)	6 (2.7)	40 (17.9)	117 (52.2)	33 (14.7)
Distance education can not replace face-to-face instructional strategies*.	10 (4.5)	51 (22.8)	86 (38.4)	64 (28.6)	13 (5.8)
Educational fads have come and gone and so will distance education*.	9 (4)	1 (.4)	11 (4.9)	122 (54.5)	81 (36.2)

Table 10 Continued

Frequencies and Percentages of Characteristics of Innovation Responses

Item	DK n(%)	SD n(%)	D n(%)	A n(%)	SA n(%)
Distance education will become an educational norm in the future.	16 (7.1)	3 (1.3)	38 (17)	117 (52.2)	50 (22.3)
Compatibility					
I search the Internet for ideas to incorporate within my courses.	1 (.4)	4 (1.8)	24 (10.7)	114 (50.9)	81 (36.2)
I search the Internet for new technology to use in my courses.	4 (1.8)	9 (4)	66 (29.5)	103 (46)	42 (18.8)
Distance education will give more students an opportunity at higher education.	18 (8)	0 (0)	15 (6.7)	140 (62.5)	51 (22.8)
Distance education is not consistent with the goals and objectives of my profession*.	22 (9.8)	14 (6.3)	24 (10.7)	131 (58.5)	33 (14.7)
Complexity					
Distance education courses are difficult to implement within my courses*.	5 (22)	15 (6.7)	62 (27.7)	114 (50.9)	28 (12.5)
Learning to implement distance education is not difficult.	14 (6.3)	15 (6.7)	62 (27.7)	110 (49.1)	23 (10.3)
I can implement distance education within my current course with my existing knowledge in technology.	6 (2.7)	6 (2.7)	44 (19.6)	115 (51.3)	53 (23.7)
It is difficult to find distance education instructional strategies to use in my courses*.	25 (11.2)	6 (2.7)	37 (16.5)	128 (57.1)	28 (12.5)
I understand how to implement distance education effectively.	6 (2.7)	12 (5.4)	63 (28.1)	95 (42.4)	48 (21.4)
When trying to adopt distance education, I do not understand how to implement the best practices of distance education*.	18 (8)	6 (2.7)	52 (23.2)	114 (50.9)	34 (15.2)
There is a steep learning curve when trying to implement distance education*.	17 (7.6)	32 (14.3)	102 (45.5)	71 (31.7)	2 (.9)
Observability					
There is ample evidence in the literature to support the effectiveness of distance education.	57 (25.4)	5 (2.2)	30 (13.4)	101 (45.1)	31 (13.8)
It is difficult to observe distance education at the university where I am currently employed*.	25 (11.2)	16 (7.1)	43 (19.2)	94 (42)	46 (20.5)
My interest in distance education has encouraged other instructors to become involved in engaging in distance education delivery.	40 (17.9)	22 (9.8)	79 (35.3)	73 (32.6)	10 (4.5)

Table 10 Continued

Frequencies and Percentages of Characteristics of Innovation Responses

Item	DK n(%)	SD n(%)	D n(%)	A n(%)	SA n(%)
I have not observed students enjoying distance education courses*.	29 (12.9)	11 (4.9)	43 (19.2)	107 (47.8)	34 (15.2)
Opportunities to observe quality distance education are available.	37 (16.5)	5 (2.2)	38 (17)	115 (51.3)	29 (12.9)
I have not observed instructors' satisfaction with distance education courses*.	36 (16.1)	8 (3.6)	60 (26.8)	99 (44.2)	21 (9.4)
Trialability					
Distance education instructional strategies are difficult to try in health education courses*.	14 (6.3)	1 (.4)	37 (16.5)	136 (60.7)	36 (16.1)
Opportunities to use distance education instructional strategies before I adopt them are available.	50 (22.3)	3 (1.3)	36 (16.1)	103 (46)	32 (14.3)
Professional development related to implementing effective distance education strategies is offered, so I can try them before I adopt them.	33 (14.7)	8 (3.6)	37 (16.5)	115 (51.3)	31 (13.8)

*Items reverse coded when computing scores
(DK=don't know, SD=strongly disagree, D=disagree, A=agree, SA=strongly agree)

Communication Channels

Over half of the participants (59.4%), "agreed" or "strongly agreed" that they communicate regularly with people who advocate for distance education. However, (67.4%) "agreed" or "strongly agreed" that they don't advocate for distance education. A little over half of the participants (66.1%) "disagreed" or "strongly disagreed" with the statement that they don't communicate with faculty at other universities to increase their knowledge on distance education. However, participants (62.9%) "agreed" or "strongly agreed" that they rarely communicate with others about distance education. See Table 12 for more detailed information on the communication channels.

Table 11

Frequencies and Percentages of Social System Responses

Item	DK n(%)	SD n(%)	D n(%)	A n(%)	SA n(%)
My university's distance education program has a policy they employ regarding responding to students within a timely fashion.	94 (42)	13 (5.8)	38 (17)	64 (28.6)	15 (6.7)
Release time to develop distance education courses and programs is not provided at my university*.	35 (15.6)	51 (22.8)	77 (34.4)	51 (22.8)	10 (4.5)
There are no monetary incentives to implement distance education at my university*.	28 (12.5)	31 (13.8)	66 (29.5)	71 (31.7)	28 (12.5)
There is minimal I.T. (information technology) support at my university*.	2 (.9)	11 (4.9)	40 (17.9)	90 (44.2)	72 (32.1)
Incentives are offered at my university to implement distance education.	31 (13.8)	27 (12.1)	71 (31.7)	78 (34.8)	17 (7.6)
Administrators at my university understand the best practices of distance education.	64 (28.6)	14 (6.3)	55 (24.6)	70 (31.3)	21 (9.4)
At my university there is a higher demand for distance education than in the past.	20 (8.9)	2 (.9)	14 (6.3)	103 (46)	85 (37.9)
My department chair advocates for the implementation of distance education.	22 (9.8)	11 (4.9)	29 (12.9)	113 (50.4)	49 (21.9)
My department chair supports implementation of distance education.	14 (6.3)	8 (3.6)	23 (10.3)	111 (49.6)	68 (30.4)
Property rights in distance education are an area of concern for faculty*.	47 (21)	35 (15.6)	92 (41.1)	46 (20.5)	4 (1.8)
Faculty at my university, are intimidated by distance education*.	38 (17)	17 (7.6)	90 (40.2)	69 (30.8)	10 (4.5)
The technical support for distance education at my university is inadequate*.	11 (4.9)	19 (8.5)	45 (20.1)	94 (42)	55 (24.6)
Training faculty how to implement the "best practices" in distance education will be expensive*.	34 (15.2)	4 (1.8)	37 (16.5)	130 (58)	19 (8.5)
My university has adequate professional development programs related to distance education.	3 (1.3)	25 (11.2)	48 (21.4)	107 (47.8)	41 (18.3)

Table 11 Continued

Frequencies and Percentages of Social System Responses

Item	DK n(%)	SD n(%)	D n(%)	A n(%)	SA n(%)
Distance education will result in a reduction of staff at my university*.	45 (20.1)	6 (2.7)	11 (4.9)	126 (56.3)	31 (13.8)

*Items reverse coded when computing scores
(DK=don't know, SD=strongly disagree, D=disagree, A=agree, SA=strongly agree)

Table 12

Frequencies and Percentages of Communication Channels Responses

Item	DK n(%)	SD n(%)	D n(%)	A n(%)	SA n(%)
I communicate regularly with people who advocate for distance education.	12 (5.4)	17 (7.6)	62 (27.7)	108 (48.2)	25 (11.2)
I do not advocate for distance education at my university*.	4 (1.8)	19 (8.5)	50 (22.3)	106 (47.3)	45 (20.1)
Few faculty at my university advocate for distance education*.	38 (17)	11 (4.9)	68 (30.4)	97 (43.3)	10 (4.5)
Faculty approaches me for advice on distance education.	3 (1.3)	31 (13.8)	76 (33.9)	97 (43.3)	17 (7.6)
I help other faculty at my university implement distance education effectively.	8 (3.6)	34 (15.2)	89 (39.7)	79 (35.3)	14 (6.3)
I have no difficulty telling other faculty how distance education improves my courses.	22 (9.8)	18 (8)	56 (25)	104 (46.4)	24 (10.7)
My university doesn't offer a course management system (Blackboard, D2L, etc..) to implement distance education*.	6 (2.7)	2 (.9)	2 (.9)	43 (19.2)	171 (76.3)
Faculty at my university will help me locate valid and reliable health information on the Internet.	28 (12.5)	7 (3.1)	40 (17.9)	114 (50.9)	35 (15.6)
I do not communicate with faculty at other universities to increase my knowledge of distance education*.	3 (1.3)	24 (10.7)	124 (55.4)	61 (27.2)	12 (5.4)
I rarely communicate with others about distance education*.	2 (.9)	11 (4.9)	70 (31.3)	121 (54)	20 (8.9)

*Items reverse coded when computing scores
(DK=don't know, SD=strongly disagree, D=disagree, A=agree, SA=strongly agree)

Characteristics of Adopters (Health Education Faculty)

The majority of participants in this study "agreed" or "strongly agreed" that they have difficulty helping students with technological issues (64.7%); they can't record a lecture for students to view on the Internet (85.7%); they can't record a power point presentation for students to view on the Internet (97.3%); they don't know how to use a webcam (78.6%), don't know how to use a headset and microphone (91.1%); and they don't keep up with current trends in technology (78.5%). Participants also "agreed" or "strongly agreed" that all their courses should be taught face-to-face (66.6%). See Table 13 for more detailed information on the characteristics of adopters (health education faculty).

Research Question #2: To what extent do differences exists among participants' total construct scores based on demographic variables such as gender, age, highest degree, type of institution (public or private), teaching or research oriented type of institution, and experience?

Independent sample t-tests were conducted to assess the difference in participants' total construct mean scores (mean score of items 1-82) within the demographic variables of: gender (male/female), highest degree (Master's/PhD, type of institution (public/private), and experience with distance education. The participants' total construct mean score was not significantly different if a person was male or female (p=.224), if they had a Master's or PhD (p=.537), if they taught at a public or private university (p=.068), or if they had experience with distance education or not (p=.469). There were no significant differences among any of these demographic variables. See Tables 14, 15, 16, and 17 for more detailed information.

Table 13

Frequencies and Percentages of Characteristics of Adopters Responses

Item	DK n(%)	SD n(%)	D n(%)	A n(%)	SA n(%)
In my courses, I use my university's course management system more than my colleagues (D2L, Blackboard, etc.).	23 (10.3)	12 (5.4)	70 (31.3)	71 (31.7)	48 (21.4)
I have difficulty helping students with technological issues*.	5 (2.2)	13 (5.8)	61 (27.2)	106 (47.3)	39 (17.4)
I can not record a lecture for students to access on the Internet*.	9 (4)	3 (1.3)	3 (1.3)	97 (43.3)	95 (42.4)
I can not create a power point presentation for students to access on the Internet*.	0 (0)	3 (1.3)	3 (1.3)	52 (23.2)	166 (74.1)
I communicate more often with my students through email than face-to-face.	3 (1.3)	21 (9.4)	74 (33)	74 (33)	52 (23.2)
I can create timed exams and quizzes for distance education*.	7 (3.1)	104 (46.4)	75 (33.5)	27 (12.7)	11 (4.9)
I do not know how to use a webcam*.	3 (1.3)	7 (3.1)	38 (17)	101 (45.1)	75 (33.5)
I do not know how to use a headset and microphone*.	1 (.4)	1 (.4)	18 (8)	96 (42.9)	108 (48.2)
I do not keep up with current trends in technology*.	0 (0)	1 (.4)	47 (21)	115 (51.3)	61 (27.2)
I am open to understanding other people's perspectives on distance education (pro or con).	3 (1.3)	1 (.4)	1 (.4)	130 (58)	89 (39.7)
I believe that my courses should all be taught face-to-face*.	14 (6.3)	20 (8.9)	41 (18.3)	122 (54.5)	27 (12.1)
I believe that I don't have control over how I teach my courses (whether face-to-face or online)*.	3 (1.3)	8 (3.6)	21 (9.4)	82 (36.6)	110 (49.1)
I have trouble getting technology to work in my courses*.	3(1.3)	7(3.1)	46(20.5)	119(53.1)	49(21.9)
I am more likely than my colleagues to try new technologies in my courses.	22 (9.8)	4 (1.8)	63 (28.1)	105 (45.5)	33 (14.7)
I am more likely than my colleagues to take risks.	44 (19.6)	4 (1.8)	51 (22.8)	97 (43.3)	28 (12.5)
I am more likely than my colleagues to implement new instructional strategies in my courses.	36 (16.1)	0 (0)	48 (21.4)	98 (43.8)	42 (18.8)
I communicate with my colleagues through email more often than face-to-face.	6 (2.7)	10 (4.5)	66 (29.5)	104 (46.4)	38 (17)

*Items reverse coded when computing scores
(DK=don't know, SD=strongly disagree, D=disagree, A=agree, SA=strongly agree)

Table 14

Comparing Mean Total Construct Score by Gender (n=224)

Item	Mean	SD	N	t	df	SIG
Gender				.50	222	.224
Male	210.97	6.56	77			
Female	210.70	41.41	147			

Independent Sample T-Test Results

Table 15

Comparing Mean Total Construct Score by Highest degree (n=224)

Item	Mean	SD	N	t	df	SIG
Degree				.963	222	.537
Masters	217.52	34.03	27			
PhD	209.97	38.73	197			

Independent Sample T-Test Results

Table 16

Comparing Mean Total Construct Score by Type of Institution (n=224)

Item	Mean	SD	N	t	df	SIG
Institution				3.586	222	.068
Public	213.84	36.32	201			
Private	183.77	45.68	22			

Independent Sample T-Test Results

Table 17

Comparing Mean Total Construct Score by Experience (n=224)

Item	Mean	SD	N	t	df	SIG
Experience				-6.602	222	.469
No Exp.	213.74	35.85	77			
Exp.	211.11	40.83	147			

Independent Sample T-Test Results

One-way ANOVAs were conducted to assess the difference in participants' total construct mean scores for the demographic variables age and type of institution (research/teaching/both). The participants' total construct mean score was not significantly different based on their age (p=.144) or what type of institution they worked for (teaching/ research/both) (p=.602). There were no significant differences in either of the one-way ANOVA tests that were calculated. See Tables 18 and 19 for more detailed information

Research Question #3: To what extent do differences exist among participants' adopter categories based on independent variables such as perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty)?

One-way ANOVA was used to see if differences existed for the constructs of the diffusion of innovation theory based on the three adopter categories represented by participants in this study (there were no people in the innovator and laggard categories). The post-hoc test used for ANOVA was Tukey's Honestly Significant Difference (HSD) test. Tukey's HSD test is a conservative test, with a strong control for family wise error rate (Howell, 2009). Family wise error rate is the probability that the results contain at least one Type I error (i.e. false positive or rejecting at least one true hypothesis) (Howell, 2002; Newton & Rudestam, 1999).

ANOVA results for the perception of need construct revealed statistically significant differences among the three adopter categories (p=.000). Tukey's HSD post hoc analysis confirmed differences between late majority and early majority adopter categories (p=.000), early majority and early adopter categories (p=.001), and late majority and early adopters (p=.000). See Table 20 for more detailed information about significant differences between adopter categories and the perception of need construct.

Table 18

Comparing Mean Total Construct Score by Age (n=224)

Item	Mean	SD	N	F	df	SIG
Age				1.822	221	.144
25-34	219.71	38.53	24			
35-44	209.67	40.72	26			
45-54	216.76	34.07	57			
55+	203.99	38.93	117			

ANOVA Results

Table 19

Comparing Mean Total Construct Score by Type of Institution (n=224)

Item	Mean	SD	N	F	df	SIG
Institution				.622	221	.602
Teaching	206.90	35.84	72			
Research	209.53	37.17	55			
Both	214.47	40.43	96			

ANOVA Results

ANOVA results for the characteristics of the innovation (distance education) construct revealed statistically significant differences among the three adopter categories represented in this study (p=.000). Tukey's HSD post hoc analysis confirmed differences between late majority and early majority adopter categories (p=.000), early majority and early adopter categories (p=.000), and late majority and early adopters (p=.000). See Table 21 for more detailed information about significant differences between adopter categories and the characteristics of the innovation (distance educatioin) construct.

ANOVA results for the social system construct revealed statistically significant differences among the three adopter categories represented in this study (p=.000). Tukey's HSD

Table 20

Comparing Mean Perceptions of Need Construct Scores by Adopter Category (n=224)

Model	**SS**	**df**	**MS**	**F**	**SIG**
Regression	289.691	2	144.845	30.490	.000*
Residual	1049.863	222	4.751		
Total	1339.554	224			

Tukey's HSD Results

		Mean Diff.	**Std. Error**	**SIG**
Late Majority	Early Majority	-2.82432	.42899	.000*
	Early Adopter	-5.54444	.82836	.000*
Early Majority	Late Majority	2.82432	.42899	.000*
	Early Adopter	-2.72012	.74398	.001*
Early Adopter	Late Majority	5.54444	.82836	.000*
	Early Majority	2.72012	.74398	.001*

*****p < .05, ANOVA and Tukey's Post Hoc Results

Table 21

Comparing Mean Characteristics of Innovation Construct Scores by Adopter Category (n=224)

Model	**SS**	**df**	**MS**	**F**	**SIG**
Regression	49495.754	2	24747.877	117.493	.000
Residual	46549.960	221	210.633		
Total	96045.714	223			

Tukey's HSD Results

		Mean Diff.	**Std. Error**	**SIG**
Late Majority	Early Majority	-36.00811	2.85651	.000*
	Early Adopter	-74.05556	5.51587	.000*
Early Majority	Late Majority	36.00811	2.85651	.000*
	Early Adopter	-38.04745	4.95401	.000*
Early Adopter	Late Majority	74.05556	5.51587	.000*
	Early Majority	38.04745	4.95401	.000*

*****p < .05, ANOVA and Tukey's Post Hoc Results

post hoc analysis confirmed differences between late majority and early majority adopter categories (p=.000), early majority and early adopter categories (p=.000), and late majority and early adopters (p=.000). See Table 22 for more detailed information about significant differences between adopter categories and the social system construct.

Table 22

Comparing Mean Social System Construct Score by Adopters Category (n=224)

Model	**SS**	**df**	**MS**	**F**	**SIG**
Regression	7697.700	2	3848.850	87.079	.000*
Residual	9768.139	221	44.200		
Total	17465.839	223			

Tukey's HSD Results

		Mean Diff.	**Std. Error**	**SIG**
Late Majority	Early Majority	-15.45225	1.30853	.000*
	Early Adopter	-26.62222	2.52674	.000*
Early Majority	Late Majority	15.45225	1.30853	.000*
	Early Adopter	-11.16997	2.26936	.000*
Early Adopter	Late Majority	26.62222	2.52674	.000*
	Early Majority	11.16997	2.26936	.000*

*****p<.05, ANOVA and Tukey's Post Hoc Results

ANOVA results for the communication channels construct revealed statistically significant differences among the three adopter categories represented in this study (p=.000). Tukey's HSD post hoc analysis confirmed differences between late majority and early majority adopter categories (p=.000), early majority and early adopter categories (p=.000), and late majority and early adopters (p=.000). See Table 23 for more detailed information about significant differences between adopter categories and the communication channels construct.

ANOVA results for the characteristics of adopters (health education faculty) construct revealed statistically significant differences among the three adopter categories represented in this study (p=.000). Tukey's HSD post hoc analysis confirmed differences between late majority and early majority adopter categories (p=.000), early majority and early adopter categories (p=.000), and late majority and early adopters (p=.000). See Table 24 for more detailed information about significant differences between adopter categories and the characteristics of adopters (health education faculty) construct.

Table 23

Comparing Mean Communication Channels Construct Scores by Adopter Category (n=224)

Model	SS	df	MS	F	Sig.
Regression	2172.622	2	1086.311	62.423	.000
Residual	3845.932	221	17.402		
Total	6018.554	223			

Tukey's HSD Results

		Mean Diff.	Std. Error	Sig.
Late Majority	Early Majority	-7.36036	.82106	.000*
	Early Adopter	-15.80000	1.58546	.000*
Early Majority	Late Majority	7.36036	.82106	.000*
	Early Adopter	-8.43964	1.42396	.000*
Early Adopter	Late Majority	15.80000	1.58546	.000*
	Early Majority	8.43964	1.42396	.000*

*****p<.05, ANOVA and Tukey's Post Hoc Results

Table 24

Comparing Mean Characteristics of Adopter Construct Score by Adopter Category (n=224)

Model	SS	df	MS	F	SIG
Regression	4239.620	2	2119.810	58.823	.000
Residual	7964.161	221	36.037		
Total	12203.781	223			

Tukey's HSD Results

		Mean Diff.	Std. Error	SIG
Late Majority	Early Majority	-10.83423	1.18154	.000*
	Early Adopter	-21.15556	2.28152	.000*
Early Majority	Late Majority	10.83423	1.18154	.000*
	Early Adopter	-10.32132	2.04912	.000*
Early Adopter	Late Majority	21.15556	2.28152	.000*
	Early Majority	10.32132	2.04912	.000*

*****p<.05, ANOVA and Tukey's Post Hoc Results

Research Questions #4: What is the relationship between perception of need, characteristics of the innovation (distance education), social system, communication channels, characteristics of adopters (health education faculty), and participants' total construct score and participants' experience with distance education?

There was a strong correlation between communication channels and characteristics of the innovation (r=.761). There were moderate correlations between characteristics of the innovation and characteristics of adopters (r=.669), characteristics of the innovation and social system (r=.660), communication channels and social system (r=.604), participants' experience with distance education and communication channels (r=.509), and participants' experience with distance education and characteristics of the innovation (r=.501). Weaker relationships were found between participants' experience with distance education and characteristics of adopters (r=.411), participants' experience with distance education and social system (r=.291), and participants' experience with distance education and perception of need (r=.252).

The researcher assessed which constructs of the diffusion of innovation theory were most correlated with the participants' total construct score and participants' experience with distance education. The 2 constructs with the highest correlation to participants' experience with distance education were communication channels (r=.509) and characteristics of the innovation (distance education) constructs (.501). The same constructs had the highest correlation to participants' total construct score. The communication channels had a Pearson correlation of (r=.816) and characteristics of the innovation (distance education) was (r=.966). See Table 25 and 26 for more detailed information on Pearson Correlation test results.

Research Question #5: How much variance in the participants' experience with distance education can be attributed to the perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty)?

Table 25

Diffusion of Innovation and Experience with Distance Education Correlation (n=224)

	Exp.	**Communication Channels**	**Characteristics Innovation**	**Characteristics Adopters**	**Social System**	**Perception of Need**
Experience	1					
Communication Channels	.509*	1				
Characteristics Innovation	.501*	.761*	1			
Characteristics Adopters	.411*	.519*	.669*	1		
Social System	.291*	.604*	.660*	.394*	1	
Perception of Need	.252*	.416*	.582*	.454*	.409*	1

*p < .05, Pearsons Correlation Results

Table 26

Diffusion of Innovation and Participants' Total Construct Score Correlation (n=224)

	Total Score	**Communication Channels**	**Characteristics Innovation**	**Characteristics Adopters**	**Social System**	**Perception of Need**
Total Score	1					
Communication Channels	.816*	1				
Characteristics Innovation	.966*	.761*	1			
Characteristics Adopters	.748*	.519*	.669*	1		
Social System	.775*	.604*	.660*	.394*	1	
Perception of Need	.620*	.416*	.582*	.454*	.409*	1

*p < .05, Pearsons Correlation Results

A multiple linear regression analysis was conducted to examine the predictive impact of perception of need, characteristics of distance education, characteristics of adopters, social system, and the communication channels on the participants' experience with distance education. According to Brace, Kemp, & Snelgar (2000), "the R2 Adj. value gives the most useful measure of the success of the model" (p. 209). The R2 Adj. value for the model was .293; showing 29.3% of the variance in experience with distance education could be attributed to perception of need, characteristics of distance education, characteristics of adopters, social system, and communication channels. Of the five, predictor variables, two were found to be statistically significant. Communication channels ($t(224)=3.648$; $p=.000$) and characteristics of the innovation ($t(224)=2.450$; $p= .015$) were identified as individual predictors of experience with distance education. See Tables 27 for more detailed information on the linear regression analysis results.

Summary of Results

This chapter provided an overview of this study's results by answering each research question. The results determined that statistically significant differences occurred among several demographic variables and the adoption of distance education. Results showed the strongest correlation for the adoption of distance education among the communication channels and characteristics of distance education constructs. ANOVA results showed that differences existed between all adopter categories of the communication channels and characteristics of adopters construct. Simple linear regression analyses indicated that the communication channels and characteristics of distance education are the best predictors of distance education adoption among health education faculty. The last chapter will provide a discussion on this study's findings, conclusions based on these findings and recommendations based on these findings.

Table 27

Summary of Linear Regression Analysis for Diffusion of Innovation Constructs

Model Summary

R	R Square	Adj. R Square	SEE
.556	.309	.293	9.68808

Full Regression Model

Model	SS	df	MS	F	SIG
Regression	9158.201	5	1831.640	19.515	.000*
Residual	20461.228	219	93.859		
Total	29619.429	224			

Individual Predictors of Participants' Experience with Distance Education

	Unstandardized Coefficients		Standardized Coefficients		
Model	**B**	**Std. Error**	**Beta**	**t**	**SIG**
(Constant)	-23.305	4.730		-4.927	.000
Perception of Need	-.260	.329	-.055	-.792	.430
Characteristics of Innovation	.155	.063	.279	2.450	.015*
Communication Channels	.720	.197	.325	3.648	.000*
Social System	-.152	.100	-.117	-1.514	.131
Characteristics of Adopters	.198	.119	.127	1.658	.099

*p < .05

CHAPTER 5

SUMMARY, CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS

Introduction

This chapter provides a detailed discussion about the possible meanings, conclusions, and limitations of this study's results. Recommendations for future research on adoption and diffusion of distance education among health education faculty will also be discussed.

Purpose of the Study

The primary purpose of this study was to identify which constructs in Rogers' (2003) diffusion of innovation theory are more likely to contribute to adoption and diffusion of distance education in health education. The main constructs of Rogers' (2003) diffusion of innovation theory include characteristics of the innovation (distance education), social system (surrounding health education faculty), communication channels (used by health education faculty), and time (characteristics of health education faculty and adopter category).

Research Questions

The following research questions were addressed in this study:

1) What are the self-reported levels of knowledge and experience with distance education based on perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty) among the participants in this study?
2) To what extent do differences exists among participants' total construct scores based on demographic variables such as gender, age, highest degree, type of institution (public or private), teaching or research oriented type of institution, and experience?

3) To what extent do differences exist among participants' adopter categories based on independent variables such as perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty)?
4) What is the relationship between perception of need, characteristics of the innovation (distance education), social system, communication channels, characteristics of adopters (health education faculty), and participants' total construct score and participants' experience with distance education?
5) How much variance in the participants' experience with distance education can be attributed to the perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty)?

A variety of statistical analyses were used to answer the research questions using SPSS 19.0 (SPSS, Inc., 2010). Descriptive statistics were computed for each item including frequencies, percentages, mean, and standard deviation. Items within each of the diffusion of innovation constructs and factors were summed to create total scores so that frequencies, percentages, measures of central tendency, and measures of dispersion could be calculated. Independent T-Tests were used to determine if differences existed among participants' total construct scores based on demographic variables such as gender, highest degree (Masters or PhD), type of institution (public or private), and experience with distance education (no experience or experience). ANOVAs were used to determine if differences existed among participants' total construct scores based on demographic variables such as age and type of institution (research, teaching, or both).

ANOVAs were used to determine if differences existed among participants' adopter categories based on independent variables such as perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty). Pearson correlations were calculated to determine the relationship between perception of need, characteristics of the innovation (distance education), social system, communication channels, characteristics of adopters (health education faculty), and participants' total construct score and participants' experience with distance education. Multiple linear regression was calculated to determine how much variance in participants' experience with distance education can be attributed to the perception of need, characteristics of the innovation (distance education), social system, communication channels, and characteristics of adopters (health education faculty).

The statistical analyses were chosen to identify the constructs that affect the adoption and diffusion of distance education among health education faculty. Surveys missing more than five percent of data were not included in data analysis. If a survey was missing less than five percent of data, the mean score for items with missing data was used. An alpha level of .05 was used to determine statistical significance.

Conclusions

Based on the results of this study, the following conclusions were made:

1. The likelihood of distance education adoption by health education faculty is highly dependent on the communication channels and characteristics of the innovation (distance education) construct.

2. Based on the results of the study it can be concluded that the majority of participants have not yet decided whether to adopt or reject distance education and distance education has not fully diffused through the represented sample in this study.
3. There was a large majority of participants in the early majority adopter category.
4. Experience with distance education was not shown to increase the likelihood of distance education adoption.
5. There were not many differences that existed among the characteristics of participants who have adopted distance education and those who have not adopted it.
6. The social system construct was the least predictive of distance education adoption. If distance education has not yet fully diffused through the health education profession then it is hard for the social system to impact the likelihood of distance education adoption.
7. The likelihood of distance education adoption is not dependent on age, gender, highest degree obtained by the participant (Master's/PhD), type of university the participant is employed by (public/private), or the type of institution the participant is employed by (research/teaching/both).
8. A majority of the participants don't believe that distance education meets the goals and objectives of the health education profession.
9. The perception of need construct can be taken out of the instrument. The Cronbach alpha was lower than .70 and the questions asked are already implied within the instrument.

Discussion

Dearing (2004) observed that most people used the diffusion of innovation theory to explain why adoption occurred. He believed this use of the theory did not do it justice and that diffusion of innovation studies used to implement and increase the adoption and diffusion of an

innovation could be more helpful (Dearing, 2004). Using Rogers' (2003) theory for this type of research could help to implement and possibly increase adoption and diffusion of distance education in the health education profession. The primary purpose of this study was to identify which constructs in Rogers' (2003) diffusion of innovation theory are more likely to contribute to adoption and diffusion of distance education in health education. In other words, this study suggests the necessary constructs to use to help implement distance education in health education. It also suggests that distance education has not been totally adopted or rejected by the participants in this study, which means that distance education has not fully diffused through the sample represented in this study.

This study did not use Rogers (2003) diffusion of innovation theory to explain why distance education adoption has occurred. Rogers (2003) explained that his theory has been proven and future researchers need to go beyond his findings. Researchers tend to use the results from past research to piece together programs by borrowing components from what has worked in the past rather than conducting original research to use the diffusion of innovation theory to study what is currently working and adopting those working parts into their program (Dearing, Rogers, Meyer, Casey, Rao, Campo, & Henderson, 1996). People act out of convenience and use the results of past research based on diffusion of innovation rather than exploring what is working to implement a program effectively (Johnson, 1996).

Without conducting the proper research, even groups within the same organization lack the proper information to implement a program effectively in order to help with the diffusion of a program or product (O'Dell & Grayson, 1998). It is a disadvantage when only a small amount of people understand how to implement a program successfully and this knowledge is not diffused to the rest of the group (Wittenbaum & Park, 2001). This study uses the theory to identify the

constructs of the theory that are influencing adoption and diffusion of distance education. If health education professionals want to implement distance education then they can use the information to help them.

Based on the results of this study, it can be suggested that the communication channels and characteristics of the innovation (distance education) constructs are predictors of adoption and diffusion of distance education among health education faculty that completed the instrument. Results also can be drawn from the study about the state of adoption and diffusion of distance education within the health education profession. It can be suggested that the majority of the participants have not yet decided whether to adopt or reject distance education and distance education has not fully diffused yet.

Experience with Distance Education

The participants who didn't have any experience with distance education and those who did have experience with distance education had a wide range of total construct scores (items 1-82). No differences existed between participants who had experience with distance education and those who had no experience. There were no differences within the age categories of participants' and experience with distance education. There was a large majority of participants in the early majority adopter category. Overall, these findings suggest that the majority of participants have not yet decided whether to adopt or reject distance education and distance education has not fully diffused.

Participants are in the decision stage of Rogers (2003) model of the innovation-decision process. In this stage people are deciding whether to accept or reject an innovation and some people have begun to implement it and some people are not (Rogers, 2003). About 33% of the participants had no experience with distance education and their total construct score varied.

These results could explain why most of the participants were in the early majority adopter category and that distance education has not fully diffused through the sample represented in this study. Dearing (2004) explained that using Rogers (2003) theory through this approach targets an innovation during the diffusion of it because early adopters are often the least likely to need the innovation in question, but most likely to have the necessary resources to adopt. The early adopters are more likely to use the innovation because they have the resources. By identifying the diffusion of innovation constructs that are more likely to contribute to the adoption of an innovation the people in this category are more aware of what needs to be used if they choose to implement distance education.

Adopter Categories

Participants were not present in all adopter categories because complete diffusion of distance education has not yet occurred. Rogers (2003) explained that over time, once an innovation has completely diffused, participants fall into all the adopter categories. The results from the ANOVAs (RQ3) may have been misleading because there were so many participants in the early majority adopter category. This occurred because distance education hasn't fully diffused. However, Dearing (2004) explained that it is important to conduct research on an innovation before it has completely been adopted because if an innovation has a demonstrated advantage then this type of study can propel the innovation into use.

Even though the ANOVA (RQ3) results may have been misleading, the results from the Pearson correlations and the multiple regression suggests that the communication channels and characteristics of the innovation (distance education) constructs should be used to help increase implementation of distance education within the health education profession. Past studies have demonstrated that positive interventions at different points within social networks can increase

the amplification of a program or product (Abrahamson & Rosenkepf, 1997; Valente & Davis, 1999). In five to ten years these results are probably going to be different and different suggestions will probably be made to improve distance education.

Communication Channels

A major finding in this study was that the communication channel construct was the most significant predictor of adoption. Adoption begins when an individual is exposed to an innovation's existence and gains an understanding of how it functions (Rogers, 2003). Communication is essential for knowledge to be transferred and this study found that there is a lack of communication about the implementation of distance education among most participants who completed the survey. If knowledge about the implementation of distance education is not being communicated then distance education will not be adopted by health education professionals. It has been stated that to properly implement a distance education course or program, it is important that faculty communicate and advocate for the involvement of all instructors (Menchaca & Bekele, 2008).

Participants expressed that they have communicated with other faculty about distance education, but indicated that this does not happen often. Further more, most faculty who responded to this survey said that they don't advocate for distance education and there are not many faculty at their university who do advocate for distance education. A lack of communication hinders the adoption and implementation process of distance education within the health education profession.

To create effective distance education instructors, courses, and programs, health educators must begin to communicate. It was found that a competent instructor increased the effectiveness of a distance education course (Tallent-Runnels et al., 2006). If faculty want to

become a competent instructor within distance education, faculty must communicate with each other on how to properly implement it. Faculty should assemble a team to help communicate, develop, and teach distance education courses (Bounds et al., 2008). Health education faculty should begin to talk with each other about the proper technology to use to increase the implementation of distance education.

Characteristics of the Innovation (Distance Education)

The characteristics of the innovation (distance education) construct was the second strongest predictor of distance education adoption. Most participants agreed that they can implement distance education, but they didn't think these courses were consistent with the goals and objectives of health education or their teaching style. Health education professionals wonder how distance education learning strategies can be implemented effectively in health-related distance education courses (Ransdell et al., 2008). Health education professionals also think that students need immediate feedback while completing these learning strategies to help them learn more effectively and this can be hard to do in a distance education course (Ransdell et al., 2008). If health education instructors don't believe that distance education is as effective as face-to-face, then they are not going to communicate with other faculty on how to implement it properly. This could help explain why the communication channel construct was the most significant to adoption.

It should not be assumed that the adoption and diffusion of an innovation will be considered desirable by everyone (Rogers, 2003). This study found that most participants don't believe that distance education can meet the needs of the health education profession. Therefore, most participants don't find distance education desirable even though it was stated in the literature that distance education keeps growing every year (Allen & Seaman, 2013).

It was reported in a national study among all higher education faculty that two-thirds of faculty believed that the learning outcomes for a distance education course were inferior or somewhat inferior to those for a comparable face-to-face course (Allen, Seaman, Lederman, & Jaschik, 2012). Health education instructors are not the only instructors who have questions about the legitimacy of distance education. However, the next generation of tech-savvy students should have the opportunity to learn via distance education if they choose to. It is important for health education instructors to learn about this generation and provide distance education learning environments that challenge them in relevant ways (Simonson et al., 2012).

Characteristics of Adopters (Health Education Faculty)

The characteristics of adopters (health education faculty) construct was not a significant predictor of adoption. There were not many differences that existed among the characteristics of participants who have adopted distance education and those who have not adopted it. The majority of participants in this study are in the decision stage and early majority adopter category. They are still trying to decide whether to accept or reject distance education because is has not fully diffused through the health education profession.

When participants were asked to compare themselves to their colleagues most of them reported that they were more likely than their colleagues to try new technology in their courses, to implement new strategies into their courses, and to use the universities course management system. However, most of the participants also agreed that they have trouble with technology in their courses, they have trouble helping students with technology, and they believed that all courses should be taught face-to-face. It seems there is a contradiction among what participants think they are willing to do and what they actually can do. These findings could mean that

participants might believe they are accepting of distance education, but they are not doing anything to implement it into their courses.

Allen et al. (2012) also found a contradiction in the implementation of distance education among higher education faculty. They found that nearly one half of higher education faculty who believed learning outcomes in distance education were inferior to those for face-to-face still recommended distance education courses for their students (Allen et al., 2012). Allen et al. (2012) study found that students got referred to distance education courses by instructors who didn't think that distance education can produce the same quality as face-to-face courses. This could lead to a decrease in student motivation and students are going to struggle if instructors are teaching courses that they don't believe are effective.

Instructors who can embrace technology should be ones to implement technology. To help with the implementation of distance education the instructors should reinforce positive perceptions about technology and experience with technology to keep students motivated (Salter, 2005). Instructors should promote deep critical thinking within online discussion boards, model appropriate discussion posts, focus discussions on specific issues, and apply learning activities within courses to real-life situations (Anderson, 2009). Instructors should encourage student participation, provide timely and explicit feedback to students by evaluating and elaborating on all student posts, and encourage students to ask for help when they are confused (Reeder, 2010)

Social System

The social system construct was not a significant predictor of adoption. In a social system all members cooperate to solve a common problem and to reach a certain goal (Rogers, 2003). Most participants in the study are not communicating about distance education adoption, let alone cooperating to solve the issue of effective distance education adoption and

implementation. This could suggest reasons why the social system construct was the least correlated and predictive of adoption. Most participants aren't concerned with policies about distance education, incentives to develop it, release time to develop it, and property rights of distance education if they are not thinking about implementing it.

The social system is the conditions that surround and support or reject the diffusion of an innovation (Rogers, 2003). Instructors should get institutional support in the form of specific training to teach distance education and continual professional development opportunities to stay up-to-date with technology (Bounds et al., 2008). It is very important to provide the faculty with sufficient support materials and training to help increase the quality of distance education (Chaney et al., 2009). However, if instructors are unwilling to accept and communicate about distance education then they are probably not going to search out these opportunities or take advantage of them when they are offered.

An interesting side note is that in the pilot study, of faculty members at a Midwestern university, the social system construct was the most correlated with adoption and diffusion of distance education. This could mean that each university or educational discipline could have different reasons for adoption of distance education and different constructs of the diffusion of innovation theory could be impacting the adoption of distance education. The culture at each university and within each educational discipline could impact the adoption and diffusion of distance education implementation. The social system could become more of a significant predictor at universities or departments where distance education has become more of a priority.

Perception of Need

There were no significant findings from within this construct. The perception of need construct was not included in the pilot study and added for the purpose of the main study. It was

recommended by the researcher's committee that three questions be added and be used for the perception of need construct. These questions are "To stay competitive in higher education more distance education courses should be offered in health education", "Increases in distance education will not increase student enrollment at your university", and "To reach more nontraditional students in higher education more distance education courses should be offered". After further examination of the items in this construct, the researcher realized that the construct is not needed because the items within the construct are already asked or implied in the instrument.

Distance Education Implementation

Hopefully, health education instructors and faculty will use the information obtained from the results of this study to implement distance education. Allen and Seaman (2013) reported that distance education enrollment has become more common in colleges and universities, increasing from 1.6 million students in 1998 to an estimated 6.7 million in 2012 (Allen & Seaman, 2012). However, health education faculty who participated in this study questioned the effectiveness of distance education. A majority of participants in this study believe that distance education doesn't meet the goals and objectives of the health education profession. Ransdell et al. (2008) had a similar finding when they conducted a study on instructors who teach health-related courses. Their study found that instructors of health-related face-to-face courses questioned how distance education courses could meet the national standards for health-related courses (Ransdell et al., 2008).

It is essential that instructors who plan to teach distance education courses develop new skills and techniques to deliver courses effectively (Varvel, 2007). Participants also need to be willing to implement it. Most participants in the study expressed that they are more willing to

implement distance education than their colleagues. However, this is called into question by the way participants answered items in other constructs. Participants expressed that they are not keeping up with current technology trends, don't know how to use a webcam, can't create a Powerpoint presentation or lecture for students to view on the Internet, can't create timed quizzes or exams for students to take on the Internet, and so on.

It has been stated that effective implementation of distance education in health education requires instructors to stay up-to-date with technology (Chaney, et al., 2009). However, the majority of health education faculty reported that they do not to stay up-to-date with technology. Reader (2010) also explained that when using distance education instructors should always use relevant learning resources. Health education instructors are not always using relevant learning resources in their courses if they are not staying up to date with technology. In this study, the results suggest that the participants seem to think that they are more willing to take risks, but when it comes to distance education they are not willing to risk adopting it.

It has been suggested that health education faculty use the information from this study to implement distance education. Health education faculty and departments can use the information from this study to create and suggest professional development opportunities for themselves or their staff. It also was suggested that as part of students' professional preparation programs health educators could use the findings from this research to educate their students about the adoption and diffusion of distance education.

Limitations

The researcher attempted to use all of Rogers' (2003) constructs to develop an inclusive instrument. There are few studies that this has been done and it is unclear yet whether this was effective because a factor analysis and more studies need to be conducted to confirm the validity

and reliability of the instrument. The researcher also attempted to use Rogers' (2003) theory to identify what constructs were affecting the adoption and diffusion of distance education before the innovation has fully diffused. Dearing (2004) explained the effectiveness of this type of research, but there were few studies found by the researcher that have done this in the past. It is possible that using Rogers' (2003) theory might not work and that another theory could be developed. It could be concluded that using all of Rogers' (2003) constructs in one instrument is too extensive and that this study should have been two studies. Once again, more research needs to be conducted to confirm this.

The researcher used nonprobality sampling and the ability to generalize may be limited because of self-selection bias. The researcher used the AAHE Directory (2011) and some faculty have relocated or retired. The AAHE (2011) directory also does not include all health education programs in the United States. There also were health education departments listed in the AAHE (2011) directory that contained the incorrect contact information. Data collection took place over the winter break and this could have limited the total number of participants who completed the instrument. The next sections will provide information on how to use the results from this study within the health education profession and in the future.

Recommendations for Future Research

Based on the results of this study, the following recommendations for future research were made:

1. Continue to strengthen the instrument. Suggestions include:
    - Eliminate the perception of need construct because it contains repeat questions and is already implied in the other constructs.
    - Conduct a factor analysis on the instrument to confirm the reliability and validity of the instrument.

- Combine questions. An example is to combine the questions that ask "I don't know how to use a web cam, microphone, and headset" into one question.
- Eliminate questions that are asking the same thing. An example is one question stated "I understand how to implement distance education effectively" and another question stated "when adopting distance education, I do not understand how to implement the best practices of distance education".

2. As technology and society progress, items should be added to address current issues. Examples might include:
    - Your department currently offers Massive Open Online Courses (MOOCs) or plans to in the future.
    - Your department has a distance education conference room/classroom that is specifically set up to conduct distance education or plans to in the future.
3. Using this instrument, conduct further research on the adoption of distance education in other educational disciplines (e.g. physical education, kinesiology, social work, public health). To help identify what constructs of the diffusion of innovation theory can increase the adoption of distance education in other social science disciplines and compare them to the results of this study.
4. If a university wants to implement distance education they could use the instrument in this study to identify which constructs of the diffusion of innovation are more likely to contribute to adoption and diffusion of distance education. By identifying the constructs that lead to an increase in adoption, the university can develop more effective professional development opportunities based on these constructs.

5. Use the information from this study to help conduct interviews or focus groups within each health education department. This will help identify specific barriers to the implementation of distance education within each health education department. By identifying specific barriers, the department can develop more effective professional development opportunities.

Recommendations for the Health Education Profession

Based on the results of this study, the following recommendations to increase the adoption and diffusion of distance education in the health education profession were made:

1. Create a team of 2-5 faculty members to help communicate and mentor other faculty on the implementation of distance education. Some ideas of where to begin are:
    - Learn how to use the university's course management system if the university has one.
    - Communicate with faculty at other universities to see how they implement distance education.
    - Create a policy to ensure timely and proper feedback to all student posts, emails, assignments, and tests.
    - Figure out what procedures to take when faculty and students have problems with technology.
    - Start to work on developing sample distance education courses and policies for proper implementation.
    - This team should be responsible for keeping up with technology and reporting it to the rest of the staff.

2. Advocate for all faculty to be involved in the process of distance education adoption. Not all instructors have to teach distance education, but health education departments can benefit from the input of all instructors. Instructors who don't want to teach distance education courses can provide valuable insight as to whether the activities designed to meet the goals and objectives of an online course are actually meeting them.
3. Suggest to the staff that they attend professional development seminars on the implementation of distance education. These professional development seminars can help staff learn how to implement essential learning strategies such as role playing, debating, working in groups, case studies, and applying coursework to real-life situations on the Internet. Professional development seminars might include:
    - Learning how to use a webcam, microphone, and headset
    - Learning how to create a Power Point presentation and lecture online.
    - Learning how to communicate face-to-face with students online.
    - Learning how to use the university course management system (Desire to Learn (D2L), Blackboard, etc.).
    - Learning who to contact or where to go if they or their students are having problems with the technology they are using.
    - Learning how to create a class website to post assignments, communicate with the class, and create timed quizzes and exams for their course.
    - Observing another instructor implementing distance education.
4. Most participants in this study don't think distance education is effective, they have not seen other faculty enjoying it, people they know who have taken courses say it is not effective, and it can't meet the goals and objectives of their courses. Suggestions to

develop a more positive opinion of distance education within health education departments are to:

- Work together to develop a distance education course or program that meets the same goals and objectives as a face-to-face health education course does.
- Show faculty examples of how to meet the goals and objectives of a face-to-face health education course using distance education.
- Discuss the barriers of distance education implementation and how to over come these barriers.
- Get regular feedback from students who have taken distance education courses to figure out what learning strategies are helping to make distance education just as effective as face-to-face courses..
- Have a presenter from a different department show how to implement distance education and answer questions on how to implement distance education.
- Ask someone from the I.T. department to come in and talk about how to solve technology issues, where to go and who to contact if you have technology issues, and answer any questions related to distance education implementation.

5. In the future, as part of their professional preparation programs, health education faculty should prepare students to implement distance education within their professional practice. However, before health educators start to educate their students on distance education they should feel competent in their abilities to use distance education based on the recommendations above.

SUMMARY

Based on the results from the study, the researcher has realized that most of the participants in this study have not decided whether to accept or reject distance education. However, the next generation of technologically savvy students is coming and as educators we need to be prepared. When implementing a distance education program, professionals have to be open-minded to new strategies and procedures. In this field of study, along with all others, it is time to put personal biases aside for the sake of the students. Distance education is not going away and the demand for it continues to rise. The only way educators will be able to produce quality programs is if they work together to create programs that are as effective as face-to-face programs. The researcher is interested in getting more people involved with distance education in the health education profession. This study has provided insight into the constructs that contribute to the acceptance or rejection of distance education in health education to help amplify the adoption and diffusion of the effective implementation of distance education in the health education profession.

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APPENDICES

APPENDIX A

FIVE PILLARS OF QUALITY DISTANCE EDUCATION

FROM SLOAN CONSORTIUM WEBSITE (2011)

LEARNING EFFECTIVENESS pillar is concerned with ensuring that online students are provided with a high quality education. This means that online students' learning should at least be equivalent to that of traditional students. This does not necessarily mean that online learning experiences should duplicate those in traditional classrooms. Rather it means that instructors and course developers should take advantage of the unique characteristics of online environments to provide learning experiences that represent the distinctive quality of the institution offering them. Effective practices that support learning effectiveness fall into (and can be explored under) the following categories: Course Design , Learning Resources. Faculty Development, Learner Characteristics, Pedagogy, Interaction (eg., with content, faculty, other students; development of learning communities, etc.), Assessment, and Learning Outcomes (eg. student satisfaction, retention, achievement, performance, etc.).

SCALE pillar is the principle that enables institutions to offer their best educational value to learners and to achieve capacity enrollment. Institutional commitment to quality and finite resources require continuous improvement policies for developing and assessing cost-effectiveness measures and practices. The goal is to control costs so that tuition is affordable yet sufficient to meet development and maintenance costs -- and to provide a return on investment in startup and infrastructure. Metrics may compare the costs and benefits of delivery modes by discipline and educational level; faculty salary and workload; capital, physical plant and maintenance investments; equipment and communications technology costs; scalability options; and/or various learning processes and outcomes, such as satisfaction levels and retention rates. These types of comparison enable institutions to: develop better strategic plans for market demand and capture; achieve capacity enrollment; develop brand recognition; and secure long-term loyalty among current and prospective constituents. Practices for scale help to leverage key educational resources while offering new online learning opportunities to students and faculty. Practices for scale help to leverage key educational resources while offering new online learning opportunities to students and faculty in these categories: Cost Effectiveness, Institutional Commitment, Institutional Infrastructure, Technical Infrastructure, Methodologies (e.g. for conserving costs, resources, time, effort), Partnerships, Scalability, Marketing, Localness. and Global-ness.

ACCESS pillar provides the means for all qualified, motivated students to complete courses, degrees, or programs in their disciplines of choice. The goal is to provide meaningful and effective access throughout the entire student's life cycle. Access starts with enabling prospective learners to become aware of available opportunities through effective marketing, branding, and basic program information. It continues with providing program access (for example, quantity and variety of available program options, clear program information), seamless access to courses (for example, readiness assessment, intuitive navigability), and appropriate learning resources. Access includes three areas of support: academic (such as tutoring, advising, and library); administrative (such as financial aid, and disability support); and technical (such as hardware

reliability and uptime, and help desk). Effective practices for measuring increasing accessibility may analyze and apply the results student and provider surveys, narrative or case study description, focus groups, or other means of measuring access. Larger-scale access implementation may also result from mission-based strategic planning in a variety of institutional areas: Technical Infrastructure, Academic Administrative Services (eg. registration, student loans, bursar, etc.), Student Support Services (eg. 24/7 help, readiness assessment, support social groups, etc.), Learning Resources (eg., library, tutoring, DLOs (digital learning objects),etc.), Course Design, Program Access (eg., basic information, variety of offerings, course previews, etc.), and Localness.

FACULTY SATISFACTION pillar means that instructors find the online teaching experience personally rewarding and professionally beneficial. Personal factors contributing to faculty satisfaction with the online experience include opportunities to extend interactive learning communities to new populations of students and to conduct and publish research related to online teaching and learning. Institutional factors related to faculty satisfaction include three categories: support, rewards, and institutional study/research. Faculty satisfaction is enhanced when the institution supports faculty members with a robust and well-maintained technical infrastructure, training in online instructional skills, and ongoing technical and administrative assistance. Faculty members also expect to be included in the governance and quality assurance of online programs, especially as these relate to curricular decisions and development of policies of particular importance to the online environment (such as intellectual property, copyright, royalties, collaborative design and delivery). Faculty satisfaction is closely related to an institutional reward system that recognizes the rigor and value of online teaching. Satisfaction increases when workload assignments/assessments reflect the greater time commitment in developing and teaching online courses and when online teaching is valued on par with face-to-face teaching in promotion and tenure decisions. A final institutional factor -- crucial to recruiting, retaining, and expanding a dedicated online faculty -- is commitment to ongoing study of and enhancement of the online faculty experience. Categories: Institutional Rewards (eg., promotion tenure issues, recognition), Administrative Support (eg., recognition, course buyout, monetary supplement, etc.), Faculty Support (eg., professional development, design/technology support, 24/7 help, learning communities, etc.), Technological Infrastructure, Online Experience (eg., access to students, flexibility, interaction, etc.), and Opportunities for Research Publication.

STUDENT SATISFACTION pillar reflects the effectiveness of all aspects of the educational experience. The goal is that all students who complete a course express satisfaction with course rigor and fairness, with professor and peer interaction, and with support services. Online students put a primary value on appropriate, constructive, and substantive interaction with faculty and other students. Effective professors help students achieve learning outcomes that match course and learner objectives by using current information and communications technologies to support active, individualized, engaged, and constructive learning. As consumers, students are satisfied when provider services-learning resources, academic and administrative services, technology and infrastructure support -- are responsive, timely, and personalized. Effective practices may analyze and apply the results of student and alumni surveys, referrals, testimonials or other means of measuring perceived satisfaction with learning communities. Student satisfaction is the most important key to continuing learning. (Sloan Consortium, 2011).

APPENDIX B

PROFESSIONAL BACKGROUND OF EXPERT PANEL MEMBERS

Expert Panel Member: Dr. Stephen Brown
Degree(s): PHD Public Health Education, MS Worksite Wellness, BS Business Administration
Present Position: Associate Professor of Health Education at Southern Illinois University-Carbondale
Experience with distance education, health education, or instrument development:
15 years teaching at the university level; Developed and validated instruments; Integration of distance education into some classes

Expert Panel Member: Dr. Elizabeth Freeburg
Degree(s): PHD Education
Present Position: Chair, Department of Workforce Education and Development at Southern Illinois University-Carbondale
Experience with distance education, health education, or instrument development:
The workforce education and development department has extensive offerings that include face-to-face, hybrid, and online course. Dr. Freeburg has developed 3 online courses and is currently heading the development of an online 18-hour, ISD specialist certification. She has also developed 2 instruments that she has used in quantitative studies.

Expert Panel Member: Dr. Elizabeth Hensleigh Chaney
Degree(s): PHD in Health Education, MA in Health Studies, BS in Biology
Present Position: Assistant Professor, Department of Health Education and Behavior at the University of Florida
Experience with distance education, health education, or instrument development:
Instrument development is my area of expertise; I have worked on several grant-funded projects involving the development of instruments to assess various aspects of health education and distance education. My dissertation resulted in the development of an instrument to assess quality indicators of distance education; this research was published in *The American Journal of Distance Education*

Expert Panel Member: Dr. Lavada M. Pullens
Degree(s): PHD Education, MS Education, BS General Business
Present Position: Program Director/Instructor, Business Administrative Technology Program, Lanier Technical College Cumming, GA
Experience with distance education, health education, or instrument development:
Over the past 8 years, I have taught courses using the Hybrid, 100% Online and Traditional delivery formats. In addition, I have taught courses using the following Course Management Systems: WebCt/Vista, Blackboard, Ecollege, ANGEL and WebTycho. I implement a variety of researched online teaching strategies into my courses on a regular basis. I have also presented a number of faculty development workshops at regional and national professional association conferences regarding effective online teaching strategies.

Expert Panel Member: Dr. Jennifer Calvin
Degree(s): PHD Education, MS Human Resource Development, BS Technical Education and Training
Present Position: Assistant Professor, Workforce Education and Development at Southern Illinois University-Carbondale
Experience with distance education, health education, or instrument development: Research on self-regulation in online learning environments; taught, developed, and designed numerous online course; developed two instruments related to online learning and reviewed numerous instruments for online learning.

APPENDIX C

EXPERT PANEL MEMBER COMMENTS

SECTION 1:

Characteristics of the Innovation (characteristics of distance education)

Relative Advantage (degree to which distance education is better than or equal to traditional education):

1. Distance education will incur additional monetary costs (Reverse Code).
Expert 1: Revise: To create or to deliver? What is going to cost more?
Expert 2: Revise: As compared to what?
Expert 3: Revise: Cost to which stakeholder? (all or to students)
Expert 4: Retain
Expert 5: Retain

2. Distance education will become an educational norm in the future.
Expert 1: Revise: What is meant by norm?
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Retain

3. Educational fads have come and gone and so will distance education (Reverse Code).
Expert 1: Retain
Expert 2: Retain
Expert 3: Revise: Distance education is 100 yrs. old and is not going away, but if you want to assess this perception then you can keep.
Expert 4: Retain
Expert 5: Retain

4. Distance education can't replace face-to-face health education teaching methods (Reverse Code).
Expert 1: Retain
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Retain

5. Distance education instructional strategies enhance my post secondary health education courses.
Expert 1: Revise: ? assumes they are currently teaching DE and is any of sample not post secondary?
Expert 2: Retain: post secondary?

Expert 3: Retain
Expert 4: Revise: This question seems to imply that all instructional strategies enhance… perhaps "Distance education instructional strategies that are recommended for health education courses enhance my….."
Expert 5: Retain

6. Health education courses delivered through distance education are as effective as face-to-face health education courses.
Expert 1: Revise: add most to beginning because there are exceptions (1st aid/CPR)
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Retain

7. Distance education will address needs of students enrolled in health education courses.
Expert 1: It is unclear what this question is referring to.
Expert 2: Revise: Instructional strategies or techniques, or what?
Expert 3: Revise: You might want to say what type of distance education.
Expert 4: Retain
Expert 5: Retain

8. There is a lack of interaction within distance education courses (Reverse Code).
Expert 1: Retain
Expert 2: Revise: Between what groups (student to student or student to teacher, etc)?
Expert 3: Revise: There are 3 types of communication in DE (student-student, student-teacher, student-content), to which are you referring?
Expert 4: Revise: I am concerned about the validity of the question. It implies lack of interaction in all. One can't answer this if they don't have knowledge of existing research.
Expert 5: Retain

9. Distance education can make learning more fun for the student.
Expert 1: Revise: More than what?
Expert 2: Revise: What part of distance education (DE technologies)?
Expert 3: Retain
Expert 4: Revise: Maybe start "With the proper activities (or something similar) distance education can make….."
Expert 5: Retain

Add any items or suggestions about items that could be missing from this section:
Expert 1: What about concerns for destroying the current face to face program if DE goes to far?
What about the benefits of face to face interaction beyond learning concepts?
How about a question about instructor preference and student preferences?
Ex. I don't think I would enjoy teaching DE as much?
Ex. Students don't enjoy DE as much
Expert 2: No Comments
Expert 3: No Comments

Expert 4: No Comments
Expert 5: If you have a research question that asks about the characteristics of the innovation then these items are ok.

Compatibility (degree to which distance education is consistent with the values and needs of post secondary health education professionals):

1. Distance education will meet the needs of students in post secondary health education.
Expert 1: It is unclear what this question is referring to.
Expert 2: Revise: The courses or programs will meet needs. Also post secondary?
Expert 3: Revise: I would put examples of needs, "meet the needs (e.g. ___) of students".
Expert 4: Retain
Expert 5: Retain

2. Distance education instructional strategies are consistent with my teaching style.
Expert 1: Revise: I would reverse code this one.
Expert 2: Retain: Fix wording to oppose #4, define instructional strategies and teaching style
Expert 3: Revise: To broad, you can mimic any teaching strategy in DE. Are you asking if teaching online (specifically) is consistent with the respondents teaching style?
Expert 4: Revise: Distance education instructional strategies can be consistent…… "Or many instructional strategies that I have observed are consistent with…."
Expert 5: Retain

3. I research new products and ideas for distance education.
Expert 1: Revise: Assumes current involvement in DE and population for study is unknown.
Expert 2: Retain: What is meant by new products and ideas for DE?
Expert 3: Retain: Could be a double barreled question; respondents may search for new ideas, but not new products and vice versa.
Expert 4: Retain
Expert 5: Retain

4. Distance education is not compatible with my teaching style (Reverse Code).
Expert 1: same question as #2, ok to have for reliability but move them further apart
Expert 2: Revise: fix wording to oppose #2 (add instructional strategies and define again)
Expert 3: Retain: Could be a double barreled question; respondents may search for new ideas, but not new products and vice versa.
Expert 4: Retain
Expert 5: Retain

5. There is a need to increase trainings on distance education in post secondary education.
Expert 1: Doesn't match compatibility definition.
Expert 2: Retain
Expert 3: Retain: Increase the number of trainings or provide more?
Expert 4: Revise: Maybe "In order to remain relevant, constant training is …….
Expert 5: Retain

6. More colleges and universities should offer distance education courses in health education.
Expert 1: Retain
Expert 2: Retain
Expert 3: Retain
Expert 4: Revise: Maybe, "In order to maximize instruction and give more students an opportunity to gain an education in health care, more distance education courses in……
Expert 5: Retain

7. Distance education is not consistent with the goals of the health education profession (Reverse Code).
Expert 1: Revise: add objectives, so it says goals and objectives
Expert 2: Retain
Expert 3: Revise: Goals of profession as stated by whom? Maybe put goals in parenthesis
Expert 4: Retain
Expert 5: Retain

8. Distance education courses reward sedentary behavior (Reverse Code).
Expert 1: Sitting in classroom is sedentary also, did ? come from literature?
Expert 2: Delete: face-to-face does the same
Expert 3: Revise: Example of sedentary behavior is needed for this question.
Expert 4: Retain
Expert 5: Retain

Add any items or suggestions about items that could be missing from this section:
Expert 1: Ex: I will probably need to implement DE at some point but I feel I will be delivering a lower quality education at that point?
Expert 2: the questions are unclear when talking about post secondary and health education. What is post secondary health education?
Expert 3: No Comments
Expert 4: No Comments
Expert 5: If you have a research question that asks about the characteristics of the innovation then these items are ok.

Complexity (degree to which distance education is perceived as difficult or easy to adopt):

1. Distance education courses are complicated to integrate into post secondary health education courses (Reverse Code).
Expert 1: Revise: Do you mean integrate into courses or curricula?
Expert 2: Revise: courses or programs
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise
2. Learning to implement distance education in any post secondary course is easy.
Expert 1: Retain: Is it necessary to state post secondary?
Expert 2: Revise: implementing DE technologies and instructional strategies

Expert 3: Revise: Might get negative responses because of the "any" term. Some respondents might that it is easy to implement content DE courses, but not processed based.
Expert 4: Revise: Substitute another word or phrase for easy. (not difficult) something to sound more scholarly.
Expert 5: Revise

3. I can implement distance education with my existing knowledge in technology.
Expert 1: Revise: This ? is a better measure of a persons level of expertise and not attitude toward DE?
Expert 2: Revise: Implement DE into what?
Expert 3: Retain: It will be interesting to see if respondents equate DE to knowing how to use technology. Technology is a vehicle, but doesn't take away the need for sound pedagogy.
Expert 4: Retain
Expert 5: Revise

4. Health education instructors need more time to implement distance education (Reverse Code).
Expert 1: Revise: More time as in years to adopt or hours to prep for class?
Expert 2: Revise: implementing DE technologies and instructional strategies
Expert 3: Revise: I'm not sure respondents would be able to truly give an accurate perception in other professions. Might want to delete or consider the reasoning behind it.
Expert 4: Retain
Expert 5: Revise

5. It is difficult to find distance education instructional strategies to use in my post secondary health education course (Reverse Code).
Expert 1: Retain: post secondary?
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

6. I understand how to implement distance education effectively.
Expert 1: Revise: ?his ? is a better measure of a persons level of expertise and not attitude toward DE?
Expert 2: Revise: understanding and doing are 2 separate things
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

7. I can find valid health information to use in my post secondary health education course on the Internet.
Expert 1: Delete: this does not directly relate to DE
Expert 2: Revise: valid HED info. on the internet
Expert 3: Retain
Expert 4: Revise: By utilizing the internet, I can find valid……
Expert 5: Revise

Add any items or suggestions about items that could be missing from this section:
Expert 1: Maybe add practical questions like: no technical support at my institution, no release time to work on DE, no platform to put it on, etc..
Expert 2: No Comments
Expert 3: No Comments
Expert 4: No Comments
Expert 5: No Comments

Observability (degree to which the results of adopting distance education are observable to post secondary health education professionals):

1. Evidence of the effectiveness of distance education is clear.
Expert 1: Revise: By clear do you mean I am aware of it or I am aware of it and it is convincing, what if I just haven't heard of it?
Expert 2: Retain
Expert 3: Retain: Are you asking if it's clear, or if the respondent thinks it is valid (accurate)?
Expert 4: Revise: Not quite clear. Do you mean at your institution? "Existing evidence"
Expert 5: Revise

2. Health Education National Standards can be achieved through distance education.
Expert 1: Revise: start ? with achievement of
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

3. I have had an opportunity to observe other health education instructors using distance education.
Expert 1: This is behavior not attitude, Are you measuring attitude or opportunity?
Expert 2: Delete: duplicate
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

4. It is not easy to observe distance education at the university where I am currently employed (Reverse Code).
Expert 1: Are you measuring attitude or opportunity?
Expert 2: Delete
Expert 3: Retain
Expert 4: Revise: Substitute word or phrase for easy.
Expert 5: Revise

5. Other instructors have become interested in distance education when they saw me using it.
Expert 1: Are you measuring attitude or opportunity?

Expert 2: Revise: using the technologies and instructional strategies
Expert 3: Retain: My interest in DE has encouraged other instructors to become involved in engaging in DE delivery.
Expert 4: Revise: Don't end your question with preposition
Expert 5: Revise

6. I have observed other instructors implementing distance education and enjoying it.
Expert 1: Are you measuring attitude or opportunity?
Expert 2: Revise: implementing DE courses
Expert 3: Revise: Try to avoid ending items with prepositions (grammatical errors can throw off respondents).
Expert 4: Revise: Don't end your question with preposition
Expert 5: Revise

7. I have not observed students enjoying distance education instructional strategies (Reverse Code).
Expert 1: Are you measuring attitude or opportunity
Expert 2: Retain
Expert 3: Retain
Expert 4: Revise: At my institution, I have not…
Expert 5: Revise

Add any items or suggestions about items that could be missing from this section:
Expert 1: Questions are about opportunity are you trying to measure their exposure or whether they believe it is observable?
Expert 2: No Comments
Expert 3: No Comments
Expert 4: No Comments
Expert 5: No Comments

Trialability (degree to which distance education can be experimented with before adopted):

1. Trying distance education before implementation is important.
Expert 1: Does not match definition: definition is whether I believe it is triable not if I think it is important
Expert 2: Retain: pilot, take a course? (look at #5)
Expert 3: Retain: Pilot Testing?
Expert 4: Revise: Testing or piloting distance education before….
Expert 5: Revise

2. Examples of distance education instructional strategies in health education are available for me to try.
Expert 1: Are you measuring attitude or opportunity?
Expert 2: Retain
Expert 3: Retain
Expert 4: Revise: At my institution…

Expert 5: Revise
3. I do not understand the "best practices" of distance education (Reverse Code).
Expert 1: good question but not triability
Expert 2: Delete: unclear question
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

4. I rarely have good experiences with distance education (Reverse Code).
Expert 1: good question but not triability
Expert 2: Revise: as instructor or student
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

5. I am more likely to use distance education if I can pilot test it first.
Expert 1: Retain
Expert 2: Retain: look at #2
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

6. The university offers opportunities for me to use distance education instructional strategies before I adopt them.
Expert 1: Are you measuring attitude or opportunity?
Expert 2: Retain: How are 5 and 6 different? (also add my university)
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

7. The university offers training on effective distance education strategies, so I can try them before I adopt them.
Expert 1: Are you measuring attitude or opportunity?
Expert 2: Retain: add my university
Expert 3: Retain: I think this one is better than #6
Expert 4: Retain: They offer an ample amount?
Expert 5: Revise

Add any items or suggestions about items that could be missing from this section:
Expert 1: How will I know if I enjoy DE if it is so difficult to try? There is a steep learning curve with experimenting with DE?
Expert 2: No Comments
Expert 3: No Comments
Expert 4: No Comments
Expert 5: No Comments

SECTION 2:

The Social System (the college/university setting)

1. Distance education will result in a reduction in staff (Reverse Code)?
Expert 1: Retain
Expert 2: Revise: What kind of staff? (support, instructors, ect.)
Expert 3: Retain: Staff and faculty or just staff?
Expert 4: Retain
Expert 5: Revise

2. My university has adequate professional development programs related to distance education.
Expert 1: Good ? if you are measuring opportunity
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

3. Training (teaching) health education instructors about the "best practices" in distance education will be expensive (Reverse Code).
Expert 1: Retain
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

4. Inadequate resources are available to implement distance education at my university (Reverse Code).
Expert 1: Good ? if you are measuring opportunity
Expert 2: Revise: What kind of resources?
Expert 3: Revise: The resources available to implement DE at my university are inadequate.
Expert 4: Retain
Expert 5: Revise

5. Instructors at my university are intimidated by distance education.
Expert 1: Retain
Expert 2: Revise: Intimidated by technologies, strategies, ect.?
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

6. Property rights in distance education are an area of concern (Reverse Code).
Expert 1: Retain
Expert 2: Retain: Is property rights the best phrase? Concern for student, instructor, ect.?
Expert 3: Retain

Expert 4: Revise: Concern for? Instructor or in general? I would revise.
Expert 5: Revise

7. The chair of the health education department at my university support distance education implementation.
Expert 1: Revise: my chair supports….
Expert 2: Revise: by attitude or money, ect.
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

8. There is a higher demand for distance education at colleges/universities than ever before.
Expert 1: Retain
Expert 2: Retain
Expert 3: Retain
Expert 4: Revise: Maybe, "higher demand currently than in the past"
Expert 5: Revise

9. Administrators at the university understand the best practices of distance education.
Expert 1: Retain
Expert 2: Revise: at my and what administrators
Expert 3: Retain
Expert 4: Retain: At my university…
Expert 5: Revise

Add any items or suggestions about items that could be missing from this section:
Expert 1: No Comments
Expert 2: No Comments
Expert 3: I think that in addition to asking about the administration-level support, you should ask about incentives for faculty to become involved in DE offerings at his/her university (e.g. compensation, incorporated into teaching loads and T&P)
Expert 4: No Comments
Expert 5: No Comments

SECTION 3:

Communication Channels Questions (the process by which health educators create and share information about distance education)

1. I do not communicate regularly with people who advocate for implementing distance education (Reverse Code).
Expert 1: Revise: to "wordy"
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

2. I advocate for distance education implementation at my university.
Expert 1: Assumes exposure.
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

3. Health education faculty at my university do not advocate for distance education implementation (Reverse Code).
Expert 1: Revise: to "wordy"
Expert 2: Retain
Expert 3: Retain
Expert 4: Revise: Be careful with the word most. An individual would not know (most) unless there is some type of existing data available. (may cause a problem with your research committee member)
Expert 5: Revise

4. Faculty come to me for advice on distance education.
Expert 1: Assumes exposure.
Expert 2: Revise: advice about what?
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

5. I help other faculty implement distance education effectively.
Expert 1: Assumes exposure.
Expert 2: Retain: Faculty in department or university?
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

6. I have no difficulty telling other faculty how distance education improved my courses.
Expert 1: Assumes exposure.
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

7. The university where I am employed offers a course management system (Blackboard, D2L, etc..) to accomplish course objectives.
Expert 1: Retain
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

8. Other faculty at my university can help me locate valid health information on the Internet to enhance my courses.
Expert 1: "wordy"
Expert 2: Retain: can or will, not the same
Expert 3: Revise: Enhance DE courses or any courses? Be Specific.
Expert 4: Retain
Expert 5: Revise

9. I communicate with health education instructors at other universities to help increase my knowledge of distance education.
Expert 1: Retain
Expert 2: Retain
Expert 3: Retain
Expert 4: Revise: What if this individual communicates with HE instructors but these instructors do not have the Distance Education experience. Maybe revise to show that these instructors teach using distance education.
Expert 5: Revise

10. Students have told me that distance education is not very effective in my health education courses (Reverse Code).
Expert 1: Retain
Expert 2: Retain: This assumes that you use it.
Expert 3: Revise: I would delete "very", and just say not effective.
Expert 4: Retain
Expert 5: Revise

11. Colleagues who have taken health education distance education courses have told me that the course was not very effective (Reverse Code).
Expert 1: Revise: Taken or taught or 2 different questions.
Expert 2: Revise: Course were not very effective.
Expert 3: Revise: I would delete "very", and just say not effective.
Expert 4: Revise: The course**(s)** were not very effective
Expert 5: Revise

Add any items or suggestions about items that could be missing from this section:
Expert 1: Half the questions assume respondent is already doing DE.
Expert 2: No Comments
Expert 3: No Comments
Expert 4: No Comments
Expert 5: No Comments

SECTION 4:

Characteristics of the Adopters (Innovators, Early Adopters, Early Majority Adopters, Late Majority Adopters, or Laggards)

1. I have worked with my universities course management system (D2L, Blackboard, etc.).
Expert 1: Retain
Expert 2: Revise: What is meant by worked with?
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

2. I have problems helping students with technological issues (Reverse Code).
Expert 1: Retain
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

3. I don't know how to create DE health education courses that address National Health Education Standards (Reverse Code).
Expert 1: Not sure this is a characteristic question.
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

4. I can record a lecture or power point presentation for students to view or listen to over the Internet.
Expert 1: Retain
Expert 2: Retain
Expert 3: Revise: Double-barreled question. Someone might be able to use software to create a lecture for students to hear audio, but not video. How would they answer this question?
Expert 4: Retain: Change wording.
Expert 5: Revise

5. I respond to all student emails within 24 hours.
Expert 1: Not sure this is a characteristic question.
Expert 2: Delete
Expert 3: Delete: I see where you are going here, but I would say ask if the respondent has a policy they employ regarding responding to students within a timely fashion (i.e. within 24 or 48 hrs, unless notification of being out of town is sent to students).
Expert 4: Retain
Expert 5: Revise

6. I can create timed exams and quizzes for distance education.
Expert 1: Assumes exposure.
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain

Expert 5: Revise
7. I know how to use a webcam.
Expert 1: Retain
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

8. I know how to use a headset and microphone.
Expert 1: Retain
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

9. I know how to use social networking sites on the Internet.
Expert 1: Retain
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

10. I keep up with current trends in technology.
Expert 1: Retain
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

11. I am more empathetic than other health education professionals that I know.
Expert 1: Not sure this is a characteristic question.
Expert 2: Retain
Expert 3: Delete
Expert 4: Retain
Expert 5: Revise

12. I strongly believe that health education courses should be taught with face-to-face instructional strategies (Reverse Code).
Expert 1: Retain
Expert 2: Retain
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

13. In my health education courses, I want to use the most effective means to reach my students.
Expert 1: Retain

Expert 2: Retain
Expert 3: Retain
Expert 4: Revise: Substitute another word for means.
Expert 5: Revise

14. The courses I teach each semester have not changed much since I started teaching them (Reverse Code).
Expert 1: Revise: I doubt anyone would say yes to this as worded.
Expert 2: Retain: Course or course context.
Expert 3: Retain
Expert 4: Retain
Expert 5: Revise

15. I believe that I have the ability to control my future.
Expert 1: This is more locus of control.
Expert 2: Retain
Expert 3: Delete: Their academic future? Course schedules, structures? This is confusing…
Expert 4: Retain
Expert 5: Revise

16. I get embarrassed when the technology doesn't work in my health education courses (Reverse Code).
Expert 1: Revise: I have trouble getting technology to work.
Expert 2: Retain
Expert 3: Retain
Expert 4: Revise: I believe it reflects on my abilities as an instructor when the technology…..
Expert 5: Revise

17. I am more likely to try new programs than my colleagues are.
Expert 1: Revise: What is meant by new programs?
Expert 2: Retain: What new programs? Colleagues at university or in dept.?
Expert 3: Retain
Expert 4: Revise: You don't want to end your sentence with are.
Expert 5: Revise

18. I am more likely to take risks than my colleagues are.
Expert 1: Revise: Give it some context?
Expert 2: Retain
Expert 3: Delete
Expert 4: Revise: You don't want to end your sentence with are.
Expert 5: Revise

Add any items or suggestions about items that could be missing from this section:
Expert 1: Half of the questions are specifically about technology adoption. Is it possible that I could be an innovator in other aspects of teaching or research without doing do with technology?

Are you trying to get at adoption of distance education specifically or an adopter personality in general?
Expert 2: Knowing how to use and using are not the same.
Expert 3: Have you checked out the SASODE instrument I developed and published in AJDE? That might be helpful, as well.
Expert 4: Revise
Expert 5: Revise

ADDITIONAL COMMENTS

Provide any additional comments about the instrument, research questions, and purposed scale:

Expert 1: No Comments
Expert 2: I don't have any questions that address access (i.e., Internet connection for students, band width, etc..). This is the new digital divide.
Expert 3: Have you checked out the SASODE instrument I developed and published in AJDE? That might be helpful, as well.
Expert 4: Great job! I think you have done an excellent job with your questions. My suggestions are minor; however, a couple of the questions that I have marked with possible validity issues, check with your research person to see if there will be a problem. This issue could be resolved also by taking a look at some of the curriculum from your previous assessment courses. Best of luck to you! Please keep me posted on your progress.
Expert 5: No Comments

APPENDIX D

INSTRUMENT FOR PILOT STUDY AND LIKERT SCALE

LIKERT SCALE for all questions:

Strongly Disagree Disagree Agree Strongly Agree

Section 1 Characteristics of the Innovation

Relative Advantage

1. At your university, implementing distance education will incur additional monetary costs (Reverse Code).
2. Distance education will become an educational norm in the future.
3. Educational fads have come and gone and so will distance education (Reverse Code).
4. Distance education can't replace face-to-face instructional strategies. (Reverse Code).
5. Distance education instructional strategies will enhance my courses.
6. Courses delivered through distance education can be as effective as face-to-face courses.
7. Distance education will meet the educational needs of students in college courses.
8. There is a lack of interaction within distance education courses between the student and the instructor (Reverse Code).
9. Instructional strategies that are recommended for distance education can make learning just as interesting as face-to-face courses.
10. Distance education will replace face-to-face instruction in the future.
11. Teaching distance education is just as enjoyable as teaching face-to-face.
12. Students do not enjoy taking distance education courses. (Reverse code)
13. The benefits of face-to-face interaction can be accomplished in distance education courses.
14. I feel I will be delivering a lower quality education if I implement distance education. (Reverse Code)
15. Students have told me they don't learn as much in distance education courses (Reverse Code).
16. Colleagues who have taken distance education courses have told me that the course was not effective (Reverse Code).

Compatability

1. The strategies used in distance education are not consistent with my teaching style (Reverse Code).
2. I search the Internet for ideas to incorporate within my courses.
3. I search the Internet for new technology to use in my courses.
4. For distance education to remain relevant, ongoing training is necessary.
5. Distance education will give more students an opportunity at higher education.
6. Distance education is not consistent with the goals and objectives of my profession (Reverse Code).
7. Increasing distance education is not part of my university's strategic plan (Reverse Code).

Complexity

1. Distance education courses are difficult to implement into my courses (Reverse Code).
2. Learning to implement distance education is not difficult.
3. I can implement distance education within my current course with my existing knowledge in technology.
4. It takes more time to design distance education courses than face-to-face courses (Reverse Code).
5. It is difficult to find distance education instructional strategies to use in my courses (Reverse Code).
6. I understand how to implement distance education effectively.
7. By using the Internet, I can find valid and reliable health information to use in my courses.
8. When trying to adopt distance education I do not understand how to implement the "best practices" of distance education (Reverse Code).
9. There is a steep learning curve when trying to implement distance education (Reverse Code).

Observability

1. There is ample evidence in the literature to support the effectiveness of distance education.
2. It is difficult to observe distance education at the university where I am currently employed (Reverse Code).
3. My interest in distance education has encouraged other instructors to become involved in engaging in distance education delivery.
4. I have not observed students enjoying distance education courses (Reverse Code).
5. Opportunities to observe quality distance education are available.
6. I have not observed instructor's satisfaction with distance education courses (Reverse Code).

Triability

1. Pilot testing distance education before implementation is not possible (Reverse Code).
2. Distance education instructional strategies can not be piloted within face-to-face courses (Reverse Code).
3. Opportunities for me to use distance education instructional strategies before I adopt them are available.
4. Professional development related to implementing effective distance education strategies is offered, so I can try them before I adopt them.

Section 2 Social System

1. Distance education will result in a reduction of staff at my university (Reverse Code).
2. My university has adequate professional development programs related to distance education.
3. Training faculty how to implement the "best practices" in distance education will be expensive (Reverse Code).
4. The technical support for distance education at my university is inadequate (Reverse Code).
5. Faculty at my university are intimidated by distance education (Reverse Code).
6. Property rights in distance education are an area of concern for faculty (Reverse Code).

7. My department chair supports the implementation of distance education.
8. My department chair advocates for the implementation of distance education.
9. There is a higher demand for distance education than in the past at my university.
10. Administrators at my university understand the best practices of distance education.
11. Incentives are offered at my university to implement distance education.
12. There is no technical support at my university (Reverse Code).
13. There are no monetary incentives to implement distance education at my university (Reverse Code).
14. Release time to develop distance education courses and programs is not provided at my university (Reverse Code).
15. Distance education will not increase the enrollment at my university (Reverse Code).
16. My university's distance education program has a policy they employ regarding responding to students within a timely fashion.

Section 3 Communication Channels

1. I communicate regularly with people who advocate for distance education.
2. I don't advocate for distance education at my university (Reverse Code).
3. Few faculty at my university advocate for distance education (Reverse Code).
4. Faculty approaches me for advice on distance education.
5. I help other faculty at my university implement distance education effectively.
6. I have no difficulty telling other faculty how distance education improves my courses.
7. My university doesn't offer a course management system (Blackboard, D2L, etc..) to implement distance education (Reverse Code).
8. Faculty at my university will help me locate valid and reliable health information on the Internet.
9. I don't communicate with faculty at other universities to increase my knowledge of distance education (Reverse Code).
10. I rarely communicate with others about distance education. (Reverse Code)
11. Information from others on distance education is rarely communicated face to face.

Section 4 Adopter Characteristics

1. In my courses, I use my university's course management system more than my colleagues (D2L, Blackboard, etc.).
2. I have difficulty helping students with technological issues (Reverse Code).
3. I can't record a lecture for students to access on the Internet (Reverse Code).
4. I can't create a power point presentation for students to access on the Internet (Reverse Code).
5. I communicate more often with my students through email than face-to-face.
6. I can create timed exams and quizzes for distance education.
7. I don't know how to use a webcam (Reverse Code).
8. I don't know how to use a headset and microphone (Reverse Code).
9. I spend more time on social networking sites than my colleagues.
10. I don't keep up with current trends in technology (Reverse Code).
11. I am open to understanding other people's perspectives on distance education (pro or con).
12. I believe that my courses should all be taught face-to-face (Reverse Code).

13. I believe that I don't have control over how I teach my courses (Reverse Code).
14. I have trouble getting technology to work in my courses (Reverse Code).
15. I am more likely than my colleagues to try new technologies in my courses.
16. I am more likely than my colleagues to take risks.
17. I am more likely than my colleagues to implement new instructional strategies in my courses.
18. I communicate with my colleagues through email more often than face-to-face.

Demographics

1. Which category below includes your age?
Younger than 21
21-29
30-39
40-49
50-59
60 or older
2. What is your gender?
Male
Female
3. Have you taught a course completely online within the last 5 years?
Yes
No
4. How many years have you been teaching at the university level?
1-5
6-10
11-15
16-20
21-25
25+

APPENDIX E

INSTRUMENT IN SURVEY MONKEY FOR MAIN STUDY

LIKERT SCALE for all questions:

Don't Know Strongly Disagree Disagree Agree Strongly Agree

1. In my courses, I use my university's course management system more than my colleagues (D2L, Blackboard, etc.).
2. At my university, implementing distance education will incur additional monetary costs.
3. The strategies used in distance education are not consistent with my teaching style.
4. Distance education courses are difficult to implement within my courses.
5. There is ample evidence in the literature to support the effectiveness of distance education.
6. To stay competitive in higher education, more distance education courses should be offered in health education.
7. Distance education will result in a reduction of staff at my university.
8. I communicate regularly with people who advocate for distance education.
9. I have difficulty helping students with technological issues.
10. Distance education will become an educational norm in the future.
11. My university has adequate professional development programs related to distance education.
12. Distance education instructional strategies are difficult to try in health education courses.
13. I can not record a lecture for students to access on the Internet.
14. Educational fads have come and gone and so will distance education.
15. I search the Internet for ideas to incorporate within my courses.
16. Learning to implement distance education is not difficult.
17. It is difficult to observe distance education at the university where I am currently employed.
18. I do not advocate for distance education at my university.

19. Training faculty how to implement the “best practices” in distance education will be expensive.
20. Few instructors at my university advocate for distance education.
21. I can not create a power point presentation for students to access on the Internet.
22. Distance education can not replace face-to-face instructional strategies.
23. The technical support for distance education at my university is inadequate.
24. Faculty approaches me for advice on distance education.
25. I communicate more often with my students through email than face-to-face.
26. Distance education instructional strategies will enhance my courses.
27. I can implement distance education within my current course with my existing knowledge in technology.
28. Faculty at my university is intimidated by distance education.
29. I help other faculty at my university implement distance education effectively.
30. I can create timed exams and quizzes for distance education.
31. Courses delivered through distance education can be as effective as face-to-face courses.
32. I search the Internet for new technology to use in my courses.
33. Increases in distance education will not increase student enrollment at my university.
34. My interest in distance education has encouraged other instructors to become involved in engaging in distance education delivery.
35. Property rights in distance education are an area of concern for faculty.
36. I have no difficulty telling other faculty how distance education improves my courses.
37. I do not know how to use a webcam.
38. Distance education will meet the educational needs of students in college courses.
39. I do not know how to use a headset and microphone.
40. There is a lack of interaction between the student and the instructor within distance education courses.

41. To reach more nontraditional students in higher education, more distance education courses should be offered.

42. It is difficult to find distance education instructional strategies to use in my courses.

43. My department chair supports implementation of distance education.

44. My university does not offer a course management system (Blackboard, D2L, etc..) to implement distance education.

45. I do not keep up with current trends in technology.

46. Instructional strategies that are recommended for distance education can make learning just as interesting as face-to-face courses.

47. I am open to understanding other people's perspectives on distance education.

48. Distance education will replace face-to-face instruction in the future.

49. I believe that my courses should all be taught face-to-face.

50. Distance education will give more students an opportunity at higher education.

51. I understand how to implement distance education effectively.

52. I have not observed students enjoying distance education courses.

53. Opportunities to try distance education instructional strategies before I adopt them are available.

54. My department chair advocates for implementation of distance education.

55. Faculty at my university will help me locate valid and reliable health information on the Internet.

56. I believe that I do not have control over how I teach my courses (whether face-to-face or online).

57. Teaching distance education is just as enjoyable as teaching face-to-face.

58. At my university there is a higher demand for distance education than in the past.

59. I have trouble getting technology to work in my courses.

60. Students do not enjoy taking distance education courses.

61. Administrators at my university understand the best practices of distance education.

62. I am more likely than my colleagues to try new technologies in my courses.

63. Incentives are offered at my university to implement distance education.

64. I am more likely than my colleagues to take risks.

65. The benefits of face-to-face interaction can be accomplished in distance education courses.

66. Distance education is not consistent with the goals and objectives of my profession.

67. When trying to adopt distance education, I do not understand how to implement the "best practices" of distance education.

68. Opportunities to observe quality distance education are available.

69. There is minimal IT (information technology) support at my university.

70. I feel I will be delivering a lower quality education if I implement distance education.

71. There are no monetary incentives to implement distance education at my university.

72. I do not communicate with faculty at other universities to increase my knowledge of distance education.

73. Release time to develop distance education courses and programs is not provided at my university.

74. Students have told me they do not learn as much in distance education courses.

75. I am more likely than my colleagues to implement new instructional strategies in my courses.

76. There is a steep learning curve when trying to implement distance education.

77. I have not observed instructors' satisfaction with distance education courses.

78. Professional development related to implementing effective distance education strategies is offered, so I can try them before I adopt them.

79. I rarely communicate with others about distance education.

80. I communicate with my colleagues through email more often than face-to-face.

81. People (colleagues, students, friends, ect.) who have taken distance education courses have told me that the course was not effective.

82. My university's distance education program has a policy they employ regarding responding to students within a timely fashion.

83. What is your age?

84. What is your gender?

85. What is your ethnicity?

86. What is your highest degree (Master's or PhD)?

87. What type of institution do you work for (Public or Private)?

88. What is your institution considered (research oriented or teaching oriented)?

89. How many years have you taught at the university level?

90. Have you ever taught a hybrid course? (If you answer "yes" then please answer the rest of the questions and if your answer was "no" then you have completed the survey)

91. Have you ever taught a course entirely online?

92. What year did you start teaching hybrid courses?

93. How many hybrid courses did you teach in that academic year?

94. What year did you start teaching courses that were delivered entirely online?

95. How many courses did you teach entirely online in that academic year?

96. During the fall semester of 2011, spring semester 2012, and fall semester of 2012 how many hybrid courses did you teach?

97. During the fall semester of 2011, spring semester 2012, and fall semester of 2012 how many courses did you teach entirely online?

APPENDIX F

INSTRUMENT FOR MAIN STUDY WITH CONSTRUCTS

LIKERT SCALE for all questions:

Don't Know Strongly Disagree Disagree Agree Strongly Agree

Section 1 Characteristics of the Innovation

Relative Advantage

1. At your university, implementing distance education will incur additional monetary costs (Reverse Code). Question 2 in survey monkey
2. Distance education will become an educational norm in the future. Question 10 in survey monkey
3. Educational fads have come and gone and so will distance education (Reverse Code). Question 14 in survey monkey
4. Distance education can't replace face-to-face instructional strategies. (Reverse Code). Question 22 in survey monkey
5. Distance education instructional strategies will enhance my courses. Question 26 in survey monkey
6. Courses delivered through distance education can be as effective as face-to-face courses. Question 31 in survey monkey
7. Distance education will meet the educational needs of students in college courses. Question 38 in survey monkey
8. There is a lack of interaction within distance education courses between the student and the instructor (Reverse Code). Question 40 in survey monkey
9. Instructional strategies that are recommended for distance education can make learning just as interesting as face-to-face courses. Question 46 in survey monkey
10. Distance education will replace face-to-face instruction in the future. Question 48 in survey monkey
11. Teaching distance education is just as enjoyable as teaching face-to-face. Question 57 in survey monkey
12. Students do not enjoy taking distance education courses (Reverse code). Question 60 in survey monkey
13. The benefits of face-to-face interaction can be accomplished in distance education courses. Question 65 in survey monkey
14. I feel I will be delivering a lower quality education if I implement distance education (Reverse Code). Question 70 in survey monkey
15. Students have told me they don't learn as much in distance education courses (Reverse Code). Question 74 in survey monkey
16. People (colleagues, students, friends, ect.) who have taken distance education courses have told me that the course was not effective (Reverse Code). Question 81 in survey monkey

Compatability

1. The strategies used in distance education are not consistent with my teaching style (Reverse Code). Question 3 in survey monkey
2. I search the Internet for ideas to incorporate within my courses. Question 15 in survey monkey
3. I search the Internet for new technology to use in my courses. Question 32 in survey monkey
4. Distance education will give more students an opportunity at higher education. Question 50 in survey monkey
5. Distance education is not consistent with the goals and objectives of my profession (Reverse Code). Question 66 in survey monkey

Complexity

1. Distance education courses are difficult to implement into my courses (Reverse Code). Question 4 in survey monkey
2. Learning to implement distance education is not difficult. Question 16 in survey monkey
3. I can implement distance education within my current course with my existing knowledge in technology. Question 27 in survey monkey
4. It is difficult to find distance education instructional strategies to use in my courses (Reverse Code). Question 42 in survey monkey
5. I understand how to implement distance education effectively. Question 51 in survey monkey
6. When trying to adopt distance education I do not understand how to implement the "best practices" of distance education (Reverse Code). Question 67 in survey monkey
7. There is a steep learning curve when trying to implement distance education (Reverse Code). Question 76 in survey monkey

Observability

1. There is ample evidence in the literature to support the effectiveness of distance education. Question 5 in survey monkey
2. It is difficult to observe distance education at the university where I am currently employed (Reverse Code). Question 17 in survey monkey
3. My interest in distance education has encouraged other instructors to become involved in engaging in distance education delivery. Question 34 in survey monkey
4. I have not observed students enjoying distance education courses (Reverse Code). Question 52 in survey monkey
5. Opportunities to observe quality distance education are available. Question 68 in survey monkey
6. I have not observed instructor's satisfaction with distance education courses (Reverse Code). Question 77 in survey monkey

Triability

1. Distance education instructional strategies are difficult to try in health education courses. (Reverse Code). Question 12 in survey monkey
2. Opportunities to try distance education instructional strategies before I adopt them are available. Question 53 in survey monkey
3. Professional development related to implementing effective distance education strategies is offered, so I can try them before I adopt them. Question 78 in survey monkey

Section 2 Social System

1. Distance education will result in a reduction of staff at my university (Reverse Code). Question 7 in survey monkey
2. My university has adequate professional development programs related to distance education. Question 11 in survey monkey
3. Training faculty how to implement the "best practices" in distance education will be expensive (Reverse Code). Question 19 in survey monkey
4. The technical support for distance education at my university is inadequate (Reverse Code). Question 23 in survey monkey
5. Faculty at my university are intimidated by distance education (Reverse Code). Question 28 in survey monkey
6. Property rights in distance education are an area of concern for faculty (Reverse Code). Question 35 in survey monkey
7. My department chair supports the implementation of distance education. Question 43 in survey monkey
8. My department chair advocates for the implementation of distance education. Question 54 in survey monkey
9. There is a higher demand for distance education than in the past at my university. Question 58 in survey monkey
10. Administrators at my university understand the best practices of distance education. Question 61 in survey monkey
11. Incentives are offered at my university to implement distance education. Question 63 in survey monkey
12. There is no technical support at my university (Reverse Code). Question 69 in survey monkey
13. There are no monetary incentives to implement distance education at my university (Reverse Code). Question 71 in survey monkey
14. Release time to develop distance education courses and programs is not provided at my university (Reverse Code). Question 73 in survey monkey
15. My university's distance education program has a policy they employ regarding responding to students within a timely fashion. Question 82 in survey monkey

Section 3 Communication Channels

1. I communicate regularly with people who advocate for distance education. Question 8 in survey monkey
2. I don't advocate for distance education at my university (Reverse Code). Question 18 in survey monkey
3. Few faculty at my university advocate for distance education (Reverse Code). Question 20 in survey monkey
4. Faculty approaches me for advice on distance education. Question 24 in survey monkey
5. I help other faculty at my university implement distance education effectively. Question 29 in survey monkey
6. I have no difficulty telling other faculty how distance education improves my courses. Question 36 in survey monkey
7. My university doesn't offer a course management system (Blackboard, D2L, etc..) to implement distance education (Reverse Code). Question 44 in survey monkey
8. Faculty at my university will help me locate valid and reliable health information on the Internet. Question 55 in survey monkey
9. I don't communicate with faculty at other universities to increase my knowledge of distance education (Reverse Code). Question 72 in survey monkey
10. I rarely communicate with others about distance education (Reverse Code). Question 79 in survey monkey

Section 4 Adopter Characteristics

1. In my courses, I use my university's course management system more than my colleagues (D2L, Blackboard, etc.). Question 1 in survey monkey
2. I have difficulty helping students with technological issues (Reverse Code). Question 9 in survey monkey
3. I can't record a lecture for students to access on the Internet (Reverse Code). Question 13 in survey monkey
4. I can't create a power point presentation for students to access on the Internet (Reverse Code). Question 21 in survey monkey
5. I communicate more often with my students through email than face-to-face. Question 25 in survey monkey
6. I can create timed exams and quizzes for distance education. Question 30 in survey monkey
7. I don't know how to use a webcam (Reverse Code). Question 37 in survey monkey
8. I don't know how to use a headset and microphone (Reverse Code). Question 39 in survey monkey
9. I don't keep up with current trends in technology (Reverse Code). Question 45 in survey monkey
10. I am open to understanding other people's perspectives on distance education (pro or con). Question 47 in survey monkey
11. I believe that my courses should all be taught face-to-face (Reverse Code). Question 49 in survey monkey
12. I believe that I don't have control over how I teach my courses (Reverse Code). Question 56 in survey monkey

13. I have trouble getting technology to work in my courses (Reverse Code). Question 59 in survey monkey
14. I am more likely than my colleagues to try new technologies in my courses. Question 62 in survey monkey
15. I am more likely than my colleagues to take risks. Question 64 in survey monkey
16. I am more likely than my colleagues to implement new instructional strategies in my courses. Question 75 in survey monkey
17. I communicate with my colleagues through email more often than face-to-face. Question 80 in survey monkey

Perception of Need

1. To stay competitive in higher education more distance education courses should be offered in health education. Question 6 in survey monkey
2. Increases in distance education will not increase student enrollment at your university (Reverse Code). Question 33 in survey monkey
3. To reach more nontraditional students in higher education more distance education courses should be offered. Question 41 in survey monkey

Demographics

1. What is your age? Question 83 in survey monkey
2. What is your gender? Question 84 in survey monkey
3. What is your ethnicity? Question 85 in survey monkey
4. What is your highest degree (Master's or PhD)? Question 86 in survey monkey
5. What type of institution do you work for (Public or Private)? Question 87 in survey monkey
6. What is your institution considered (research oriented or teaching oriented)? Question 88 in survey monkey
7. How many years have you taught at the university level? Question 89 in survey monkey
8. Have you ever taught a hybrid course? Question 90 in survey monkey
9. Have you ever taught a course entirely online? Question 91 in survey monkey
10. What year did you start teaching hybrid courses? Question 92 in survey monkey
11. How many hybrid courses did you teach in that academic year? Question 93 in survey monkey
12. What year did you start teaching courses that were delivered entirely online? Question 94 in survey monkey
13. How many courses did you teach entirely online in that year? Question 95 in survey monkey
14. During the fall semester of 2011, spring semester 2012, and fall semester of 2012 how many hybrid courses did you teach? Question 96 in survey monkey
15. During the fall semester of 2011, spring semester 2012, and fall semester of 2012 how many courses did you teach entirely online? Question 97 in survey monkey

APPENDIX G

EMAIL SOLCITATION TO PARTICIPANTS FOR STUDY

Dear participant,

My name is James Ball and I am a Doctoral student at Southern Illinois University Carbondale in Health Education. I am emailing you to request your assistance in my dissertation research. I am attempting to identify factors affecting the adoption and diffusion of distance education **(hybrid and online courses)** among health faculty **(Public Health, Health Education, Community Health, Physical Education, etc).**

More specifically, I want to explore why **people DO NOT use or DO use distance education** in the health courses they teach at the university level. I have requested and received the American Association of Health Education Directory (2011). You were selected because the health department by which you are employed was listed in the AAHE (2011) directory.

If you are a faculty member, please take 10-20 minutes to complete a survey about your experiences or lack of experiences with distance education. All your responses will be confidential. Only people directly involved with this project will have access to the surveys.

Completion and return of this survey will indicate voluntary consent to participate in this study. Questions about this study can be directed to me or to my supervising professor, Dr. Joyce Fetro, Department of Health Education and recreation, SIUC, Carbondale, IL 62901- 4632* Phone (618) 453-2777.

Participation is voluntary, so if you are interested please complete the survey via survey monkey by clicking on this link: https://www.surveymonkey.com/s/DEINHED

If you are not interested please disregard this email or reply explaining not to include your email on any future mailings. If you do not respond to this survey or return the opt-out message, you will be contacted again with this request two more times during the next four weeks. After that, I will discontinue attempting to contact you for this research.

Thank you for taking the time to assist me in this research.

James Ball, Health Education PHD student
301 S. Eason Dr. Apt #1
Carbondale, IL 62901
608-385-3011
Jamball36@siu.edu

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, SIUC, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail: siuhsc@siu.edu

APPENDIX H

COVER LETTER ON SURVEY MONKEY FOR STUDY

Dear Participant,

I am a graduate student seeking my doctoral degree in the Department of Health Education and Recreation at Southern Illinois University-Carbondale.

The purpose of my research is to conduct a study to explore the factors affecting the adoption and diffusion of distance education (**specifically hybrid/online courses**). I am looking to explore the reasons why people do or do not use distance education in the health courses they teach at the university level.

All health faculty listed in the American Association of Health Education (2011) Directory have been selected to participate in this study. You were selected because the health department in which you are employed was listed in this directory. If you are a faculty member in health (Public Health, Health Education, Community Health, Physical Education, etc) then please complete the survey.

The survey will take 10 to 20 minutes to complete. All your responses will be kept confidential. Only people directly involved with this project will have access to the surveys.

Completion and return of this survey indicate voluntary consent to participate in this study.

Questions about this study can be directed to me or to my supervising professor, Dr. Joyce Fetro, Department of Health Education, SIUC, Carbondale, IL 62901- 4632* Phone (618) 453-2777.

Thank you for taking the time to assist me in this research.

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This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this research may be addressed to the Committee Chairperson, Office of Sponsored Projects Administration, SIUC, Carbondale, IL 62901-4709. Phone (618) 453-4533. E-mail: siuhsc@siu.edu

VITA

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University of Wisconsin La Crosse, La Crosse, WI, December 2002
Bachelor of Science, Health Education

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Dissertation: Factors Affecting Adoption and Diffusion of Distance Education among Health Education Faculty

Publications

Bice, M., Ball, J., & Ramsey, A. (2012). Implementation of the C.A.T.C.H. health education classroom curriculum in 5th grade classes in southern Illinois. The Health Education Student Monograph. 29(2), 13-18.

Ball, J. (2011). Addressing and overcoming the digital divide in schools. The Health Education Student Monograph. 28(2), 56-59.

Ball, J., Simpson, S., Ardovino, P., & Skemp-Arlt, K. (2008). Leadership competencies of university recreational directors in Wisconsin. Recreational Sports Journal. 32(1), 3-10.