FACULTY MEMBERS' READINESS FOR E-LEARNING IN THE COLLEGE OF BASIC EDUCATION IN KUWAIT

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The Public Authority for Applied Education and Training (PAAET) in Kuwait consists of more than 10 academic colleges with a total number of 120 faculty members. The College of Basic Education (CBE) is one of them. The implementation of e-learning at the College of Basic Education requires that all the learning community members, instructors and students, understand that an e-learning course is like a learning community with the privilege of sharing knowledge, opinions, experiences related to class subject, and productive outcomes that are beneficial to this learning community.

This study indentified the statistically significant differences in demographic characteristics of e-learning adopters and non-adopters among faculty members at CBE, examining faculty members' attitudes and skills toward e-learning readiness. The study explored perceived barriers that face e-learning at CBE.

Applying the Rogers diffusion of innovation theory, the influence of 4 factors was examined regarding faculty readiness for e-learning at CBE. Chi-square techniques, *t*-tests, and factor analysis were conducted to analyze the data and answer research questions. Statistically significant differences were identified among e-learning adopters and non-adopters regarding age difference and department discipline, both technical and non-technical.

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CHAPTER 1

INTRODUCTION

For many years educators have been seeking a general definition of e-learning Liaw, Huang, and Chen (2007) define e-learning as the convergence of technology and learning, and as the use of network technologies to facilitate learning anytime, anywhere. Davis (2001) describes e-learning as technology-enabled learning that covers various concepts, or a phenomenon delivering instructions through technology. Welsh, Wanberg, Brown, and Simmering (2003, p. 246) define e-learning as the use of computer network technology through the Internet to deliver information and instruction to learners. Rosenberg (2001) refers to e-learning as using Internet technologies to deliver various solutions to learners. Holmes and Gardner (2006) point out that e-learning provide access to resources that promotes learning on an anyplace, anytime basis. However, the most well-known definition that educators agree on is that "e-learning is set of synchronous and asynchronous instruction delivered to learners over technology" (Colvin & Mayer, 2008, p. 10).

E-learning encompasses related terms like online learning, virtual learning, Web-based learning, and distance learning (Panda & Mishra, 2007). Obringer (2001) mentioned that the history of e-learning goes back to 1983 when Nova Southern University in Fort Lauderdale, Florida, offered online courses to students for credit, and since then, schools have made a serious move toward the implementation of e-learning into curricula. In 2005, nearly 32.2 million students took at least one e-learning course (Lin, Lin, & Laffey, 2008). In general, e-learning is the future of learning that focuses on both the individual needs of learners as well as the delivered content (Colvin & Mayer, 2008).

The number of educational institutions all over the world who have already implemented e-learning into their curricula and others who are in the process of implementing e-learning is growing rapidly. Implementing e-learning by educational institutions has strong purposes, one of which is, as Seretta (2008) has mentioned in an interview for CHECK point e-Learning newsletter, that today's youth are adapting and finding new ways to use technology. All of these have significant implications on higher education institutions and the work place. As always, today's youth culture gets incorporated into tomorrow's global culture. Seretta thinks educators should learn from the next generation today. Today's youth live in the Web 2.0 era; they use the Internet to communicate, to publish and share contents, and to form virtual teams with people whom they do not know. There is a clear common ground between Seretta's thoughts and e-learning implications: the means for communicating, discussing, and sharing content activities can be created within an e-learning environment.

Another purpose is to take advantage of today's advanced technology to raise the educational level to a higher level and shrink the digital divide among students (Elges, Righettini & Combs, 2006). A good purpose of an e-learning implementation is that students will be exposed to different learning models, such as constructivism, rather than being limited to the traditional learning (Leidner & Jarvenpaa, 1995). One more significant purpose of e-learning is to lower expenditures on new classrooms and parking buildings, and invest the saved money in research labs for future scientific breakthroughs or innovations. E-learning as a part of today's technology has proven that it is appropriate for most students' mentalities and is a mind tool (Jonassen, 2002), which promotes learning models such as Constructivism, collaborative learning, and critical thinking (Gunga & Richetts, 2007).

E-learning projects will oblige instructors to apply new philosophical learning models for better communication and deliverance of knowledge to learners in addition to the conventional philosophical learning model (Aldhafeeri, Almulla, & Alraqas, 2006). E-learning will provide faculty members extra teaching tools such as multimedia, chat rooms, and the flexibility of delivering materials from anywhere and anytime. E-learning will help educators to engage students in a communication process that will give remarkable feedback related to the course materials whether or not the materials need improvements (Colvin & Mayer, 2008).

The Public Authority for Applied Education and Training (PAAET) in Kuwait consists of more than 10 academic colleges, including the College of Basic Education (CBE), with a total number of 120 faculty members. The implementation of e-learning at the College of Basic Education requires that all the learning community members, instructors and students, to understand that an e-learning course is like a learning community with the privilege of sharing knowledge, opinions, and experiences related to class subject, and to generate productive outcomes that are beneficial to this learning community. In order for the e-learning community to be formed and successful, sources and supports need to be in place (Chen, Hsu, & Caropreso, 2009).

Resource factors can be shaped through providing appropriate resources such as tools and materials, for example, reliable learning management systems (LMS) and outstanding networks that can handle a large number of users. E-learning materials such as compatible content, utilities, library, Web links, handouts, and manuals can definitely sustain the progress of the e-learning community. An e-learning community also needs technical support that can solve any technical problem which may hinder student learning. In addition to the technical support, there

must be learning support provided by instructors that can facilitate task engagement and goal achievement of the e-learning course.

Implementing e-learning by educational institutions has strong benefits, one of which is that e-learning provides consistent content that assists students to overcome problems involved with instructors' different teaching styles. Another benefit of an e-learning course is that self-paced learning allows students to skip material they already know and move onto the next topic (Lewis, 2007). The third benefit of an e-learning course is that the course materials are uploaded to the server, which allows instructors and the technical support team to easily update and manage the materials (Lewis, 2007). A fourth benefit is offering students the freedom of learning anytime and anywhere.

Statement of the Problem

The College of Basic Education at PAAET in Kuwait requires that every instructor integrate technology into his/her classes, e-learning could be a one of the integrated technologies. The college is fully equipped with advanced computer labs. Every faculty has a free laptop. Despite the fact that faculty members are provided with required tools to implement e-learning into their classes, they still have not done so (Mohammad, 2009). Using e-learning to teach pre-service teachers at the College of Basic Education, who are the future teachers, will help them to incorporate this new learning model into their curricula as well as the technology into their classes, thus, flexible, up-to-date learning content is required (Mohammad, 2009). Using new technology in teaching will make students more capable of working on their own to collect information from variety of sources besides the instructor, and in this way, e-learning will create a competitive learning environment (Gotthardt, Siegert, Schlieck, Schneider, Kinnert, Gross, et al., 2006). Unfortunately, most faculty members at the College of Basic Education are not

incorporating e-learning into their courses. Furthermore, no study has been conducted to explore faculty attitudes toward and skills with e-learning, or perceived barriers that might be faced at the College of Basic Education in Kuwait during the implementation of e-learning (Aldhafeeri, Almulla, & Alraqas, 2006). Therefore, the following study will tackle major issues facing faculty members in e-learning implementation at the College of Basic Education.

Purpose

The purpose of this study is to examine faculty members' readiness for e-learning at the College of Basic Education of PAAET in Kuwait. The study will use Rogers's "Diffusion of Innovation" model to explore the faculty members' readiness for e-learning as well as their attitudes and self-efficacy towards e-learning. By doing so, the study hopes to uncover barriers that faculty encounter while incorporating e-learning into their teaching. Factors such as age difference and technical background will serve as initial constructs to achieve the goal of the study.

The Significance of the Study

This study has the following significance:

- To introduce a new learning model, e-learning, at College of Basic Education
- To make College of Basic Education outcomes compatible with global educational institutional outcomes
- To explore whether or not faculty members are early adopters of new learning technologies or late adopters
- To expose faculty members as well as students to different learning models, mainly to infuse a "collaboration" learning model in addition to the existing learning model of "objectivism"

- To make students more capable of collecting information on their own by introducing other sources such as the Internet in addition to the instructor's knowledge and course text-book.
- To create a more competitive learning environment
- To prepare students with up-to-date learning content and technical skills that future job will require

Research Questions

The research questions are the following:

- Based on Rogers's "Diffusion of Innovation" model, to what extent are faculty members at the College of Basic Education of PAAET in Kuwait ready to adopt e-learning?
- What are the faculty members' attitudes and levels of skills toward integrating e-learning in their teaching?
- What barriers are faculty members facing in implementing e-learning in their teaching?

Limitations

This study was conducted under the following limitations:

- The study did not use a random sample of teachers from different colleges at PAAET, instead, participants were only from the College of Basic Education at PAAET. All available faculty members at the College of Basic Education from different departments were chosen as the subjects of the study.
- The response rate will affect the expectations of this study, in other words, if most participants are young faculty members, then the testing hypothesis cannot be tested with respect to age difference. The study will look at age difference and technical

departments. Therefore, participation of senior and young faculty members is imperative; also, technical and non-technical department faculty participation is required.

- The questionnaire consisted of three parts: attitudes, skills, and barriers, totaling 28 questions. The number of questions is about average compared to previous instruments in this field which can affect the completion rate of the whole survey.
- Faculty members may be on sabbatical leave or involved in governmental contracts indicating that few faculty members are not regularly on campus and the number of participants will be lower than what the research design projects.

CHAPTER 2

LITERATURE REVIEW

This chapter begins with a theoretical framework that shows how e-learning will likely expose faculty members and students to a new learning model. It will discuss how e-learning integration can fit into current curricula, and how the analysis, design, development, implementation, and evaluation (ADDIE) model may provide a sound instructional design strategy for successfully implementing e-learning into current curricula. Collaboration, where learning emerges through interaction of individuals with other individuals (Leidner & Jarvenpaa, 1995) may help instructors to shift their traditional teaching style to other teaching styles that are suitable for e-learning (Ruiz, Mintzer, & Leipzig, 2006).

An extensive review of the literature will be conducted to gain an understanding of faculty members' attitudes, skills, and perceptions toward the implementation of e-learning. This chapter will also include a literature discussion of faculty members' attitudes, perceptions, and skills. In general, the purpose of this chapter is to set a foundation for the inquiry to the research with respect to: e-learning as an innovation in Kuwait, how the diffusion of innovation theory can be applied in this study by depicting Rogers's model, attitudes and skills of faculty members towards e-learning, and the barriers that faculty members perceive in teaching with e-learning.

In 2004, in Kuwait and right after I graduated from University of South Florida, I observed that e-learning was (and is still) not implemented at the Kuwaiti Public Authority for Applied Education and Training (PAAET) College of Basic Education (CBE). Therefore, I realized the necessity to explore the reasons behind the lack of use of e-learning as possible a modern teaching style. I assumed that if faculty members at the College of Basic Education agreed to apply e-learning into their classes, students, instructors, and administrators would

probably have no choice but to accept the new learning style. However, I discovered that none of the faculty members taught an e-learning course. From this point, I decided to explore three main components related to attitudes and skills of the faculty members toward the implementation of e-learning. I also wanted to explore the perceived barriers that faculty members encounter in order to implement e-learning. I figured that if a faculty member had a positive attitude and updated computer skills, the barriers could be overcome, and e-learning could, without difficulty, be implemented at the College of Basic Education.

E-learning Curricula and Design Model

The relationship between theory and method is more like action and reaction where theory is the result of a process of cognition that reproduces a certain fragment of existence (Spirkin, 1983). Method, on the other hand, is the way of obtaining and building up such knowledge (Spirkin, 1983). The current philosophical learning model or theory that governments rely on is probably objectivism, and the method is conventional teaching, face-to-face, where instructors have objectives that need to be met by the end of the course, and to satisfy the government's requirements by making students pass governmentally designed and required tests. This philosophical learning model will possibly in the future contradict the philosophical learning model of e-learning, where students are forced to discover things on their own by constructing individual knowledge (Leidner & Jarvenpaa, 1995). E-learning may impose a new learning theory that faculty members are required to embrace in order to ensure the success of e-learning implementation. Collaborative learning is another philosophical learning theory which is a branch of constructivism; this learning model could inspire students to engage in class discussion and share knowledge relating to class subjects. In other words, collaborative learning could emerge through interaction of individuals with other individuals and learning occurs as

students exercise, verify, solidify, and improve their mental models through communicative actions such as discussing information. The collaborative learning model in e-learning may change teachers' roles from providers of information to expert questioners, where learners probably construct their knowledge and solve problems as they view topics from multiple perspectives (Gunga & Richetts, 2007). The constructivism learning model also covers other sub-learning models such as the cognitive learning model and the social learning model.

As Bovy (1983) implicated, in regard to the cognitive learning model, "the instructional support required is inversely related to the depth of existing knowledge as well as to the effectiveness of the learner's information processing style" (Bovy, 1983, p. 4). Cognitive learning models will partially be implemented in e-learning materials especially in evaluation and analysis projects. As for the social learning model, constructed knowledge is possibly tied to learners' cultural backgrounds in a way that simplifies the understanding of e-learning materials. E-learning projects could oblige instructors to apply new philosophical learning models for better communication and deliverance of knowledge to learners besides the conventional philosophical learning model (Aldhafeeri, Almulla, & Alraqas, 2006, p. 9).

Abouchedid and Eid (2004) mentioned that faculty members had several concerns related to the transition from traditional education to e-learning. The first concern was that administration officials and instructors were not fully aware of or familiar with e-learning content and outcomes, as well as students' first-time experiences with e-learning courses because of a 180-degree shift in the philosophical learning model. The second concern was that there were not enough plans designed to guide educational institutions for a smooth educational transition to e-learning which can cause unwanted consequences such as a possible drop in students' enrollment leading to a drop in school's revenue. The third concern is that

governmental officials refuse the idea of converting educational institutions to “no lecture” institutions, indicating that e-learning philosophical models will make students independent from their instructors, and the old impression that learning is obtained from the instructor will probably be demolished.

According to Pinheiro (2002), an educational curriculum is “a connective link between teacher and student, organized in such a way to achieve goals previously set by the teacher, the learning organization or by the curriculum specialists.” Another definition of curriculum as Todd (1965) stated is “the planned educational experiences offered by a school which can take place anywhere at any time”. The curriculum in education could guide instructors on how to deliver information to students with respect to the amount of information and the time that this information will take to be understood by students. The e-learning curriculum still carries the same definition of Pinheiro, but with extra aspect of “learning to learn.” “Learning to learn” is an aspect that was found to fulfill the missing component of electronic curriculum; it refers to the capacity of students to learn outside of a paced and structured classroom context (Anderson, 2002).

E-learning course curricula may need to be designed in such a way that is relevant in the quality of information with the outside world because students will use different resources besides their instructor. E-learning course curricula may need to be based on learning approaches other than face-to-face course curriculum, which offers students opportunities to discuss their knowledge related to a certain topic rather than only to listen to the instructor as a provider of information. E-learning curriculum could push students to engage in ways not previously possible in face-to-face curriculum, and create new learning and teaching possibilities that will generate greater outcomes (DEECD, 2008). According to Colvin & Mayer (2008) an e-learning

curriculum may help infuse constructivist learning, when students are encouraged to spend more time interacting with each other than simply listening to the instructor, and requires students to work autonomously and concurrently in a competitive environment so that each individual will construct his or her own knowledge based on the interactions that take place during the e-learning course. The e-learning curriculum is an advanced version of the traditional curriculum, because it focuses more on student-centered learning and effective communication skills to ensure that students and their instructor are involved in a productive sharing of information. Instructors at the College of Basic Education possibly need to distinguish between e-learning and traditional curriculum through adding the mentioned aspects into the e-learning curriculum.

The ADDIE model is one of the hundreds of instructional design models known for its efficiency in learning and training. The ADDIE in this study will be discussed as a structure or organization on how to implement e-learning, but the study doesn't support the theoretical side of objectivism that it represents. The ADDIE model components of analysis, design, development, implementation, and evaluation could lead instructional designers to generate an applicable model that best fits the desired goals. Each component or step in the ADDIE model is typically followed by a reflection/feedback phase to ensure that the effectiveness or goal of that given step is achieved (Halight, 2008). It is true that the ADDIE model has been criticized by other instructional designers as being too systematic, linear, constraining, even time- consuming to implement. On the contrary, it is the father of almost all instructional designs and a reliable design especially for new projects (Kruse, 2004).

The history of the ADDIE started in 1975, when Florida State University developed the ADDIE model, which was selected by the U.S. armed services as the primary means for developing training. Clark (2004) explained that the term ADDIE was not used, but rather

systems approach to training (SAT). When the model was first introduced, it was strictly a waterfall method in that except for evaluation, which was performed throughout the entire process. The other steps were performed in linear order. However, by 1984, the model evolved into a more dynamic nature in which a learner could go back to the other steps as needed.

The importance of the ADDIE model can be seen during a student personal instructional design model. The student can unintentionally relate 60% of his final instructional design model to the ADDIE instructional design model (Magliaro & Shambaugh, 2006). The ADDIE model stems, in part, from the natural process of human thinking, in which operates through at least three components of ADDIE. The necessary components of the ADDIE model have proven their capability to design a variety of learning or training courses (Kruse, 2004).

The ADDIE model is the most common model and known for its simplicity among other instructional design models. It is recognized for the ease of application and possibilities inherent in the cyclical features of the process when compared to the Smith/Ragan model and the Morrison/Ross/Kemp model. The ADDIE components could enable instructional designers a more holistic overview of the instructional design process. The analysis component or process guides the designer to develop a clear understanding of the gaps between the desired outcomes and the learners' existing knowledge and skills. The analysis process identifies the learning problem and informs the instructor of what students know about a specific subject and how to extend their knowledge regarding this subject using the analysis component of the ADDIE model.

The second component of the ADDIE model is the design component. The instructor determines specific learning objectives, assessment instruments, exercises, and content. After collecting students' background knowledge from the analysis stage, the instructor can tackle

students' preferred learning styles that will be implemented, as well as the type of learning materials during the design process.

The third component of the ADDIE model is the development process in which the creation of the learning materials takes place based on the desired outcomes. The fourth component of the ADDIE model is the implementation process, where the developed learning materials are delivered to students. After delivery, the effectiveness of the learning materials is evaluated during the evaluation process. Normally, the evaluation process consists of two forms of evaluation, formative and summative (Learning Theories, 2008). The formative evaluation is present in each stage of the ADDIE process to ensure each stage's effectiveness. The summative evaluation consists of tests designed for criterion-related reference items and providing opportunities for feedback from the learners. Based on the learners' feedback, the instructional design can be revised and another improved design developed for future deliverance.

Objective e-learning implementation requires a compatible instructional design that can facilitate the delivery of the e-learning materials, as well as produce desired outcomes that can be noticed on students' performance. Faculty members need to shift their teaching practices and knowledge from classroom materials developed during their classroom experiences, to e-learning materials that promote participation from all students. It is an obstacle for instructors to relate emerging philosophical learning theories such as collaborative learning theory to e-learning class discussions. Magnussen (2008) observed that instructors need to spend more time on the computer to design an e-learning course. Instructors need to look for suitable ideas that allow them to shift their traditional teaching experiences to an e-learning teaching style. An educator is viewed not as a distributor of content, but as a facilitator of learning (Ruiz, Mintzer, & Leipzig, 2006). In order to create successful e-learning materials, the first step is to analyze the students'

backgrounds and qualifications through a small survey or a brief personal introduction. The second step is to design the e-learning materials that are more appealing to students' needs. In e-learning, instructors are able to update materials and resources instantly, track student discussion progress, push the discussion forward by questioning, and inspire students to engage more by introducing new relevant perspectives (Gunga & Richetts, 2007). During the second step, the instructor can determine specific learning objectives, assessment instruments, exercises, outcomes, and e-learning content. The third step is to develop the e-learning materials to achieve the desired outcomes that were defined during the design step.

The fourth step is the implementation process, in which the developed e-learning materials are delivered to students. The delivery process will be different in e-learning than in the traditional face-to-face class, because students will participate in the implementation of materials through posting their discussions with evidence such as Web links to support their points. However, the instructor needs to make sure that student participations are relevant to the class materials. Otherwise, s/he should shift the discussion toward the class subject and push it forward. The fifth step is to examine the effectiveness of the learning materials through a cooperative evaluation among students including their instructor. Students will also recommend improvements to include in future classes. In general, the ADDIE process is standard; the only tools that change are those required by e-learning, and it is imperative to adapt the ADDIE steps to the tools.

E-learning has become all about delivering new learning materials in an electronic format. What has been probably more difficult to achieve is the effective design of instruction in order to provide a common sense of the online content. Therefore, the online course principles are based on previous experiences with online course materials from variety of schools. The

multimedia principle indicates that "students engage more with materials if they include text and graphics" (Colvin & Mayer, 2008, p. 117) such as drawings, charts, maps, etc. Multimedia presentation assists students in making connections between graphics and text to simplify the understanding and memorization processes. The contiguity principle emphasizes the coordination of printed words and graphics, and how words need to be placed near graphics they refer to. The modality principle recommends that words be presented in a spoken form rather than printed form so that students' visions can apprehend materials gradually.

The redundancy principle helps to eliminate repetitive on-screen text presented simultaneously to on-screen graphics so that students don't waste extra time on the same content and get confused. The coherence principle asks educators to avoid the use of extraneous audio in online materials so students don't get distracted while learning. The personalization principle helps to engage students in conversational learning process rather than formal process. For instance, a formal learning content can be, "the capital of England is London" but the conversational content can be, "when people ask you, 'what is the capital of England,' you should say, 'London'." The segmenting principle recommends that educators break lessons into smaller segments to minimize the amount of information that students need to learn at a given time.

E-learning as Innovation in Kuwait

Mohammad (2009) said that, "As in other countries, e-learning has gained a respected place into their educational system, in Kuwait on the other hand, we have conducted several studies related to implementing new technologies." He pointed out that although all necessities are provided by the College of Basic Education, the faculty are still not using e-learning. Mohammad reported on the development of the pre-service students' curricula in Kuwait for

whom the College of Basic Education requires instructors to use technology as part of their teaching. Yet, there has not been an actual implementation of e-learning. He stated that the attitudes of faculty need to be analyzed through a detailed study to figure out the obstacles that hinder e-learning implementation.

The Kuwait Ministry of Education, which sets the educational goals for the country, has also developed a general technology standard that includes introduction to computer technologies, such as email and the World Wide Web, as part of the Kuwaiti school curriculum. However, as yet the standard makes no provision for incorporating e-learning technology into faculty members' classes. Further, there is no strategy in place to implement e-learning in the College of Basic Education. Faculty members currently receive no training and have no experience that can assist them in using e-learning as a new teaching style. Neither College of Basic Education administrators nor faculty have pushed the e-learning initiative forward, even though the college has provided all necessities for teachers to begin using e-learning.

Kuwait has two major public undergraduate schools. Kuwait University (KU) opened in 1966 (Kuwait University, 2009) and became the first university in Kuwait that offers almost all majors. The second university is the Public Authority for Applied Education and Training (PAAET) which opened in 1982 (Public Authority for Applied Education and Training, 2009) and emphasizes education, technology, nursing, and engineering. In 2002, the Kuwait ministry of education passed a law that allowed private universities to operate in Kuwait. Since then, five new operational private universities have opened in Kuwait joining Kuwait University and PAAET as providers of higher education (British Council, 2009). The five private universities include Gulf Institute of Science and Technology (GUST), American University of Kuwait (AUK), The Arab Open University (AOU), the Australian College of Kuwait (ACK), and the

American University of the Middle East (AUM). Among all five private universities, GUST is the only private university that has a mission to implement e-learning as a substitution for the traditional learning (GUST, 2009), but this mission hasn't taken place so far.

Diffusion of Innovation Theory

Diffusion of innovation theory has been applied in many fields such as instructional technology, electronic publishing, communication tools, and media literacy programs (Powell, 2008). The process of diffusion relies mainly of the communication channels available for the change agents within a social system. As Surry & Farquhar (1997) defined it, diffusion is the process by which an innovation is adopted and accepted by member of the community. The rapid growth of individual knowledge and industrial fields has obliged the world to come up with quite few diffusion of innovation models that best fit communities' needs. Rogers's diffusion of innovation model is one of the most well-known models, and it has been tested over the last 40 years. Despite the fact that Rogers's model lacks the capability of anticipating the outcomes of an innovation and providing direction on how to speed up the rate of adoption among people so that the innovation gets spread quickly and easily, it is considered as a generic model of most diffusion of innovation models (Almobarraz, 2007).

The Rogers Model

The Rogers theory originated from agricultural investigations in the late 1950s. Over the years, this model of diffusion of innovation has been applied to diverse fields including education and technology integration in particular. Rogers (2003) defined diffusion as "the process by which an innovation is communicated through certain channels over time among the members of a social system." It is clear that Rogers set four major elements that could control the diffusion framework process: innovation, communication channels, time, and social system. The

innovation, according to Rogers, is defined as "an idea, practice or object that is perceived as new, whether or not it is objectively new as measured by the lapse of time since its first use or discovery" (Rogers, 2003, p. 12).

As aforementioned, the diffusion framework consists of four components according to Rogers (1995), one of which is innovation. In this component the primary inquiry is: Why do certain innovations spread more quickly than others? It is because there are characteristics that every innovation has that direct the usability of this innovation. The second component, communication channels, could comprise the means that participants use to create and share information with one another in order to find common understanding. One of the most reliable and powerful communication channels is mass media because it spreads knowledge of innovations to large audiences in a short period of time (Orr, 2003).

The third element is time, which needs to be broken down into three parts: time involved in the innovation-decision process of an individual, time involved in the innovativeness of an individual, and time involved in the rate of adoption by the members of a social system. The innovation-decision process is when an individual passes from first knowledge of an innovation to forming an attitude about the innovation. Time involved in the innovativeness of an individual is relative to the earliness/lateness of adopting the innovation. Time involved in the rate of adoption of a system is measured as the number of members of the system adopting the innovation in a given time.

The fourth element is the social system, which is a set of interrelated units that are engaged in joint effort to accomplish a common goal. A point to mention is that there are two social systems we need to consider: the heterophilous social system, where members come from different backgrounds and ethnicity, and the homophilous social system, where members share

the same backgrounds (Orr, 2003). In a heterophilous social system, members tend to go against system norms, indicating a greater interest in adopting new innovations. Homophilous social system members, on the other hand, are controlled by social norms and tend to more follow social rules, indicating a lower interest in adopting new innovations, and typically it takes longer for this system to adopt new innovation.

In Figure 1 it is obvious that the rates of a successful adoption through time for a given population for three different innovations tend to follow an S-shaped pattern. Diffusion is typically slow at the beginning. Later on, the diffusion enters the "tipping point" period of quick spread. Rogers (2003) mentioned that the tipping point takes a place when the adoption rate is between 10% and 20% of the target population. Later the adoption rates take flat diffusion shape at the "permanent" level, signaling that almost all members, including late adopters, have adopted the innovation. Characteristics of innovations, communication channels, and social systems interact with one another affecting the slopes of adoption, as seen in Figure 1.

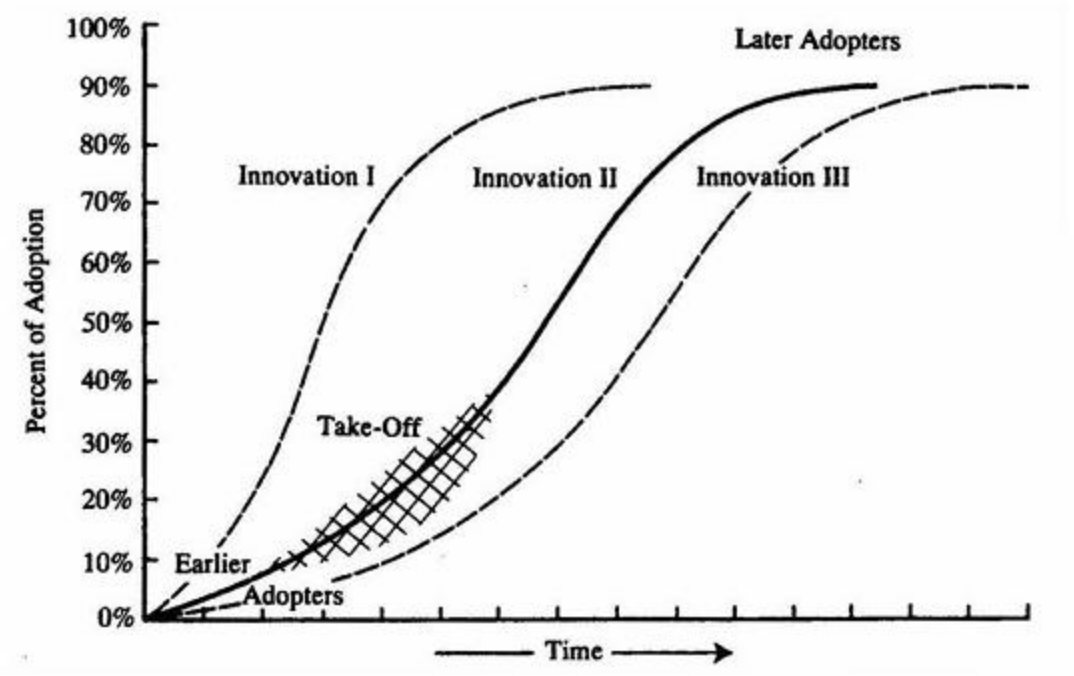

Figure 1. The diffusion process (Rogers, 2003, p. 11).

Rogers (1995) specified that each member of a social system may face a five-step innovation-decision process in order to adopt an innovation, given that the decision is optional innovation decision, not authoritative or collective. However, before an innovation is formally evaluated by an individual, four prior conditions must be met, one of which is that the person or unit of analysis needs to have previous experiences relevant to the innovation. The second condition is that there is a perceived need or problem facing the individual to consider the innovation as an option. The third condition is that the new ideas or techniques must have novelty or innovativeness. The fourth condition is regarding the norms of the social system, where they need to show acceptance of the new innovation.

The five steps that each member of a social system could face before making adoption decision are: knowledge, persuasion decision, implementation, and confirmation. It is clear that Rogers' steps tackle important issues with an individual's brain. It starts with learning about the

innovation knowledge as a first step, where an individual becomes aware of the innovation and its functions. The second step is processing the new information, or persuasion, where an individual forms a favorable or unfavorable attitude toward the innovation. The third step is constructing personal facts of the innovation, or decision, leading the individual to a choice of adopting or rejecting the innovation. The fourth step is putting the innovation into use, implementation. The fifth step is verifying the decision made, or confirmation, wherein the individual evaluates the innovation decision. The following figure shows Rogers's sequential steps of the innovation-decision process:

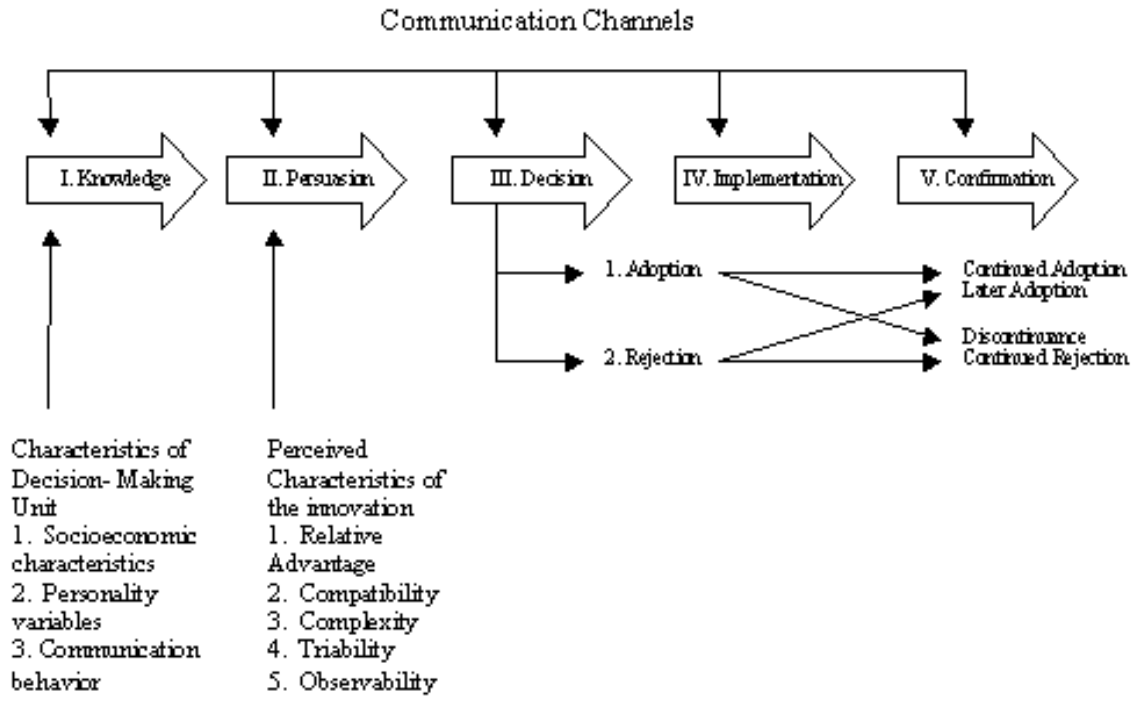

Figure 2. Diffusion of innovation model (Rogers, 2003, p. 170).

Extensive research by Rogers (1995) discovered that adoption of a new innovation is a continuous process that requires early adapters to suspend judgment related to this new innovation. What is shocking about the diffusion theory is that, for most members of a social system, the innovation decision may depend heavily on the innovation decision of the other

members, particularly opinion leaders of the system, indicating that effective communication channels help to spread members' decisions and opinions of an innovation over a short period of time (Orr, 2003).

Rogers described the four elements that can play a role in the diffusion of a new innovation. He also mentioned the nature of individuals' five characteristics in making an optional decision of a new innovation. Rogers (2003) did not forget to discuss the five characteristics that determine an innovation's adoption rate in a specific social system. The five characteristics of adoption rate are relative advantage, compatibility, complexity, trialability, and observability.

1. *Relative advantage* is the degree to which an innovation is perceived as better than the idea it supersedes. The higher the degree to which an individual recognizes the advantages of an innovation, the faster the adoption rate will take place.
2. *Compatibility* is the degree to which an innovation is perceived as being consistent with existing values, past experiences, and needs of potential adopters. If an idea is inconsistent with the values and norms of a social system, it will have an extremely slow adoption rate compared with the adoption rate of a compatible idea.
3. *Complexity* is the degree of the innovation's difficulty to be understood and used. Innovations that are easy to understand and use claim higher adoption rates than do complicated innovations.
4. *Trialability* is the degree to which an innovation may be experimented with on limited bases. New innovations that can be tried before adoption will be adopted quickly, giving individuals a sense of assurance for adaptation.

5. *Observability* is the degree to which the results of an innovation are visible to others. The easier to see positive results of an innovation, the more likely users will be adopting it.

The following Figure 3 shows the characteristics of adoption rate of an innovation:

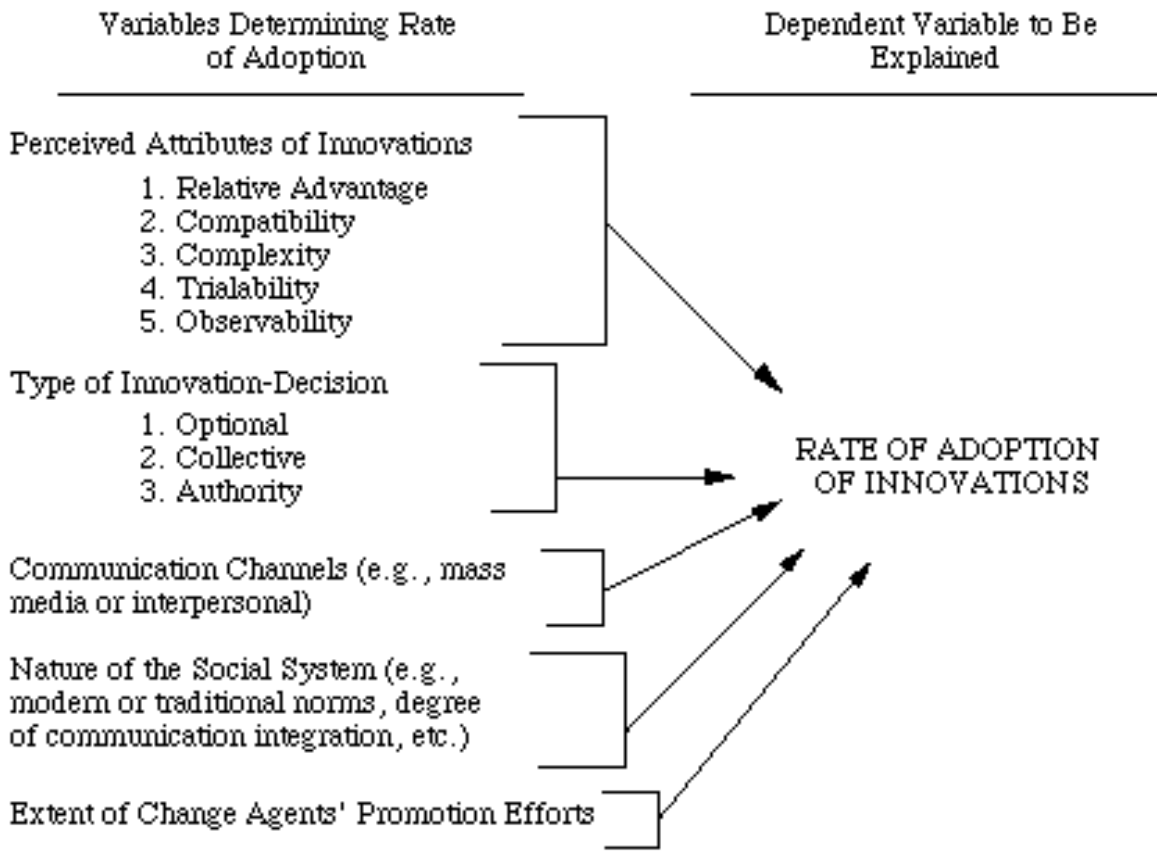

Figure 3. Variables determining the rate of adoption of innovations (Rogers, 2003, p. 222).

Yi, Jackson, Park, and Probst. (2006) reported in their study that relative advantage, complexity, and observability are the most important factors in predicting users' intentions to apply the use of technology. In another study conducted by Martins, Steil, and Todesco (2004) on the usage of Internet as an instructional tool in Brazil, they discovered that the two most important predictors in users' intentions toward new technology are trialability and observability. According to Surry and Gustafson (1994), relative advantage, compatibility, and complexity are also important factors in introducing an innovation into instructional settings.

Addressing main factors involved in the diffusion of new innovations could lead to effective, fast adoption within a social system. Rogers (1995) introduced the adopter categories wherein people can be classified based on their adoption rate of a new innovation. Rogers admitted that each individual goes through the five-step innovation-decision process, but the decision will be made according to the individual's characteristics. This diversity of decision making is what makes diffusion possible (Powell, 2008). Rogers stated that for a successful innovation, the adopter distribution must have the bell-shape instead of the S-shape that begins at one extreme with some people willing to try the innovation and ends with people who reluctantly take the time to review and accept the innovation (Rogers, 1995, p. 262). The bell-shape distribution of a new innovation has five categories that members of a social system fall into: innovators, early adopters, early majority, late majority, and laggards. Regarding technology adoption, these categories matches the times in which adopters identify a technology and start to implement it into their work or daily life.

Innovators are the venturesome/adventurous souls who can imagine what the innovation can do for them, and have an obsession with trying new things. Typically the percentage of innovators is the lowest among the distribution categories. Early adaptors are respectful people, normally opinion leaders, who observe whether or not the innovation turned out to be effective for the innovators, and then they will be inspired to adopt it. Early majority are thoughtful, careful people who can accept changes more quickly than average people. Late majority people are skeptical individuals who observe the innovation to see if it has resulted in a social/economic benefit to earlier adopters, then they will adopt it. Laggards are either traditional people who resist changes or isolates in their social system that lack social communication with other

members, resulting in a low awareness of the social system (Orr, 2003). Figure 4 gives more graphic illustration of adopters' categories:

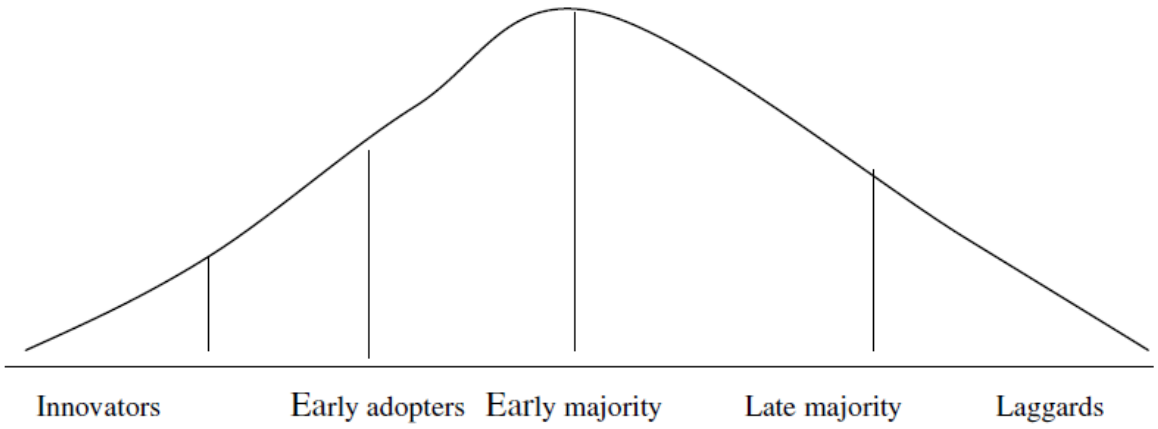

Figure 4. Distribution of adopter categories (Rogers, 1995, p. 262).

The above figure could be a good model to base this study on because the figure can be compared to faculty members at the College of Basic Education adoption's distribution of e-learning. According to Rollins (1993), the distribution of adoption new technology does not have to reveal all five categories. Rather, it can reveal four categories instead, depending on the social system in question.

Rogers's model of diffusion of innovation and adopter distribution categories have set up another foundation for a lot of studies related to technology adoption and diffusion. This study used the distribution model to show where faculty members at the College of Basic Education in Kuwait fall in Rogers's five-level adopter model. Are faculty members early adopters or later adopters of e-learning? Rogers's theory has been used to explain the phenomenon of technology diffusion in higher education, as well as to investigate the differences between early and late adopters, and the perceived barriers and incentives to adoption of new innovations (Al-Senaidi, Lin, & Poirot, 2009). Many studies have believed in the guiding principles of diffusion of

innovation to help describe and explain the process of technology integration because it is considered as a new innovation.

Attitudes

Attitude is a mental "state of readiness that exerts a dynamic influence upon an individual's responses" (Ostrum, 1989). It has an influence on student's performance (Petty & Krosnick, 1995). Cohen's (1993) definition of attitudes, states, "An attitude describes a person's feelings." "Attitude questions are evaluative and require people to decide whether they have positive or negative feelings about a concept or an entity" (Dillman, 1978, p. 8). Another definition for attitude has been defined by Hyrkstedt and Kalaja, (1998) as "attitudes are favorable or unfavorable responses to stimuli" more specifically, in the case of e-learning attitudes, to varieties of a single teaching style or different teaching styles. What is more, attitudes are capable of being developed, and they are "organized through experience" (Fishbein, 1967, p. 8).

Attitude consists of three major components: affective, cognitive, and behavioral. The affective component is the emotion feeling that includes statements of likes or dislikes toward particular perceptions. The cognitive component of attitude refers to statements of beliefs which can be judged based on an individual's previous background, and the behavioral component is what an individual actually does or plan to do (Triandis, 1971). It has been indicated that faculty attitudes toward e-learning or online instruction can directly affect their willingness to teach online (Kosak, Manning, Dobson, Rogerson, Cotnam, Colarie, & McFadden, 2004).

Faculty attitude could be one of the sources of the academic program change effort, on contrary, faculty development studies show that faculty members "are inclined to accept only those changes they deem necessary or desirable" (Costa, McPhail, Smith, and Brisk, 2005, p.

105). E-learning is a new teaching technology, and no matter how sophisticated or competent this technology is, its effective implementation relies on users having a positive attitude toward it. Once faculty attitudes about e-learning become more positive, there is greater incentive to use it (Liaw Huang, & Chen, 2007).

Faculty members may be reluctant to apply new teaching styles because of the extensive effort involved with the adaptation of the new teaching style. Therefore, there is a demand to change the negative attitude toward e-learning implementation among faculty members to fulfill e-learning teaching requirements. The threat of the new teaching style involved with technology

> is not to deny or neglect the dangers of a situation; not to run away from it by destroying it and depriving oneself of its advantages; but to realize the dangers and meet them with conscious action based upon personal decision. This neutralizes the danger and lets us enjoy the advantages of technology without letting it deprive us of our humanity (Betterlheim).

The faculty attitude has become a critical issue for e-learning; instructors are concerned about several factors that can have a big impact on e-learning. Magnussen (2008) indicated that the necessity of implementing e-learning is due to the general shift toward philosophical theories in which an educator is viewed, not as a distributor of content, but as a facilitator of learning (Ruiz, Mintzer, & Leipzig, 2006). Another concern is that many educators rely on current textbook resources to provide authoritative guidance about the material to be included in a course. However, textbooks typically cover an overwhelming amount of information that can be stressful to learners. Therefore, it is important that educators design e-learning based courses which could focus on major concepts and their relationship to the course materials instead of asking learners to memorize isolated facts from textbooks.

Faculty members are mainly concerned about the increased workload they may encounter in e-learning. Eighty percent of faculty surveyed indicated that they would spend more time

teaching an e-learning class (Christianson, Tiene, & Luft, 2002). Another concern is that faculty may have to spend too much time on the computer to manage the learning process; they have to design an applicable e-learning course that is appealing to what learners want to learn. Prabhu (2008, p. 1) mentioned that "Online students report deeper learning approaches, more challenging coursework than their peers in face-to-face classes." Faculty members may need to provide individualized support and feedback to each learner and make sure that learners are on the right track. Besides the lengthy amount of time that faculty members spend designing the e-learning course and monitoring learners' performances, they may have to provide a clear schedule of their availability indicating times when learners can receive a prompt response.

In regard to age difference and the implementation of e-learning, Sederberg (2003) indicated that senior faculty members—who are used to traditional teaching, may not be technologically literate, and/or could resist the innovation of technology in education—are possibly worried about losing their jobs if e-learning is implemented; their negative attitudes toward modern technology in education stemming from a strong anxiety about the future of their jobs. He also indicated that technological department faculty members, in areas such as computer science and learning technologies have extremely positive attitudes towards the implementation of e-learning, compared to their colleagues from non-technological departments such as English and philosophy. Faculty members in the technological departments are consistently applying technology in their classes, and their teaching style will not be significantly affected if e-learning is implemented.

As Abouchedid & Eid (2004) mentioned, faculty members often favor e-learning because it will improve education and raise it to a more technological level of education. Elges, Righettini, and Combs (2006) mentioned that the biggest advantage of an e-learning

implementation is that students could be exposed to different learning models that can raise the educational level to a higher standard. Students can be asked to participate in discussion boards that offer greater opportunities for asynchronous communication that, in turn, enables students to search any discussed topic and present their points of view. In other words, the time factors that used to constrain classroom sessions are eliminated, and students would have a flexible timetable in which to respond to peers' discussions. Another advantage is that there could be an increase in pay because of the larger workload that faculty members have to perform with e-learning. Some faculty members are going to be more proactive in wanting to teach e-learning courses because of the motivation of a higher pay; this creates greater incentives to teach e-learning (Merwe & Mouton, 2005). E-learning may benefit faculty by not being concerned about students' physical attendance because materials are posted online for students to retrieve at anytime. Faculty members can eliminate student questions about grades because they can be posted under the e-course grades tab. Other advantages are that instructors could be able to update materials and resources instantly, track student discussion progress, push the discussion forward by questioning, and inspire students to engage more by introducing new relevant perspectives (Gunga & Richetts, 2007). One good advantage that Carter (2008) mentioned is that during slow economy, the e-learning enrollment will jump by more than 10% because of a decline in student spending.

Bai and Ertmer (2004) suggested that faculty attitudes toward a technology could be improved by integration of this technology into the faculty members' course work. An important point to mention is that "faculty members may [teach] as they have been taught, and it is unlikely that computer skills will be transferred to students and encouraged by faculty members unless the faculties have positive attitudes toward e-learning" (Yildirim, 2000, p. 481). With the larger

workload that faculty members have with e-learning, there could be incentives as rewards for extra effort to motivate faculty to sincerely be committed to e-learning implementation. Extra money for extra work will definitely motivate some faculty members to become involved in e-learning initiatives. The money incentive will probably encourage lecturers to take steps toward e-learning and the amount of money allocated to faculty members will depend on the discipline (Merwe & Mouton, 2005).

There is an attitude issue that Hasselbring (1991) raised by stating that technology has failed to meet the expectations and hopes of improving learning that faculty members and administrators have set for it. Technology could have a larger impact if the proper implementation had taken place with respect to software development, hardware capabilities, and faculty members' training. Some faculty members at the College of Basic Education believe that e-learning will not improve learning or advance it to a higher level. Instead, e-learning will be a new burden added to faculty teaching activities.

Hasselbring's point takes us back to the ongoing debate between Clark and Kozma. Clark's position was that technology doesn't influence learning; technology simply lowers the cost and gives access to more learners (Clark, 1994). Kozma, on the other hand, said that in order to convince faculty members to incorporate technology, "we will have to understand the potential for a relationship between technology and learning when we consider it as an interaction between cognitive processes and characteristics of the environment" (Kozma, 1994, p. 8). There were several technology-based projects, some of which used computers and others using video streaming process that have been shown to positively influence learning (Colvin & Mayer, 2008).More recently, technology is being incorporated as an important element that facilitates the learning process when implemented appropriately.

Clearly, there has been a major opposition saying that media could have no influence on learning environment and that media can be replaced by different learning tools through which students can experience the same results (Clark, 1994). Assuming momentarily that Clark is right, should faculty disregard advanced technology and be content with graduating students who are technology illiterates? I strongly recommend the implementation of media into our curricula to make sure that our students are technology literates.

Clark believes that technology is a tool that can affect learning, and he assumes that what happens inside the brain ("stimulus response") is completely different and has nothing to do with media. His view was introduced in early1970s. As technology advanced and more learners agree that media helps to understand the materials in a simple and fast way, Clark's view according to Kozma (1991) is an old perspective based on his radical objectivist thinking.

Kozma (1991) believes that the advanced technology will probably produce lots of media tools that can enhance everyone's ability to learn. Learning using media elements "is a complementary process within which representations are constructed and procedures performed, sometimes by the learner and sometimes by the medium" (Kozma, 1991). Current technology has been possibly integrated into every sector of the workforce, and educators need some help to demonstrate to students technologically excellent applications that has been implemented. Moreover, technology is evolving dramatically and it is imperative that faculty members expose students to the appropriate usage of technology and prove to students that many learning styles are compatible with current technology.

Other authors may disagree with the above literature reviews stating that age could have no influence over attitudes in adopting a new technology. Czaja and Sharit (1998) conducted a study of 384 participants aging from 20 to 75 years; their objective is to find out if age difference

affects their attitudes toward computers. According to Czaja and Sharit (1998), age has no influence over adopting a new technology; the level of experience is the determining factor of attitudes toward a new technology. Faculty members at the College of Basic Education may have the knowledge but no practical experience with e-learning, once they start implementing e-learning into their curricula; it is no longer a matter of age. Instead, it will be a matter of experience on how to utilize e-learning into their course work professionally. Direct interaction experience with e-learning can boost faculty members' feelings of competence and increase their level of interest (Czaja & Sharit, 1998). As aforementioned in previous literature reviews, it is commonly considered that senior faculty members are not in favor of new technology and they are more resistant to using new technology than junior faculty members. Czaja and Sharit (1998) study turned to oppose this consideration indicating that experience has more influence on attitudes than age difference. Attitudes toward e-learning are adjustable. Providing faculty members with learning management software (LMS) to use for their course work is a positive effect of attitude change (Czaja & Sharit, 1998).

Skills

Skill is "the capacity to do something well; technique, ability. Skills are usually acquired or learned, as opposed to abilities, which are often thought of as innate" (Allwords, 2008). Faculty members worried about the software and hardware capabilities within the school after implementing e-learning illustrate the urgent need to establish an adequate technical support team that is available 24/7, and equipped with the latest information technology resources for both faculty and student needs to solve any technical problem that can hinder the e-learning implementation and process (Pajo & Wallace, 2001). In their study, Snoeyink and Ertmer (2001-2002), found that inadequate computer skills was an indicator of the lack of in-class technology

integration by faculty members who failed to try any technology-related activity with their students until they had developed basic skills such as working on Microsoft Office. Baldwin (1998) found that faculty usage of technology was limited to supplement traditional instruction, not to redefine the instructional process. In other words, technology was being used to simplify the delivery of information, not to provide new information. At the early stages of e-learning implementation, the technical support team will probably be under extensive pressure because both faculty and students are unfamiliar with the technology. Later, when both parties become more familiar with the programs, they will be able to pick up and adopt the fundamentals of e-learning courses.

Teachers may need to acquire knowledge and skills in handling information and communication techniques for e-learning courses. As Levinsen (2007) indicated, several studies demonstrate that technical obstacles are easier to overcome than lack of communication skills. He mentioned that instructors may need to have some form of training in communication skills, because it has a strong effect on e-learning courses. "Although almost all faculty members' education programs provide some technology training, many of these programs don't necessarily have adequate resources" (Hasselbring, 1991). The training of faculty members to use new technology may need to be compatible with faculty members' expertise in technology and the technology that already exists in schools. Communication skills play an important role in adapting e-learning skills the instructor has to diversify his communication skills, from being only a provider of information to also a facilitator of learning. In order to provide a quality experience in e-learning courses, instructors may need training sessions to improve their skills and online communication. Levinsen (2007) suggested that proper supervision for instructors who are beginning to use an e-learning course will possibly increase instructor skills, while

prioritizing instructors' needs for technical support will speed instructors' familiarity with the use of technical tools. Skills, communication, and technology are three related domains that instructors need to adopt to conduct a good quality e-learning course.

Schrum (1999) presented four helpful points related to faculty e-learning training that can lead to fast skill adoption, one of which is that it takes longer time to learn about e-learning for personal or pedagogical use than learning a new teaching model. The second point is that access to the new technology at school and from home is crucial to ensure a smooth technological transition in teaching. The third point is that the fear of the unknown needs to be addressed. In other words, initial common mistakes that affect first-time user's level of skills can be avoided. Lastly, the use of new technology such as e-learning may require faculty members to reconsider the ways in which they typically deliver instruction ("traditional teaching"). There are many approaches and techniques for faculty training to enable them gain basic skill level of a new technology (Georgina & Hosford, 2009).

The increasing number of e-learning implementations has resulted in the development of new skills and competencies among faculty members, such as learning how to monitor the learning process without a full control over this process, and how to push discussions forward so that students will cover as much information as they can regard a specific topic. "Traditional skills are essential to e-learning but are insufficient," according to Gray, Ryan, and Coulon (2004), who recommended that faculty members gain skills to teach the first e-learning course with a more constructivist or behaviorist approach. The second course will be taught with less teacher control and with a constructivist approach. Subsequent courses will shift focus to learners rather than instructor. Successful design and management of e-learning courses require new skills to overcome major problems such as user needs analysis, instructional design, development

of materials, delivery of information, and evaluation of the course. The learner needs can be obtained through a questionnaire or survey at the beginning of the course, used to analyze the learner needs to assist the instructor in providing any support needed to make the e-learning course more appealing to learners. A proper instructional design of the course will probably facilitate the learning process to learners. The development of the content may need to be learner-centered rather than instructor-centered, and the content may need to follow the constructivist approach. The delivery of knowledge is dependent on the content; if the content was designed constructively then learners will participate in the delivery process which will possibly increase the amount of knowledge shared among learners as well as the instructor.

In regard to age difference and the implementation of e-learning, Sederberg (2003) indicated that senior faculty members—who have been teaching in traditional manners—are not always technologically literate and sometimes resist the innovation of technology and its evolution in education. Senior faculty members are somewhat worried about losing their jobs if e-learning is implemented, because of their inadequate skills with modern technology in education. Sederberg also showed that technological departments' faculty, such as those in computer science and learning technologies, tend to be more skillful and computer-savvy, indicating a pre-acceptance of e-learning implementation. Other departments majoring in non-technological fields such as English and philosophy fields probably tend to oppose the e-learning implementation partly because they lack technological skills. Technology-resistant faculty, who could typically be senior faculty members, will be devalued and marginalized (Baldwin, 1998). Those faculty members require special training and support to overcome their resistance to adopt new technology such as e-learning. Baldwin (1998) found that once faculty members adopt e-learning, and the results will be driven by the technology itself not by the knowledge that a

faculty member may need to present. Faculty members who adopt e-learning at early stage can show new applicable methods on how to integrate this technology into classroom. Late adopters, on the other hand, can enlighten other faculty members on the difficulty of the process of skills acquisition to overcome these difficulties in the near future.

As Conrad and Munro (2008) described self-efficacy, it is the beliefs in one's own capabilities to arrange and complete the steps required to generate a predefined outcome. Few researchers look at self-efficacy as the general efficacy an individual has. In other words, it is the general confidence in an individual's capacity to encounter different situations (Wallston, 1992, cited in Conrad & Munro, 2008). On the contrary, Bandura (1977, 1986, 1999a cited in Conrad & Munro, 2008) disagreed, stating that individuals will apply different beliefs about themselves in different situations, and that any measure of self-efficacy needs to be situation specific. To illustrate, for instance: an excellent face-to-face instructor will lack self-efficacy when it comes to teaching an e-learning course because of the instructor's low level of technological skills. The more frequently an individual uses a technology and gets sufficient training to master the use of this technology, the more self-efficacy will this individual have (Conrad & Munro, 2008). E-learning training and use will definitely lead to higher efficacy beliefs about e-learning technology, which eventually inspire faculty members to implement e-learning.

A recent study by Cassidy and Eachus (2002) reported a positive relationship between self-efficacy and computing experience. Employing efficacy constructs to measure relationships among factors relating to technology use such as e-learning is one approach of measuring the factors controlling technology use and approval. An important point to mention is that continuous modifications in learning technologies has indicated that the existing measures of

technology self-efficacy may be obsolete, and the need to incorporate new measures of technology self-efficacy, in this instance e-learning, is imminent.

Other authors state that age could have no ifluence over skills toward a new technology. According to Westerman and Davies (2000), the acquisition of new technology skills among older and younger adults depends on the amount of time given to practice this new technology. With extensive amount of practice to both older and younger adults over an extended period of time, there comes a point where performance reaches equivalence between older and younger adults skills level (Westerman & Davies, 2000). The authors mentioned that with extreme advanced new technology, older adults could gain new skills of this technology comparable to younger adults if given additional practice. The authors also stated that few older adults are talented enough to acquire new skills as quickly as younger adults and sometimes quicker. All in all, Westerman and Davies (2000) tried to deliver a message that indicates age doesn't play a role in acquiring new skills.

Barriers

The faculty members' readiness has become a critical issue for e-learning; instructors are concerned about several factors that may have a big impact on e-learning. Magnussen (2008) indicated that the necessity of implementing e-learning is due to the general shift toward philosophical theories in which an educator is viewed, not as a distributor of content, but as a facilitator of learning (Ruiz, Mintzer & Leipzig, 2006). Another concern is that many educators rely on current textbook resources to provide authoritative guidance about the material to be included in a course. However, textbooks typically cover an overwhelming amount of information that can be stressful to learners. Therefore, it is important that educators design e-

learning based courses which focus on major concepts and their relationship to the course materials instead of asking learners to memorize isolated facts from textbooks.

Faculty members are mainly concerned about the increased workload they may encounter in e-learning. Eighty percent of faculty surveyed indicated that they would have to spend more time teaching an e-learning class (Christianson, Tiene, & Luft, 2002). Another barrier is that faculty will have to spend too much time on the computer to manage the learning process; they have to design an applicable e-learning course that is appealing to what learners want to learn. Prabhu (2008, p. 1) mentioned that "Online students report deeper learning approaches, more challenging coursework than their peers in face-to-face classes." Faculty members may have to provide individualized support and feedback to each learner and make sure that learners are on the right track. Besides the lengthy amount of time that faculty members spend to design the e-learning course and monitoring learners' performances, they have to provide a clear schedule of their availability indicating times when learners can receive a prompt response.

With a larger workload as a barrier that faculty members may have in e-learning, it is not surprising that it has been suggested that there should be incentives as rewards for extra effort to motivate faculty to sincerely be more committed to e-learning an implementation. Extra money for extra work will probably get many faculty members involved in e-learning initiatives. The money incentive will possibly encourage lecturers to take steps toward e-learning, and the amount of money allocated to faculty members will depend on the learning field, such as human sciences or engineering (Merwe & Mouton, 2005).

Another incentive is to establish faculty training courses and e-learning workshops during the training. There should also be an orientation or initial training to explain the critical elements skills and needs for faculty members. This orientation would provide knowledge regarding

preparation for e-learning (Barron, 2006). The training should take care of a major concern of senior faculty members who are not technologically literate and who therefore resist the innovation of technology; senior faculty members are worried about losing their jobs, if e-learning is implemented. Sederberg (2003) suggested that with extensive training, the technological digital divide will be minimized among faculty, and senior faculty members will no longer be concerned about their jobs. The training courses will help instructors understand the basic technological needs for an e-learning course. However, faculty should also be required to learn more about e-learning course design at their own pace, which will offer them a wide range of options to adopt the technical skills of e-learning.

Faculty members are also worried about the software and hardware capabilities within the school after implementing e-learning. A good example to mention is when Rogers (1999) interviewed 28 university and college faculty members in Minnesota. He found out that the four major barriers that almost all universities share are: funds not precisely allocated for technology-related necessities, the lack of sharing of beneficial practices and knowledge across the system, the need of on-call/line technical support staff, and the need of release time and time for training faculty members. Therefore, there is an urgent need to establish an adequate technical support team that is available 24/7 and equipped with the latest information technology resources for both faculty and student needs to solve any technical problem that can hinder the e-learning implementation and process (Pajo & Wallace, 2001).

The software and hardware problem that schools typically create is to discontinue purchasing new equipment and software that match the old equipment and software in order to capitalize on faculty members' training, students' familiarity with programs, and the installed base of software (Hasselbring, 1991). Another barrier that faculty members encounter in

adopting new technology is that a school follows an early commitment to invest in certain technologies instead of new technology that promotes learning. For instance, providing free computers to faculty members to close the digital divide, if there is one, will probably shift school's attention from investing in instructional educational programs (Hasselbring, 1991). Speaking of software adequacy, new software often lacks instructional adequacy, which leads to inappropriate usage of the software in education. One reason behind software instruction inadequacy is the evaluation process of the software that focuses on the technical quality of the software, instead of focusing on the learning outcomes of the software (Hasselbring, 1991).

There are four stages of learning: acquisition, fluency, application, and generalization, that indicate if learning occurs or not. Unfortunately, the relationship between the software instructional adequacy and learning stages has been misinterpreted and unobserved. At the early implementation of e-learning, the technical support team will be under extensive pressure because both faculty and students are unfamiliar with the e-learning system and process. Later, when both parties become more familiar with the programs, they will be able pick up and adopt the fundamentals of e-learning courses

From among the many barriers to e-learning, cultural and technical barriers may be identified as major factors (Panda & Mishra, 2007). The cultural factors can be faculty resistance to innovation and change, and negative attitude towards technology. Straub, Keil, and Brenner (1997) used the Technology Acceptance Model (TAM) in a cross-cultural study with participants from United States, Switzerland, and Japan. The study showed remarkable results in that the TAM model worked fairly for Switzerland and United States, but not for Japan because of cultural issues. The discrepancy indicates that the TAM model is not capable enough to anticipate technology usage problems across different cultures all over the world. The technical

factors include technology reliability, connectivity, adequate infrastructure and technical support, and longer number of hours of work (Pajo & Wallace, 2001). Barriers can vary from one culture to another based on the social norms of the social systems.

Quite a few authors categorize barriers into two categories: external barriers and internal barriers. External barriers can be related to the available resources, such as lack of time, lack of technical support, lack of training, and high-technical problem issues. Internal barriers, on the other hand, can be related to the teachers' attitudes towards e-learning, such as lack of confidence, resistance to change leading to negative attitudes, and no perception of benefits or beliefs (Ertmer, 1999; Snoeyink and Ertmer, 2001-2002). To classify the barriers in groups, first we need to consider whether they are relevant to a faculty member's level of barriers, such as lack of time, lack of access to quality computing resources, lack of effective training and technical support, or to the institution level barriers including lack of time, lack of confidence, resistance to change and negative attitudes, and no perception of benefits or incentives. The lack of time to design e-learning course or adopt e-learning technology can fall under either category, as teacher's lack of time may be due to the system's pre-defined standards set by the school, making it therefore a school-level barrier. The lack of time may also be caused by the teacher's own organization and preferences, which makes it a teacher level barrier (Al-Senaidi et al., 2009). Understanding the degree to which these barriers affect faculty members and the institutions they teach at can lead to decide how to tackle those barriers (Becta, 2004).

One more barrier about e-learning is that instructors' knowledge of classroom materials are developed during their classroom experiences, and it may be an obstacle for instructors to relate emerging philosophical learning theories such as collaborative learning theory to e-learning class discussions. Instructors may need to look for suitable ideas that allow them to shift

their traditional teaching experiences to an e-learning teaching style. Magnussen (2008) brought up a point about instructors needing to spend more time on the computer to design an e-learning course, and this barrier concerns all instructors who are considering e-learning.

Another barrier that Sederberg (2003) indicated is that senior faculty members who may not be technological literate and resist the innovation of technology are worried about losing their jobs if e-learning is implemented, because of their inadequate knowledge about modern technology in education. One more barrier is that a handful of faculty members will possible miss the interaction with students that they have in a face-to-face classroom. This barrier discourages faculty members from productive communication (G. Knezek, personal communication, June 12, 2010) with students, and consequently leads to a weak level of interaction (C. Norris, personal communication, October 7, 2008).

Research on faculty members' readiness of teaching with e-learning is important, because it can support the expansion of pedagogical practices for professors. Since professors are role models for teaching, and there are epistemological conditions of teaching at the higher education level, such as engaging and piquing the interests of students, that should be explored (Fernández, Mira, López, Álvarez, Manjarrés, & Barro, 1995). Along with exploring faculty members' readiness, understanding the knowledge that faculty members have of teaching will eventually lead to better understand its balance with student learning (Major & Parmer, 2002). The focus on faculty member readiness is to show them that they must consider their students and how students will learn through e-learning. Students are likely to learn through engaging in discussions, communicating with other peers, and processing news ideas, which is widely known as the Socratic method. Therefore, faculty members must re-think about how students learn different kinds of materials for different purposes in e-learning. As faculty members analyze

students' learning environments during traditional or face-to-face teaching, with e-learning implementation it is time for faculty members to perform new analysis on students' learning environments with e-learning.

Faculty member readiness is one of the sources of the academic program effort to change. Faculty development studies show that faculty members "are inclined to accept only those changes they deem necessary or desirable" (Costa, McPhil, Smith, and Brisk, 2005, p. 105).To assure a smooth transition to e-learning, a training course needs to be offered to faculty members to provide a complete instructional structure and adequate technical support at the beginning of the training, and then gradually lessen that instructional structure and the support as faculty members become more confident with the e-learning characteristics and skills required for teaching. This procedure is called "scaffolding," and it is unfortunate that a great number of researchers do not use it (Major & Palmer, 2002). By providing supportive e-learning environments for faculty members early on, they can gradually build up personal, long-lasting knowledge on how to teach students using e-learning as a new teaching style.

When it comes to implementing e-learning at the College of Basic Education, Grant (1988, cited in Major & Palmer, 2006) pointed out that experienced faculty members will probably have more confidence in teaching materials using e-learning than those who have less experience, because experienced faculty members could know their subjects very well and can thrive online. "I think the on-ground faculty members who excel in the on- ground classroom tend to find ways to excel in the online classroom" (McDaniel, 2004, cited in Distance Education Report, 2004, p. 4).

If a transition to e-learning is to occur, faculty members' readiness of pedagogical techniques need to undergo beyond the recycling of instructional techniques they experienced as

students (Major & Palmer, 2006). One important variable that will have a significant effect on the course is the quality of faculty member's technical knowledge.

> Instructors whose technical knowledge was not very high did not tend to have the higher quality online classes. They did not know how to use chat rooms effectively, or they did not know how to embed interactive components like Java applets, videos, or PowerPoint (Distance Education Report, 2004, p. 4).

It is well known that some faculty members are just throwing their black and white lecture notes online and thinking it is an online course, but at least those instructors knew that they needed to possess some level of technical knowledge before they jumped online (McDaniel, 2004, cited in Distance Education Report, 2004). Faculty members' knowledge of e-learning enables them to incorporate this knowledge into learning subjects, then to pass it on to their students.

A forward move to continually build up readiness is to establish faculty training courses and e-learning workshops during the training. There should also be an orientation or initial training to explain the critical elements skills and needed by faculty members. This orientation would provide knowledge as about how to begin preparating for e-learning (Barron, 2006). The training should take care of a major concern of senior faculty members who are not technologically literate and who therefore resist the innovation of technology; senior faculty members are worried about losing their jobs if e-learning is implemented. Sederberg (2003) suggested that with extensive training, the technological digital divide will be minimized among faculty members and senior faculty members will no longer be concerned about their jobs. The training courses will help instructors understand the basic technological needs for an e-learning course. However, faculty are usually required to learn more about e-learning course design at their own pace, which will offer them a wide range of options to adopt the technical skills of e-learning.

The readiness of faculty members may need to be updated consistently with evolving e-learning issues that could start to appear as e-learning takes place. Therefore, it is imperative to design evaluation tools for future improvements to keep e-learning on the right track and increase positive results. The main indicator for successful e-learning implementation is student achievements in e-learning courses. Barron (2006) mentioned several evaluation tools, one of which is to get learner feedback on e-learning courses by conducting a general survey, which can be reviewed by instructors and school administrators for improvement and suggestions later on. As technology and science advance, the e-learning course materials must be updated with the latest information to demonstrate to students that learning content is compatible with the outside world. The success of e-learning is largely dependent on building relationships with learners, with faculty members, and with school administrators during the e-learning process to provide meaningful learning experiences.

Faculty members, on the other hand, are sometimes required to submit reflection letters that include personal experience in e-learning, positive and negative aspects, and possible revisions for future improvements. This reflection letter will include a list of problematic issues that need to be resolved gradually as the e-learning process continues. Merwe and Mouton (2005) suggested a new evaluation tool, to be established by faculty development unit that is specialized in e-learning so that faculty can exchange their experiences regarding e-learning courses and how to design development plans to improve e-learning results.

Porter and Donthu indicated that age is not directly associated with perceived ease of use of the Internet. As Porter and Donthu (2006) stated, that older and young adults perceive the same barriers toward using a new technology due mainly to the limited experience that they have. A step-by-step process to introduce older and younger adults to a new technology will

lower the number of barriers they may encounter, and make them more ambitious to explore this technology (Porter & Donthu, 2006).

CHAPTER 3

METHODOLOGY

The study will take a place at the Public Authority for Applied Education and Training (PAAET) College of Basic Education in Kuwait, targeting all faculty members in the college. The college offers more than 10 academic programs and has a total number of 120 faculty members. The study will look into demographic components, including what department the faculty members belong to, and the number of years they have taught.

The following hypotheses are established to answer the three research questions of the study as below:

1. Based on Rogers's "diffusion of innovation" model, to what extent are faculty members at the College of Basic Education of PAAET in Kuwait ready to adopt e-learning?
2. What are the faculty members' attitudes and skills integrating e-learning in their teaching?
3. What barriers are faculty members facing in implementing e-learning in their teaching?

Hypotheses

Hypothesis 1: Diffusion of innovation

- Motivated Hypothesis 1: A higher proportion of Kuwaiti faculty members will fall within the late majority level compared to Rogers's distribution of adopter categories.
- Null Hypothesis 1: There is no significant difference between the adopter distribution of e-learning of Kuwaiti faculty members and Rogers's model.

The purpose of this part is to explore where faculty members at the College of Basic Education fall in Rogers's distribution of adopter categories in adopting e-learning. Four instruments of one item each were distributed to faculty members, three of which were validated

instruments and were based on three models. I created the fourth instrument, which was based on one of the three validated models, and which was designed to figure out where faculty members fall in Rogers's five levels of adopters regarding e-learning. This fourth instrument was not validated. The reason to use an invalidated instrument along with validated instruments was: (a) to test the instrument because it is a testable instrument when put with the three validated instruments, and (b) to correlate the results of the instruments and derive a final distribution of adopter categories based on the Rogers scale for faculty e-learning adoption.

The first instrument was based on Christensen (1997), which was also based on diffusion of innovation that incorporates the Rogers stages of adoption. It included one item with six multiple choices that determined an individual category of the distribution adopter categories. The choices were apparently indicators of Rogers's categories: innovators, early adaptors, early majority, late majority, and laggards keeping in mind that category four which late majority has choices.

The second instrument is Apple Classrooms of Tomorrow Project (ACOT) teacher stages (adapted by Clark based on Dwyer, 1983), grown out of the 10+-year Apple Classrooms of Tomorrow Project. This instrument is a one item with five choices: innovators, early adaptors, early majority, late majority, and laggards that perfectly matches Rogers's categories model.

The third instrument is Concerns-Based Adoption Model (CBAM) adapted by (Griffin & Christensen, 1999) based on Hall and Rutherford's Concerns Based Adoption Model (1975). This is a one question with eight choices: innovators, early adaptors, early majority A and B, late majority A, B, and C, and laggards. The CBAM instrument choices are expanded on two categories, early majority and late majority.

The fourth instrument has one question with five choices: innovators, early adaptors, early majority, late majority, and laggards in relation with e-learning adoption at the College of Basic Education. A Hancock, Knezek, and Christensen (2007) study showed a concrete validation of the three instruments, and they make a nice higher-order scale when correlated with each other.

Hypothesis 2: Attitudes and skills (self-efficacy)

- Motivated Hypothesis 2: Younger faculty members will have more favorable dispositions toward teaching with e-learning than older faculty members, in the areas of:
    - Attitudes as measured by Sadik (2007)
    - Skills (self-efficacy) as measured by Sadik (2007)
- Null Hypothesis 2: There is no significant difference between younger and older faculty members' attitudes or skills towards teaching with e-learning.

The purpose of this part is to explore specific factors related to faculty readiness toward e-learning: attitudes and skills (self-efficacy). An instrument was based on specific demographic questions and the mentioned factors. Five to seven questions on the survey will be designated for each factor; those designated questions will operate as an indicator for each factor which will generate answers for the research questions.

The survey was developed after reviewing a number of studies in the literature review, including Sadik (2007) from Egypt, Alsenaidi, Lin, & Poirot (2009) from Oman, Liaw, Huang, & Chen (2007) from China, and Panda & Mishra (2007) from India. Specific questions from these surveys were used because they provided ideas that I used to develop the final instrument. The questions were revised numerous times after consulting with my committee and faculty

members of the College of Basic Education in Kuwait, who reviewed the draft questions and made comments and suggestions.

Hypothesis 3: Barriers to e-learning

- Motivated Hypothesis 3:

  (a) Younger faculty members will perceive fewer barriers toward teaching with e-learning than older faculty members as measured by Alsenaidi, Lin, Poirot (2009).

  (b) Technological department faculty members will perceive fewer barriers toward teaching with e-learning than non-technological departments' faculty members as measured by Alsenaidi, Lin, Poirot (2009)

- Null Hypothesis 3: There is no significant difference between younger and older, or technological and non-technological department faculty members in their perceived barriers to e-learning.

The purpose of this part was to explore a specific factor, barriers, as it related to faculty readiness towards e-learning. An instrument was designed based on Alsenaidi, Lin, & Poirot (2009) from Oman instrument. Eleven questions on the survey were designated for this factor; those designated questions operated as indicators which generated answers for the research questions.

The questions were chosen after reviewing a number of studies in the literature review, including Sadik (2007) from Egypt, Al-Senaidi et al., (2009) from Oman, Liaw et al., (2007) from China, and Panda & Mishra (2007) from India. The questions were revised numerous times after consulting with my committee and faculty members of the College of Basic Education in Kuwait, who reviewed the draft questions and made comments and suggestions.

CHAPTER 4

RESULTS

The study was designed to measure four scales: where faculty members fell in Rogers's diffusion of innovation adopters' model, and the attitudes, skills, and barriers that faculty members encounter in implementing e-learning.

Analysis of Data

With the experiments completed and all data collected, this chapter begins with a description of the study's participants, continues with a verification of the validity of its measure instruments, outlines the incorporation of control variables and other adjustments, and concludes with formal tests of the hypotheses developed in Chapter 3.

Description of the Study's Participants

All of those solicited for participation are College of Basic Education faculty members who currently teach in Kuwait. There were 51 faculty members contacted through email and a few through phone and email. Participants were classified as senior and junior faculty members who teach in technical or non-technical departments. A junior faculty member's age would usually be between 30 and 40 years old, while senior faculty average age is 41 years and older. As for the technical and non-technical departments, the survey was filled out by faculty members from different departments at the College of Basic Education. Participants sometimes called their departments different names, such as family nutrition or human nutrition, depending on the degrees and schools they went to, but they teach at the same departments. The same situation applies for learning technology and information technology departments. Therefore, departments such as information science and communication, education computing, information technology, and learning technology were classified as technical departments. Departments such as

curriculum and instruction, health and safety, family sciences, food and nutrition, and English/languages were classified as non-technical departments. It was typical that some participants failed to complete the whole survey; in this study, some participants filled out only the demographic questions and quit the survey. Other participants quit in the middle of the survey. Table 1 will show the number of participants and their ages:

Table 1

Participants by Age

Sample Participation by Age			
	Age		
	30 – 40 years	41+ years	Total
Faculty members	20	31	51

As can be seen in Table 1, 20 participants or 39.2% of the sample were junior faculty members, and 31 participants or 60.8% of the total sample 23re senior faculty members.

Table 2

Participants by Department

Sample Participants by Department			
	Department		
	Technical	Non-technical	Total
Faculty members	29	22	51

As can be seen in Table 2, 22 participants or 43.1% of the sample were teaching in technical departments, and 29 participants or 56.9% of the total sample were teaching in non-technical departments.

Reliability

In this section, the reliability or Cronbach's alpha was measured for three tested hypotheses: diffusion of innovation, attitudes and skills, and barriers. The diffusion of innovation part includes four items: stages of adoption, Apple Classrooms of Tomorrow Project (ACOT), Concerns-Based Adoption Model (CBAM), and e-learning. Cronbach's alpha for diffusion of innovation is 0.874, which is high, indicating that the 4 instruments of Part 1 nicely hold together. The mean of Part 1 is 16.44 and the standard deviation 5.69. Cronbach's alpha for attitudes is 0.812 with a 10.03 mean and 3.939 standard deviation. Cronbach's alpha for skills is 0.79 with a mean of 13.25 and 4.16 standard deviation. Cronbach's alpha for barriers is 0.89 with a 27.8 mean and 8.189 standard deviation. The numbers were derived from running SPSS® statistical and data management package (SPSS Inc., Chicago, www.spss.com) version 17.

Testing Hypotheses

Hypothesis 1: Diffusion of innovation

- Motivated Hypothesis 1: Higher proportions of Kuwaiti faculty members will fall into the late majority level compared to Rogers's distribution of adopter categories.
- Null Hypothesis 1: There is no significant difference between the adopter distribution of e-learning of Kuwaiti faculty members and the Rogers model.

The purpose of this part was to determine what the percentage of faculty members at the College of Basic Education fall in the Rogers distribution of adopter categories in adopting e-learning. Statistical calculations were conducted to determine the percentage of faculty members that fall in each of the Rogers five categories: innovators, early adopters, early majority, late majority, and laggards. The expected percentages were obtained from Rogers (2003), but the

observed percentages were obtained from the e-learning frequency table under valid percentage. Figure 5 shows the observed percentages:

Table 3

Observed Percentages

E-learning					
		Frequency	Percent	Valid percent	Cumulative percent
Valid	1	5	9.8	11.6	11.6
	2	6	11.8	14.0	25.6
	3	9	17.6	20.9	46.5
	4	15	29.4	34.9	81.4
	5	8	15.7	18.6	100.0
	Total	43	84.3	100.0	
Missing	system	8	15.7		
Total		51	100.0		

Later on, each percentage was multiplied by the total number of participants to derive the actual number of faculty members for each category. Table 4 shows the details:

Table 4

Expected and Observed Percentages

Categories	(Expected) Rogers % * total participants	(Observed) Study % * total participants
Laggards	0.160 * 43 = 7	0.116 * 43 = 5
Late Majority	0.340 * 43 = 14.5	0.140 * 43 = 6
Early majority	0.340 * 43 = 14.5	0.209 * 43 = 9
Early adopters	0.135 * 43 = 6	0.349 * 43 = 15
Innovators	0.250 * 43 = 1	0.186 * 43 = 8
Total	43	43

Then a chi-square test was conducted to measure the goodness of fit-test of each category that faculty members at the College of Education will fall in based on Rogers's adopters' model. Table 4 shows the percentage of faculty members who fall into each category according to the Rogers model. It is clear that the Rogers model presents different percentages than what the study presents. This indicates that the original motivated hypothesis, that a higher proportion of Kuwaiti faculty members will fall into the late majority level of the Rogers's distribution of adopter categories, is not confirmed. The null hypothesis in this case, *There is no significant difference between the adopter distribution of e-learning of Kuwaiti faculty members and Rogers's model*, has to be rejected because there is a statistical significance between what the Rogers model assumed and the study report stated here.

Table 5

Chi-square Test

Categories	Expected %	Observed %	Chi-square test %
Laggards	16.0	11.6	16.23
Late majority	34.0	14.0	32.56
Early majority	34.0	20.9	34.88
Early adopters	13.5	34.9	13.95
Innovators	2.5	18.6	2.33

Table 4 shows the expected percentage according to the Rogers model compared to the study percentage, and then both percentages were put under chi-square test to figure out if there was any statistical significance. Chi-square test (*p*) value equals 70.043 with 4 degrees of freedom, and the 2-tailed *p* value is less than .0001 meaning that there is a statistical significance between expected and observed percentages but it is extremely low, in other words, this difference would happen fewer than one time in 10000 by chance. This discrepancy is very rare; the sample distributions differ though. This also leads to the rejection of the null hypothesis because the adopters' distribution differs from Rogers' and in fact is in the opposite direction of what was hypothesized. The null hypothesis states that there is no significant difference between the adopter distribution of e-learning of Kuwaiti faculty members and the Rogers's model.

In Figure 5 it is clear that the first hypothesis, that a majority of faculty members will fall into the laggards' category, is not confirmed because the figure shows the opposite result: a majority of faculty members fall into the early adopters and early majority categories, and the frequency of faculty members dominates the early categories of the Rogers model. As a result,

the null hypothesis, There is no significant difference between the adopter distribution of e-learning *of Kuwaiti faculty members and Rogers's model*, has to be rejected because there is a statistically significant difference ($p < .01$) between what the Rogers model assumes and the study results. Class terminology on the graph refers to the scale that includes: stages of adoption, ACOT, CBAM, and e-learning. In other words, faculty members at the College of Basic Education are early adopters of new technologies and Figure 6 is a solid evidence of this.

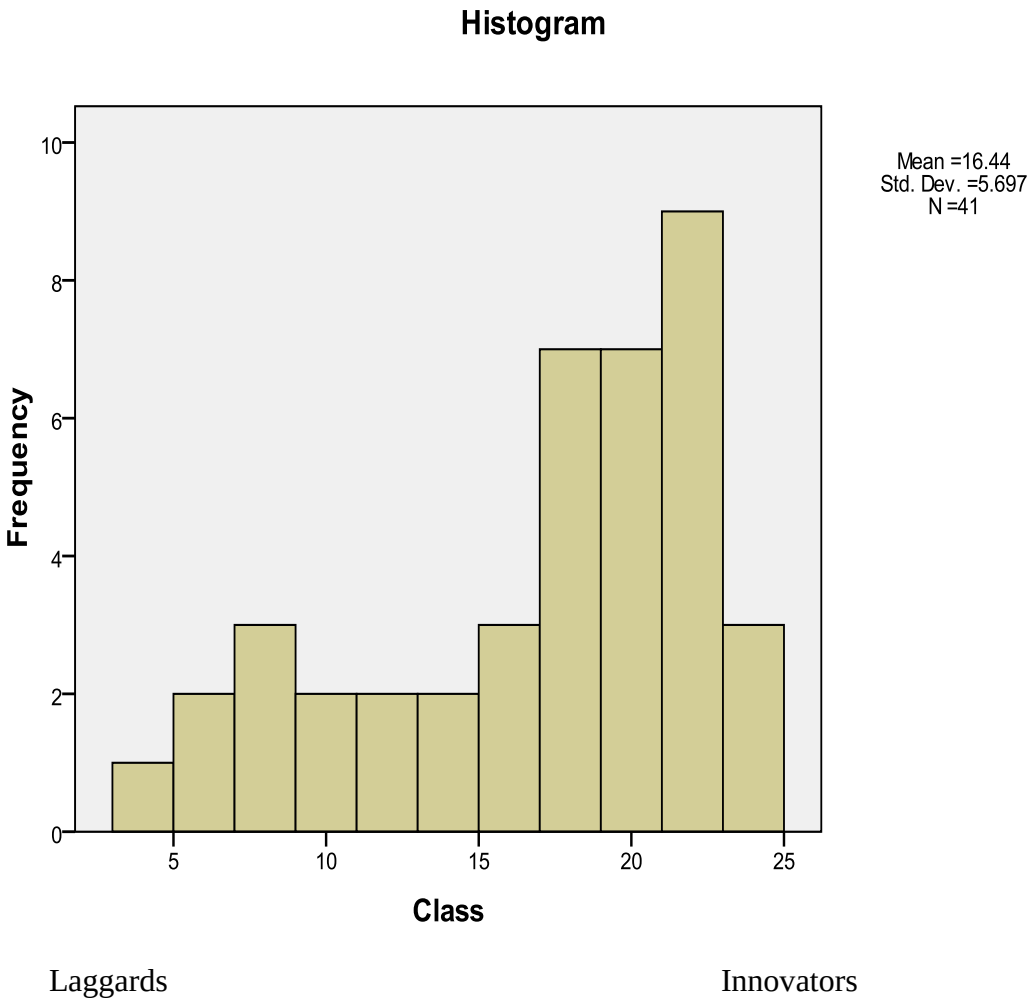

Figure 5. CBE faculty adopter categories.

Figure 6 is another confirmation that faculty members at the College of Basic Education are early adopters, not laggards, because the majority of them are categorized as early adopters. The laggards category has the lowest number of faculty members, which is exactly the opposite of what the hypothesis proposed. As a result, the first hypothesis, *majority of faculty members will fall in the laggards' category*, is not confirmed. Faculty members at the College of Basic Education are early adopters of new technologies such as e-learning. The null hypothesis, *There is no significant difference between the adopter distribution of e-learning of Kuwaiti faculty members and the Rogers model*, on the other hand, has to be rejected because there is a statistically significant difference ($p < .01$) between what the Rogers model assumes and the results of the study.

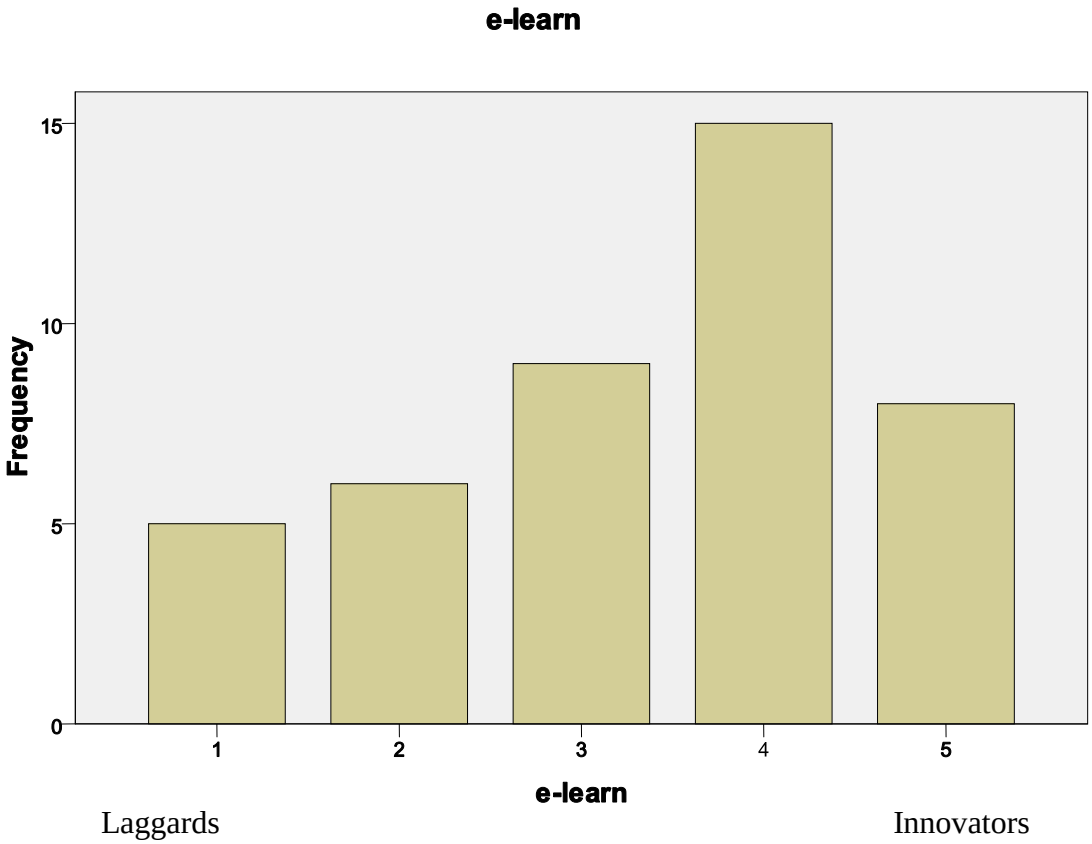

Figure 6. E-learning adopter categories.

Hypothesis 2: Attitudes and skills (self-efficacy)

- Motivated Hypothesis 2: Younger faculty members will have more favorable dispositions toward teaching with e-learning than older faculty members, in the areas of:
    - Attitudes as measured by Sadik (2007)
    - Skills (self-efficacy) as measured by Sadik (2007)
- Null Hypothesis 2: There is no significant difference between younger and older faculty members' attitudes or skills toward teaching with e-learning.

The purpose of this part of the study is to explore specific factors related to faculty readiness towards e-learning: attitudes and skills (self-efficacy). In this part of the study, some items were reversed based on the wording of the items. One item from attitudes was removed for two reasons, one of which was that the factor analysis showed that all items except Item 5 held together and presented higher Cronbach's alpha scores, from .78 to .81. The second reason is that the meaning of Item 5 was not parallel to the other items, which made participants misunderstand the item itself. Therefore, Item 5 was removed from the attitudes instrument. The same thing happened with Item 4 from the skills instrument, so it was removed because the meaning of Item 4 was not parallel with the other items, which made participants misunderstand the item itself. The removal of Item 4 resulted in higher Cronbach's alpha score increased, from .75 to .79.

As for statistical significance between faculty member attitudes and age, Table 6 shows that a 2-tailed *t*-test indicated no statistical significance. However, the attitudes test is a single-tail or 1-test; therefore, we have to divide .276 by 2 which equals .138. The results show no statistical significance between attitudes and age. Based on the results of this analysis, there is no reason to conclude that younger and older faculty members differ in their attitudes toward e-learning.

Table 6

T-*test between Attitudes and Age*

Independent Samples Test

		Levene's test for equality of variances		*t*-test for equality of means						
									95% confidence interval of the difference	
		f	Sig.	*t*	*df*	Sig. (2-tailed)	M difference	SE difference	Lower	Upper
Attitude	Equal variances assumed	.550	.463	-1.105	40.00	.276	-.1962	.1775	-.5549	.1626
	Equal variances not assumed			-1.154	38.906	.255	-.1962	.1699	-.5399	.1475

As for statistical significance between faculty skills based on age, Table 7 shows that a 2-tailed *t*-test indicating no statistical significance. However, the skills test is a single-tail or 1-test; therefore, we have to divide .304 by 2, which equals .152. The results show no statistical significant difference ($p < .01$) in skills based on age. This is insufficient to conclude that younger and older faculty members differ in their skills, based on age.

Table 7

T-*test between Skills and Age*

Independent Samples Test

		Levene's test for equality of variances		*t*-test for equality of means						
									95% confidence interval of the Difference	
		f	Sig.	*t*	*df*	Sig. (2-tailed)	*M* difference	*SE* difference	Lower	Upper
Skills	Equal variances assumed	2.925	.095	-1.042	40.000	.304	-.2789	.2676	-.8198	.2619
	Equal variances not assumed			-1.110	39.844	.274	-.2789	.2514	-.7871	.2292

Based on the above information, the second hypothesis, *younger faculty members will have more favorable dispositions toward teaching with e-learning than older faculty members, in the areas of attitudes and skills*, is not confirmed. There is in sufficient evidence to conclude that faculty members at the College of Basic Education differ in attitudes and skills toward teaching with e-learning based on age. On the other hand, the null hypothesis, *there is no significant difference between younger and older faculty members' attitudes or skills toward teaching with e-learning*, has to be accepted because there is no statistically significant difference between faculty attitudes or skills based on age.

Hypothesis 3: Barriers to e-learning

- Motivated Hypothesis 3:

(a) Younger faculty members will perceive fewer barriers toward teaching with e-learning than older faculty members, as measured by Alsenaidi, Lin, Poirot (2009).

(b) Technological department faculty members will perceive fewer barriers toward teaching with e-learning than non-technological department faculty members as measured by Alsenaidi, Lin, Poirot (2009)

- Null Hypothesis 3: There is no significant difference between younger and older, or technological and non-technological department, faculty in their perceived barriers toward e-learning.

The purpose of this part of the study is to explore specific factors, namely, barriers, as they are related to faculty members' readiness for e-learning. In this part of the study, no items were reversed or removed. The factor analysis showed that all barrier items held together strongly and presented a high Cronbach's alpha score of .89.

As for statistical significance between faculty age and perceived barriers, Table 8 shows that a 2-tailed *t*-test indicated no statistical significance. However, the perceived barriers test is a single-tail or 1-test; therefore, we have to divide .201 by 2, which equals.1005. The results show no statistical significance between perceived barriers and age. Younger and older faculty members perceived barriers similarly.

Table 8

T-*test between Age and Perceived Barriers*

Independent Samples Test

		Levene's test for equality of variances		*t*-test for equality of means						
									95% confidence interval of the difference	
		f	Sig.	*t*	*df*	Sig. (2-tailed)	*M* difference	*SE* difference	Lower	Upper
Ball	Equal variances assumed	1.114	.298	1.301	39.000	.201	3.34804	2.57378	-1.85792	8.55400
	Equal variances not assumed			1.313	35.689	.198	3.34804	2.55061	-1.82640	8.52248

Based on the above information the third hypothesis Part (a), *younger faculty members will perceive fewer barriers toward teaching with e-learning than older faculty members*, was not confirmed. In other words, College of Basic Education faculty, both young and old, perceived barriers toward teaching with e-learning similarly; the 2-tail test in Table 8 is solid evidence. The null hypothesis on the other hand, *there is no significant difference between younger and older faculty members in their perceived barriers towards teaching with e-learning*, had to be accepted because there was no statistical significance between faculty member age and the perceived barriers.

As for statistical significance between faculty departments and perceived barriers, Table 9 shows that a 2-tailed *t*-test indicated no statistical significance. However, the perceived barriers test is a single-tail or 1-test; therefore, we have to divide .074 by 2, which equals .037. The results show that there was a statistical significance between perceived barriers and departments.

Faculty members from technical departments perceived lower barriers than those from non-technical departments.

Table 9

T-*test between Departments and Perceived Barriers*

Independent Samples Test

		Levene's test for equality of variances		*t*-test for equality of means						
									95% confidence interval of the difference	
		f	Sig.	*t*	*df*	Sig. (2-tailed)	*M* difference	*SE* difference	Lower	Upper
Ball	Equal variances assumed	.114	.738	1.839	39.000	.074	4.58134	2.49163	-.45847	9.62115
	Equal variances not assumed			1.819	35.956	.077	4.58134	2.51837	-.52637	9.68905

Based on the above information, the third hypothesis, Part (b), *technological departments faculty members will perceive fewer barriers toward teaching with e-learning than non-technological departments faculty members,* was accepted. In other words, College of Basic Education faculty from technological departments perceived fewer barriers than their colleagues from non-technological departments toward teaching with e-learning. The 2-tail *t*-test in Table 9 is solid evidence. The null hypothesis, on the other hand, *There is no significant difference between technological and non-technological departments' faculty members in their perceived barriers towards teaching with e-learning*, had to be rejected because there was a statistical significance between faculty members from technological departments and non-technological departments and their perceived barriers.

Correlations with All Scales

In this part of the study, each scale of the adopter distribution class, attitudes, skills, and barriers ball correlated with other scales to find out the general assumption of the study. The general assumption is: if faculty members are early adopters or early majority according to the Rogers model, then they will have positive attitudes and high levels of skills, which lead to the conclusion that those faculty members will perceive fewer barriers. On the contrary, if faculty members are late majority or laggards according to the Rogers model, then they will have negative attitudes and low levels of skills, which lead to the conclusion that those faculty members will perceive more barriers.

Table 10

Correlation with All Scales

Correlations

		Class	Attitude	Skills	Ball
Class	Pearson correlation	1	-.641**	-.653**	.382*
	Sig. (2-tailed)		.000	.000	.016
	N	41	34	38	39
Attitude	Pearson correlation	-.641**	1	.599**	-.264
	Sig. (2-tailed)	.000		.000	.120
	N	34	36	35	36
Skills	Pearson correlation	-.653**	.599**	1	-.512**
	Sig. (2-tailed)	.000	.000		.001
	N	38	35	40	40
Ball	Pearson correlation	.382*	-.264	-.512**	1
	Sig. (2-tailed)	.016	.120	.001	
	N	39	36	40	41

It was interesting to discover that the results of the study differ from the assumptions made before conducting the study. The assumption before the study was that if faculty members were early adopters or early majority, according to the Rogers model, then they would have positive attitudes and high level of skills, which lead to the conclusion that those faculty members will perceive fewer barriers and vice-versa. However, according to Table 10, it is clear that the assumption before conducting the study was not confirmed, because early adopters faculty members presented negative attitudes, showed low levels of skills, and perceived fewer barriers toward teaching with e-learning.

CHAPTER 5

DISCUSSION

E-learning impact will be shown in both students and their instructors in the way that they use technology. The e-learning cycle will force instructors to continue improving the online materials based upon student feedback; the improvement process allows instructors to gain technical as well as design skills for online courses. The repetition experience of designing different online classes enables instructors to set new standards of designing e-learning courses that are compatible with Kuwait's educational system. E-learning impact on faculty members can be noticed through the new technical skills that they will gain through interacting with online materials. Furthermore, faculty members will begin to master how to apply the constructivism learning model to their teaching process. Multimedia integration into the online materials helps faculty members to realize that teaching requires different tools that can facilitate the teaching process. E-learning shows faculty members that communication and information technology is still being explored and developed. As of now, in Kuwait, faculty members are constantly seeking new approaches to capture the attention of students, and to create active learning environments by using different tools of information technology. The impact of e-learning as technology prospers will force faculty members to become updated with new technological innovations which can be incorporated within online materials.

The attitudes and skills of faculty members need to be updated consistently with evolving e-learning issues that could start to appear as e-learning takes place. As for the perceived barriers, faculty members need to show a high level of cooperation to overcome the barriers by presenting personal examples of how a particular barrier was overcome. Therefore, it

is imperative to design evaluation tools for future improvements to keep e-learning on the right track and increase positive results.

Barron (2006) mentioned several evaluation tools, one of which is to get learner feedback on e-learning courses by conducting a general survey, which can be reviewed by instructors and school administrators for improvement and suggestions later on. Faculty members, on the other hand, are required to submit a reflection letter that includes personal experience in e-learning, positive and negative aspects, and possible revisions for future improvements. This reflection letter will include a list of problematic issues that need to be resolved gradually as the e-learning process continues. Merwe and Mouton (2005) suggested a new evaluation tool to be established by the faculty development unit that is specialized in e-learning where faculty members can exchange their experiences regarding e-learning courses and learn how to design development plans to improve e-learning results.

This study reviewed e-learning implementation from a faculty perspective based on three major issues: attitudes, skills, and barriers. Barriers are a huge concern for faculty members as well as evaluation tools that are needed to (a) overcome those barriers, (b) improve to e-learning quality. As Abouchedid & Eid (2004) mentioned, faculty members are in favor of e-learning because it will improve education and raise it to higher technological level of education. In the beginning, the e-learning project will have its own barriers for faculty members because of the extra work and preparation time. Once faculty members pick up the essence of e-learning, they will benefit from the advantages of having their students working most of the time on their own, with little or no personal instruction, and the appealing incentives. This study will be the start of future research regarding e-learning at the Kuwaiti College of Basic Education. The incentives that will motivate faculty members to welcome the e-learning project will inspire a whole new

educational reform. Although huge expenditures have been allocated to committed technology improvements rather than technology that faculty members can use for personal productivity and teaching. In order to see the impact of technology on learning, it is necessary to transfer technology power into the hands of faculty members to deliver it to students (Hasselbring, 1991).

As for governmental approval of an e-learning project, it will take an effort from faculty members and government officials to push for the funding of an e-learning project. Society will benefit immensely from the advanced technology that e-learning will bring in facilitating learning for all students and encouraging them to work hard in order to make new breakthroughs in science and other significant fields of study. E-learning is a new educational project that has been implemented in many educational institutions outside of Kuwait, and has been found to be compatible with the technological world that we live in. It can bring educational prosperity, which will have big effect on Kuwait.

Hypotheses Discussions

Hypothesis 1: Diffusion of innovation

- Motivated Hypothesis 1: A higher proportion of Kuwaiti faculty members will fall into the late majority level compared to the Rogers distribution of adopter categories.
- Null Hypothesis 1: There is no significant difference between the adopter distribution of e-learning of Kuwaiti faculty members and the Rogers model.

The purpose of this part of the study is to explore the percentage of faculty members at the Kuwaiti Public Authority for Applied Education and Training (PAAET) College of Basic Education fall into the Rogers distribution of adopter categories in adopting e-learning. Statistical calculations were conducted to determine the percentage of faculty members that fall in each of the Rogers five categories: innovators, early adopters, early majority, late majority,

and laggards. It is clear that the Rogers model presents different percentages than what the study presents. This indicates that the original motivated hypothesis, *higher proportion of Kuwaiti faculty members will fall in late majority level compared to Rogers's distribution of adopter categories*, was not confirmed. The null hypothesis in this case, *There is no significant difference between the adopter distribution of e-learning of Kuwaiti faculty members and the Rogers model*, had to be rejected because there was a statistical significance between what the Rogers model assumed and the study results.

The literature review regarding Rogers's model did explain that innovation is controlled by four main factors: innovation, communication channels, time, and social system. As for the innovation, it is e-learning and faculty members have in one occasion or another had heard of it. The communication channels do exist in Kuwait from radio and TV to internet and cell-phones. The time for faculty members to learn about e-learning can be found and it is not a big of an issue. However, the social system is the catch in Kuwait. Kuwait is a homophilious society that would take longer time for the innovation to spread and be adopt due to social norms and every member of the society tend to follow social rules, indicating a lower interest in adopting new innovations quickly. Not like the heterophilous social system where members tend to go against system norms, indicating a greater interest in adopting new innovations. In general, faculty members at the College of Basic Education have the knowledge but they resist teaching with e-learning because they come from homophilios society that shows resistance to new innovations.

The reason that the study presented a trend that was completely opposite from what was hypothesized was because faculty members are aware of e-learning technology but have not used in their classes. There could be related obstacles that hindered the implementation of e-learning. One obstacles could be administrators refusal "…The lack of familiarity with e-learning

techniques and methods among deans and chairpersons" (Abouchedid & Eid, 2004, p.7) has slowed the implementation of e-learning in Kuwait. Another obstacle is that school administrators could raise is the lack of regulatory policies that can affect the process of implementing e-learning and governs e-learning implementation process to avoid copyrights

Hypothesis 2: Attitudes and skills (self-efficacy)

- Motivated Hypothesis 2: Younger faculty members will have more favorable disposition toward teaching with e-learning than older faculty members, in the areas of:
    - Attitudes as measured by Sadik (2007)
    - Skills (self-efficacy) as measured by Sadik (2007)
- Null Hypothesis 2: There is no significant difference between younger and older faculty members' attitudes or skills towards teaching with e-learning.

The purpose of this part of the study was to explore specific factors related to faculty members' readiness to engage in e-learning: attitudes and skills (self-efficacy). As for statistical significance between faculty member attitudes and age, there was no statistical significance between attitudes and age. Younger and older faculty members shared almost equivalent amount of attitude toward e-learning. As for statistical significance between faculty member skills and age, there was no statistical significance between skills and age as well. Younger and older faculty members shared almost equivalent amounts of skills related to e-learning. This leads to the conclusion that the second hypothesis, *younger faculty members will have more favorable disposition toward teaching with e-learning than older faculty members, in the areas of attitudes and skills,* was not confirmed. In other words, faculty members at the College of Basic Education shared almost equivalent attitudes and skills toward teaching with e-learning. The null hypothesis on the other hand, *There is no significant difference between younger and older*

faculty members' attitudes or skills toward teaching with e-learning, had to be accepted because there was no statistical significance between faculty members attitudes or skills and their ages.

In hypothesis 2 the results came out opposite of what the most literature reviews have described, except when Czaja and Sharit (1998) stated that age has no influence over adopting a new technology. According to Czaja and Sharit (1998), the level of experience is the determining factor of attitudes toward adopting a new technology. Most of the literature reviews have indicated that senior faculty members would be more resistant toward e-learning than junior faculty members due to concern of losing their jobs and changing their teaching style that they have been applying for many years. Some literature reviews also stated that junior faculty members would have higher level of technological skills than senior faculty members because technology in education was found and spread during junior faculty era. However, According to Westerman and Davies (2000), the acquisition of new technology skills among older and younger faculty members depends on the amount of time given to practice this new technology; With extensive amount of practice to both older and younger faculty members over an extended period of time, there comes a point where performance reaches equivalence between older and younger faculty members' skills level (Westerman & Davies, 2000) The results have shown a complete opposition of what most of the literature reviews have described, and a complete consistancy with Czaja and Sharit (1998).

The reason that the study didn't find statistical significance between attitudes or skills and the age of faculty members was because most of the faculty members were graduates of U.S. and England universities. E-learning is a well-known technology in those countries and is being used in many schools. Another reason is one that Knezek brought up in his study on more than 5,000 teachers in Allen Independent School District (ISD), namely, that age showed no statistical

significance in how teachers were willing to adopt new technologies (G. Knezek, personal communication, May 11, 2010). To the contrary, Knezek found that older teachers had positive attitudes and were more willing to try new technology and incorporate new technology into their classes than were younger teachers.

Hypothesis 3: Barriers to e-learning

- Motivated Hypothesis 3:

  (a) Younger faculty members will perceive fewer barriers toward teaching with e-learning than older faculty members as measured by Alsenaidi, Lin, Poirot (2009).

  (b) Technological department faculty members will perceive fewer barriers toward teaching with e-learning than non-technological department faculty members as measured by Alsenaidi, Lin, Poirot (2009)

- Null Hypothesis 3: There is no significant difference between younger and older, or technological and non-technological department faculty members in their perceived barriers related to e-learning.

The purpose of this part of the study was to explore specific factors, namely, barriers, as related to faculty member readiness for e-learning. As for statistical significance between faculty member age and perceived barriers, there was no statistical significance between perceived barriers and age. Younger and older faculty members perceive barriers similarly, indicating that the third hypothesis, Part (a), *Younger faculty members will perceive fewer barriers toward teaching with e-learning than older faculty members*, was not confirmed. The null hypothesis, on the other hand, *There is no significant difference between younger and older faculty members in their perceived barriers towards teaching with e-learning*, had to be accepted because there was no statistical significance between faculty member age and the perceived barriers.

As for statistical significance between faculty member departments and perceived barriers, Table 9 showed that there was a statistical significance between perceived barriers and departments. Faculty members from technical departments perceived lower barriers than those from non-technical departments because the materials they teach involve more work with technology than does theory. Therefore the third hypothesis Part (b), *technological departments faculty members will perceive fewer barriers toward teaching with e-learning than non-technological departments faculty members,* was accepted. In other words, faculty members at the College of Basic Education from technological departments perceived fewer barriers than their colleagues from non-technological departments in relation to teaching with e-learning. The 2-tail *t*-test in Table 9 is solid evidence or the result. The null hypothesis, on the other hand, *There is no significant difference between technological and non-technological departments' faculty members in their perceived barriers towards teaching with e-learning*, had to be rejected because there was a statistical significance between faculty members from technological departments and non-technological departments and their perceived barriers.

The results of hypothesis 3 part a has shown an opposite direction of what most of the literature review has described, except for Porter and Donthu (2006). According to Porter and Donthu (2006) older and young adults perceive the same barriers toward using a new technology due mainly to the limited experience that they have. Appearantly, faculty members at CBE have some sort of experience about e-learning technology, therefore, senior and junior faculty members perceive the same barriers. Most of the literature review clearly stated that young faculty members will perceive fewer barriers than old faculty members who have lower level of technology literacy and tend to resist new technology. Part b of hypothesis 3 has agreed with the literature review statements that faculty members from technological departments perceive fewer

barriers than faculty members from non-technological departments. The reason that technological departments' faculty members perceive fewer barriers is because of their work's environment that is fully dependent on technology. Technology has become part of technological department's faculty members daily job, and therefore, they perceive fewer barriers than their peers from non-technological departments.

Correlations with All Scales

In this part of the study, each scale of the adopters' distribution class, attitudes, skills, and barriers ball correlated with other scales to confirm the general assumption of the study. The general assumption was: if faculty members are early adopters or early majority according to the Rogers model, then they will have positive attitudes and high level of skills, which lead to the conclusion that those faculty members perceived fewer barriers. To the contrary, if faculty members fell into the categories of late majority or laggards according to the Rogers model, then the attitudes and low levels of skills lead to the conclusion that those faculty members perceived more barriers.

It was interesting to find that faculty members had different assumptions than it was assumed they held before the study was conducted. The assumption before the study was that if faculty members were early adopters or early majority according to the Rogers model, then they had positive attitudes and high levels of skills, which led to the conclusion that those faculty members perceived fewer barriers and vice-versa. However, and according to Table 10, it is clear that the pre-study assumption was not confirmed because early adopters faculty members presented negative attitudes, showed low levels of skills, and perceived fewer barriers toward teaching with e-learning. Technically, if a faculty member was an early adopter of e-learning technology, he presented positive attitudes, high levels of skills, and perceived fewer barriers.

This present study showed the opposite, despite the expectations of experts in the field, such as Knezek, who specifically said, "I would be one of those who showed the opposite expectation" (G. Knezek, personal communication, May 11, 2010). The opposite expectation of the study can be further investigated in future research to figure out why faculty early adopters presented negative attitudes, lower levels of skills, and perceived fewer barriers.

Implications

The study has raised more questions than answers because two of the three hypotheses were not confirmed. Questions such as: since faculty members are innovators instead of laggards, why haven't they implemented e-learning into their classes. Another question is why age has no influence over faculty members' attitudes and skills toward e-learning. The last question is why age doesn't influence the number of barriers that faculty members encounter with e-learning.

The study showed that attitudes, skills, perceptions, and ages are not obstacles toward the implementation of e-learning. Other related obstacles could be administrators refusal "…The lack of familiarity with e-learning techniques and methods among deans and chairpersons" (Abouchedid & Eid, 2004, p.7) has slowed the implementation of e-learning in Kuwait. Another obstacle is that school administrators could raise is the lack of regulatory policies that can affect the process of implementing e-learning and governs e-learning implementation process to avoid copyrights violations.

Faculty members as future e-learning course designers need to create flexible evaluation tools to measure the effectiveness of early e-learning course designs. Fluidity at the beginning of e-learning implementation can assist designers to avoid future oversights that can hinder the continuation of e-learning.

Since faculty members seem to be ready for e-learning, it is time to introduce a learning management system (LMS) that faculty members need to be familiar with its features. Most LMS share the same basic features; therefore, an introductory training course with one or two sessions at most for faculty members will most likely dissipate any confusion related to the particular LMS that they may have at the beginning.

Future Research

Future research can be conducted by applying e-learning methods to a traditional course in one specific department. This can take a place through an open-source learning management system (LMS) such as Moodle. This course can be offered in consecutive semesters to monitor student performance each semester and to record student feedback, which can assist course designers to improve the e-learning course design and make it more appealing to students to learn. Later on, this e-learning experience can be applied to other departments. Future research can shift the focus from faculty members to student perspectives on e-learning implementation at the College of Basic Education. The acceptance of e-learning will vary from one department to another, focusing not only on faculty members but also on students. The establishment of training centers for both faculty members and students can facilitate the implementation of e-learning.

Evaluation tools for e-learning in teaching and learning processes can lead to successful, desired outcomes that faculty members are looking for. Another research area is to find the relationship, if any, between late majority adopters and their attitudes or skills, as suggested in Christensen (1997). Another future research area is to monitor the time that it takes for laggard faculty members to move from laggard level to early adopter level according the Rogers model, which could be an interesting study over time. Another future research project that needs to be

carried out is to understand the relationship between human learning and e-learning. Currently, the amount of empirical evidence regarding how e-learning technology can influence learning is fairly small and there is a need to explore it to understand how e-learning enhances learning. One last future study is to figure out why early adopters faculty members present negative attitudes, lower levels of skills, and perceive fewer barriers.

Conclusion

In conclusion, the study examined faculty members' readiness for e-learning at the College of Basic Education of PAAET in Kuwait. The study showed that faculty members are innovators and early adopters of e-learning instead of laggards which was completely opposite of what the study has hypothesized. The study also measured faculty members' attitudes and skills toward teaching with e-learning with respect to their ages. it is clear that age has no influence over faculty members' attitudes or skills toward teaching with e-learning. Age also has no influence over the number of barriers that faculty members may encounter in teaching with e-learning. One statistical significance that was found in this study is that faculty members from technological departments perceive fewer barriers than their peers from non-technological departments in teaching with e-learning. The study showed that attitudes, skills, perceptions, and ages are not obstacles toward the implementation of e-learning. One related obstacle could be administrators' refusal, such as deans and chairpersons, of e-learning due to unfamiliarity of this technology techniques and methods. Another obstacle is that school administrators could raise is the lack of regulatory policies that can affect the process of implementing e-learning and governing e-learning implementation process to avoid copyrights violations. All in all, the purpose of the study is to measure faculty members' readiness toward e-learning and that was

achieved. Faculty members at the College of Basic Education in Kuwait are fully ready for e-learning implementation.

APPENDIX A

INSTRUMENT

Gender: Male Female

Age: 1) 32-40 2) 41- 49 3) 50-59 4) 60 +

Department:

Part 1: Diffusion of Innovation

Instrument 1 (Stages of Adoption of Technology based on Christensen 1997)

Please read the descriptions of each of the six stages related to adoption of technology. Choose the stage that best describes where you are in the adoption of technology:

- I am aware that technology exists buy have not used it – perhaps I am even avoiding it. I am anxious about the prospect of using computers.
- I am currently trying to learn the basics. I am sometimes frustrated using computers. I lack confidence when using computers.
- I am beginning to understand the process of using technology and can think of specific tasks in which it might be useful.
- I am gaining a sense of confidence in using the computer for specific tasks. I am starting to feel comfortable using the computer.
- I think about the computer as a tool to help me and am no longer concerned about it as technology. I can use it in many applications and as an instructional aid.
- I can apply what I know about technology in the classroom. I am able to use it as an instructional tool and integrate it into the curriculum.

Instrument 2 (ACOT Teacher Stages based on Dwyer 1983)

What would estimate to be your current level of understanding and use of technology? Select one from the list below:

- I am trying to learn the basics of using technology.

- I can successfully use technology on a basic level.
- I am discovering technology's potential for increased productivity.
- I can use technology 'effortlessly' as a tool to accomplish a variety of instructional and management goals.
- I am prepared to develop entirely new learning environments that utilize technology as a flexible tool.

Instrument 3 (CBAM Levels of Use based on Hall & Rutherford 1974)

Please mark one category that best indicates your overall level of use of information technology:

- I have little or no knowledge of information technology in education, no involvement with it, and I am doing nothing toward becoming involved.
- I am seeking or acquiring information about information technology in education.
- I am preparing for the first use of information technology in education.
- I focus most effort on the short-term, day-to-day use of information technology with little time for reflection. My effort is primary directed toward mastering tasks required to use the information technology.
- I feel comfortable using information technology in education. However, I am putting forth little effort or thought to improve information technology in education or its consequences.
- I vary the use of information technology in education to increase the expected benefits within the classroom. I am working on using information technology to maximize the effects with my students.
- I am combining my own efforts with related activities of other teachers and colleagues to achieve impact in the classroom.

- I re-evaluate the quality of use of information technology in education, seek major modifications of, or alternatives to, present innovation to achieve increased impact, examine new developments in the field, and explore new goals for myself.

Instrument 4 (perception of e-learning based on Rogers 5-levels of adoption)

Please choose one category that best indicates your overall level of use of e-learning technology:

- I am aware that e-learning exists but have not used it. I am even resisting it. I am anxious about the future of e-learning.
- I am currently trying to learn the basics of e-learning. I am sometimes frustrated thinking of e-learning. I lack confidence when teaching with e-learning.
- I am beginning to understand the process of incorporating e-learning in my courses and can think of specific tasks in which it might be useful.
- I think about e-learning as a tool to assist me teaching my courses. I can use many applications in e-learning. I am able to use it as an instructional tool.
- I can apply what I know about e-learning in the classroom and integrate it into the curriculum. I can be innovative in designing courses using e-learning.

Part 2: Attitudes & Skills (Self-Efficacy)

Instructions: Please read each statement and check the correspondent box that best fits your answer regarding E-learning:

SD	D	U	A	SA
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

Attitudes (Sadik, 2007)

#	Statement	SD	D	U	A	SA

1	I like the idea of using e-learning to design and deliver instruction.					
2	I think it is fun figuring out how to use computing to teach.					
3	I do not understand why some lecturers like to spend so much time developing computer-based courses.					
4	I like to try new technologies in teaching.					
5	Developing an e-learning course would take significantly more time than developing a traditional course.					
6	Greater incentives are needed to get faculty members to design an e-learning course.					

Skills (Self- Efficacy) (Sadik, 2007)

#	Statement	SD	D	U	A	SA
1	I feel confident in my ability to use e-learning in teaching.					
2	I hesitate to use e-learning for fear of making mistakes.					
3	I can teach myself most of the things I need to know about using e-learning.					
4	I would feel better about using e-learning if I knew more about it.					
5	I feel threatened when I see others using e-learning in					

	their teaching.					
6	Developing e-learning materials require extensive training and support.					

Part 3: Barriers

Instructions: Please read each statement and check the correspondent box that best fits your answer regarding E-learning:

SD	D	U	A	SA
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

Barriers (Alsenaidi, Lin, Poirot, 2009)

#	Statement	SD	D	U	A	SA
1	Faculty members don't have convenient time for training.					
2	Lack of administrative support for adopting e-learning into teaching.					
3	Lack of adequate financial support to develop technology-based activities.					
4	Faculty members have to spend extra time to create e-learning courses.					
5	Faculty members have to spend extra time to respond to students' inquiries.					

6	Faculty members lack access to essential hardware.					
7	Faculty members lack access to essential software.					
8	Software is inappropriate for meeting students' needs.					
9	Faculty members think that e-learning is unreliable.					
10	Faculty members lack time to adopt e-learning.					
11	Faculty members believe that it is difficult to manage an e-learning course.					

APPENDIX B

ACCEPTANCE LETTER BY UNIVERSITY OF NORTH TEXAS INSTITUTIONAL REVIEW BOARD

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Discover the power of ideas.

OFFICE OF THE VICE PRESIDENT FOR RESEARCH AND ECONOMIC DEVELOPMENT

September 15, 2009

Mohammed Alajmi
Department of Learning Technologies
University of North Texas

Re: Human Subjects Application No. 09325

Dear Mr. Alajmi:

As permitted by federal law and regulations governing the use of human subjects in research projects (45 CFR 46), the UNT Institutional Review Board has reviewed your proposed project titled "The Impact of Faculty Members' Attitudes, Skills, and Knowledge on E-learning Implementation at the College of Basic Education in Kuwait." The risks inherent in this research are minimal, and the potential benefits to the subject outweigh those risks. The submitted protocol is hereby approved for the use of human subjects in this study. **Federal Policy 45 CFR 46.109(e) stipulates that IRB approval is for one year only, September 15, 2009 to September 14, 2010.**

Enclosed is the consent document with stamped IRB approval. Please copy and **use this form only** for your study subjects.

It is your responsibility according to U.S. Department of Health and Human Services regulations to submit annual and terminal progress reports to the IRB for this project. The IRB must also review this project prior to any modifications.

Please contact Shelia Bourns, Research Compliance Administrator, or Boyd Herndon, Director of Research Compliance, at extension 3940, if you wish to make changes or need additional information.

Sincerely,

Patricia L. Kaminski, Ph.D.
Associate Professor
Chair, Institutional Review Board

PK:sb

CC: Dr. Lin Lin

1155 Union Circle #305250 | Denton, Texas 76203-5017 | TEL 940.565.3940 | FAX 940.565.4277
TTY 940.369.8652 | http://research.unt.edu

University of North Texas Institutional Review Board

Information Notice

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

Title of Study: The Impact of Faculty Members' Attitudes, Skills, and Knowledge on E-learning Implementation at the College of Basic Education in Kuwait

Principal Investigator: Mohammed Alajmi, a graduate student in the University of North Texas (UNT) Department of Learning Technologies.

Purpose of the Study: The purpose of this study is to examine the faculty members' attitudes, skills, and knowledge toward implementing E-Learning into their classes at the College of Basic Education in Kuwait. This study will explore whether or not faculty members are fully ready for a complete transition from traditional learning to e-learning.

Study Procedures: The study will include a survey that will ask about attitudes, skills, and knowledge toward the implementation of e-learning at the college of basic education. The survey will take an approximate time of 20-30 minutes.

Foreseeable Risks: There are no foreseeable risks involved in this study.

Benefits to the Subjects or Others: We expect the project to benefit you by generating a conclusion about the impact of faculty members' attitudes, skills, and knowledge toward the implementation of e-learning at the college of basic education in Kuwait.

Procedures for Maintaining Confidentiality of Research Records: The research records will be maintained with the principal investigator for three years, with no disclosure to any human subject.

Questions about the Study: If you have any questions about the study, you may contact Mohammed Alajmi at telephone number (940) 395-7773 or the Faculty Advisor, Dr.Lin_Lin at telephone number (940) 369-7572 .

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.

Office of Research Services
University of North Texas
Last Updated: August 9, 2007

Research Participants' Rights:

- You understand the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as a research participant and you voluntarily consent to participate in this study.
- You may print a copy of this notice for your records.

APPROVED BY THE UNT IRB
FROM 9/15/09 TO 9/14/10

Office of Research Services
University of North Texas
Last Updated: August 9, 2007

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OFFICE OF THE VICE PRESIDENT FOR RESEARCH AND ECONOMIC DEVELOPMENT
Research Services

April 19, 2010

Mohammed Alajmi
Department of Learning Technologies
University of North Texas

Institutional Review Board for the Protection of Human Subjects in Research (IRB)
RE: Human Subject Application #09325

Dear Mr. Alajmi:

The UNT IRB has received your request to modify your study now titled "Faculty Members' Readiness for E-learning in the College of Basic Education in Kuwait." As required by federal law and regulations governing the use of human subjects in research projects, the UNT IRB has examined the request to change the title of this study and to modify the survey used in this study from 72 questions to 27 questions. The modifications to this study are hereby approved for the use of human subjects.

Please contact Shelia Bourns, Research Compliance Analyst, at (940) 565-3940, or Boyd Herndon, Director of Research Compliance, at (940) 565-3941, if you wish to make changes or need additional information.

Sincerely,

Boyd Herndon for PLK

Patricia L. Kaminski, Ph.D.
Associate Professor
Chair
Institutional Review Board

PK/sb

CC: Dr. Lin Lin

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