Determining the Factor(s) that Affect Students' E-learning Readiness in a Developing Country

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Abstract

This dissertation addresses the critical issue of student e-readiness for online learning, particularly in developing countries where the challenges and disparities in access to technology and digital literacy are pronounced. Despite the increasing adoption of online education, the readiness of students to effectively engage in e-learning remains inadequately considered by higher education institutions. This lack of e-readiness can lead to various challenges, including technical difficulties, time management issues, communication and collaboration deficits, lack of motivation, and limited resource access.

This dissertation explored five key factors - financial, motivation, self-directed learning, self-competence, and perceived usefulness - that collectively contribute to students' e-readiness in developing countries. Utilizing confirmatory factor analysis (CFA) and correlation analysis, this research aims to provide a comprehensive understanding of the multifaceted nature of e-readiness among students in a developing country context. The results of this study have had the potential to inform the design and implementation of effective e-learning strategies and interventions to enhance student readiness and improve their overall online learning experience.

This research revealed unique patterns of correlations among the five factors in developing countries, notably with financial resources and motivation. This departure from established models highlighted the importance of considering contextual factors when assessing e-readiness. Additionally, the hypothesized model proved to have convergent and discriminant validity for all five factors. Recommendations for future research include refining the model, expanding the items for certain factors, and

potentially studying financial resources and motivation separately to gain a deeper understanding of their impact on e-readiness in developing countries.

In summary, this dissertation contributes valuable insights into the complex landscape of student e-readiness in developing countries while offering a foundation for further research and practical implications that can positively impact the quality and effectiveness of e-learning initiatives in these regions.

Dedication

This dissertation is dedicated to my late father, who provided unwavering support and encouragement throughout my doctoral journey. His dream was to witness my graduation. I deeply miss him, and I love you, Dad.

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Chapter 1

Introduction

E-learning has become a widely adopted mode of education in recent years. However, the effectiveness of e-learning largely relies on the readiness of learners, instructors, and institutions to embrace this mode of education. E-learning readiness (ELR) pertains to the level of preparedness of these stakeholders to engage in e-learning activities efficiently. This chapter provides an overview of the scope of this dissertation. It begins with a background section, which contextualizes the current work. The statement of the problem is also provided. Additionally, the purpose and significance of the research are discussed, which leads to the formulation of the key research questions in this chapter. Delimitations, assumptions, and the definition of the terms are also described in this dissertation. Finally, the structure and organization of the entire dissertation are outlined at the end of this chapter.

Background

In 1989, Sir Tim Berners-Lee invented the World Wide Web, which has significantly impacted online learning opportunities due to increased access to high-speed internet technology. Over the past decade, numerous studies have documented a rise in the number of students participating in online learning. Radford and Weko (2011) report that the percentage of undergraduates enrolled in at least one online course increased from 8% in 2000 to 20% in 2008. Furthermore, a study conducted by the EDUCAUSE Center for Analysis and Research (ECAR) in 2013 found that more than 80% of higher education institutions reported high growth in e-learning. Over half of the institutions

offered various courses online, while more than half provided entire programs online (Bischel, 2013).

E-learning, also known as electronic learning, refers to engaging in various activities through virtual learning platforms, enabling students and instructors to interact with each other and participate in audiovisual investigations on various topics (Amado-Salvatierra et al., 2016). Abdelraheem (2006) explains that e-learning is generally considered a tool that can enhance learning by incorporating real-world examples, promoting collaboration and cooperation with distant partners, emphasizing results over attendance, and encouraging reflection rather than mere reaction. The author further notes that through the facilitation of communication, the learning process becomes active, with all participants contributing their thoughts and ideas to the online forum discussion. When combined with collaborative knowledge construction, critical thinking empowers the learning process (Abdelraheem, 2006).

Mohammed et al. (2017) note that online learning offers several benefits, including increased flexibility for both learners and instructors, as well as improved interactions between them. They explain that online learning allows for the integration of various learning styles and technologies, leading to a greater understanding of course material and increased opportunities for discussions, which can enhance students' technological, writing, and interpersonal skills.

Previous research on e-learning indicates that students' readiness is an essential factor for success (Hukle, 2009; Ilgaz & Gülbahar, 2015; So & Swatman, 2006; Wang et al., 2009). E-readiness is defined as the level of development at which a student is ready to be enrolled in courses in an online learning environment (Alem et al., 2016, p. 214).

Conely et al. (2007) also add that a student's ELR or e-readiness measures their ability to succeed in online courses in a higher education system without having to take remedial courses. Education professionals and schools have suggested ensuring students' readiness before implementing the program (Wang et al., 2009). Generally, ELR refers to the ability to use electronic media effectively and efficiently for learning (Wang et al., 2009). Similarly, Kaur and Abbas (2004) define ELR as the capability to use electronic and multimedia resources to enhance learning. To implement e-learning effectively, it is imperative to measure the level of student readiness. Policymakers can use the level of students' readiness to determine the best strategy for implementing e-learning (Kaur & Abbas, 2004).

Statement of the Problem

Despite the growing number of students enrolling in online courses, many higher education institutions fail to consider student e-readiness when implementing online teaching strategies and technological innovations (Watkins et al., 2014; Pillay et al., 2007). However, students' e-readiness is crucial for successful online learning design and implementation (Hukle, 2009; Ilgaz & Gülbahar, 2015). In online learning, students must take a more proactive role in their education than in traditional learning modalities, where the teacher is a facilitator and resource person. Proactive learning is a student-centered pedagogical approach focusing on increasing student engagement, understanding, and content acquisition (Köpeczi-Bócz, 2020). This approach requires students to prepare for class, collect and analyze data using Information and Communication Technology (ICT) systems, and engage in higher levels of information processing during class based on their individual experiences (Köpeczi-Bócz, 2020).

When students are not adequately prepared or e-learning ready, they may encounter several challenges and problems with e-learning. One challenge is technical difficulties. Students who lack the necessary technical skills or access to appropriate technology may face difficulties in accessing and using e-learning platforms (Alzahrani & Sarker, 2021). For example, students who struggle with basic computer skills or who have difficulty navigating online resources may find it challenging to keep up with their coursework, which can negatively impact their academic performance and limit their opportunities for educational advancement. Additionally, students who face issues such as slow internet connectivity, incompatible devices, or insufficient software may also struggle to access and use e-learning platforms, which can further hinder their learning (Al-Khateeb, 2019).

Another challenge that students may face is time management. E-learning requires students to manage their time effectively and set aside dedicated study periods. Students who are not prepared for the time demands of online learning may struggle to balance their academic work with other responsibilities or activities (Zhu & Li, 2021).

Another challenge or problem students may encounter is related to communication and collaboration. E-learning often relies on effective communication and collaboration among students and instructors. Students unprepared for online communication and collaboration may struggle to engage with their peers or instructors and miss out on valuable learning opportunities (Ibrahim& Alshibly, 2021).

Additionally, students may experience a lack of motivation. Without sufficient motivation, students may struggle to engage with e-learning materials or complete online

assignments. A lack of interaction and feedback from instructors or peers may also contribute to a lack of motivation and engagement (Cavanagh et al., 2021).

Finally, limited access to resources may impact students. Students who lack access to resources such as textbooks, online journals, or learning materials may struggle to keep up with the pace of e-learning courses or assignments (Al-Ajlan & Al-Sharhan, 2021; Alemayehu & Fenta, 2020). These challenges can significantly impact students' e-learning experiences and may lead to lower levels of academic achievement or satisfaction with the learning process.

There is a significant technological gap between developed and developing countries, which contributes to the inequalities in distance education opportunities (Lorente et al., 2020). E-learning is already a challenge to universities and students in developing countries (Sife et al., 2007). Some universities in developing countries do not have the e-learning presence or infrastructure available (Biswas & Debnath, 2020) such as access to high-speed internet, sufficient bandwidth, and reliable hardware and software (Tella & Akande, 2017) when compared to developed countries with well-established infrastructures to support online learning (Sife et al., 2007). Many learners in developing countries lack basic digital literacy skills, such as the ability to use computers, navigate the internet, and use digital tools and resources. This can make it challenging for them to engage effectively in e-learning (Moser-Mercer & Steiner, 2013). Furthermore, e-learning content is often developed in English or other major languages, which can pose a barrier for learners who are not proficient in these languages. Cultural differences and norms can also impact the effectiveness of e-learning programs in developing countries (Andoh, 2012). Several Arab countries have been among the poorest in the world

(Abdelraheem 2006), suffering from outrageous wars resulting from political instability, which has resulted in poor infrastructure, such as inadequate electricity (El Turk & Cherney 2016). Financial challenges are also identified as obstacles to implementing e-learning in developing countries. According to Nasser and AbuChedid (2010), the high cost of training and technology investments contributes to the shortage of qualified staff to guide piloting and running online courses. For example, there are several Arab countries with low Growth Domestic Products (GDPs), which create limitations to investing in e-learning platforms and systems that can be quite costly. Thus, the lack of funds represents a significant barrier to the integration of the necessary technology (Abouchedid & Eid, 2004; Nasser & AbuChedid, 2010; Tarhini et al., 2013).

Furthermore, financial challenges affect students in developing countries who struggle to afford to purchase internet services and/or computer devices (Biswas & Debnath, 2020). There is also a general lack of confidence among academicians regarding the feasibility of implementing e-learning (Nasser and Chedid, 2010). Some developing countries in the Middle East and North Africa region (MENA) do not officially recognize distance learning due to the absence of a quality assurance agency and the abundance of higher education institutions relative to a small country with such a small geographical area (El Amine, 2016). Households located in some underdeveloped countries of Asia and Africa, which have a lower level of economic development and a larger population, have a lower percentage of distance learners than those from Europe or North America (Li et al., 2022).

There is value in mastering the e-learning service to accommodate many students unfamiliar with online classes in developing countries (OECD, 2020). Institutions

interested in implementing e-learning originate from a wide range of cultures and countries, all of which have different resources, capabilities, and perspectives on meeting their e-learning needs (Kaur & Zoraini, 2004). It is necessary for institutions to assess their current situation and measure their students' readiness to implement e-learning (Clark & Mayer, 2011). E-learning can be costly when it is not adopted correctly, and e-learning products may not be attractive, resulting in failure (Clark & Mayer, 2011).

Therefore, it is essential to study e-readiness and determine the factors that contribute to the successful implementation of e-learning in the best possible way (Hukle, 2009; Ilgaz & Gülbahar, 2015; Stansfield et al., 2004). E-readiness needs to be assessed and measured before implementing e-learning (So & Swatman, 2006). This assessment and measurement would help design effectively and implement suitable e-learning strategies and communication technology skills (Kaur & Abas, 2004). It is essential for students to possess specific technical and educational skills to successfully complete their online courses (Pillay et al., 2007). In addition to the technical aspects of online learning, Kuo et al. (2013) note that the psychological aspects are as important as the technological ones.

The literature on ELR in developing countries shows two levels of analysis. Prior studies have examined e-readiness in developing countries at the organizational level (i.e., teachers, faculty, administrators, etc.) and student level. Studies that examined ELR at the student level in developing countries identify several factors affecting students' performance and/or satisfaction. Factors include financial, motivation, self-direction, self-competence, and perceived usefulness. However, to the best of my knowledge, there is no prior study that examines all the aforementioned five factors together in the ELR

literature in developing countries. According to Alem et al. (2016), these five factors together make the best tool to measure and predict students' ELR. Alem et al. (2016) study suggests that the ELR tool can accurately differentiate successful online learners from the rest with a success rate of 92%. This dissertation used five factors: financial, motivation, self-directed learning, self-competence, and perceived usefulness to study students' ELR in a developing country sample. This dissertation sought to fill the gap in the literature and provides a first time understanding of the five factors that affect students' e-readiness to use e-learning in developing countries. This problem is consistent with the research call made by Alem et al. (2016), who used the five factors in a developed country sample and called for future research to apply the five-factor e-readiness tool in other samples, such as the developing country sample.

Purpose of the Study

The dissertation aimed to investigate the level of ELR of students in developing countries, with a focus on five factors: financial, motivation, self-direction, self-competence, and perceived usefulness. The predictive power of these factors in determining students' ELR was analyzed to gain a better understanding of their impact on the students. The study also explored the relationships among self-competence, self-directed learning, motivation, financial, and usefulness and examined whether the impact was passive or reflective. Additionally, the research identified the most influential factor(s) that contribute to students' ELR in developing countries. The results informed the design, development, and delivery of quality e-learning courses to enhance student learning and meet the requirements for successful e-learning adoption in developing countries.

Significance of the Study

The significance of the student ELR study would be multifaceted. First, identifying the factors that impact the e-readiness of higher education students in a developing country would be of value in offering students a better distance learning environment and supporting student success. Understanding these factors could inform policy and decision-making at institutional and national levels, leading to the development of more effective strategies for the integration of e-learning in education systems and resource allocation (Alem et al., 2016; Watkins et al., 2014).

Second, the results could help institution management and instructors identify students' strengths and weaknesses in relation to e-learning. This, in turn, enables the development of more targeted interventions and resources that could improve students' readiness and enhance their learning experience. The multidimensional aspect of the ELR measure could assist practitioners in better understanding the aspects that contribute to students' readiness (Alem et al., 2016).

This dissertation would contribute to the body of theoretical knowledge and literature in understanding students' experiences of e-learning and the factors that affect their e-readiness in a developing country. Furthermore, it would support faculty, university administrations, governments, including departments or ministries of higher education, university students, and instructional designers in developing countries to improve the design, development, and delivery of quality e-learning courses by meeting the requirements that lead to successful e-learning adoption using the ELRCS instrument by Alem et al. (2016). Weak results would enable practitioners and administrators to offer prerequisite courses, orientation, or training courses to improve students' ELR.

Delimitations

According to Lunenburg and Irby (2008), delimitations refer to "self-imposed boundaries set by the researcher on the purpose and scope of the study" (p. 134). This dissertation focused on the e-readiness of higher education students in e-learning in a developing country. The current study was subject to factors that limited the scope of the investigation. First, the study was limited to Lebanon, a single developing nation. Another delimiting factor was that the study was limited to one university located in Beirut, Lebanon. Lastly, the study only included Lebanese students enrolled in at least one online course.

Assumptions

Assumptions refer to "postulates, premises, and propositions that are accepted as operational for purposes of the research" (Lunenburg & Irby, 2008, p. 135). Four assumptions guided this dissertation: (a) the tool used is accurate and reliable; (b) all protocols to collect the data are standardized; (c) participants understand the intent and the survey questions; (d) students provide honest answers.

Research Questions

The dissertation seeks to answer the following two research questions:

RQ1

What are the relationships among the factors of self-competence, self-directed learning, motivation, financial, and usefulness for higher education students in a developing country?

RQ2

Which factor or factors have the highest impact on e-readiness for higher education students in a developing country?

Definition of Terms

The definitions of research terms used for the purpose of this dissertation are provided as follows:

Online Learning

Learning that takes place in web-based environments.

Learner E-readiness

Learner e-readiness is defined as the level of development at which the student is ready to be enrolled in courses in an online learning environment (Alem et al., 2016).

E-learning

The most recent evolution of distance learning— is a learning situation where instructors and learners are separated by distance, time, or both (Raab et al., 2002).

Technology infrastructure

The availability and quality of technology resources, such as computers, internet connectivity, and software (Tella & Akande, 2017).

Digital Literacy

The ability to use digital tools and resources effectively is critical for ELR. Digital literacy includes skills such as information literacy, media literacy, and technology literacy (Alexander et al., 2016).

Self-Directed Learning

The self-directed learning factor is defined as a learning process in which learning is perceived as something that is planned (Alem et al., 2016).

Intrinsic Motivation

The intrinsic factor is the enjoyment that comes from learning or completing an activity on its own (Ryan & Deci, 2000).

Extrinsic Motivation

Refers to a behavior performed in order to receive a reward or escape punishment (Ryan & Deci, 2000).

Perceived Usefulness

Perceived usefulness is defined as the degree to which a person believes using a particular system would enhance his or her performance at work (Alem et al., 2016).

Computer Self-Efficacy

Predicts students' satisfaction and achievement levels in online learning (Lim, 2001).

Self-Competence

Self-competence is one of the keys to success in online learning, which refers to students' self-efficacy in the field of information and communication technologies (ICT) (Lim, 2001).

Self-Efficacy

Refers to “beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments” (Bandura, 1997).

Organization of the Study

This dissertation is divided into five chapters. Chapter 1 introduces the study and outlines the statement of the problem, research questions, purpose of the research, limitations, definitions of research terms, and organization of the study. Chapter 2 presents a comprehensive review of the literature on ELR and its components, including theoretical frameworks, definitions, and the working definition in this dissertation. Additionally, it examines the benefits of e-learning, learners' characteristics, challenges of e-learning, e-learning measuring tools, and ELR factors in the literature. Chapter 3 describes the methodology employed in this study, including research questions, hypotheses, research design, participants, instruments used for data collection, data collection procedures, and data analysis. Chapter 4 presents the research results for the quantitative data collected in relation to the research questions and hypotheses, including the results of the correlation and confirmatory factor analysis. Finally, chapter 5 discusses the study's results, limitations, recommendations for future research, conclusions, and implications.

Chapter 2

Review of the Literature

This chapter presents a comprehensive review of the existing research literature on ELR and its constituent components. It encompasses a wide range of definitions, including the working definition in this dissertation, and discusses the theoretical framework underpinning the ELR concept. The chapter also includes a detailed analysis of the various e-learning measuring tools available in the literature and examines the factors contributing to students' ELR.

E-learning Definition & Research

The term e-learning refers to an evolution of distance learning in which instructors and students are separated by distance, time, or both (Raab et al., 2002). The term e-learning includes expressions such as virtual, online, distance, and web-based learning (Panda & Mishra, 2007). According to Cidral et al. (2018), it is a web-based learning ecosystem that facilitates the dissemination of knowledge, information, and communications for education and training. As part of e-learning, learners receive both synchronous and asynchronous instructions via technology (Colvin & Mayor, 2008). The instructions are delivered via a digital device, such as a computer or mobile phone, to facilitate learning (Clark & Mayor, 2016). It is important to note that there are several forms of e-learning, depending on how the student interacts with the teacher. Several forms of e-learning are fully online and asynchronous, meaning the student does not need to interact with the teacher in real-time (Roskvist et al., 2020). This type of instruction offers advantages such as flexibility in timing, the ability to accommodate busy schedules, and an improvement in students' cognitive abilities (Mohammed et al., 2017).

Learning can be delivered in several ways, such as self-paced (SCORM), audio/video, e-mail, discussion forums, wikis, blogs, webcasts, web conferencing, computer-based learning, simulations, and games (Soni, 2015). One of the drawbacks of asynchronous e-learning is the limited opportunity for interaction and communication, which may lead learners to feel isolated (Mohammed et al., 2017).

Conversely, synchronous e-learning methods, such as video/audio conferencing, texting or chat, instant messaging (IM), live webcasting, application sharing, whiteboards, and virtual classrooms, enable real-time interactions between teachers and students (Soni, 2015). This promotes effective communication and knowledge sharing between instructors and learners. Synchronous e-learning also provides an opportunity for immediate feedback and the development of social skills through peer interactions. While synchronous e-learning provides opportunities for real-time interactions, it lacks flexibility in terms of managing one's time (Mohammed et al., 2017).

Blended learning, which combines face-to-face, asynchronous, and synchronous learning, offers a more comprehensive and flexible learning experience that caters to the diverse needs of learners (Dziuban et al., 2018). By integrating various learning methods, blended learning can provide learners with personalized attention and guidance from teachers while still allowing them to learn at their own pace and on their own time. This approach to learning enables learners to engage with course materials in various ways, fostering a more holistic and interactive learning experience (Mohammed et al., 2017).

Benefits of E-learning

E-learning in education has brought many benefits to education institutions (Bouhnik & Marcus, 2006; Chen, 2007; Liaw, 2008; Liaw, Huang, Mehanna, 2004;

Marcus, 2014; Raab et al., 2002; Saekow & Samson, 2011; Shotsberger, 2000). There are several studies that indicate that e-learning has helped students improve their self-evaluation abilities, that multimedia use enhances their thinking skills, and that it may be beneficial to students in rural areas who are low performers (Kwangmuang et al., 2021; McDonald et al., 2018; Panyajamorn et al., 2018).

Bouhnik and Marcus (2006) conducted a survey to explore the advantages of online learning as reported by students. The survey revealed that online learners identified multiple benefits of online learning, which included increased flexibility in terms of access to course materials and study time. Additionally, online learning was found to be more accessible, and students reported that it provided enhanced visualization of multimedia. The study found that flexibility is the most important aspect of e-learning that appeals to learners (Bouhnik & Marcus, 2006; Schoech, 2000). The flexibility of distance-learning courses enables students to take courses at a time that is convenient to their schedules (Kember, Lai, & Murphy, 1994). It facilitates the completion of academic transactions (reading chapter materials, submitting homework assignments, quizzes, and exams, recording presentations, etc.) around the clock at the convenience of students (Marcus, 2014). This advantage is attractive to adult learners due to its ability to accommodate work schedules and allow flexibility to deal with family responsibilities (Kember, Lai, & Murphy, 1994).

According to a study by Allen and Seaman (2017), 86% of students reported that online courses offered flexibility in terms of when they could complete coursework. Moreover, the flexibility of the online environment has made it possible for scholars to assess the satisfaction of students with online educational programs (Shelton, 2010). E-

learning platforms often provide opportunities for students to interact with one another and their instructors through online discussion forums, live chats, and video conferencing. This can lead to increased engagement and collaboration (Garrison & Kanuka, 2004). According to Chen et al. (2010), online learning environments constitute a dynamic learning environment that promotes student engagement, which is another benefit of online learning, allowing students and professors from other universities or countries to collaborate. The authors noted that students should be encouraged to interact with faculty and with other students, engage in active learning, receive prompt feedback, spend a considerable amount of time on tasks, and have high expectations. In addition, the authors explained that the use of communication and information technology alone would not guarantee the success of students. Educators must instead use technology as a tool to enhance social interaction. It has been found that the use of web-based learning technology and student engagement are positively related to learning outcomes (Chen et al., 2010).

E-learning also gives students the opportunity to express their thoughts and opinions and to ask questions (Marcus, 2014). E-learning also facilitates self-learning and the development of independent ideas by providing students with access to and availability of online courses and related materials, which they can explore at their discretion. This allows students to utilize the newly acquired knowledge in conjunction with their employment tasks (Bouhnik & Marcus, 2006). Improved self-paced learning is another benefit of e-learning. E-learning can enable students to take control of their learning and move at a pace that suits their individual needs (Means et al., 2010). This can lead to better outcomes as students are able to spend more time on topics that they

find challenging and less time on topics they already understand (Means et al., 2010). On the other hand, e-learning can be more cost-effective than traditional classroom-based learning as it eliminates the need for expenses such as commuting, textbooks, and housing. According to a report by Babson Survey Group (2019), 35% of college students reported that the cost of online courses was lower than traditional classroom-based courses. Another benefit of e-learning is the increased access to education. E-learning can help students in developing countries who may not have access to traditional classroom-based learning due to geographic or economic barriers. This can provide more equitable access to education for individuals who may not otherwise have had the opportunity to pursue higher education (Kanwar, 2017).

Finally, Liaw (2008) reported that perceived self-efficacy significantly impacts learners' satisfaction with online learning systems. The perceived usefulness of learning, as well as the perceived satisfaction of learning, positively influence learning intentions. These studies suggest that e-learning effectiveness can also be affected by the quality of the e-learning system, multimedia instruction, and interactive learning activities.

E-learning Challenges

It has been noted that some students may encounter challenges adapting to the online learning environment as they are required to take full responsibility for their own learning while simultaneously feeling hesitant to abandon traditional face-to-face instruction (Vaughan, 2007). To ensure success, it is recommended that students are involved in the decision-making process of the learning experience (Chang & Smith, 2008). Previous research has indicated that students' ELR is a predictor of their

satisfaction with online courses, which is likely to result in successful program completion (Boehlje et al., 2002).

Despite universities endorsing distance learning platforms, insufficient considerations are given to student and technical prerequisites necessary to enable success and satisfaction in educational institutions (Pillay et al., 2007). To benefit from online courses via distance learning, students need to possess specific technical and educational skills (Pillay et al., 2007). Therefore, when learner readiness is considered in technology-driven classrooms, the challenges posed by e-learning are better understood and addressed.

Researchers have identified challenges associated with online learning, including a lack of access to technology, access to reliable internet, sufficient resources to support e-learning, digital literacy skills, and language barriers (Balakrishnan & Balakrishnan, 2017; Kafyulilo & Fisser, 2017; Kizito & Tindyebwa, 2017; Mtebe & Raisamo, 2014). In developing countries, many students do not have access to the necessary technology to engage in e-learning, such as computers, smartphones, or tablets, making it challenging for them to complete coursework or access online resources (Kizito & Tindyebwa, 2017). Furthermore, limited access to reliable internet due to a lack of infrastructure or high costs associated with internet access in some areas may prevent students from participating in online classes or accessing course materials (Aboderin, 2015; Embi, 2011). In addition, power outages or insufficient bandwidth in some areas may limit the implementation of e-learning programs (Aboderin, 2015; Embi, 2011). Moreover, some students may not have the digital literacy skills needed to navigate e-learning platforms effectively due to a lack of prior exposure to technology or insufficient training and

support (Kafyulilo & Fisser, 2017). The language barrier is another challenge that students face, as e-learning materials may not be available in their native language, making it difficult for them to understand course content or fully participate in online discussions (Mtebe & Raisamo, 2014). Finally, e-learning programs may not be designed to support the specific needs of students in developing countries, and students may not have access to necessary support services, such as tutoring or counseling, to help them succeed in an e-learning environment (Balakrishnan & Balakrishnan, 2017).

On the other hand, a significant challenge for instructors in technology-enhanced learning is accommodating the diverse preferences of students, which should be acknowledged and considered when designing content (Sherina et al., 2016). Furthermore, in a distance education environment, interaction between instructors and students, students and their peers, and students and course content are crucial for effective learning (Zhao & Tan, 2005). Although e-learning has become increasingly popular over the past few years, many professionals remain concerned about whether students are prepared for such an environment (Rotas & Cahapay, 2021).

Distance Learners' Characteristics

Learner characteristics are important factors to consider in ELR studies, as they can greatly impact the success of e-learning and students' decision to enroll. Yukselturk and Bulut (2007) identified several learner characteristics examined in ELR studies, such as age, gender, prior knowledge, motivation, self-efficacy, learning styles, and preferences.

Distance education has provided access to a population that typically would not enroll in traditional face-to-face programs, including older students who work full-time

while attending school, students in rural areas, active military personnel, and disabled students (Bacow et al., 2012). Lin (2011) found that older students who had more experience with computers and the Internet were more likely to be ready for e-learning. Roca et al. (2006) found that female students were more likely to be ready for e-learning than male students, as they had higher levels of perceived usefulness and ease of use of e-learning technologies.

Successful online learners possess interpersonal and communication skills and are proficient in using online learning technologies. Gheisari and Rajaee (2016) found that students with higher levels of self-efficacy were more likely to be ready for e-learning as they had greater confidence in their ability to learn using online tools and resources. Students who value interaction and collaborative learning and exhibit an independent learning style are also more likely to be successful in e-learning (Boyer, 2014; Hung et al., 2010). Zhang et al. (2015) found that students who preferred visual learning were more likely to be ready for e-learning, as they found it easier to understand and process information presented in visual formats. Additionally, students who were more motivated to learn were more likely to be ready for e-learning, as they were more engaged and willing to participate in online discussions and activities (Teo & Noyes, 2011).

E-readiness Definition

This dissertation uses the term e-readiness to refer to ELR. The concept of e-readiness has been defined in various ways in the literature. For this study, the definition of e-readiness provided by Alem et al. (2016) was adopted, which defines e-readiness as the level of development at which a student is prepared to enroll in online courses. E-readiness is characterized by the possession of specific skills and characteristics, which

serve as prerequisites for online course enrollment. Additionally, e-readiness can be seen as the ability of students to effectively apply their technological competencies in an electronic learning environment (Akaslan & Law, 2011). Conley et al. (2007) also conceptualized e-readiness as the capability of students to succeed in online courses without the need for remedial courses. Given the specific skills and orientations required to successfully engage in e-learning environments, student readiness is a crucial factor in e-learning (Stansfield, McLellan, & Connolly, 2004). Zeithaml et al. (2002) suggest that e-readiness also encompasses individuals' level of readiness to adopt technologies. It is important to consider several factors, such as instructor awareness, user knowledge, and attitudes toward technology adoption, to make educational technology effective (Msila, 2015).

Assessing students' readiness through reliable tools is essential to predict success in e-learning (Alem et al., 2016; Watkins et al., 2014). Studies have also shown that evaluating students' readiness can predict their satisfaction with online courses (Boehlje et al., 2002). However, existing research has mainly emphasized pedagogical and technological aspects of e-learning while overlooking the importance of user readiness. Hence, evaluating students' readiness is critical in boosting the success of e-learning.

E-learning Readiness Challenges

Distance education leaders have continued to express interest in issues related to students' readiness to learn online and their satisfaction with e-learning courses (Adkins et al., 2011). Several studies have identified challenges related to ELR. For instance, investigations during the COVID-19 pandemic have shown that the shift from in-person to virtual training resulted in decreased student performance (Jjod, 2020). Another study

conducted in Saudi Arabia during the pandemic demonstrated that virtual learning may not always be effective or appealing (Al-Nofaie, 2020). Aguilera-Hermida (2020) found that students preferred in-person to virtual training and believed there was a lack of support resources during the transition to e-learning.

E-learning Readiness Factors and E-readiness Measuring Tools: Overview of Prior Research

This section of the literature review provides an overview of research on ELR measuring tools and the factors that influence e-readiness. Online learning poses challenges for both educators and students, and meeting specific conditions is crucial for success. Research has shown that a student's readiness for e-learning is a significant determinant of their success in this mode of learning. Many studies have evaluated ELR among higher education students (Chung et al., 2020; Dray et al., 2011; Hasani et al., 2020; Hung et al., 2010; Linjawi & Alfadda, 2018; Neupane et al., 2020), and the results demonstrate the importance of students' readiness for the success of their online learning efforts. To prepare for e-learning, students need to have technical skills and a positive attitude towards the process. This helps them achieve their learning goals and expectations (Händel et al., 2020). Thus, it is critical to measure a student's readiness before implementing e-learning (So & Swatman, 2006). Doing so can help develop and implement effective e-learning strategies and communication skills (Kaur & Abas, 2004), thereby increasing the likelihood of success. In summary, *measuring a student's ELR is essential for effective e-learning, and it can improve the design and implementation of e-learning strategies* (Kaur & Abas, 2004).

E-readiness Assessment Tools and Factors.

Several researchers have developed scales to measure students' readiness for e-learning (Adu and Owusu-Manu, 2018; Alem et al., 2016; Anwar et al., 2016; Castellano-Reyes, 2020; Doculan, 2016; Hung et al., 2010; Khandaker et al., 2018; Oliver, 2011; Paraskevas & Papadopoulou, 2005; Tubaishat & Ansari, 2011; Yu, 2014). For instance, Hung et al. (2010) created the Online Learning Readiness Scale (OLRS) to measure five components of online learning readiness, including self-directed learning, learner control, motivation, computer/internet self-efficacy, and online communication self-efficacy, among Taiwanese students. Teachers should pay attention to these dimensions when conducting online learning (Hung et al., 2010), as students who are prepared for online learning tend to have better outcomes (Hung et al., 2010). Therefore, instructors must take students' readiness into account to ensure that e-learning is effective (Churiyah et al., 2020). Oliver (2001) suggested that assessing e-readiness involves four dimensions: teaching skills, technology access, technology literacy (a combination of technical, social, and cultural skills), and self-learning. It is essential to consider students' ability to learn via the Internet before implementing e-learning (Oliver, 2001).

Similarly, Tubaishat and Ansari (2011) developed a model to measure the ELR of students in the Gulf region. The model considers six dimensions, including infrastructure availability, internet use, computer skills, confidence development, preferred means of communication, and students' perceptions of e-learning. Similarly, Yu (2014) developed the Student Online Learning Readiness instrument (SOLR), which measures online learning readiness across four main areas: social competency with the instructor, communication competency, social competency with classmates, and technical

competency. Academic achievement was found to be positively correlated with these four factors.

Doe et al. (2017) used the revised and improved Online Learning Readiness instrument to measure the readiness of students taking beginner courses in Psychology at different universities in the Southeastern United States. This instrument includes Information Communication and Technology (ICT) engagement and the intention of students to enroll in online courses, making it useful in assessing students' interest in taking distance education courses or enrolling in a distance education program. Castellano-Reyes (2020) highlighted the importance of social presence in online learning environments through the emphasis on social competencies, which is unique to the Community of Inquiry (CoI) Framework. Additionally, Hasani et al. (2020) identified five significant factors that impact student readiness to adopt distance learning during the COVID-19 pandemic, including self-competence, comfort level with e-learning, ability to avoid uncertainty, financial ability, and technology availability. However, their statistical analysis found that motivation and self-directed learning skills did not significantly influence students' readiness.

Several e-readiness assessment tools have been developed to evaluate and measure students' readiness for e-learning. For example, Paraskevas and Papadopoulou (2005) developed the Technology Readiness Index (TRI) to measure an individual's readiness to use technology for learning. Ho and Ip (2014) developed the e-learning readiness assessment (ELRA) model, which measures students' technological readiness, self-directed learning, and motivation. Adu and Owusu-Manu (2018) developed the e-learning readiness evaluation (ERE) tool, which measures students' access to technology,

technological competence, and attitudes toward e-learning. Anwar et al. (2016) developed the e-learning readiness assessment (ERA) questionnaire, which measures students' self-efficacy, technology anxiety, and motivation. Finally, Khandaker et al. (2018) developed the e-learning readiness assessment framework (ERAF), which assesses students' readiness for e-learning by measuring their computer literacy, internet literacy, and attitudes toward e-learning.

As an additional component, the existing instruments may contain multidimensional measurement scales that measure the following characteristics (Searle & Waugh, 2013):

a) self-directed learning,

b) motivation for online learning,

c) attitudes toward online learning,

d) computer/Internet self-efficacy,

e) technical skills,

f) learner control, and

g) communication.

It has been demonstrated that several characteristics of online students, such as motivation, attitude, confidence, independence, and communication, significantly impact their participation, interaction, and satisfaction (Searle & Waugh, 2013). In a study by Shih and Gamon (2001), students preferred web-based instruction due to its convenience and their ability to control the pace of learning. This finding is supported by other studies in the literature (Magda & Smalec, 2020; Miller & Miller, 2008; Noel-Levitz Inc., 2006).

Several studies investigated the relationship between e-learner attitudes and e-readiness (Liaw et al., 2007; Ngampornchai & Adams, 2016) and found that skills and attitudes are significant predictors of e-readiness (Kurniabudi et al., 2015). A lack of understanding and experience with online education can result in a lack of information, leading to a decreased acceptance of online education (Ngampornchai & Adams, 2016). Therefore, students' acceptance of e-learning is positively related to their ability to self-regulate (Ngampornchai & Adams, 2016). Self-regulation, originally coined by Zimmerman (1990), refers to students' participation in self-motivation and the use of appropriate strategies to achieve self-determined goals and is a critical success factor for online students (Oliver, 2014).

Recent research by Yavuzalp & Bahcivan (2021) investigated the relationship between e-readiness and self-regulation skills, satisfaction, and academic achievement among university students taking campus-based courses through distance learning and finds that university students' e-readiness has an effect on their self-regulation skills, satisfaction with their academic experience, and academic achievement. Additionally, computer self-efficacy is another important factor of ELR that predicts students' satisfaction and achievement levels in online learning (Lim, 2001). Computer and internet self-efficacy have been found to improve problem-solving performance in online learning and online system management, leading to increased satisfaction and achievement (Eastin & LaRose, 2000). Furthermore, students with higher internet self-efficacy levels tend to learn better in web-based learning tasks compared to students with lower levels (Tsai & Tsai, 2003). Self-efficacy has also been identified as the strongest and most significant predictor of e-readiness (Alqurashi, 2017; Gunawardena et al.,

2010). As such, completing online requirements requires a certain level of e-readiness in self-efficacy, self-directed learning, time management, and interpersonal skills (Abdelraheem, 2006; Yilmaz, 2016).

Comfort with technology is another critical factor that influences online learning, and several survey instruments have been developed to measure online readiness, including comfort with technology (Alem et al., 2016; Cabi & Kalelioglu, 2019; Doe et al., 2017; Hong & Kim, 2018; Hung et al., 2010; Pillay et al., 2007; Yu, 2018; Zabadi & Al-Alawi, 2016). These online self-assessment tools provide immediate feedback on students' potential success in an online learning environment and predict whether they are ready to take online courses.

Alem et al. (2014) conducted a systematic review of tools available for assessing students' readiness for online learning and found that only 10 readiness tools were identified during the 20-year period from 1990 to 2010. Although 31 constructs were examined in the 10 instruments, the highest number of similarities was seven, demonstrating the differences in focus among the studies during this period. Additionally, universities generally develop their own instruments when investigating student readiness rather than using preexisting ones. Alem et al. (2016) developed the ELR questionnaire based on Social Cognitive Theory and Transactional Distance Theory, consisting of 17 items factored into five dimensions: self-competence, self-directed learning, motivation, financial assistance, and perceived usefulness. The ELR is a valid and reliable instrument and can be used to assess students taking online courses, taking into consideration two new dimensions (financial assistance and perceived usefulness) not considered in prior instruments.

This dissertation adopted the framework and instrument of ELR developed by Alem et al. (2016), which was found to be relevant and yields intriguing findings in early studies using the framework. The five dimensions of the ELR are self-competence, self-directed learning, motivation, financial assistance, and perceived usefulness. According to Alem et al. (2016), these five factors together make the best tool to measure and predict students' ELR. These five factors have predictive power to correctly classify 92.2 % of students (Alem et al., 2016).

Theoretical Framework

This section highlights the theoretical foundation of this dissertation, which is Social Cognitive Theory (Bandura, 1986). This dissertation uses Social Cognitive Theory to differentiate the three factors from the five factors relating to e-readiness, namely self-competence, self-directed learning, and motivation. Moreover, this dissertation uses the results of previous empirical studies to further explain the other two factors that are related to e-readiness, financial assistance, and perceived usefulness. To investigate the phenomenon under study, to build on data analysis, and to generate findings, the ELR model (Alem et al., 2016) was chosen as the foundational instrument.

Social Cognitive Theory

Social Cognitive Theory was developed by Bandura earlier in the 1960s and is now widely applied in various disciplines, including education, psychology, and telecommunications (Bandura, 1986). The theory describes how people acquire knowledge vicariously from observing others through social interactions and experiences (Bandura, 1986). Although originally developed to explain in-person behavior imitation, the theory's principles can be applied to e-learning technologies, such as videos, audio,

and other streaming software, that recreate experiences by allowing real-time presentations by faculty and tutors.

This dissertation investigates factors related to e-readiness among higher education students in a developing country. Social Cognitive Theory suggests that successful students display high levels of self-regulation, self-direction, and motivation, apply effective independent learning strategies, and respond to situations effectively (Pintrich, 2002). The theory proposes that learning is promoted through the interaction between three primary factors: personal, behavioral, and environmental, which all contribute to self-regulation (Alem et al., 2016). Zimmerman (1990) defined self-regulation as "students' active involvement in self-motivation and the use of appropriate learning strategies to pursue self-established goals." Self-regulated learners are motivated, employ effective learning strategies, and adapt well to their external environment (Pintrich, 2002). The theory emphasizes the importance of learners' psychological, technical, and attitudinal preparation for online learning activities to maintain motivation and ensure success. The following is an explanation of the three factors, including self-competence, self-directed learning, and motivation relating to e-readiness using the social cognitive theory.

Self-Competence. It has been noted in many literature sources that self-competence is an important factor for students' e-readiness (Abdelraheem, 2006; Alem et al., 2016; Erlich et al., 2005; Muse, 2003). Self-competence refers to a student's ability to use computer tools and apply technological skills in various technical environments (Erlich et al., 2005; Muse, 2003). Self-competence is a critical factor in online learning success, referring to students' self-efficacy in the field of information and communication

technologies (ICT) (Lim, 2001). Self-efficacy refers to "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). Students who are more confident in using ICT are more likely to be prepared to participate in online learning (Chung et al., 2020). Taipjutorus (2014) added that online learning self-efficacy is "One's beliefs in their own capabilities to succeed in online learning environments." Self-efficacy also refers to students' self-competence in online learning.

Self-competence is a potent factor in the success of e-learning, with students, professors, and technology playing critical roles (Alem et al., 2016; Chyung, 2007). Chyung (2007) finds that self-competence is the most significant predictor of learners' success in online learning. Thus, it is essential to have technical skills before taking any online course. When students lack a fundamental understanding of computer tools and experience anxiety about technology, it can result in psychological barriers to accepting online learning (El Turk, 2016). Tavakol and Abu Talib (2015) found that self-competency is a significant predictor of student readiness for e-learning, with students who had higher levels of self-competency being more likely to manage their time effectively, set goals, and take responsibility for their learning. Additionally, computer self-efficacy, a sub-factor of readiness for e-learning, predicts satisfaction in web-based distance learning courses (Lim, 2001).

Self-competency is also positively associated with student satisfaction and perceived learning outcomes in blended learning environments (Al-Fraihat et al., 2020). Thus, instructors should provide opportunities for students to develop their self-competency, such as by offering online tutorials and self-paced learning modules. Self-

assessment and self-reflection activities can also help students improve their self-competency (Nafukho et al., 2015).

Previous studies have examined the effects of distance education on self-efficacy, with students demonstrating higher levels of self-efficacy performing better on examinations (Chang et al., 2014). Faculties should adopt e-learning as early adopters and provide students with a user-friendly and effective e-learning platform that is easy to use and designed to provide effective instruction. Clear instructions for both students and instructors and providing students with necessary resources, such as an internet connection, can help students succeed in distance learning (Hasani et al., 2020).

Self-competency is also positively associated with student performance in virtual learning environments (García-Peñalvo et al., 2017). Therefore, instructors should provide personalized feedback and support and encourage self-directed learning to help students develop their self-competency.

In conclusion, self-competency is an essential factor in student ELR, and it can influence student engagement, satisfaction, and performance in online and blended learning environments. Instructors and institutions should prioritize the development of self-competency support in their e-learning programs to help students become more effective self-directed learners.

Self-Directed Learning. Self-directed learning is a critical factor in student readiness for e-learning, as it has been associated with positive learning outcomes. Alem et al. (2016) define self-directed learning as a planned learning process. Therefore, students need to take responsibility for their academic progress to ensure online learning is effective (Hao, 2016; Moore & Kearsley, 2005). Successful completion of online

courses requires self-directed learning, self-efficacy, time management, and interpersonal skills (Grabau 2015; Yilmaz 2016). According to Carver and Kellough (2019), self-directed learning is a critical factor for success in online learning environments. Students who possess self-directed learning skills have a higher level of course completion and satisfaction. Piskurich (2003) identified skills such as the ability to work alone, perseverance, reading ability, computer competency, word-processing skills, and the ability to develop a plan for completing work as important for self-directed learners. As a theoretical framework, self-directed learning (SDL) is used to analyze students' success in online learning (Lynch & Dembo, 2004). Hofstede's cultural dimensions (2001) show that students with long-term goal orientation, collectivist attitudes, and high-power orientations are more likely to embrace technology for SDL outside the classroom (Lai et al., 2016). Self-directed learning is positively associated with academic achievement in e-learning courses (Akhlaq et al., 2020). Khojah and Khamis (2019) found that self-directed learning is positively associated with student satisfaction and academic achievement in an online learning environment. In a study by Bahmani and Barzegar (2019), self-directed learning is positively associated with student engagement and academic achievement in a blended learning environment. The authors suggest that instructors should use strategies that promote self-directed learning, such as providing opportunities for students to set their own learning goals and assess their progress.

Lee, Yeung, and Ip (2016) characterized self-directed learning by three key constructs, including self-management, desire for learning, and self-control, as well as personal factors such as age, gender, language learning anxiety, and language learning style in a university environment. Self-regulation in online learning is characterized by

individuals' responsibility for their own learning, their control of their own learning processes, their ability to adjust their learning processes as needed, and their ability to motivate themselves (Hung et al., 2010; Zimmerman, 2011). SDL focuses on metacognition, cognitive strategy, and social strategy, which are all related to autonomous learning (Garrison, 1997). Students who develop metacognitive strategies such as planning, being organized, and being motivated can take control of their learning processes (Yukselturk & Bulut, 2007). Knowles (1975) suggested that SDL involves processes that enable learners to identify what they need to learn, formulate strategies, set goals, and evaluate their outcomes. Self-directed learning and student control play an essential role in assessing online readiness (Hung et al., 2010).

Overall, these studies suggest that self-directed learning is an important factor in student e-readiness, and it can lead to positive outcomes in e-learning. Instructors and institutions should focus on promoting self-directed learning skills to help students succeed in online learning environments.

Motivation. The motivation of students is an essential factor that impacts their learning process (Bolliger, Supanakorn, & Boggs, 2010; Ryan & Deci, 2000). Pintrich and Schunk (1996) defined motivation for learning as emphasizing *why* learners choose to learn. Motivation has been cited frequently in the literature on distance education (Bates, 1995; Holmberg, 1995; Kearsley, 2000; Keegan, 1996; Schrum & Hong, 2002). Chen and Jang (2010) found that motivation is a significant predictor of student ELR, and So and Brush (2008) reported that motivation is a key factor in student engagement in e-learning. Martin and Bolliger (2018) found that motivation is positively associated with student satisfaction and perceived learning outcomes in an online learning environment,

and Kuo et al. (2014) demonstrated that motivation is positively associated with academic achievement in an online learning environment. Alem et al. (2016) and Unsal (2012) showed that motivation also increases students' satisfaction in a virtual environment and is a critical element of e-readiness.

Motivation may be viewed through the lens of social cognitive theory as a process that initiates goal-oriented behavior. An individual's goal is what he or she is striving to achieve (Schunk & DiBenedetto, 2020). The literature suggests that motivation plays a significant role in influencing students' attitudes and learning behaviors. In psychology, two types of motivation are intrinsic and extrinsic. Intrinsic motivation refers to the enjoyment that comes from learning or completing an activity on its own, while extrinsic motivation refers to a behavior performed in order to receive a reward or escape punishment (Hung et al., 2010). Therefore, motivation toward e-learning is composed of learners' intrinsic and/or extrinsic orientations in relation to comprehension (Hung et al., 2010).

Motivation is essential for a learner to remember, understand, recall, apply, analyze, and synthesize information. It is the primary factor associated with student achievement, while self-efficacy is a factor that predicts student achievement. Self-efficacy derives from the concept of auto-evaluation, which refers to how an individual perceives the performance of a particular task (Bandura, 1998). The literature has previously examined the effects of motivation in an online learning environment. Miller and Miller (2005) report that the most reported motivators for enrolling in an online master's degree are intrinsic motivation and acquiring technical knowledge. In general, graduates from 1993 expressed a greater interest in enjoyment and learning, whereas

those from 2001 exhibited a greater interest in professional development (Miller & Miller, 2005).

Several motivation factors found in the literature for pursuing a distance education degree include employment goals, personal development benefits, current job requirements, pursuing a good career, enjoyment of learning new information, flexibility to complete the program, and the convenience of distance learning (Abramenka, 2015; Carroll et al., 2011; Noel-Levitz, 2006; Oguz et al., 2015; Pate & Miller, 2012; Roberts et al., 2005; Russell, 2013).

According to Cabi and Kalelioglu (2019), students will be motivated and satisfied in the distance education process if the interaction between teachers and students, the course content, and their readiness levels for online learning are considered. Shih and Gamon (2001) noted that motivation can have a significant impact on student achievement. The National Online Learners Priorities Report finds that convenience, work schedules, flexibility, and program requirements are the most important factors motivating students to enroll in online courses. (Noel-Levitz Inc., 2006). Magda and Smalec (2020) reported similar results, indicating that 91.3% of respondents cited flexibility as their top factor, followed by convenience and program length (Magda & Smalec, 2020).

These studies suggest that motivation is a key factor in student e-readiness and can lead to positive outcomes in e-learning. Also, motivation can influence student engagement, satisfaction, and performance in online and mobile learning environments. Instructors and institutions should prioritize the development of motivational support in their e-learning programs to help students succeed.

Financial Assistance. Financial resources are essential for the success of e-learning and for ensuring that students have access to technology and internet resources necessary for online learning (Alem et al., 2016; Morris et al., 2005). Financial readiness is one of the factors that institutions should evaluate before implementing e-learning, according to Chapnick's (2000) e-readiness assessment model. Hasani et al. (2020) found that both financial and technological factors positively impact students' perceived readiness for distance learning adoption. Financial constraints can be a significant barrier to e-learning participation in developing countries, such as Bangladesh (Rahman & Mishra, 2018) and Tanzania (Mtebe & Raphael, 2019), and can affect students' ability to afford internet connections and access computers. Institutions should provide affordable and reliable devices, internet connectivity, and financial assistance to students to ensure equitable access to e-learning opportunities (Adu et al., 2018; Alemu & Alemneh, 2018; Aziz et al., 2019). A study by Alemu and Alemneh (2018) found that students' access to devices and internet connectivity is a significant predictor of their intention to use e-learning systems in Ethiopian universities. The authors suggest that institutions should provide students with affordable and reliable devices and internet connectivity to increase e-learning participation and usage.

These findings suggest that financial support, incentives, and infrastructure are critical in addressing financial barriers to e-learning and improving students' access to online learning opportunities.

Perceived Usefulness. Perceived usefulness is a critical factor in students' behavioral intentions to enroll in any technology environment, including virtual classrooms and mobile learning (Iqbal & Bhatti, 2015; Iqbal, 2013). Perceived usefulness

refers to the extent to which individuals believe that using a particular system will enhance their performance at work (Alem et al., 2016). Al-Samarraie and Salloum (2019) found that perceived usefulness significantly predicts students' readiness for e-learning. Additionally, several studies have found a positive relationship between technology readiness, perceived usefulness, and ease of use (Erdogmus & Esen, 2011; Iqbal, 2013). The Technology Acceptance Model (TAM) proposed by Venkatesh et al. (2003) suggests that perceived usefulness is a crucial factor in determining users' acceptance and adoption of technology and has been extensively applied in the context of e-learning. For e-learning to be successful, students must feel comfortable with technology and the e-learning process (Tuntirojanawong, 2013).

Liu et al. (2020) found that perceived usefulness is positively associated with student satisfaction and perceived learning outcomes in a mobile learning environment. The authors suggest that instructors should design e-learning materials that meet students' learning needs and preferences and are perceived as useful. Gikas and Grant (2013) found that perceived usefulness was positively correlated with student motivation to participate in e-learning activities. They suggest that instructors should provide feedback and support to students and create opportunities for collaboration and interaction to enhance students' perception of e-learning as useful and motivating.

Jiang et al. (2020) found that perceived usefulness is positively associated with student engagement in an online learning environment. The authors suggest that instructors should provide clear and specific learning objectives and demonstrate how e-learning activities are related to these objectives to enhance students' perceived usefulness of e-learning. Similarly, Huang et al. (2018) found that perceived usefulness

was a significant predictor of student engagement in a Massive Open Online Course (MOOC). The authors suggest that instructors should provide clear and specific goals for learning activities and assignments and ensure that the content is relevant and useful to students to enhance engagement and learning outcomes.

Effective teaching strategies must be researched to improve e-learning, which should not only be technologically feasible but also effective in terms of student readiness (Tuntirojanawong, 2013). Alem et al. (2016) state that "e-learning is considered a technology that plays an important role in education."

These studies indicate that perceived usefulness is a critical factor in student ELR and can influence adoption, engagement, motivation, and learning outcomes in online and blended learning environments. Instructors and institutions must focus on designing e-learning systems and activities that are perceived as useful and relevant to students' learning needs and goals and provide support and feedback to enhance students' motivation and engagement.

In this dissertation, the ELR instrument developed by Alem et al. (2016) will be utilized to identify the most relevant e-readiness factor(s) among higher education students in developing countries. Alem et al.'s (2016) instrument was developed through a systematic review of the literature and theories of distance education, resulting in a reliable and valid measurement tool. The ELR instrument comprises 17 items organized into five dimensions: self-competence, self-directed learning, motivation, financial assistance, and perceived usefulness. Alem et al. (2016) demonstrate that the ELR instrument is a useful tool for assessing students taking online courses.

Summary

This chapter covered several significant topics, including the e-learning definition and research, the benefits of e-learning, e-learning challenges, distance learners' characteristics, e-readiness definition, ELR challenges, ELR factors, and e-readiness measuring tools, an overview of prior research, and the theoretical framework. The next section will discuss the methodology and research design in detail.

Chapter 3

Methods

This dissertation sought to uncover the factor(s) that affect students' e-readiness to use e-learning in a developing country. This chapter details the methods used to carry out the research. This chapter outlines the research design, selection of participants, measurement, data collection procedure, data analysis, and hypothesis testing, as well as limitations.

Research Design

This dissertation employed a quantitative research methodology, which is commonly referred to as the "deductive approach" or the "statistical approach." This approach involves creating a theory and hypothesis and then testing the hypothesis (Trochim, 2006). E-readiness, a crucial construct in today's digital age, has been extensively measured using a diverse range of dimensions and factors, including e-readiness surveys, verified benchmarking, statistics, and various analyses (Gay, 2016; Hashim & Tasir, 2014). In line with this, the current dissertation employed a quantitative method to investigate the effect of five factors on the e-readiness levels of core stakeholders, specifically "higher education students" in a developing country.

This quantitative dissertation utilized the e-learning readiness concept scale (ELRCS) developed by Alem et al. in 2016 to assess the ELR of higher education students in a developing country who are enrolled in at least one online course. Correlation analysis was employed to examine the relationships between the five key factors of self-competence, self-directed learning, motivation, financial, and perceived usefulness. Furthermore, confirmatory factor analysis was utilized to demonstrate the

relationship between e-readiness and the aforementioned factors and to identify the most influential factor(s) that impact e-readiness in higher education students in a developing country. The outcomes of this dissertation were expected to uncover the crucial factor(s) that contribute to ELR in the target population.

Selection of Participants

Lebanon is one of the developing countries in the Middle East and North Africa region (MENA). A convenience sampling method is used. According to Tarhini et al. (2013), most empirical research on e-readiness employs a convenience sampling technique, which enables the researcher to collect data from participants according to their availability. One university in Lebanon was selected for this dissertation. The target population for this study consists of graduate and undergraduate students currently enrolled in at least one online course or who have taken one within the past 12 months offered by one private university in Lebanon. The primary data was collected using a survey conducted among students in Lebanon who are over the age of 18.

Measurement

According to Isaac and Michael (1995), surveys are the most widely used technique in education and behavioral sciences for collecting data. Surveys provide a means of gathering information on a specified set of data, ranging from physical counts and frequencies to attitudes and opinions. A survey is considered an efficient and affordable data collection form (Khorana et al., 2008). For this dissertation, primary data was collected through an ELRCS survey developed by Alem et al. (2016). The researcher contacted the ELR authors and received approval to use the survey (see Appendix C). The ELRCS survey has been validated as a reliable instrument for measuring ELR among

students taking online courses, with a composite reliability coefficient (Jöreskog's rho) and Cronbach's alpha above 0.70 (Alem et al., 2016). The ELR tool is designed based on the Social Cognitive Theory and the Transactional Distance Theory, measuring the latent variable ELR through five factors, including self-competence, self-directed learning, motivation, financial, and perceived usefulness, with a total of 17 items with a five scale. Self-competence is the first factor, measured through three items. Self-directed learning is the second factor and is measured through five items. Motivation is the third factor measured through three items. Financial assistance is the fourth factor and is measured through three items. The fifth factor is perceived usefulness, which is measured through three items (see Appendix A). These five factors are measured using a 5-level interval scale, ranging from 1 (strongly disagree) to 5 (strongly agree), following Likert's (1932) psychometric response scale for obtaining participants' preferences or degree of agreement with a statement or set of statements (Bertram, 2006).

The survey was comprised of two parts: the first part includes general demographic variables such as age, gender, marital status, educational background, and nationality. The second part contains Alem et al.'s ELRCS questionnaire.

The ELRCS survey in this dissertation aimed to study the relationships among the five e-readiness factors for higher education students in a developing country who are already taking at least one online course and to determine which factor or factors are most likely to impact their e-readiness. This study enables higher education institutions to design a system based on the measurement results for successful implementation in developing countries.

Data Collection Procedure

After receiving approval from Baker University's Institutional Review Board (IRB) to conduct human subject research, the researcher contacted one private university in Lebanon. The researcher emailed the university in Lebanon. In order to obtain permission to send the survey to the students, the researcher was required to complete an IRB Protocol Exempt Application by the private university. Following approval from the private Lebanese university, a web-based survey was randomly distributed via email to students along with an introductory email introducing the research (see Appendix B). The survey was available to students for a period of two months. Attached to the survey was an introductory letter that explained the survey's goals and ensured that the participants' responses and their identities were confidential. Participation in the survey was voluntary. All participants were required to provide electronic consent prior to taking the survey. All participants were free to withdraw at any time. To ensure confidentiality, participants' data and responses were presented in statistical data summaries, with no identifying information used in the analysis. In order to protect the privacy of participants, the data collected for this study was not publicly available. The results were measurable and were analyzed using mathematical and statistical approaches.

Data Analysis and Hypothesis Testing

RQ1

What are the relationships among the factors of self-competence, self-directed learning, motivation, financial, and usefulness for higher education students in a developing country?

H1. There are relationships among the factors of self-competence, self-directed

learning, motivation, financial, and usefulness for higher education students in a developing country.

RQ2

Which factor or factors have the highest impact on e-readiness for higher education students in a developing country?

H2. One or more factors have an impact on e-readiness for higher education students in a developing country.

The data were analyzed using the AMOS and the SPSS Statistics GradPack 29 statistical package. Student demographics, including gender, marital status, age, and level of education, were presented. Descriptive statistics were gathered in relation to the demographic variables. Additionally, composite reliability (CR), convergent validity (AVE), and discriminant validity (MSV) were conducted to test the scale's internal reliability and validity.

Correlation analysis was used to solve Research Question 1, which sought to explore the relationships among the factors of self-competence, self-directed learning, motivation, financial, and usefulness for higher education students in a developing country. Correlation analysis involves calculating the correlation coefficient, which quantifies the strength and direction of the relationship between two variables. The correlation coefficient varies between -1 to +1, where a value of -1 signifies a perfect negative correlation, +1 denotes a perfect positive correlation, and 0 represents no correlation.

The direction of correlation indicates the nature of the relationship between variables. In a positive correlation, an increase in one variable is associated with a

corresponding increase in the other variable. In contrast, in a negative correlation, an increase in one variable is associated with a decrease in the other variable. The strength of the correlation represents the degree of association between variables. A strong correlation indicates a close relationship between the variables, where changes in one variable are highly predictive of changes in the other variable. A moderate correlation suggests a moderate degree of association, where changes in one variable can predict changes in the other variable to some extent. A weak correlation indicates little or no relationship between the variables, where changes in one variable are not predictive of changes in the other variable. A correlation coefficient of .10 is typically indicative of a weak or small association, while a correlation coefficient of .30 is deemed a moderate correlation. A correlation coefficient of .50 or greater is considered to represent a strong or large correlation (Cohen, 1988).

Confirmatory factor analysis was used to analyze Research Question 2, which aimed to identify which factor or factors had the highest impact on e-readiness. For research Question 2, the researcher measured the relationships of five factors on ELR. Confirmatory factor analysis (CFA) is a statistical method that is used to examine whether a pre-determined factor structure is suitable for a given set of data. CFA helps to determine the number and characteristics of underlying variables or factors that are responsible for the association among a group of observed variables. The primary objective of CFA is to evaluate the appropriateness of a specific theoretical model for a given set of data. The goodness of fit of the model is assessed using statistical measures that describe how closely the model represents the observed data. CFA is widely used in the assessment of the reliability and validity of various measures such as tests, surveys,

and rating scales (Brown, 2015, p.1). As the preferred method for assessing construct validity, CFA provides more information about the model fit (Bourque et al., 2006). In this research, the researcher used second-order Confirmatory Factor Analysis (CFA) to answer RQ2. A second-order Confirmatory Factor Analysis (CFA) in the context of structural equation modeling examines the hierarchical relationships between higher-order and lower-order latent factors. Lower-order factors directly relate to observable indicators, while the second-order factor represents a higher-level construct that explains these lower-order relationships. This technique is useful for understanding how a higher-order factor influences and explains the connections among lower-order factors with distinct but related attributes.

For evaluating the fit of the model, the researcher used the following indices such as the Comparative Fit Index (CFI), which measures the improvement in fit over the null model. A Comparative Fit Index (CFI) ranges between 0 to 1 and a score that is higher than or near .95 is regarded as indicative of a reasonably good fit (Hu & Bentler, 1999; Kline, 2015), while scores falling within the range of .90 to .949 are deemed acceptable (Brown, 2006); The Root Mean Square Error of Approximation (RMSEA), an index that measures the discrepancy between the hypothesized model and the observed data per degree of freedom. In general, a value of less than 0.05 indicates a good fit, while a value of less than 0.08 is acceptable (Kline, 2015), and values equal to or surpassing .10 are deemed unacceptable (Browne & Cudeck, 1992); The Tucker-Lewis Index (TLI) compares the fit of the hypothesized model with the fit of a null model (a model without correlations among the variables). A TLI value greater than 0.90 indicates a good fit (Kline, 2015). The Bentler-Bonett Normed Fit Index (NFI) evaluates the difference

between the chi-squared value of a proposed model and a null model, with a tendency for negative bias. Scores equal to or exceeding 0.95 are regarded as very good, those between 0.9 and 0.95 as good, between 0.8 and 0.9 as indicative of a suboptimal fit, and scores below 0.8 as bad fit (Portela, 2012 as cited in Saremnto & Costa, 2019); A chi-square test is a statistical method employed to compare observed outcomes with anticipated outcomes. This test aims to ascertain whether disparities between observed and expected data arise by chance or if there is a discernible relationship between the variables. A chi-square test is a statistical method employed to compare observed outcomes with anticipated outcomes. This test aims to ascertain whether disparities between observed and expected data arise by chance or if there is a discernible relationship between the variables (Kothari, 2007).

By using these indices, the researcher can determine whether the hypothesized model fits the observed data well and guide decisions regarding the modification and revision of the model. Ultimately, CFA provided a comprehensive evaluation of the hypothesized model's adequacy and helped validate the constructs' operationalization in the context of this research.

Limitations

There are two limitations to this dissertation. The first limitation is related to the potential bias introduced by allowing students to choose only one online course to base their responses on. It is possible that students may have chosen their favorite or least favorite course, leading to biased data. The second limitation is that the results of this study may be limited in their generalizability to other types of learning environments.

Summary

This dissertation seeks to fill the gap in the literature and to provide an initial understanding of the five factors that affect students' e-readiness to use e-learning in a developing country. Using the five factors (financial, motivation, self-direction, self-competence, and perceived usefulness) in a developed country sample, Alem et al. (2016) urge future research to apply the five-factor e-readiness tool to developing countries. The results can be used to design, develop, and deliver quality e-learning courses in developing countries to enhance student learning. The research questions that guide the quantitative section of the dissertation are: (a) What are the relationships among the factors of self-competence, self-directed learning, motivation, financial, and usefulness for higher education students in a developing country? And (b) Which factor or factors have the highest impact on e-readiness for higher education students in a developing country?

To collect primary data, a survey was administered to students in Lebanon who were enrolled in at least one online course or who had taken one in the last 12 months from one private university. Participants were above the age of 18, and the ELRCS was retrieved from Alem et al.'s (2016) study. The ELRCS survey was designed based on the Social Cognitive Theory and the Transactional Distance Theory, which are aligned with the theoretical foundations of this dissertation. This chapter provided a description of the participants and identified the exogenous and endogenous. The exogenous variables are self-competence, self-directed learning, motivation, financial, and usefulness, while the endogenous variable is e-readiness. Finally, this chapter explained the data collection procedures, including the method used to ensure adequate data, and addresses the data

analysis and the results reporting. The following section discusses the results of the collected data.

Chapter 4

Results

The purpose of this dissertation was to explore the relationships among self-competence, self-directed learning, perceived usefulness, motivation, and financial, within the context of the model of ELR among students in developing countries, while also considering whether these effects are passive or reflective. The research aimed to identify the primary factor or factors that play a significant role in shaping students' readiness for e-learning in developing countries. Furthermore, the dissertation further sought to assess the predictive capacity of these factors in determining students' readiness for e-learning while contributing to an enhanced comprehension of their influence on student preparedness.

This chapter begins with an initial review of participant demographics, hypothesis testing, model estimation fit, the hypothesized model, and an evaluation of the hypothesized model's reliability and validity. Following this, it presents the results obtained from Confirmatory Factor Analysis (CFA) and correlation analyses.

Descriptive Statistics

The primary data for this study was obtained through the administration of the ELRCS survey, as developed by Alem et al. (2016). This survey was electronically distributed to higher education students at a university in Lebanon. A total of 272 data responses were collected. Among the respondents, there were 157 females, 114 males, and 1 respondent categorized as "other" (See Table 1).

Table 1

Gender Demographics

Total Participants	Female	Male	Other
272	157	114	1

The educational distribution included 161 respondents at the graduate level and 111 respondents at the undergraduate level (See Table 2).

Table 2

Educational Level

Total Participants	Undergraduate Level	Graduate
272	111	161

Regarding the age distribution of the respondents (See Table 3), the largest age group represented among the respondents is 18 to 24, accounting for 39% (n = 106) of the valid responses. This age group showed the highest participation in the survey, reflecting a significant presence of young adults in the sample. The second most represented age group is 25 to 34, comprising 33.1% (n = 90) of the valid responses. The 35 to 44 age group constitutes 22.8% (n = 62) of the valid responses. A smaller proportion of respondents falls into the 45 to 54 age group, representing 5.1% (n = 14) of the valid responses. These demographic insights lay the foundation for the understanding of the study's participant characteristics.

Table 3

Age Demographics

Total Participants	Age Range	Percent
106	18–24	39.0
90	25–34	33.1
62	35–44	22.8
14	45–54	5.1

Hypothesis Testing

The researcher conducted a comprehensive investigation to test the research hypotheses using two key statistical techniques: correlation analysis and confirmatory factor analysis. The primary objective was to explore the relationships among the five factors and validate the theoretical constructs that underpin this study. Through correlation analysis, the researcher assessed the strength and direction of associations between these factors. Subsequently, with confirmatory factor analysis, the researcher tested specific hypotheses and assessed the compatibility of the proposed hypothesized model with the data. These analytical approaches provided valuable insights, contributing to a deeper understanding of the factors in question and their interdependencies. This empirical evidence informed the conclusions and had significant implications for both academic research and practical applications.

Correlation Analysis Among the Five Factors

RQ1

What are the relationships among the factors of self-competence, self-directed learning, motivation, financial, and perceived usefulness for higher education students in a developing country?

H1. There are relationships among the factors of self-competence, self-directed learning, motivation, financial, and perceived usefulness for higher education students in a developing country.

Correlation analysis was used to solve Hypothesis 1. The correlation table presents correlation coefficients between variables the self- competence (SC), perceived usefulness (PU), self-directed learning (SDL), motivation (M), and financial (F). These coefficients offer insights into the relationships among these variables, and their associated p-values provide information about the statistical significance of these relationships. In this dissertation, Cohen's rule of thumb was employed to assess the strength of correlation coefficients.

A Pearson correlation coefficient was performed to evaluate the relationship between SC and PU. There was a significant but moderate positive relationship between SC and PU**,** $r([.39])$, $p = [< .001]$ and a significant strong positive correlation between SCM and SDL, $r([.51])$, $p = [< .001]$**.** However, the relationship between SC and M was not significant and showed a weak negative correlation, $r([-.06])$, $p = .029]$. Similarly, the relationship between SC and F was not significant and showed a weak negative correlation, $r([-.16])$, $p = .008]$.

There was a significant but strong positive correlation between PU and SDL, $r([.63]), p = [< .001]$. While it showed a significant but weak positive relationship between PU and M**,** $r([.18]), p = .002]$, the correlation between PU and F was negligible $r([.005]), p = .93]$.

There was a weak correlation between SDL and M**,** $r([.10]), p = .09]$**.** However, the relationship between SDL and F was not significant and negligible, $r([-.08]), p = .15]$.

The relationship between M and F was significant and showed a strong positive correlation, $r([.68]), p = [< .001]$**.**

These correlations across the variables implied meaningful relationships within the dataset (See Table 4).

Table 4

Correlation Analysis

		SC	PU	SDL	M	F
SC	Pearson Correlation	1	.393**	.511**	-.063	-.160**
	Sig. (2-tailed)		<.001	<.001	.297	.008
	N	272	272	272	272	272
PU	Pearson Correlation	.393**	1	.0631**	.186**	.005
	Sig. (2-tailed)	<.001		<.001	.002	.933
	N	272	272	272	272	272
SDL	Pearson Correlation	.511**	.631**	1	.100	-.087
	Sig. (2-tailed)	<.001	<.001		.099	.0151
	N	272	272	272	272	272
M	Pearson Correlation	-.063	.186**	.0100	1	.685**
	Sig. (2-tailed)	.297	.002	.099		<.001
	N	272	272	272	272	272
F	Pearson Correlation	-.160**	.005	-.087	.685**	1
	Sig. (2-tailed)	.008	.933	.151	<.001	
	N	272	272	272	272	272

Note. ** Correlation is significant at the .01 level (2-tailed).

After conducting correlation analysis, it is evident that the three core factors (SC, PU, and SDL) exhibited substantial interconnections, while ‘M’ and ‘F’ were intrinsically

linked but diverge from the three primary factors. This observation aligned with findings from the Confirmatory Factor Analysis (CFA).

Confirmatory Factor Analysis

RQ2

Which factor or factors have the highest impact on e-readiness for higher education students in a developing country?

H2. One or more factors have an impact on e-readiness for higher education students in a developing country.

Confirmatory factor analysis was used to analyze Hypothesis 2. In this dissertation, confirmatory factor analysis (CFA) was employed as a rigorous statistical technique to assess the structural validity and measurement properties of the latent constructs under investigation to answer RQ2. CFA is particularly suited for testing pre-specified theoretical models, enabling the assessment of the hypothesized relationships between latent factors (SC, SDL, PU, M, F, and e-readiness). To answer the RQ2, the researcher used the factor loadings, the goodness-of-fit of the model, and checked the reliability & validity using CFA.

Assessment Reliability and Validity of the Measurement Model

The composite reliability (CR) is used to estimate the reliability of the measurement model (See Figure 1). A score of a CR greater than or equal to .7 is considered adequate to determine the reliability of the instrument and this reflects an adequate and reliable internal consistency of scales. The CR coefficients for SC, SDL, PU, M, and F were .87, .85, .95, .90, and .84, respectively (See Table 5), which were all above .7 suggesting that the items have high internal consistency.

Convergent validity (AVE) was tested by the method of Fornell and Larcker (1981). This method is employed to check whether the average variance extracted (AVE) is greater than .5, which means that the variance captured by the corresponding construct is more than the measurement error. The AVE value for SC, SDL, PU, M, and F were .69, .55, .88, .76, and .63 respectively, which is greater than .5, this indicated that the factors have good convergent validity. Finally, the Discriminant Validity is achieved when the average variance extracted (AVE) is greater than the maximum shared squared variance (MSV). Indices of discriminant validity indicated good validity for all five factors due to all AVE markedly higher than MSV (See Table 5).

Figure 1

Measurement Model

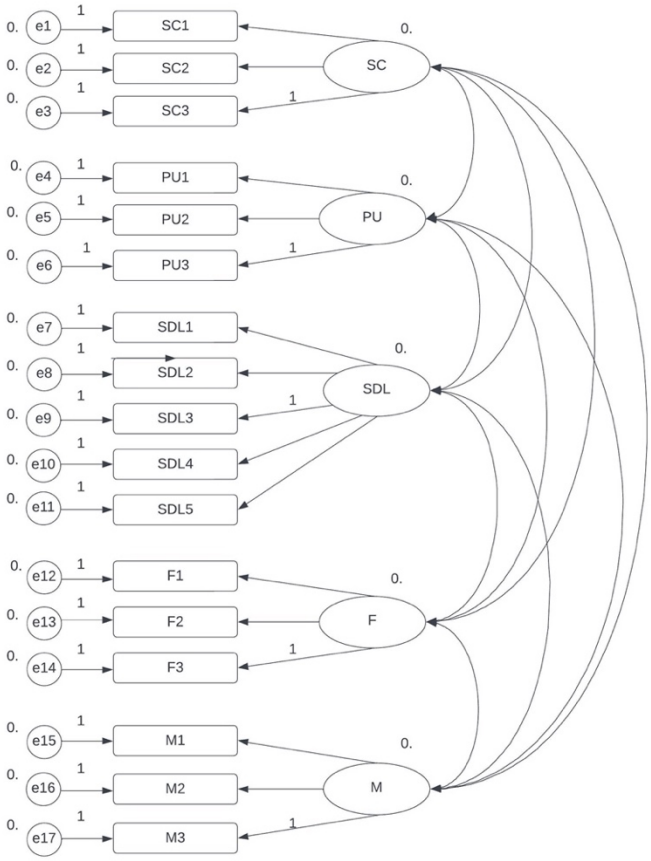


Table 5

Validity and Reliability Results

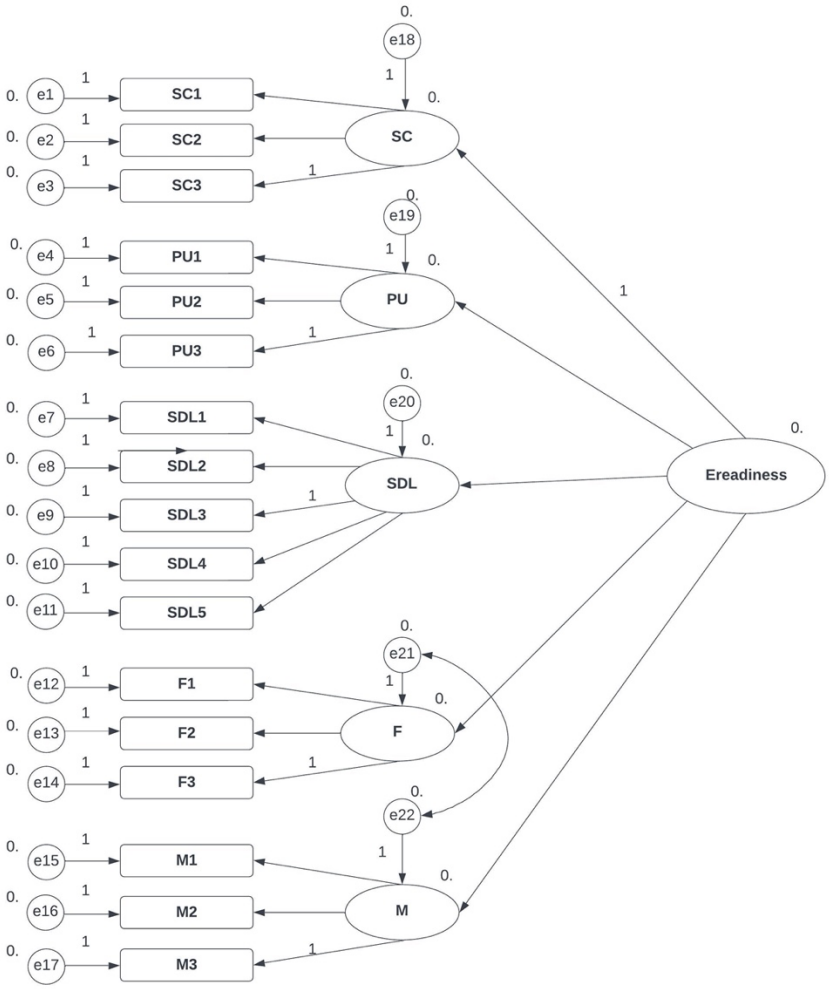
	CR	AVE	MSV
F	.840	.639	.491
SC	.872	.698	.324
PU	.958	.885	.368
SDL	.859	.557	.368
M	.906	.765	.491

Hypothesized Model

The analysis involved specifying the latent constructs, assigning observed variables to their respective factors, and specifying the expected relationships between the latent factors and observed variables based on theoretical considerations (See Figure 2). The seventeen items for the five-factor model explaining the e-readiness of higher education students in a developing country were analyzed through the second-order CFA (See Table 6). It is essential to elucidate that the initial five factors were measured from the observed variables obtained through the survey. Additionally, a second-order factor is constructed by incorporating these five first-order factors along with one error covariance. These specific values were influenced by the inclusion of an error covariance relationship between variables M and F, a necessary adjustment to achieve a satisfactory model fit.

Figure 2

Hypothesized Model



Hypothesized Model Results

The hypothesized model's chi-square value was 449.928 with 113 degrees of freedom, resulting in a p-value of .000, which suggests significant misfit between the model and the data. However, the CMIN/DF ratio was 3.983 which was less than 5 (See Table 7), indicating a reasonable fit in relation to the degrees of freedom (Marsh & Hocevar, 1985).

The presented analysis used various fit indices for a Confirmatory Factor Analysis (CFA) model. The CFI value obtained for the hypothesized model was .910, which surpasses the recommended threshold of .90, indicating a favorable correspondence between the model and the observed data. The CFI highlights the substantial agreement between the model's implied covariance matrix and the actual covariance matrix of the data. The TLI value for the hypothesized model was determined to be .87, close to the threshold of .90 considered indicative of a reasonably acceptable fit. This indicates that the model adequately replicated the observed covariance structure, demonstrating a coherent alignment between the theoretical constructs and the empirical data. The NFI yielded a value of .884 for the hypothesized model, closed to the threshold of .90 considered indicative of a reasonably acceptable fit. This signified that the model effectively captures the covariance relationships between its latent constructs and the observed variables, contributing to an overall satisfactory fit (See Table 5).

The RMSEA value of .086 suggests that the hypothesized model's fit was reasonable, as it is slightly higher than .08, indicating a marginally acceptable fit to the data. The RMSEA values are particularly important, as they provide insight into the extent to which the models replicate the observed data's covariance structure.

Table 6

Factor Loading of the 17 Final Items

Items	Factor				
	1	2	3	4	5
SC					
SC1	.895(1.05)*				
SC2	.921(1.107)*				
SC3	.663(1)*				
SDL					
SDL1		.767(.95)*			
SDL2		.848(1.08)*			
SDL3		.831(1)*			
SDL4		.7(.97)*			
SDL5		.53(1.05)*			
PU					
PU1			.932(.96)*		
PU2			.944(1.00)*		
PU3			.946(1)*		
M					
M1				.756(.85)*	
M2				.959(1.06)*	
M3				.89(1)*	
F					
F1					.855(.97)*
F2					.692(1.03)*
F3					.875(1)*

Note. *Within the parentheses are the unstandardized factor loadings.

Table 7

Model Fit Indices

Model	CMIN	DF	p-Value	CFI	CMIN/DF	NFI	TLI	RMSEA
Hypothesized Model	449.9	113	.000	.910	3.98	.884	.878	.086
Threshold				≥ 0.90	≤ 5	≥ 0.90	≥ 0.90	≤ 0.08

In summary, the hypothesized model demonstrated a reasonable fit to the observed data. The Root Mean Square Error of Approximation (RMSEA) value of .086 indicated an acceptable fit (See Table 7). Additionally, the Comparative Fit Index (CFI) exceeded its respective recommended threshold, indicating substantive correspondence between the model and the data. The Tucker-Lewis Index (TLI) value of .90 further reinforced the model's alignment with the data. Therefore, the TLI, CFI, and RMSEA fit indices collectively demonstrate that the hypothesized model in the second-order CFA presents a robust alignment between the hypothesized constructs and the empirical data. The model's fit, as indicated by these indices, suggests a substantive correspondence.

Upon conducting a second-order Confirmatory Factor Analysis (CFA), the standardized regression weights were examined to assess the suitability of the five factors (SC, PU, SDL, M, F) in our model. These standardized factor loadings, as presented in Table 6 all fall below the threshold of 1, suggesting that these factors are within acceptable limits. The SC factor loading ranged between .663 and .921, the SDL factor loading ranged between .53 and .848, the PU factor loading ranged between .932 and .946, the M factor loading ranged between .756 and .959, and the F factor loading ranged between .692 and .875. These specific values were influenced by the inclusion of an error

covariance relationship between factors M and F, a necessary adjustment to achieve a satisfactory model fit. It is essential to highlight that all factor loadings are significant, signifying statistical significance with a p-value below .001.

In conclusion, the hypothesized model in the CFA analysis exhibited favorable fit indices across multiple measures. This suggests that the model reasonably represents the relationships between the theoretical constructs and the observed variables.

Summary

This chapter provides a summary of the results of the survey from 272 participants. For RQ1, correlation analysis highlighted significant interconnections among the core factors: self-competence (SC), perceived usefulness (PU), and self-directed learning (SDL). Motivation (M) and financial (F) factors were linked but diverged from the primary three.

For RQ2, the study employed Confirmatory Factor Analysis (CFA) to analyze seventeen items representing a five-factor model assessing e-readiness in developing country higher education students. The hypothesized model demonstrated a reasonable fit with observed data. The measurement model indicated a good reliability and validity across all factors. This supports the effectiveness of the hypothesized model in representing construct relationships and reinforcing the research framework's validity. Chapter 5 provides an interpretation of the findings and recommendations for future research.

Chapter 5

Interpretation and Recommendations

In this chapter, the expansion of findings from Chapter 4 commences with a summary of the study. It includes an overview of the problem, the purpose statement and research questions, a review of the methodology, and major findings. In addition, the subsequent exploration connects the study's findings with the literature reviewed in Chapter 2. Implications for actions, recommendations for future research, and concluding remarks are presented.

Study Summary

This section offers a concise summary of the study. It presents an overview of the problem, highlights the purpose statement, and summarizes research questions. Importantly, it delves into a review of the research methodology employed for the study. Finally, the section culminates by presenting an overview of the major findings.

Overview of the Problem

Despite the increasing enrollment in online courses, the readiness of students and higher education institutions in developing countries for effective e-learning remains a concern (Pillay et al., 2007; Watkins et al., 2014). Student e-readiness is vital for successful online learning design and implementation (Hukle, 2009; Ilgaz & Gülbahar, 2015). Online learning necessitates a more proactive role from students than traditional teaching methods, emphasizing student engagement, understanding, and content acquisition (Köpeczi-Bócz, 2020). Insufficient e-readiness can lead to challenges, including technical issues, time management difficulties, communication problems, motivation deficits, and limited access to resources (Al-Ajlan & Al-Sharhan, 2021;

Alemayehu & Fenta, 2020; Alzahrani & Sarker, 2021; Cavanagh et al., 2021; Ibrahim & Alshibly, 2021; Zhu & Li, 2021).

The digital divide exacerbates these issues in developing countries, with limited infrastructure and digital literacy posing significant obstacles (Moser-Mercer & Steiner, 2013). Additionally, financial constraints hinder technology investments and student access (Biswas & Debnath, 2020). Furthermore, a lack of confidence in e-learning's feasibility and a lack of quality assurance agencies in some regions compound the problem (El Amine, 2016; Nasser & Chedid, 2010).

Purpose Statement and Research Questions

The purpose of this dissertation sought to assess students' ELR in developing countries by examining five key factors: financial readiness, motivation, self-direction, self-competence, and perceived usefulness. These factors collectively impact students' readiness for e-learning, and while previous studies have examined them individually, a comprehensive examination is needed within the context of developing countries. Bridging this gap in the literature is essential and aligns with a research call made by Alem et al. (2016). The researcher analyzed how these factors interrelate and determined their overall impact on e-readiness. Additionally, the researcher sought to identify the most influential factor(s) affecting e-readiness among students in developing nations. Two research questions guided this study:

RQ1. What are the relationships among the factors of self-competence, self-directed learning, motivation, financial, and usefulness for higher education students in a developing country?

RQ2. Which factor or factors have the highest impact on e-readiness for higher education students in a developing country?

Review of the Methodology

This dissertation employed a quantitative research methodology to investigate the e-readiness levels of higher education students in a developing country enrolled in online courses. The study utilized the ELRCS developed by Alem et al. in 2016. In total, 272 participants completed the survey with Survey Monkey. The research addresses two key questions.

To address the first research question (RQ1), the study analyzed correlation coefficients among five key factors: self-competence, self-directed learning, perceived usefulness, motivation, and financial. The analysis was conducted using SPSS Statistics GradPack 29 software.

To address the second research question (RQ2), the study employed AMOS GradPack 29 statistical software for confirmatory factor analysis (CFA). CFA assessed the structural validity and measurement properties of the latent constructs under investigation. Additionally, the second-order CFA was conducted for this study.

Moreover, composite reliability, measured by the composite reliability coefficient, assessed instrument reliability, and convergent validity was examined using Fornell and Larcker's method (1981).

Major Findings

For RQ1, following the completion of correlation analysis, it became apparent that the three fundamental factors, namely self-competence (SC), perceived usefulness (PU), and self-directed learning (SDL), displayed significant interrelationships. In

contrast, the factors of motivation (M) and financial (F) exhibited an intrinsic connection to each other but demonstrated divergence from the aforementioned three primary factors (SC, PU, SDL). It is noteworthy that this observation corroborates the outcomes obtained through a second-order CFA for RQ2.

For RQ2, the study examined the seventeen items encompassing the five-factor model designed to elucidate the e-readiness of higher education students in a developing country. This analysis was executed by means of the second-order CFA method. The application of the second-order CFA served the purpose of confirming the factor loadings, assessing the model's fit, and establishing the composite reliability, convergent validity, and discriminant validity of the measurement constructs. To evaluate the model's fit, a set of established fit indices, including CFI, TLI, and RMSEA, were employed. The outcomes of the CFA analysis revealed that the hypothesized model exhibited a reasonable fit with the observed data. In essence, this analysis underscores the effectiveness of the hypothesized model in representing the relationships between constructs and observed variables, thereby reinforcing the validity of the research framework.

Findings Related to the Literature

A comprehensive literature review was conducted to investigate the e-readiness factors that impact higher education students in developing countries. This review identified a significant gap in the existing research, which motivated the initiation of this quantitative study. Subsequent sections in this dissertation elucidate the interconnectedness between the study's findings and the literature reviewed in Chapter 2.

Online education presents challenges for educators and students, necessitating specific conditions for success. Research emphasizes that a student's ELR significantly impacts their success. Various studies have assessed ELR in higher education students, underscoring its importance (Chung et al., 2020; Dray et al., 2011; Hasani et al., 2020; Hung et al., 2010; Linjawi & Alfadda, 2018; Neupane et al., 2020).

This research adopted Alem et al.'s (2016) ELR framework, which comprises five dimensions: self-competence, self-directed learning, motivation, financial, and perceived usefulness. In this dissertation, the ELR instrument developed by Alem et al. (2016) was utilized to identify the most relevant e-readiness factor(s) among higher education students in developing countries. These factors have a strong predictive capability, correctly classifying 92.2% of students (Alem et al., 2016). Self-competence, particularly, is recognized as a crucial factor for e-readiness (Abdelraheem, 2006; Alem et al., 2016; Chyung, 2007; Erlich et al., 2005; García-Peñalvo et al., 2017; Muse, 2003). Self-competence denotes a student's ability to use computer tools and apply technological skills in various environments. Self-competence is thus vital for online learning success, reflecting students' self-efficacy in information and communication technologies (ICT) (Lim, 2001). Therefore, institutions should prioritize self-competency support in e-learning programs to foster effective self-directed learners.

Self-directed learning plays a crucial role in ELR and is linked to positive learning outcomes (Alem et al., 2016). It involves students taking responsibility for their academic progress in online learning (Moore & Kearsley, 2005; Hao, 2016; Pikurich, 2003). Success in online courses hinges on self-directed learning, self-efficacy, time management, and interpersonal skills (Grabau, 2015; Yilmaz, 2016), with self-directed

learning being a key factor for success in online environments (Carver & Kellough, 2019). Students with these skills show higher course completion and satisfaction levels (Akhlaq et al., 2020; Barzegar, 2019; Khojah & Khamis, 2019).

These studies underscore the importance of self-directed learning in enhancing student readiness for e-learning and fostering positive outcomes in online education. Instructors and institutions should emphasize the development of self-directed learning skills to facilitate students' achievements in digital learning environments.

Research highlights the vital role of perceived usefulness in shaping students' inclinations to engage with technology across various contexts, including virtual classrooms and mobile learning (Iqbal & Bhatti, 2015; Iqbal, 2013). Perceived usefulness pertains to individuals' beliefs that a given system will enhance their work performance (Alem et al., 2016). Furthermore, Al-Samarraie and Salloum (2019) discovered a significant link between perceived usefulness and students' readiness for e-learning.

In sum, these investigations collectively emphasize the importance of perceived usefulness in shaping students' readiness for e-learning, influencing their technology adoption, engagement, motivation, and ultimately, their learning outcomes in online and blended learning settings. To support students effectively, educators and institutions should prioritize the design of e-learning systems and activities that students perceive as useful and relevant to their learning objectives. They should also provide the necessary support and feedback to enhance motivation and engagement.

Motivation significantly influences the learning process. This has been highlighted by various studies (Bolliger, Supanakorn, & Boggs, 2010; Ryan & Deci, 2000). Pintrich and Schunk (1996) defined it as the driving force behind why learners

choose to engage in learning. Distance education literature has consistently emphasized motivation (Bates, 1995; Holmberg, 1995; Kearsley, 2000; Keegan, 1996; Schrum & Hong, 2002).

Chen and Jang (2010) identified motivation as a key predictor of ELR, while So and Brush (2008) emphasized its role in fostering student engagement in e-learning. Martin and Bolliger (2018) suggested a positive link between motivation and student satisfaction and learning outcomes in online environments. Kuo et al. (2014) found that motivation correlates positively with academic achievement in online learning. Furthermore, research by Alem et al. (2016) and Unsal (2012) highlights motivation as a critical factor in enhancing student satisfaction and is integral to e-readiness in virtual settings.

Finally, financial resources play a crucial role in e-learning success by ensuring students access to necessary technology and internet resources (Alem et al., 2016; Morris et al., 2005). Evaluating financial readiness is vital before implementing e-learning, as Chapnick's (2000) e-readiness assessment model indicates. Hasani et al. (2020) noted the positive impact of both financial and technological factors on students' readiness for distance learning adoption. In developing countries like Bangladesh and Tanzania, financial constraints can impede e-learning participation, affecting students' ability to afford internet access and computers (Mtebe & Raphael, 2019; Rahman & Mishra, 2018). To ensure equitable e-learning access, institutions should provide affordable devices, reliable internet connectivity, and financial assistance (Adu et al., 2018; Alemu & Alemneh, 2018; Aziz et al., 2019).

It is noteworthy that, to the best of available knowledge, prior research has not collectively examined all five of the mentioned factors within the realm of ELR literature in developing countries. As emphasized by Alem et al. (2016), these five factors collectively constitute a potent tool for both measuring and predicting students' ELR, boasting an impressive predictive accuracy rate of 92.2%.

In accordance with this perspective, this dissertation incorporated these five factors—financial, motivation, self-directed learning, self-competence, and perceived usefulness—to scrutinize students' ELR within a sample from a developing country. The principal aim of this study was to bridge this research void and provide a pioneering comprehension of how these five factors jointly influenced students' preparedness to engage with e-learning within the context of developing nations. This research endeavor aligned with the research call articulated by Alem et al. (2016), who initially employed these five factors within a sample from a developed country and advocated for future research to apply the five-factor e-readiness tool in various settings, including those in developing countries.

The results of this dissertation unveiled a puzzling aspect concerning developing nations, with the underlying reasons for this phenomenon remaining elusive. This dissertation established that the three primary factors (SC, PU, SDL) exhibited stronger factor loading coefficients in comparison to 'M' and 'F,' possibly owing to distinctions within the population.

In conclusion, developed countries demonstrated a well-fitting model encompassing all five factors, whereas developing nations validated only three factors (SC, PU, SDL). F and M did not make significant contributions to the hypothesized

model, emphasizing the relationship between financial support and motivation in developing countries. In developed nations, Alem et al.'s model showcased a robust interplay among the five factors (SC, PU, SDL, M, F), but this pattern diverged in developing countries. The findings of this dissertation suggest that insufficient financial support led to reduced motivation, contributing to this divergence. Consequently, the dissertation's hypothesized model deviates from the established norm.

Previous research on students, such as Solas (1996), concluded that financial and economic factors played a substantial role in motivating students, given their indirect connection to basic needs. Kasser and Ryan (1993) shared a similar perspective, asserting that financial pressures could elevate the risk of stress, depression, and adverse motivational outcomes. This viewpoint was echoed by Berger (2001), who identified a stable financial position as a critical physiological need significantly influencing motivational aspects. Additionally, the development of learning competencies and student motivation was influenced by various aspects of family support, including family socioeconomic status, parental guidance, parental expectations, as well as the availability of family social and material resources (Elliot et al., 2017; Ericsson et al., 2018).

In the hypothesized model, it became evident that the initial three factors (SCM, SDL, PU) exhibited strong correlations, while the other two factors (M, F) displayed notable individual correlations, albeit not with the aforementioned three factors. The origin of the correlation between 'M' and 'F' remains unexplained.

Conclusions

The research conducted in this dissertation was quantitative and descriptive. It sought to elucidate e-readiness factors in developing countries. The outcomes of this

dissertation yielded practical implications for actionable steps and provided valuable insights for the direction of future research. This section delves into these concepts more comprehensively and culminates with concluding remarks.

Implications for Action

This dissertation on student ELR holds significant value on multiple fronts. Firstly, it identifies factors influencing the readiness of higher education students in developing countries, while providing insights to improve distance learning environments and to support student success. This knowledge can inform policy decisions at institutional and national levels, enhancing strategies for integrating e-learning into education systems.

Secondly, the study may aid institutions and instructors in identifying students' strengths and weaknesses related to e-learning, enabling targeted interventions and resource allocation to enhance readiness and learning experiences. The multidimensional nature of the ELR measure may help practitioners gain a nuanced understanding of readiness factors.

Overall, the dissertation explored ELR in developing countries, focusing on financial, motivation, self-directed learning, self-competence, and perceived usefulness factors. It assessed the predictive power of these factors, examined their interrelationships, and aimed to identify the most influential factor(s) impacting students' readiness. The findings are expected to inform the development of effective e-learning courses, promoting successful e-learning adoption in developing nations.

Recommendations for Future Research

The study revealed that developed countries effectively incorporated all five factors into a well-suited model, whereas in the findings of this dissertation, developing nations only validated three factors (SC, PU, SDL). The roles of 'F' and 'M' in the hypothesized model were found to be less significant, emphasizing the link between financial support and motivation within developing countries. Despite achieving a reasonable fit, the researcher recommends the development of a more refined model for developing countries in future research. These recommendations include enhancing the model's reliability by expanding motivation (M) and Financial (F) items and considering their exclusion from future surveys. While the model was reasonably accepted, the primary three factors (SCM, SDL, PU) were more influential in explaining e-readiness than 'M' and 'F.' Consequently, the study advises future researchers to focus on investigating these two factors separately.

Concluding Remarks

Despite the increasing enrollment in online courses, higher education institutions have often overlooked the significance of assessing student e-readiness when implementing online teaching strategies and technological advancements, as noted by Watkins et al. (2014) and Pillay et al. (2007). However, understanding students' e-readiness is essential for the effective design and implementation of online learning, as emphasized by Hukle (2009) and Ilgaz & Gülbahar (2015).

This dissertation addresses these challenges by delving into ELR factors, particularly in the context of developing countries. It seeks to contribute further knowledge and propose solutions for enhancing ELR. Previous studies investigating ELR

at the student level in developed countries have identified multiple factors influencing student performance and satisfaction.

Interestingly, this study's findings reveal a distinct pattern within developing countries. The top three interrelated factors were self-directed learning, self-competence, and perceived usefulness. While motivation and financial support displayed individual correlations, they did not align closely with the aforementioned three factors. Notably, insufficient financial support was found to contribute to decreased motivation, contributing to this divergence.

In sum, this research contributes valuable insights into the complex landscape of ELR factors, highlighting their interconnectedness while exploring the unique dynamics within developing countries. These findings can inform the development of tailored strategies to enhance ELR and optimize future online learning experiences for students in these regions.

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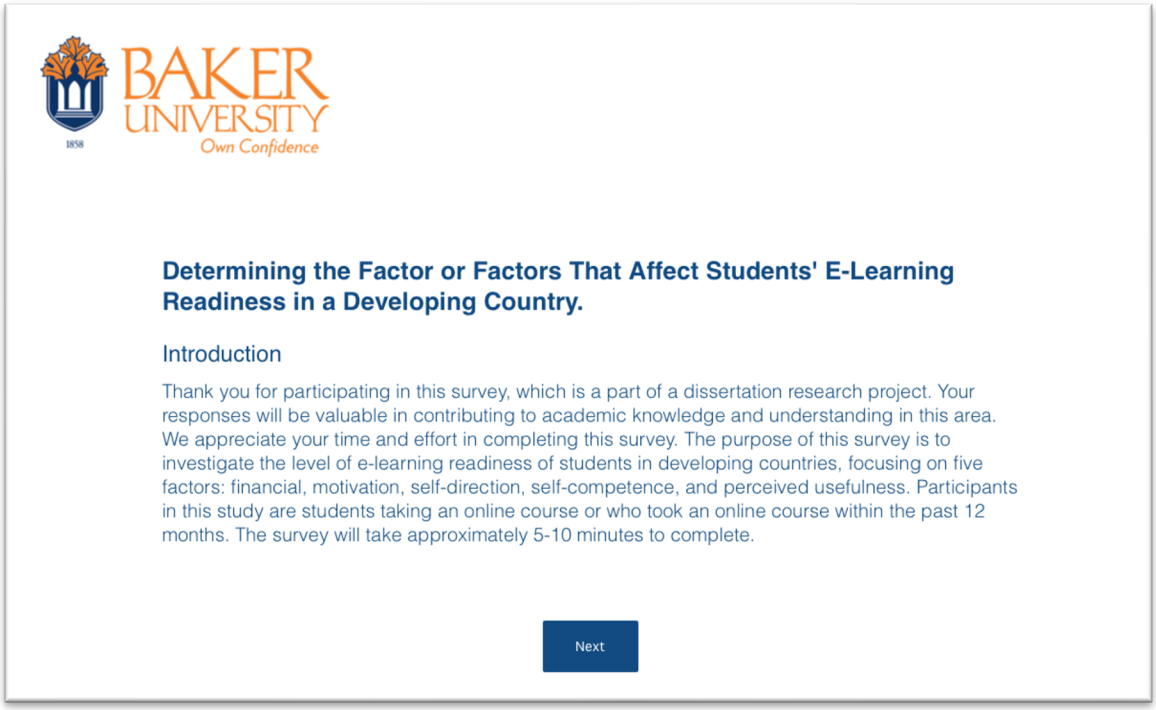
Appendices

Appendix A. E-learning Readiness Concept Scale Survey



Researcher:
Amal traboulsi, Ed.D. Candidate
amalatraboulsi@stu.bakeru.edu
School of Education, Baker University
Kansas, USA

Wendy Gentry, Ph.D.
School of Education, Baker University
wendy.gentry@bakeru.edu

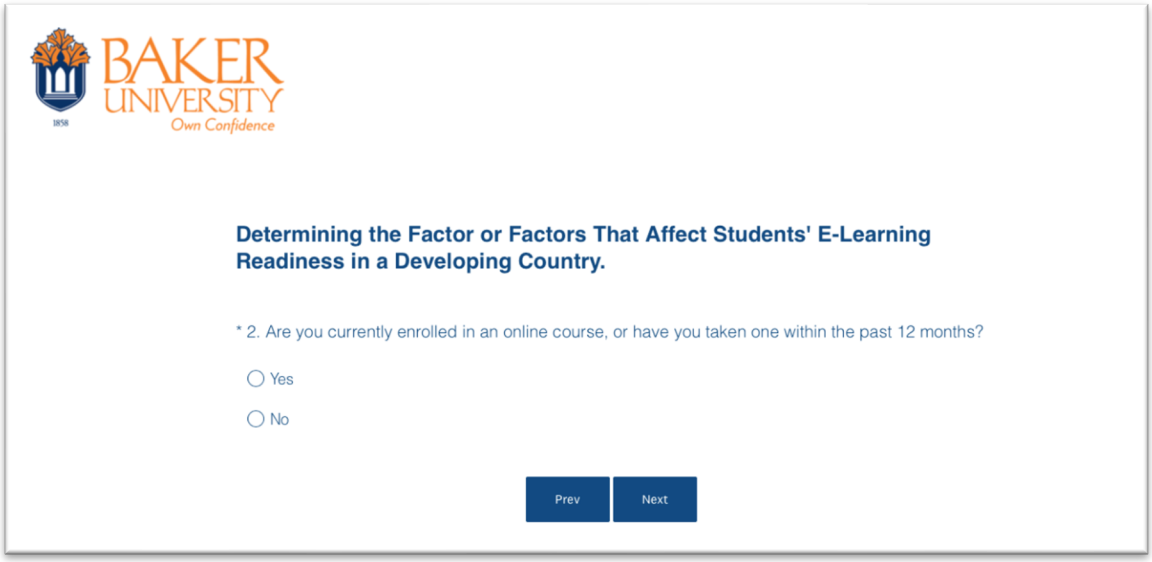
Consent: Selecting the I agree to participate option below indicates that you have read this informed consent form, that you understand it, and that you choose to participate in the survey portion of this survey. By continuing with the survey, you agree with the following statements:
1. I have been given sufficient information about this research project.
2. I understand that my answers will not be released to anyone and my identity will remain anonymous. My name will not be written on the questionnaire nor be kept in any other records.
3. When the results of the study are reported, I will not be identified by name or any other information that could be used to infer my identity. Only researchers will have access to view any data collected during this research however data cannot be linked to me.
4. I understand that I may withdraw from this research any time I wish and that I have the right to skip any question I don't want to answer.
5. I understand that my refusal to participate will not result in any penalty or loss of benefits to which I otherwise am entitled to.
6. I have been informed that the research abides by all commonly acknowledged ethical codes and that the research project has been reviewed and approved by Baker University's IRB and Lebanese American University's IRB.
7. I understand that if I have any additional questions, I can ask the research team listed below.
8. I have read and understood all statements on this form.
9. I voluntarily agree to take part in this research project by completing the following survey/Questionnaire.

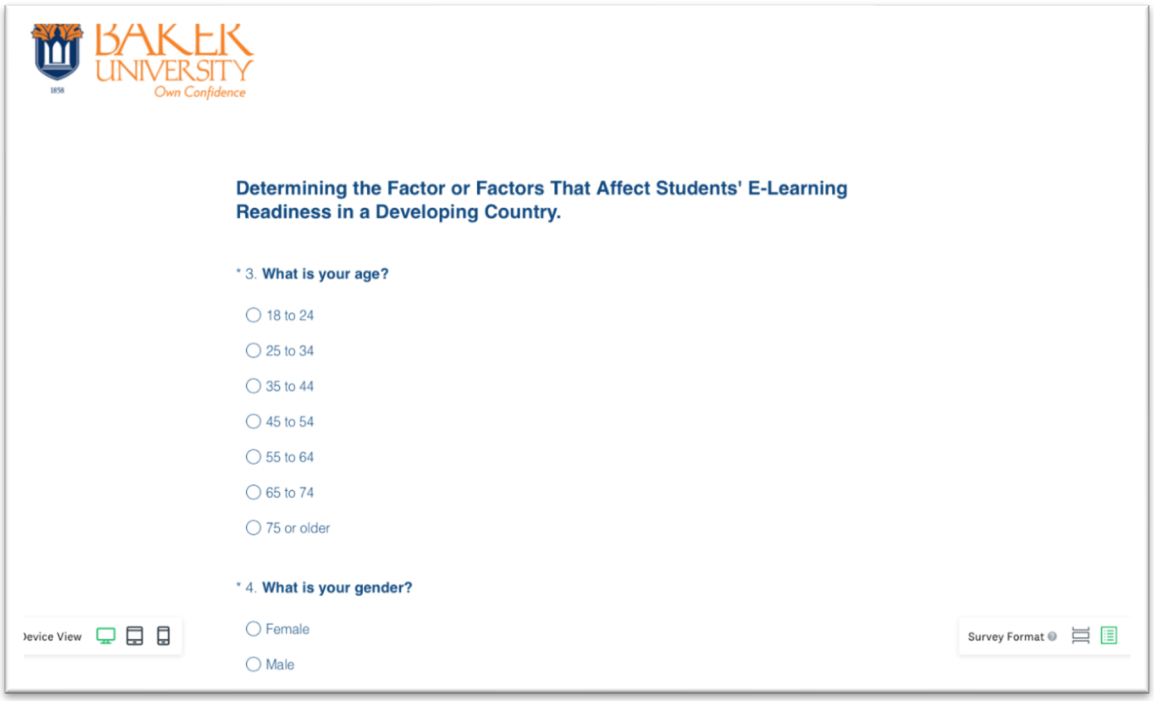
1. Do you consent to the above information?

- [ ] Yes, I do consent
- [ ] No, I do not consent

Prev Next

Powered by SurveyMonkey
See how easy it is to create a survey.


BAKER UNIVERSITY
Own Confidence
Determining the Factor or Factors That Affect Students' E-Learning Readiness in a Developing Country.
* 2. Are you currently enrolled in an online course, or have you taken one within the past 12 months?
Yes
No
Prev
Next


BAKER UNIVERSITY
Own Confidence
Determining the Factor or Factors That Affect Students' E-Learning Readiness in a Developing Country.
* 3. What is your age?
18 to 24
25 to 34
35 to 44
45 to 54
55 to 64
65 to 74
75 or older
* 4. What is your gender?
Female
Male
Survey Format

* 5. **Your educational background**

◯ Graduate Student

◯ Undergraduate Student

Prev Next

BAKER UNIVERSITY
Own Confidence

Determining the Factor or Factors That Affect Students' E-Learning Readiness in a Developing Country.

How strongly do you agree or disagree with the following statements:

* 6. **Self Competence**

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I am competent using a computer.	◯	◯	◯	◯	◯
I am confident with computers.	◯	◯	◯	◯	◯
I feel confident in my knowledge and skills of how to manage software for online learning.	◯	◯	◯	◯	◯

* 7. **Perceived Usefulness**

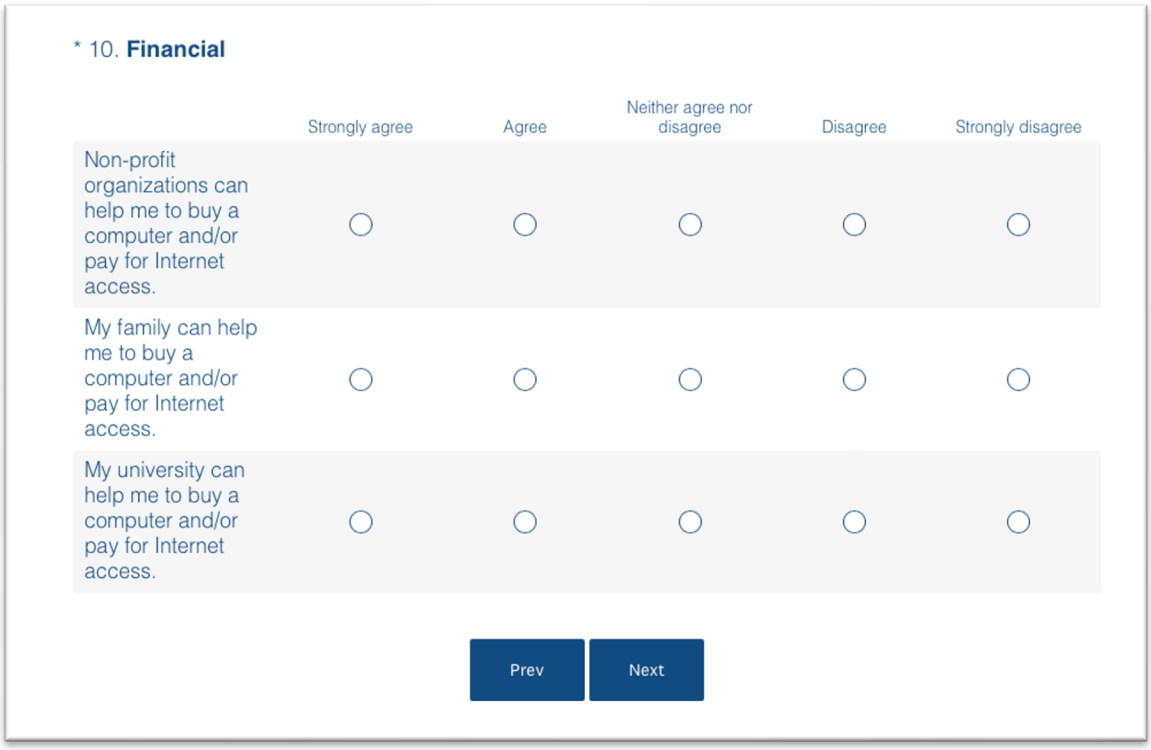
	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Using the online learning improves my performance in my studies.	◯	◯	◯	◯	◯
Using online learning will increases my productivity.	◯	◯	◯	◯	◯
Using online learning enhances my effectiveness in my studies.	◯	◯	◯	◯	◯

* 8. **Self-Directed Learning**

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I effectively take responsibility for my own learning.	○	○	○	○	○
I am confident in my ability to independently prioritize my learning goals.	○	○	○	○	○
I am able to set my own learning goals.	○	○	○	○	○
I am autonomous.	○	○	○	○	○
I am able to manage my study time effectively and easily complete assignments on time.	○	○	○	○	○

* 9. **Motivation**

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I am able to complete my work even when there are distractions in my home (e.g. television, children, and such).	○	○	○	○	○
I am able to complete my work even when there are online distractions (e.g. friends sending emails or websites to surf).	○	○	○	○	○
Even in the face of technical difficulties, I am certain I can learn the material presented in online learning.	○	○	○	○	○



* 10. **Financial**

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Non-profit organizations can help me to buy a computer and/or pay for Internet access.	○	○	○	○	○
My family can help me to buy a computer and/or pay for Internet access.	○	○	○	○	○
My university can help me to buy a computer and/or pay for Internet access.	○	○	○	○	○

Prev Next

Appendix B. Introductory Email

Subject: Invitation to Participate in a Doctoral Study

Dear [Participant],

I am writing to introduce Amal Traboulsi, a doctoral candidate in Instructional Design and Performance Technology at Baker University, USA. She is currently conducting research on "*Determining the Factor or Factors That Affect Students' E-Learning Readiness in a Developing Country*" as part of her doctoral program and we believe that you may be interested in participating.

Participation in the study involves completing a survey, which should take no more than 10 minutes. Your participation in this research would provide valuable insights and help Amal achieve her research goals. If you choose to participate, your confidentiality and anonymity will be strictly maintained, and any data collected will be used only for research purposes.

We would like to extend this invitation to all interested students who meet the criteria for this study. To participate, students can access the survey through the following link: https://www.surveymonkey.com/r/NK36XX7.

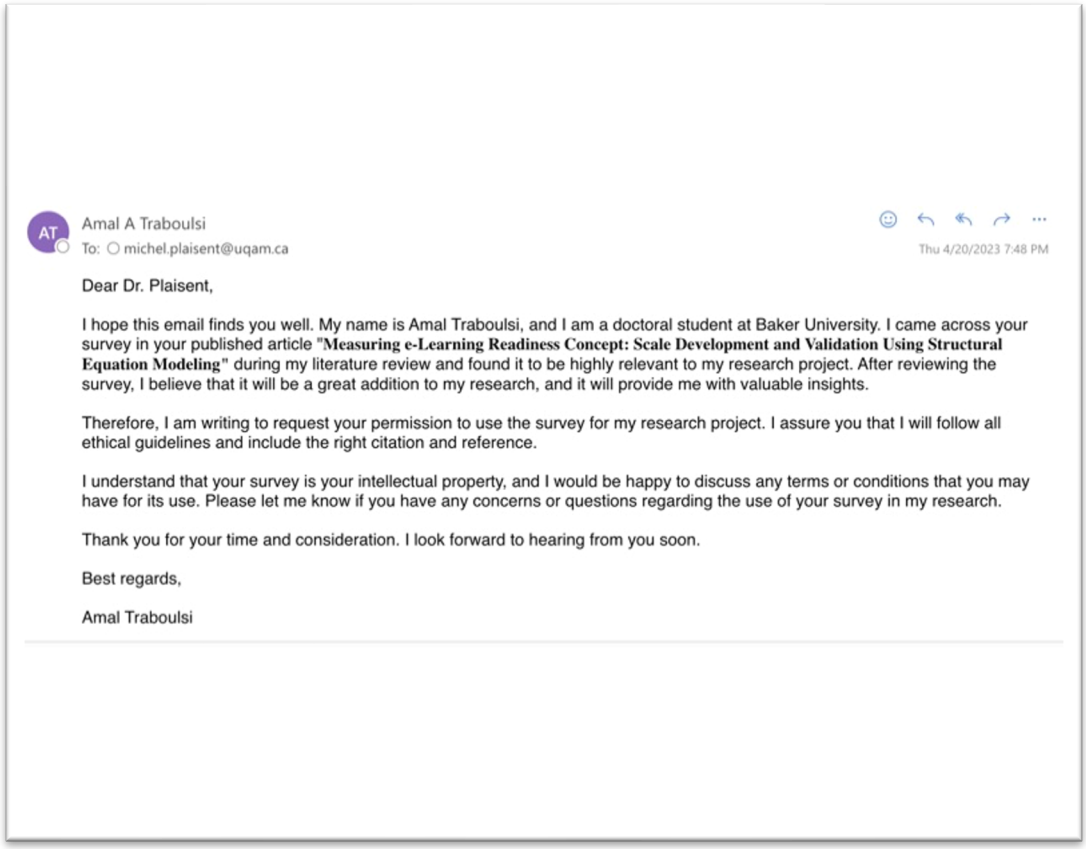
The survey will be available for one month and students can complete it at their convenience. It is important to note that participation in the study is entirely voluntary, and students can withdraw from the study at any time without penalty.

Thank you for your consideration and for completing the survey.

Sincerely,

[Professor's Name]

Appendix C. Author's Permission to Use their E-learning Readiness Concept Scale Survey



Amal A Traboulsi
To: michel.plaisent@uqam.ca
Thu 4/20/2023 7:48 PM

Dear Dr. Plaisent,

I hope this email finds you well. My name is Amal Traboulsi, and I am a doctoral student at Baker University. I came across your survey in your published article **"Measuring e-Learning Readiness Concept: Scale Development and Validation Using Structural Equation Modeling"** during my literature review and found it to be highly relevant to my research project. After reviewing the survey, I believe that it will be a great addition to my research, and it will provide me with valuable insights.

Therefore, I am writing to request your permission to use the survey for my research project. I assure you that I will follow all ethical guidelines and include the right citation and reference.

I understand that your survey is your intellectual property, and I would be happy to discuss any terms or conditions that you may have for its use. Please let me know if you have any concerns or questions regarding the use of your survey in my research.

Thank you for your time and consideration. I look forward to hearing from you soon.

Best regards,

Amal Traboulsi

farid farid <faridos62@hotmail.com>
To: Amal A Traboulsi
Cc: Dr Michel Plaisent <plaisent.michel@uqam.ca>; Zuccaro, Cataldo <zuccaro.cataldo@uqam.ca>
Fri 4/21/2023 8:37 AM

Hi Amal,

You have a permission to use our instrument. Please don't forget to cite our article in your research. If you don't mind, can you share your data related to this research with us?

Good luck in your research project.

Dr. Farid Alem

Appendix D. Baker University IRB Approval

BAKER UNIVERSITY

IRB Request

Date 05/04/2023

IRB Protocol Number _____
(IRB use only)

I. Research Investigator(s) (students must list faculty sponsor)

Graduate School of Education (IDPT)

Department(s) _____

	Name	Signature	
1.	Amal Traboulsi		Principal Investigator
2.	Dr. Kyunghwa Cho	Digitally signed by Kyunghwa Cho Date: 2023.05.04 11:22:49 -05'00'	☐ Check if faculty sponsor
3.	Dr. Wendy Gentry	Wendy Gentry Digitally signed by Wendy Gentry Date: 2023.05.04 10:05:43 -04'00'	☑ Check if faculty sponsor
4.			☐ Check if faculty sponsor

Principal investigator contact information

Phone 620-757-0782

Email amalatraboulsi@stu.bakeru.edu

Address 3501 Hernando Court
Round Rock, TX 78665

Note: When submitting your finalized, signed form to the IRB, please ensure that you cc all investigators and faculty sponsors using their official Baker University (or respective organization's) email addresses.

Faculty sponsor contact information

Phone 540-525-6329

Email wendy.gentry@bakeru.edu

Expected Category of Review: ☐ Exempt ☑ Expedited ☐ Full ☐ Renewal

II. Protocol Title

Determining the Factor or Factors That Affect Students' E-Learning Readiness in a Developing Country.

Baker IRB Submission form page 1 of 4

III. Summary:

The following questions must be answered. Be specific about exactly what participants will experience and about the protections that have been included to safeguard participants from harm.

A. In a sentence or two, please describe the background and purpose of the research.
This study seeks to fill the gap in the literature and provide a first-time understanding of the five factors that affect students' e-readiness to use e-learning in a developing country. Using the five factors (financial, motivation, self-direction, self-competence, and perceived usefulness) in a developed country sample, Alem et al. (2016) urged future research to apply the five-factor e-readiness tool to developing countries.

B. Briefly describe each condition, manipulation, or archival data set to be included within the study.
This study uses a survey from students in the universities; therefore, this study does not include any condition, manipulation, or archival data set.

IV. Protocol Details

A. What measures or observations will be taken in the study? If any questionnaire or other instruments are used, provide a brief description and attach a copy.
This study will use the e-Learning Readiness (ELR) survey developed by Alem et al. in 2016 that was applied to a population in a developed country. In this study, the researcher will use the survey to identify the most relevant e-readiness factor(s) among higher education students in a developing country. There are 17 items in the ELR survey, divided into five factors: self-competence, self-directed learning, motivation, financial assistance, and perceived usefulness. A 5-point interval scale is used to measure each of these factors, ranging from 1 (strongly disagree) to 5 (strongly agree). Survey and the permission from author are attached with this IRB.

B. Will the subjects encounter the risk of psychological, social, physical, or legal risk? If so, please describe the nature of the risk and any measures designed to mitigate that risk.
No, the subjects will not encounter any risk of psychological, social, physical, or legal risk.

C. Will any stress to subjects be involved? If so, please describe.

No, there will not be any stress to subjects involved in this study.

D. Will the subjects be deceived or misled in any way? If so, include an outline or script of the debriefing.

No, the subject will not be deceived or misled in anyway during this study.

E. Will there be a request for information which subjects might consider to be personal or sensitive? If so, please include a description.

No, there will not be any request of information which subjects might consider to be personal or sensitive.

F. Will the subjects be presented with materials which might be considered to be offensive, threatening, or degrading? If so, please describe.

No, the subjects will not be presented with materials which might be considered to be offensive, threatening, or degrading in any way.

G. Approximately how much time will be demanded of each subject?

It will take approximately 5 to 10 minutes to complete the survey.

H. Who will be the subjects in this study? How will they be solicited or contacted? Provide an outline or script of the information which will be provided to subjects prior to their volunteering to participate. Include a copy of any written solicitation as well as an outline of any oral solicitation.

The target population of this study is graduate and undergraduate students enrolled in at least one online course offered by two private universities in Lebanon. Upon approval by the universities, the web-based survey will be emailed to instructors teaching online courses, who will then forward it to their students. An email template that will be sent to instructors by the researcher is attached to this IRB. As part of the electronic survey, an introduction will explain the survey's objectives and ensure the confidentiality of participants and their responses. This survey is voluntary for participants. Prior to taking the survey, all participants will be required to provide consent. The survey contains an electronic consent form. Please find attached the survey in PDF format.

I. What steps will be taken to insure that each subject's participation is voluntary? What if any inducements will be offered to the subjects for their participation?

It will be stated in the description of the survey that participation is voluntary, and students may choose to participate once they click on the survey link in their email. Participants can withdraw at any time.

J. How will you insure that the subjects give their consent prior to participating? Will a written consent form be used? If so, include the form. If not, explain why not.

All participants will be required to sign a consent form prior to taking the survey. The consent form will have its own section in the survey. The written consent form can be found at the following link: https://www.surveymonkey.com/r/NK36XX7

K. Will any aspect of the data be made a part of any permanent record that can be identified with the subject? If so, please explain the necessity.

No, the survey data will not be in any form of permanent record that can be identified with the subject.

L. Will the fact that a subject did or did not participate in a specific experiment or study be made part of any permanent record available to a supervisor, teacher, or employer? If so, explain.

Since it is an anonymous survey, the subject's participation in this study will not be part of any permanent record available to a supervisor, instructor, or employer.

M. What steps will be taken to insure the confidentiality of the data? Where will it be stored? How long will it be stored? What will be done with the data after the study is completed?

The researcher will be using SurveyMonkey to collect the data. Responses will be analyzed using statistical data summaries without identifying information to ensure confidentiality. The collected data is anonymous. The data will be stored on an external hard drive for three years. After three years, the data will be deleted from the hard drive.

N. If there are any risks involved in the study, are there any offsetting benefits that might accrue to either the subjects or society?

There will not be any risks involved in the study or any offsetting benefits that might accrue to either the subjects or society.

O. Will any data from files or archival data be used? If so, please describe.

There will not be any data from files or archival data be used in this study since the survey data will be used.

Baker IRB Submission form page 4 of 4

Appendix E. Lebanese American University IRB Approval

LAU
الجامعة اللبنانية الأميركية
Lebanese American University

Institutional Review Board (IRB)
لجنة الأخلاقيات

NOTICE OF EXEMPTION DETERMINATION

To: Ms. Amal Traboulsi Najem
Dr. Diane Nauffal
Assistant Professor
School of Arts & Sciences

APPROVAL ISSUED: 17 May 2023
EXPIRATION DATE: 17 May 2025
REVIEW TYPE: EXEMPT CATEGORY B

Date: May 17, 2023
RE: ***IRB #:*** *LAU.SAS.DN1.17/May/2023*
Protocol Title: *Determining the Factor or Factors That Affect Students' E-Learning Readiness in a Developing Country*

Your application for the above referenced research project has been reviewed by the Lebanese American University, Institutional Review Board (LAU IRB). This research project qualifies as exempt under the category noted in the Review Type.

This notice is limited to the activities described in the Protocol Exempt Application and all submitted documents listed on page 2 of this letter. **Final reviewed consent documents or recruitment materials and data collection tools released with this notice are part of this determination and must be used in this research project.**

APPROVAL CONDITIONS FOR ALL LAU APPROVED HUMAN RESEARCH PROTOCOLS - EXEMPT

LAU RESEARCH POLICIES & PROCEDURES: *All individuals engaged in the research project must adhere to the approved protocol and all applicable LAU IRB Research Policies & Procedures. PARTICIPANTS must NOT be involved in any research related activity prior to IRB approval date or after the expiration date.*

EXEMPT CATEGORIES: *Activities that are exempt from IRB review are not exempt from IRB ethical review and the necessity for ethical conduct.*

PROTOCOL EXPIRATION: *The LAU IRB approval expiry date for studies that fall under Exemption is 2 years after this approval as noted above. If the study will continue beyond this date, a request for an extension must be submitted at least 2 weeks prior to Expiry date.*

MODIFICATIONS AND AMENDMENTS: *Certain changes may change the review criteria and disqualify the research from exemption status; therefore, any proposed changes to the previously approved exempt study must be reviewed and approved by the IRB before implementation.*

NOTIFICATION OF PROJECT COMPLETION: *A notification of research project closure and a summary of findings must be sent to the IRB office upon completion. Study files must be retained for a period of 3 years from the date of notification of project completion.*

IN THE EVENT OF NON-COMPLIANCE WITH ABOVE CONDITIONS, THE PRINCIPAL INVESTIGATOR SHOULD MEET WITH THE IRB ADMINISTRATORS IN ORDER TO RESOLVE SUCH CONDITIONS. IRB APPROVAL CANNOT BE GRANTED UNTIL NON-COMPLIANT ISSUES HAVE BEEN RESOLVED

If you have any questions concerning this information, please contact the IRB office by email at irb@lau.edu.lb

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The IRB operates in compliance with the national regulations pertaining to research under the Lebanese Minister of Public Health's Decision No.141 dated 27/1/2016 under LAU IRB Authorization reference 2016/3708, the international guidelines for Good Clinical Practice, the US Office of Human Research Protection (45CFR46) and the Food and Drug Administration (21CFR56). LAU IRB U.S. Identifier as an international institution: FWA00014723 and IRB Registration # IRB00006954 LAUIRB#1

Dr. Joseph Stephan
Chair, Institutional Review Board

DOCUMENTS SUBMITTED:

LAU IRB Exempt Protocol Application	Received 8 May 2023
IRB Approval – Baker University	Received 8 May 2023
Author's Permission	Received 8 May 2023
Research Proposal	Received 8 May 2023
Introductory email script	Received 8 May 2023
Informed Consent	Received 8 May 2023, amended 9 May 20233
Survey	Received 8 May 2023
Link to online survey	Received 8 May 2023, amended 9 May 2023
IRB Comments sent: 9 May 2023	**PI response to IRB's comments dated:** 9 May 2023
NIH Training – Diane Nauffal	Cert.# 2034545 Dated (17 March 2016)
CITI Training - Rahima Charif	Cert. # 52834477 Dated (20 November 2022)

Institutional Review Board
Lebanese American University
17 MAY 2023
APPROVED