

Confidence in pedagogical efficacy of m-learning among teachers from
the kingdom of Saudi Arabia

By

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B.A., Taif University, 2014
M.A., University of Colorado, 2017

AN ABSTRACT OF A DISSERTATION

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Abstract

The purpose of the research was to evaluate confidence in the pedagogical efficacy of M-Learning among teachers from the Kingdom of Saudi Arabia based on an initiative learning program known as Khebrat that focuses on enriching learning experiences in universities abroad, such as Kansas State University. The research instrument included a survey consisting of a 22-item questionnaire using the Likert scale (1-4), and data analysis measured significance of the results. Data was collected with the aid of Survey Monkey, an online platform. In order to strive for accuracy, each teacher that participated in the study could either agree or disagree with the offered statement, and no neutral answers were included. Examining the efficacy of M-Learning, descriptive statistics and Cronbach's Alpha reliability were chosen to measure the sample population average responses mean, standard deviation, variance, correlation and internal consistency between the items. The Cronbach's Alpha value obtained is $r > 0.994$, a high score of reliability in participants' responses. However, the pedagogical effectiveness of mobile learning remains to be further explored by developing the impact of M-learning on the consistency of the learning process.

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Approved By:

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CHAPTER 1. INTRODUCTION

Mobile Learning, also termed "M-Learning," is a method of learning and teaching with mobile technologies. It has two implications in that it is the learner's mobility where learning and teaching is not delimited to physical location and the other is the use of mobile devices, which are portable, lightweight and may be sizable to fit in a pocket; examples include smartphones, handheld computers like iPads, laptops, or Personal Digital Assistant (PDAs).

The primary benefit of M-Learning is that there are few restrictions on training. It is present anytime, anywhere, while interaction is done in real time, which allows for the convenience of tracking students' progress and helping to resolve any doubts they may have. This is advantageous to their learning process as students engage voluntarily and at their own pace.

Mobile learning also promotes changes in the optics of teaching, which makes the process of studying easier for both students and teachers. Visual graphics have been found to be more engaging for learners, as it keeps their attention, and the process is conveyed in an effective fashion (Sharples Arnedillo-Sánchez, Milrad, & Vavoula, 2009).

As a result of the support of advanced technologies teachers feel more motivated to extend their scope of learning. They can take their learning materials anywhere to learn during their regular working hours. This also encourages innovation and creative lectures that could employ information acquired from mobile learning to better his or her performance at the place of work.

The next benefit is the presence of personalization of learning provided by technological tools to tailor instructions to learner needs, learning preferences, and particular needs of different students (Childress & Benson, 2014). As a result, it becomes possible to assess the level of students' commitment in relation to studying. Teachers are inspired when they witness their students' commitment and perseverance when engaging in personalized learning (Childress & Benson, 2014).

Personalized learning gives educators a greater responsibility and power as they tailor learning experiences to the needs and wants of individual learners (Su, Tseng, Lin, & Chen, 2011). This personalized learning benefits mostly learners with disabilities and those for whom educators may have lower expectations, whether they struggle to speak English, or if they come from low-income backgrounds (Childress & Benson, 2014).

Finally, flexibility is one of the benefits of mobile learning that is closely linked to a personalized learning environment. This flexibility means that learners can use their personal mobile learning devices to access different materials and not to stereotype or categorize them into groups that are too broad. Past studies have suggested that personalized learning can enhance students' engagement and achievement (Childress & Benson, 2014). In a personalized learning environment, students and educators co-design objectives based on each student's learning needs and goals (Childress & Benson, 2014). Each student has different objectives, which gives an equal chance to both high performers and low performers (Su, Tseng, Lin, & Chen, 2011). Students drive their learning and own their learning. Students can monitor their academic progress and reflect on their experiences.

The teacher's confidence in M-Learning platforms and the pedagogical efficacy of their use is critical. This research evaluates the teachers' adherence to M-learning technologies and the pedagogical efficacy they entail. Confidence in pedagogical efficacy is a personal belief in the effectiveness of one or more teaching strategies. According to Artino (2012), confidence in the suitability of teaching strategies applied is the determinant in terms of teachers' success for self-realization. Teachers can hardly be effective leaders and motivators if they do not believe that the strategies, they use are effective. In addition, the perception of the effectiveness of learning by pedagogues must match the perception of the efficacy of learning tools used by students (Artino, 2012). Otherwise, if the connection is absent, the studying process will be ineffective. Hence, the

teachers must pay a decent attention to the establishment of a bilateral contact with students, thus improving the productiveness of the learning process. (Artino, 2012, p. 76)

The greatest problem may appear when the education system has already evolved, but teacher's confidence has obstructed adoption of modern strategies. In particular, confidence problems are evident in countries with high adherence to traditional learning practices, including most Asian countries, for example (Artino, 2012). In this light, the only proper way to improve confidence in the pedagogical propriety is to acknowledge strategies and evaluate the empirical effectiveness they can bring. In addition, teachers must understand the effects of modernization in the context of the personalized learning environment of each student independently.

The presence of technology that increases the effectiveness of teaching and learning helps to make teachers more confident in self-efficacy. The support of technology makes students more open to accepting pedagogy techniques so that teachers can feel more confident in the effectiveness of their work. Institutions must make sure that self-efficacy is adopted and positively perceived by all practicing educators through the process of adopting the innovations successfully (Artino, 2012, p. 82). There are many ways to improve confidence; however, each of these methods must be fostered by technology to make it as effective as possible. Artino (2012, p. 82) alleges that the teachers' confidence in pedagogical efficacy can be improved by providing more flexible environments where the outcomes of learning can be managed and predicted. In such a manner, teachers can improve self-confidence, and the stability of student-teacher relationships can be boosted.

Artino described self-efficacy -- a personal belief in one's capability to organize and execute courses of action required to attain designated types of performances -- as task-specific self-confidence (p. 76). Artino also indicated that research on student self-efficacy continued to receive attention in areas of academic motivation and achievement, which is an indication that self-efficacy or rather task-

specific self-confidence was deemed an important motivation for learning and achievement. The study by Artino demonstrates the importance of cultivating self-efficacy as a way to promote learning through m-learning. Thus, both educators and students can benefit from the development of self-efficacy. Teachers need to develop self-confidence in being able to deliver lessons and instructions through m-learning while students need to develop self-efficacy in order to remain motivated as they learn through m-learning (Artino, 2012, p 76).

Developing self-efficacy requires understanding of its sources. Artino (2012, p. 78) notes that there are four primary sources of self-efficacy, including enactive mastery experiences (actual performances), observation of others (vicarious experiences), forms of persuasion, and physiological and affective states from which people judge their capabilities, strengths, and vulnerability to dysfunction. Of the four sources of self-efficacy, enactive mastery experiences are the most effective. Therefore, it means that by doing, educators and learners develop self-efficacy. Engaging in m-learning will be an important way for the educators and the learners to develop and master self-efficacy, gaining confidence, motivation, and achievement in the process. This study will be tracking the potential for developing self-efficacy through performance under m-learning.

1.1 Problem Statement

In contemporary times, advancement in technology facilitates students to have online lessons via the internet. It is not explicitly known how teachers in the Kingdom of Saudi Arabia are impacted by the Khebrat program. Over time, the Kingdom of Saudi Arabia has had a challenge in obtaining effective teachers who are efficient in M-Learning. Therefore, there is a dire necessity to promote teachers' skills, confidence, and language to be effective educators and provide quality education to Saudi Arabia students. In accordance to that, a professional development program known as Khebrat

designed by the Saudi Arabia Ministry of Education towards the initiative aims to improve teachers' skills, confidence, and their language as they attend to students in their respective learning institutions.

There are online platforms that offer lessons, including international languages, and numerous people have enrolled in such. While most people across the world are adopting the use of mobile learning, there is a need to establish the significance of the activity among learners and if they have any positive influences among students who enroll for the lessons. The current study focuses on elementary and secondary teachers from the Kingdom of Saudi Arabia. Moreover, teachers need to implement confidence while in class. If students expect "consistent quality of learning and teaching" from their teachers (Steel, 2007, p.947). Individuals enrolled in mobile learning are perceived to attain more knowledge about their area of specialization. However, in the context of improving teachers' skills in terms of confidence and language in the Kingdom of Saudi Arabia, there is insufficient data.

Saudi Arabia is specified on the great number of schools, which are different in terms of size and area. For these schools, another challenge that internet connectivity has been an issue, manifested in the form low internet speeds or limited access (Al Ohali, Y., Al Suhaibani, A., Palavitsinis, N., & Koutoumanos, A., 2018).

In the last three years, the Ministry of Education of the Kingdom of Saudi Arabia has realized the value of technology and the usefulness of M-learning. As a result, many initiatives have started to switch from traditional teaching to digital learning to resolve the struggles of internet speed, the need to incorporate new teaching techniques, and the growth of K-12 teachers' skills in M-Learning.

The research questions explained as follows:

Research Question #1: To what extent do international teachers at Kansas State University have confidence in the pedagogical efficacy of mobile learning?

Research Question #2: How effective is mobile learning pedagogically?

Research Question #3: Do teachers gain confidence in using mobile learning effectively?

Definition of terms explained as follows:

International Teachers: K-12 Khebrat teachers from the Kingdom of Saudi Arabia enrolled in the Khebrat program 2019-2020.

Confidence: A personal belief in the effectiveness of one or more teaching strategies.

Pedagogical Efficacy: The growth and development of both teachers and students regarding learning knowledge and skills.

M-Learning: Devices that access course platforms materials, such as smartphones, iPads or laptops.

1.2 Theoretical Framework

In M-learning, students learn across both time and space and move in and out of engagement with technologies. According to Leo Vygotsky, there is a high level of significance in motive and consciousness towards achieving effectiveness in learning (Engeström et. Al., 2016). This underscores the need for having clear goals to enable successful learning. The work of Sharples et al., (2009) states that “the learning activity system was mediated by traditional tools which were not fully supportive of the learner’s goals, knowledge, and skills transformation.” Tools used in mobile learning like mobile phones and computers function as interactive agents in knowledge and to aid in recall and support the learning activity system.

The progressive education advocated by John Dewey, in which students learn by interacting with the environment and by doing, is supported by mobile learning. Dewey’s view that students must interact with the environment in order to adapt and to learn, and that teachers and students must learn together, extends education beyond traditional student-teacher, brick and mortar school learning (Bada, 2015, p. 66). Teachers embracing new technology are following the guidance of constructivists.

Vygotsky also ascribed to the theory of social constructivism, suggesting that students construct knowledge and meaning from their own experiences and therefore benefit from going beyond teacher-centered learning. According to Vygotsky, cognitive functions are products of social interactions (Verenikina, 2010, p. 3). Therefore, learning is collaborative in nature and involves social negotiation. Vygotsky rejected the idea that it was possible to dissociate learning from the social context (Verenikina, 2010, p. 3). Instead, he believed that learning occurs in two levels that are interacting with others and integration into the individual's mind. Interacting with others is the social level under which the inter-psychological factors play an important role in cognition. At the individual level or integration into the individual's mind the intra-psychological comes into play. Moving from the social level to the individual level results in the reducing role of the educator as the learner increases attention, logical memory, and develops concepts. Vygotsky referred to the concept as reciprocal teaching in which summarizing, questioning, clarifying, and predicting become the tools through which knowledge is transmitted. At the advanced levels, scaffolding and apprenticeships are applied to help further development of cognition, especially among the educators. Vygotsky's social constructivism theory is critical to this study as it helps explain how educators and their students co-create meaning through m-learning.

Both the students and the teachers need to learn and develop self-efficacy and the only way to do so is by doing. Dewey insisted on democratic ideals which means that both teachers and their learners are all participants in the learning experience which means that there will be sharing of experiences (Bada & Olusegun, 2015, p. 67). The roles of teacher and learner evolve during the learning process, according to Vygotsky -- the role of the educator is reduced as the learning moves from the social level to the individual level.

According to Traxler (2005), mobile learning can create opportunities that extend learning far beyond the constraints of a classroom, which will promote long-term self-regulated learning. These activities need not be done entirely by mobile phones but can be balanced with other learning and instructional techniques. In the process, it will be discovered that learning will be transformed into a seamless part of life to the level it is not seen as learning. The ability to reach underserved children, the flexibility to fit into diverse learning, the ability to promote anytime anywhere learning, improve social interaction, and allow for personalized learning experiences is central to the promise of mobile learning. Alternative models of educational improvement that can be supported by mobile technologies is an evolutionary change which expands human support and thus invents new structures for formal education. Wagner (2005) stated that “These changes involve being a part of the crucial strategy of eliminating inflexible traditional methods of education.”

1.3 Use of Smartphones in Higher Institutions of Learning

Application of such devices as smartphones in learning has become popular in the research in institutions of higher education. Mobile learning is any learning provision where the primary or leading technologies are handled via palmtop devices such as smartphones (Taxler, 2005). Number of laptops used in universities outnumbers desktop computers on campus. Furthermore, notebook computers and smartphones are ranked the most used devices in universities today (Wagner, 2005).

Smartphone use in universities viewed as a significant part of life owing to the advanced technological features. University students use smartphones to accomplish various tasks in the learning process. Increasing learning and accessibility content to students has been made possible using smartphones (Canuel& Crichton, 2011). Important thing is that Canadian libraries expand their presence and relevance through the application of downloadable apps. Consequently, students find easy access to library content through smartphones applications. According to Canuel & Crichton

(2011), the adoption of downloadable apps by some Canadian libraries sets a precedent for further research in using smartphone technology services in learning. Nonetheless, the study highlights the need for libraries to utilize smartphones in increasing content for students. Furthermore, the authors argue that there is a lack of content and services via mobile websites and apps.

A research study conducted by Dukic & Tam (2016), demonstrated how school librarians search, access, and share information via smartphones. Far from downloadable apps, students also use smartphones in the everyday learning process. A study that involved students from Tsukuba and Hong Kong universities found that smartphones are important in the learning process.

The focus group revealed that they mostly utilized smartphones in studying, and they view them as a crucial component in academic research (Dukic, Chiu & Lo, 2015). The study also revealed that students use smartphones in accessing the library catalog and online discussion of course assignments (Dukic, Chiu & Lo, 2015). Although few students use online library catalogs, libraries offer a variety of services using smartphone features. Also, the small screens of smartphones are cited for being a significant hindrance to academic learning (Dukic, Chiu & Lo, 2015).

Another study conducted across three Spanish public universities disclosed student acceptance, incidence, and the use of tech devices, mostly smartphones, and tablets. Using quantitative methodology and 419 students, researchers established factors that condition and favor digital mobile devices usage (Sevillano-García & Vázquez-Cano, 2015). As found by Sevillano-García & Vázquez-Cano (2015), “Educational factors such as student acceptance, incidence and use of tech devices established in the study include the area of research, teaching model, and standard capabilities.” The elements can lead to the outcomes that can be utilized in improving learning. It can be promoted through the smartphone technology in universities. Reviews from various research demonstrated that students use smartphones in language learning.

1.4 Purpose of the Study

The purpose of the study is to evaluate confidence in the pedagogical efficacy of M-Learning among teachers from the Kingdom of Saudi Arabia based on an initiative learning program known as Khebrat that focuses on enriching pedagogical learning experience in abroad universities such as Kansas State University. The researcher conducted a survey to evaluate confidence in three segments: Confidence of M-learning tools, Confidence in the pedagogical efficacy and Confidence in teacher's using M-Learning effectively. However, the focus is to evaluate teachers' confidence at Kansas State University to determine if mobile learning is efficiently can be implemented which “allows distance education programs to provide specialized courses for students in geographically remote areas with increasing interactivity between students and the teacher” (Al-Fahad, 2009, p.112).

The Ministry of Education in Saudi Arabia recognizes the need for successful teachers in Mobile and Digital Learning to enhance the educational performance of teachers and the performance of students as a significant part of flexible learning (Al-Ajlan, 2016). Teachers have been found to be inefficient in managing students in “developing the digital competencies they need.” (Guri-Rosenblit, 2018, p.95). Therefore, this study will evaluate a teacher's confidence of using mobile learning and the importance of its benefits. Teaching is dynamic, and rules change to enhance students' learning abilities.

Through mobile learning, teachers across the world can have an insight into the effective approach to handling students. An analysis of the study results will consider the role of confidence in M-Learning tools, and confidence in the pedagogical efficacy of M-Learning, towards effective teaching and learning.

CHAPTER 2. LITERATURE REVIEW

Through relevant literature review, several studies have shown the importance of the use of mobile learning and its advantages in the education system in different fields. In addition, multiple empirical studies on K-12 education in the Kingdom of Saudi Arabia demonstrated the need for technology to be incorporated into its education system and have refuted the Theory of Traditional Activity. In this chapter, several studies explain the importance of mobile learning and its benefits in many fields of education, medicine, mathematics, language and many other fields. All studies have agreed on the importance of M-learning in the transition towards digital education instead of traditional education. Most studies have shown that education continues beyond the classroom and outside the school, credits to innovative modern education approaches, such as M-learning, which contradict the Theory of Traditional Activity, which does not support the aims, awareness and skills of the learner. Technology has saved a lot of time and effort for students, teachers, and parents, as well as easy access to the curriculum in a limited time to benefit from relevant knowledge or assignments. Technology generates student's spirit of learning, discovery and encouragement of imagination in other fields that which, in one way or another, influence potential motivation.

2.1 Mobile Learning Is an Essential Educational Provision

Mobile learning is a new innovative wave of learning processes associated with multifold changes in Saudi Arabia Education sector. The main factor that encourages its adoption is the increased accessibility it provides to learners, especially those from remote areas through programs such as distance learning (Yamin, 2015). These programs increase the number of graduates due to better learning opportunities in universities for learners' convenience (Alahmari, 2017). More so, distance education programs provide specialized courses for students in geographically remote regions, thus enhancing interactivity between learners and educators.

Yamin (2015) reports that mobile learning competency and utilization highly depends on teaching techniques implemented by teachers to ensure that students remain engaged in a collaborative and transparent learning experience. The mobile learning technique represents an enhancement to the traditional methods where students were predominantly spectators (less active) and preferred to memorize the content without critically analyzing them. Rhamatullah et al. (2020) argue that the principal motivation for listening to the long three-hour lectures and reading the learning materials provided by their lecturers in the traditional teaching method was to pass exams with good grades. Even with online learning, there was little or no valuable learner-educator interactive activities as the e-learning approach was more individualistic and isolated. In comparison, the learning using gadgets requires a specific understanding of the content. Students should be taught how to navigate the dynamic mobile learning panorama successfully (Rhamatullah et al., 2020). Amid the limitations faced by students and teachers during distance learning, the digital system is a world of possibilities for all education institutions.

2.2 Mobile Learning Pedagogical Approach

With the increased popularity of digital learning, many pedagogy researchers focus on analyzing the most innovative strategies to sustain a conducive online learning environment. The increasing number of learners initiating the mobile learning approach has made the educational institutions to train instructors to ensure they conduct digital lessons effectively. The adoption of mobile learning is a significant adjustment from the traditional face-to-face learning environment, and it implies a fundamental change in the pedagogical strategies. Akbar (2016) argues that for smooth and purposeful mobile learning, the institutions are required to adopt the digital technology education pedagogy strategies. For instance, the student/educator interaction using mobile learning is abating as the learning materials are supplied on websites. Second, teachers need to be up to date with the current

advanced software programs to ensure smooth interaction. However, most of the teachers and sometimes learners perceive handling mobile learning as challenging, especially if unexpected situations arise (Rhamatullah et al., 2020). There are also other obstacles such as deciding about the unique and effective techniques required to impart knowledge to learners or even determining the amount of content for lessons. Therefore, the teaching fraternity needs to adopt new pedagogical interventions to help them design a flexible course curriculum, especially with the unfolding technological advancement.

Without the intervention, Phan (2017) states that mobile learning approach overburdens teachers and force them to become experts in content creation and technological stewards. Consequently, some educators resist altering their traditional face-to-face pedagogical method since they demand extra justification to how and why digital technology should be incorporated in their schooling system. Despite being a popular research topic in education, there is little evidence on ways to improve mobile learning pedagogical competence. More investigations are needed to discover strategic pedagogical approaches that will ensure effective mobile learning and describe how the interventions should be implemented into practice. Rhamatullah et al., (2020) stated that “Pedagogy competence for mobile learning is a fundamental feature that must be established in all facilities adopting digital learning to generate profound outcomes.” (p. 254). The primary pedagogy competence is a constructive educational approach as knowledge in mobile learning consists of social and individual exploratory activities instead of the previous unified receive-transfer learning approach used in the traditional face-to-face method (Rhamatullah et al., 2020). Therefore, imminent researchers need to delve deep into the mobile learning process to widen the realm of the digital pedagogical education system.

Developing new pedagogical approaches that support mobile learning should be easy as mobile learning is comparatively flexible. In this context, mobile learning teachers need more approaches to familiarize themselves with the new pedagogical tools that will enable them to interact with students conveniently and promptly. Examples of such strategies, as described by Rhamatullah et al. (2020), include the Computer-assisted Language Learning program (CALL). CALL is widely applied in Saudi Arabia to equip educators and learners with knowledge of the advanced technological world, and it has been helpful to many for their outlook of prospects (Anas, 2018). Other institutions in Saudi Arabia integrate the computer-assisted learning technique into their syllabus as a blend-in mode, especially for students transitioning from the traditional face-to-face learning method to digital technologies. However, the government needs to be supportive of the digitalization of the teaching process through funding to ensure that all mobile learning technological resources and procedures are adequate. Phan (2017) argues that such external government support will not only influence learning positively but promote technological innovativeness in these learning facilities.

2.3 Mobile Learning Literacy, Readiness of Teachers, and Learning Resources

Despite the value of mobile learning in the future generation, teachers with little proficiency in information technology skills find it challenging to manage the teaching process. Guri-Rosenblit (2018) argues that for teachers to become more productive and engage learners, they should undergo a digital training course that focuses on the development of their personality and profession. Such training can ensure that tutors make proper use of digital technology, learning materials, and resources to meet the targeted competencies and desired academic progress. Lack of confidence in digital technologies resource utilization may impact the learning process of an institution negatively.

The advent of mobile learning removes barriers such as age, culture, distance, and economic limitations. The implementation of a successful mobile learning approach will require the design and

application of effective teaching strategies. Rhamatullah et al. (2020) note that the aspect of mobile learning readiness among teachers is a significant factor in this education program. Management of online courses can be a daunting task for them due to the demanding technological basic techniques. The lack of technical and theoretical competence is a significant barrier to mobile learning readiness among the e-teachers. The changes are associated with fundamental technological challenges. Therefore, the process of shifting from traditional classroom learning to that of the virtual world will demand articulation of the academic content, delivery, and implementation of an innovative learning method.

Analysis of the Taif University faculty staff involved in virtual learning revealed that most of the members lacked the tech know-how and that they needed intensive training (Rhamatullah et al., 2020). Anas (2018) alleges that faculty members' fears from technology resulted in the obstruction of proper utilization of the mobile learning requirements and the appropriate pedagogical process. The mobile learning process in Saudi Arabia education facilities is accelerating. Teacher digital incompetency must be addressed using efficient and innovative training, especially for teacher's students, to ensure that they remain skilled in their profession and that they contemplate on the most appropriate technique to aid them in generating digitally competent students. With no digital programming expertise, the mobile learning environment can be challenging and will be insufficient to support active learning.

According to Rhamatullah et al. (2020), mobile learning such as video streaming creates a collaborative environment for students to learn. Learning institutions in Saudi Arabia are making efforts that will ensure that students become competent with advanced technology. In these learning institutions, learning achievement is attributed to the appropriate use of technological resources. Mobile learning demand for new resources for enhanced learning across various fields. Any education

facility that adopts the mobile learning technology must be willing to assist their learners in gaining awareness of the digital platform using interactive learning sources, which can be utilized by learners to get programmed guidance and feedback. These include printable versions of e-books as they are equally effective as textbooks.

Other mechanisms that can be adopted consist of the video streaming to educate learners about various digital platform features and their distinct purposes (Rhamatullah et al., 2020). The use of magazines and active participation in the discussion forums are other mechanisms to provide learners with adequate training on the mobile learning platform. For blended learning, the digital content should be designed in a manner that helps the learners to understand the concepts taught in traditional classroom environments to enable the instructors to readjust to the content matter to facilitate an efficient and convenient learning process. Yachina et al. (2016) argue that modern-day learners prefer to engage in fascinating interactive activities but are often limited by language barriers. The Computer-mediated communication (CMC) digital learning tool is effective for the acquisition of a second language. Teachers can use this resource to give enough learning instructions and helpful feedback to the learners.

2.4 Digital Transformation of Education in the Kingdom of Saudi Arabia

According to Qahmash (2018), decisions about how and when technology is used in the curriculum is an additional characteristic that can influence teachers' adoption of technology. A. I. M. argued that technology integration can be different based on grade level taught as well as the nature of curriculum which means, teachers' skills in adoption of technology comes first before applying any platforms or tools to students. According to Hujran, O., Lozi, E., and Debei, (2014), M-Learning offers important benefits and advantages to the learning process and helps to improve learners' literacy and numeracy skills as it encourages both independent and collaborative learning experiences. Authors

mentioned that M-Learning as a new technology is still under development in Saudi Arabia. However, several studies have shown the need to evaluate students' expectations of the implementation of M-Learning in Saudi Arabia.

A research study conducted by Kahveci, A., Kahveci, M., Mansour, N., and Alarfaj, (2018), demonstrated that teachers between the ages 45-94 have a higher self-efficacy than teachers in the ages 30-34. On the other hand, teachers with less experience have a significant higher self-efficacy relative to teachers with 6-10 years of experience. According to Ohali, Y., Suhaibani, A., Palavitsinis, N., and Koutoumanos, A. (2018), the coordinated use and adoption of new technologies within the classroom worldwide, has been intensified throughout the last decade. Authors mentioned several challenges to implement digital transformation of education in the Kingdom of Saudi Arabia deploying a country-wide Learning Management System (LMS) for K-12 Education. Introduction of LMS in various school topics, the ground support to teachers, training and supporting material, monitoring, evaluation, and quality assurance, and change management and motivation. Which requires more developments in the education environment of the schools and classrooms.

Bousbahi and Alrazgan (2015) looked at the views of faculty members about the inclusion of LMS in their courses at King Saud University in Saudi Arabia. In this empiric analysis, the researchers found that Blackboard was the only LMS used at KingSaud University and was frequently used as a storage system for one-way distribution of resources. Inan and Lowther (2010) study found that younger teachers are more cooperative in the adoption of technology integration more than older teachers.

2.5 Motivation for Using Mobile Learning

Today's students use mobile devices for learning extensively. It has also led them to do multitasking. However, the author identified that much of the current educational system runs on the

information-driven paradigm in which learning or education revolved around the dissemination of information by an individual often with authority (teacher) directly to learners in a physical setting such as the classroom. In contrast, mobile learning adopted a new paradigm – the participatory driven paradigm. In this type of learning context, a whole new environment of interconnectivity between academics, students or learners, and teachers is achieved which enables all stakeholders to network easily and engage in collaborative knowledge construction. The success of the participatory-driven paradigm, according to Pedro et al. (2018) is hinged on the ability of the teachers to create a participatory climate. Therefore, it is required that teachers become trained to ensure that optimum utilization of learning through mobile devices is delivered.

In that context, the study shows students and teachers however considered mobile learning is highly effective for students across different ages. But, using mobile devices in the classroom is still considered as a source of a high degree of distraction. Therefore, it impacts on the flow of communication and teaching within the classroom. Therefore, as technology progressed and offered different educational solutions. Buy, if the traditional educational system fails to adopt the new technology innovatively and effectively, students and teachers will believe that mobile learning is not highly effective. But, in true aspects, this reasoning cannot be supported based on different analyses and perspectives.

Health risks could also explain a decreased level of focus on learning. Durusoy et al. (2017) argued that children and adolescents become highly affected by electromagnetic radiation emitted from the mobile. Therefore, they develop severe health issues such as headache, dizziness, concentration difficulties, fatigue, sleep disturbances, visual disturbances, depression and dryness of throat. Based on the severity of impact, many people develop other issues such as forgetfulness and irritability. However, the study shows students do not get direct contact with the phone and instead use

headphones or other modes of connectivity, they become less impacted by using mobile phones. Therefore, extensive use of mobile phones can be severe for the health of students. Therefore, delivering education based through mobile phones only cannot be proved feasible for the students in long term perspectives. Since the degree of radiation, they would receive will result in various degrees of carcinogenic threat on them.

2.6 Effectiveness of Mobile Learning in Imparting Technical Education

Rusli et al. (2019) identified that, in the context of studying theory-based subjects such as welding mechanisms of architecture in a Polytechnic college of Malaysia, mobile education seems highly beneficial. The study analyzed various key factors such as user-friendliness, engagement, learnability, satisfaction, usefulness, and motivation through the education provided by Mobile ARC Welding Learning (MAWL) App. In all these factors, the study of the welding mechanism through the app showed a high degree of adaptability. Direct learning of welding mechanisms makes the process cumbersome and it also offers a high degree of health hazards. In that context, using mobile technology-based animation and augmented reality helps the student to better understand the process of welding mechanisms. Such as the way once they part in a practical session, they become self-sufficient to securely perform the task. It also reduces the chances of errors and other issues. In that context, students learn the subject more effectively through mobile education. It shows that the effectiveness of mobile education depends on key factors such as the subject, time of interaction with mobile required and technological innovation used while imparting education through mobile. According to Gómez-Ramirez, Valencia-Arias & Duque (2019), the study based on the Technology Acceptance Model and Theory of Planned Behavior Model has helped to recognize various aspects of m-learning among students.

The study identified that the Planned Behavior Model is based on three key heuristics such as attitudinal beliefs, normative beliefs and control beliefs. These three leads to the specific intention which governs a certain behavior. The Technology Acceptance Model offers two key heuristics such as perceived ease of use and perceived usefulness. These two heuristics help to form attitude, intention, and behavior. The analysis of a large array of data has helped to identify in that study that perceived usefulness over perceived ease of use is the key driving factor that encourages teachers and students to use M-Learning. However, student readiness and perceived self-efficacy also play a significant role in motivating students to access mobile learning through formal or informal educational channels.

Alnabhan and Aljaraideh (2014) mentioned based on a study conducted on 180 students of Jerash University, Jordan that ease of use is the most effective aspect in ensuring considerable acceptance to use collaborative mobile learning. The study was conducted on students from information technology, education and science background. Where, a high number of students were from an information technology background, followed by those from education and science backgrounds respectively. The study revealed IT students the highest degree of acceptance. It can be concluded that poor familiarity with mobile technology has discouraged many students to engage in a mobile-based collaborative study. However, the study also showed that not only ease of use, but also the learning context details, and learning style also play key roles in ensuring positive intention of people toward accepting mobile-based collaborative learning propositions.

Issaramanoros, Khlaisang & Pugsee (2018) mentioned that in the context of a study conducted on perception of Auto Mechanic Students in Thailand reveals performance expectancy is not a key factor for choosing M-Learning. They put more focus on effort expectancy, hedonic motivation, personal innovativeness, and others. However, this can be the reason that the students did not access the M-Learning solution before. But, in other perspectives, it was considered that in countries like

Thailand, people do not access proper education due to many reasons. They look for various vocational training which would help to fetch a job in potential industries. In that context, mobile learning is highly cost-effective and feasible as it allows students to study at their own pace. Learning skills and academic subjects are fundamental aspects based on which mobile learning can be implemented. In the countries where these two integral aspects are not developed, the implementation of mobile learning cannot be possible.

2.7 Acceptance of Mobile Learning among STEM Students

Chase et al. (2018) identified that mobile learning in the STEM sector is not accepted. The data gathered from 275 STEM students identified that the practitioners are willing to use various mobile devices to do self-study. If they engage in M-Learning, no considerable time is invested in knowing the gadget and become familiar with it. Thus, they are highly effective in using mobile technologies. In that context, the STEM practitioners also find traditional media such as books, journals, articles available in physical form or at the library not effective or attractive. It is important to add that students pursuing a career in that industry are key beneficiaries of mobile learning. However, they also use it to do various productive works in their free time. The study also shows that STEM practitioners consider the mobile is effective for facilitating better learning and living. It helps them to remain connected to the world around and effectively respond to the changes in the learning and living environments.

Contrary to this, Salameh, Ewais & Salameh (2020) mentioned that STEM professionals in Palestine found mobile learning highly effective for many professional courses. A study conducted on STEM students at Arab American University in Palestine. Since the students used to engage in employment while pursuing their education; they were highly benefited through mobile learning as they were able to study at their own pace with no impact on the quality of their private life. Another

key factor that helped them to accept mobile learning so positively was that they all had access to their mobile. They were very familiar with using different mobile apps. In that context, they did not have to put additional effort to learn the process through which educational applications will function properly. However, they faced it challenging to access mobile learning materials due to issues related to poor functioning of the phone. It is highly important to deliver education through M-Learning solutions by using more simulation and multimedia-based content to keep students highly professional in technology constantly motivated.

2.8 Acceptance of Mobile Learning among Students of Information Technology

As per Almaiah & Jalil (2014), a study conducted on 91 undergraduate students majoring in computer science at Universiti Malaysia Terengganu (UMT) revealed that mobile learning has helped them to get better self-paced learning cost-effectively. They also showed interest in mobile devices for administrative services. The respondents considered mobile learning as an extended version of computer-based online learning. However, they found that compared to online learning mobile learning is more effective. Since people can access the learning materials from any location. Apart from that, the cost of mobiles is comparatively lower than that of computers. Therefore, the penetration rate of mobile learning is high in Malaysia. Many students are aspiring to undertake technology-focused courses in the future. They also perceive that mobile learning is one of the key futuristic educational solutions. Thus, they highly agree to invest in mobile learning.

As the quality of smartphones and available infrastructure also impacts the effectiveness of mobile learning, Elammari & Cavus (2019), identified various key factors students consider while purchasing a smartphone. A study was conducted on 472 students of Cyprus International University, Near East University, and Eastern Mediterranean University. The students were pursuing IT-related

courses such as Computer Engineering, Management of Information Systems and Computer Information Systems.

The key factors students identify for choosing smartphones are features, prices, peer group influence, purchase intention, and brand image. Among all these factors, the price of smartphones plays a very insignificant role in purchasing any smartphones. Whereas, features and brand image of phones play very significant roles in developing the positive intention of purchasing a phone. In that context, it has also been identified in the study that many students do not conduct required research before purchasing any phones. However, the study shows that students are capable enough to engage in mobile learning if they are provided with effective mobile-friendly study material and course curriculum. Thus, not only the positive intention to access mobile learning courses which matter but also available infrastructure and educational support also play significant importance.

2.9 The Mobile Framework for Mobile Learning

A study done by Usagawa (2018, p.44) through an in-depth analysis to determine the major aspects that govern learners to have positive intentions for mobile learning revealed that there is a rising number of students that have mobile devices supporting digital information and facilitating their mobility. The study was done using a sample of 1024 students emanating from two premier educational centers of Myanmar including Mandalay Technology University and Yangon Technology University. In this analysis, the Technology Acceptance Model (TAM) was used and two major constructs were developed including the Perceived Ease of Use and Perceived Usefulness (Usagawa, 2018, p. 45). Nevertheless, the study did not limit the analysis on the basis of the major aspects only. In this regard, it had five extra aspects in the analysis including the following: Personal Innovativeness, Background Usage, Learning Behavior, Intention to Use and Expected Usefulness for Teacher. The rationale for this is that the current interconnected and technology-oriented world is

characterized by a physical learning setting that is eventually transitioning into a virtual or Internet-based location whereby students can make active learning using portable devices.

In the study by Usagawa (2018, p. 46), the integrated analysis based on the identified aspects utilizing the ANOVA model revealed that Intention to Use is a major facet that controls students to have access to mobile learning remedy. Nevertheless, the positive intention is usually introduced through three major positive aspects including Personal Innovativeness, Expected Usefulness, as well as Perceived Usefulness for educators. In this regard, the least significant aspect that has a positive notion in establishment of positive intention of mobile learning encompasses the learning behavior of learners. Nevertheless, the Background Usage along with the Perceived ease of Use have a crucial place in making sure that learners have access to mobile learning benefits. In this case, it should be noted that an educational institution is needed to comprehend the learners in their diverse aspects including needs, capabilities, and other relative notes in an attempt to customize the present mobile solutions for improved learning and cognitive development.

A study conducted by Nguyen and Pham (2011, p. 23) attempted to unravel the above information in as a way of creating solutions through a study that sought to determine Learner Open Modeling in adaptive mobile learning model for enhancement of English learning among students. The authors considered the way to utilize open learner modeling methods to adapt contents for diverse students based on various aspects. In an attempt to solve the issues, the authors attempted to create an infrastructure for mobile learning that would have adaptive elements. The research integrated various programs that were used for making mobile learning to provide improved and comprehensive platforms. In this regard, the study determined an already existent and popular mobile educational segment known as CAMCLL for Chinese language learning. There was also TenselITS meant for English language, and LOCH that catered for Japanese language. Others that were identified included

PALLAS and Tango among many (Nguyen & Pham, 2011, p. 25). In this regard, it can be deduced to mean that the study thrived to create a novel system referred to as CAMLES by incorporating the four key elements of context data, content modeling, student modeling, and knowledge. The authors reported that due to the portability, mobile advancement is an expanding trend in a wide array of activities in contemporary life.

The four factors identified above played a significant role in developing a better database layer for the model. Nevertheless, effective context rule, adaptive engine, rule, and context engine were applied in the development of an improved version of adaptation layer. In effect, the complete platform depicted three potential feature that would enhance adaptive mobile learning. They include an adaptable platform for learning content based on a student's knowledge background and context (Nguyen & Pham, 2011, p. 26). The other thing is the adaptive learning content platform that enhances the process of recalculation of value of learner model when a student applies the system in the future. However, some limitations of the identified model have been noted in the study, which as subject for review for extra changes on them. On another note, the study revealed its feasibility in making mobile learning setting effective in assisting people to study on the basis of capacity, merit, intention, as well as learning pace. In this regard, the remedy can provide improved support to learners to push for enhanced educational expertise.

2.10 Effectiveness of Mobile Learning for Studying Applied Sciences

It has already been identified that the contemporary mobile application based learning process is an effective one in taking the part of the traditional system for applied sciences. Indeed, this happens when the system is able to help students get capabilities for more reasoning through critical as well as profound problem-solving. A study conducted by Kadry and Ghazal (2019, p. 15) divulged that teachers are always frustrated with learners and their utilization of cell phones in the learning sessions,

which makes them to propose an innovative model that would encourage students to apply effectively their smartphones during class time. Through this, students are in a position to acknowledge the objective of learning and become motivated to give improved results. In regard to motivation, both Kadry and Ghazal (2019, p. 16) expound on a proposal for a solution on the basis of several theoretical lenses including Dale Cone, Bloom's Taxonomy, as well as Substitution Augmentation Modification Redefinition Model (SAMR) model. The note here is that the proposed application using the perspectives can be integrated simply into any textbook whereby no form of coding would be needed.

Most importantly, the Dale Cone model enhances the idea of practical orientation. In this model, it was determined that individuals can still retain more details on the basis of their engagement with an issue and not by hearing or listening to the matter directly. The developer of Dale Cone model stressed on effective learning as a way of enhancing direct education and remedying simulations (Kadry & Ghazal, 2019, p. 16). The other one is Bloom's Taxonomy that is founded on learning through the doing concept. In this regard, the study stressed on analysis, assessment, and creative thinking. Ideally, it can be deduced from these two that the ideology in Dale Cone model is on the 'Participation' level, while that in the Bloom's Taxonomy is on 'Application' level. In this case, the study was able to integrate both aspects and provide a cumulative notion as SAMR. The model aims at eventually rendering mobile learning a substitute to the traditional approach. In this case, there will be no functional modification toward creating mobile application in establishing novel tasks that were in the past implausible.

The impacts of SAMR model have been backed up by outcomes emanating from a small-scale segment of study that was done on 30 junior applied science learners across Lebanon (Ghazal, 2019). In this case, it was determined that if the system or other infrastructural developments linked to mobile learning are effective to impart learning on a certain subject, it can lead to the anticipated outcomes

and a high acceptance level for an effective learning solution (Kadry & Ghazal, 2019, p. 20). Another thing to note is that despite the fact that mobile learning can emerge as unacceptable and unreliable for some learners that would be taking applied courses and higher studies, it can be applied as a contemporary pedagogical model. Alsswey (2020, p. 5) indicated that the present educational systems in most schools as well as universities in the Arab nations have benefited from the notable revolution in the development as well as distribution of mobile services as an effective approach to enhance the general learning experience. Fesakis, Karta, and Kozas (2018, p. 53) added onto this inference by indicating that the utilization of math trail as a learning practice model can take the benefits of mobile computing devices for the design of reliable learning encounters in an authentic context. Fesakis et al. (2018, p. 54) added that critical mathematical problems can be resolved by learners who are 12 years if they got the right guidance. The sample of students selected for this study used Google Maps and Object Height technology and found them to be fun and interesting as it helped them learn complex ideas and information. Most importantly, it was determined that the interactive solution that was available through mobile learning played a significant role in enabling them take part in collaborative learning. Ideally, mobile learning helps students build the confidence that they need to solve even complex problems.

2.11 Effectiveness of Mobile Learning for Studying Languages

Mobile learning has not only been found to be effective for contemporary pedagogy or technical educational courses, but also crucial for studying obsolete languages. In a study done by Alblowi (2019, p. 2), what determines this success is the construct of attitudes that were found to be positively as well as significantly associated with the adoption of mobile learning. In most mobile learning platforms, the interactive, accomplished, and playful apps play a significant role in assisting students to evaluate their progress in the course of learning without experiencing threats of rivalry or

fear of intimidation for making errors. A good example is Javascript that has been adopted widely in Malaysia. The app plays a significant role in promoting constructive learning as learners are able to contemplate more and continue exploration of ideas. The dominance of digital advancement within the pedagogical discipline appears to be taking over the traditional educational model on account of its overexpanding favor as well as recognition (Rahmatullah et al., 2020, p. 252). With this in mind, the nation is in a position to resolve matters associated with the shortage of resources in education.

Moreover, it has already been identified that mobile learning plays a significant role in assisting students to improve their understanding of holy books, such as Al-Quran. Khairuldin et al. (2017, p. 74) noted that mobile learning plays a significant role in this since many learners and common people are not in a position to understand Al-Quran well. Mobile learning enables students to learn at their own pace as well as convenience. Most importantly, different researchers such as Nordin, Embi, Norman & Panah, have depicted that overseas students have a high rate of acceptance of mobile learning (p. 138). Nevertheless, there is notable demand for mobile learning across native learners of Malaysia. In this regard, the respective administration should be in a position to take up this challenge and leverage the potential demand in the country in learning Al-Quran through the mobile devices (Khairuldin et al., 2017, p. 76). In effect, this will assist in educating a big number of people from the Muslim community to understand this literature better.

2.12 Effectiveness of Mobile Learning in Organizational Context

There are various researches done regarding the effectiveness of mobile learning for students and experts to get technical education or develop skills on any subject at their convenience. In addition to this, mobile learning has been proved as effective to employees and employers in organizational settings. It plays a significant role in enhancing improved communication, partnership, as well as learning while at the same time being able to accomplish daily chores in a formal setting. A study

conducted by Alharbi et al. (2017, p. 29) divulged that mobile technology has affected almost each aspect of modern lives. In fact, this has not only been seen in the individual settings but also on organizational environments. Companies are now training their personnel through mobile learning platforms. Considering the notion that education policies across Saudi Arabia are propelled through government policy that relies on Islamic cultural belief as well as regulation, strengthening mobile learning for higher education and organizational learning would be an effective approach (Alharbi et al., 2017, p. 30). It would also be deduced that practical learning is usually enhanced by the mobile technology's transportability as well as the capacity to be used in an array of environments. Through this understanding, companies in Arabia have been able to effectively adopt mobile learning as a critical approach in professional training.

In an organizational setting, the Unified Theory of Acceptance and Use of Technology (UTAUT) has been identified as a model utilized in the ICT sector. Enabling variants directly influencing a potential users' intent, social differentials, opinions on simplicity of application in the form of expectancy, along with the views on utility in the form of performance expectancy, stand for major elements under the theory (Alharbi et al., 2017, p. 31). The notion here is that the application of mobile learning ought to be a welcome idea in organizations regardless of the obstacles involved. In fact, international distribution of mobile devices is most likely to be a continuous process. Most evidently, the acquisition of capabilities as well as learning that happens in life can be enhanced by the use of mobile learning. Indeed, this is seen to be one of the major advantages of mobile learning, in spite of empirical investigations becoming increasingly necessary across the board. Mobile learning by organizations should get more focus than it is already is since it has a significant influence on organizational learning.

CHAPTER 3. METHOD

The traditional form of learning has become obsolete in modern day time. Limitation posed by the form of learning such as variation of pace learning among individuals and the idea of disseminating the same content in class for teachers with different abilities and interests has created the need for the introduction of an alternative. M-learning surpasses the traditional education system's limitations as well as introduces new benefits to the table such as flexibility, accessibility, and suitability for multiple studying styles (Korucu & Alkan, 2011). However, there are demerits accorded to this improved mode of learning such as standardization and outpacing technology. The sole purpose of this research is to establish the teacher's stand on the pedagogical efficacy of M-learning. A survey was carried out on K-12 teachers from Saudi Arabia to collect their opinion and thoughts on the matter.

An independent Cronbach alpha analysis was administered to provide for a statistical means of comparison of their opinion and the reliability score for each question. The test called for homogeneity of variance, independence of the data, continuity of the data as well as no outliers that are extremes of the standard value. Calculations were done and the result was compared.

Data were collected via a structured survey that provided multiple choice options for standardization of answers. A modification the questionnaire was determined after a pilot study of a 45 questions survey was administered to fifteen randomly selected teachers. The questions were reduced to 22 to provide for a fast, sincere, and accurate response. The process incurred a series of limitations such as unfamiliarity with the M-learning protocol by the selected age group 25-35. Convenience mode of sampling was used that ensured the selected participants were willing and available at the time of need. Teachers were sent from the Kingdom of Saudi Arabia by the ministry for education to

the United States to improve their teaching skills whereby after they were done by the program, they were selected by the convenience sampling method.

3.1 Research Design

A Cronbach alpha analysis was used to determine the statistical significance of participants' scores in the survey carried out. The Cronbach alpha analysis was developed by Lee Cronbach, a chemist in 1951. The cross-sectional descriptive design was used to collect quantitative data. It is the most popular type of survey design used in education by which the recent attitudes, beliefs, opinions, or practices can be examined (Creswell, 2015). It is an observational study in which the outcomes and exposures are measured at a single point in time. These kinds of studies are faster and inexpensive than cohort studies, but causal relationships cannot be derived from such studies (Setia, 2016).

The Cronbach alpha analysis is the best statistical technique in this situation as the party involved will be affected by the outcome of the findings. In the application of this test, various assumptions need to be made to effectively apply the Cronbach alpha analysis formula that is the answers provided independent that is no one was influenced by any other external force such as persuasion. Secondly, it is assumed that there is a homogeneity of variance of the data that is there is a similar amount of variance within the group. Thirdly, that the data was normally distributed to avoid biasing of the data and finally there are no outliers within the study group.

Cronbach's alpha is used to measure reliability or internal consistency. Reliability stands for how accurate the test measure it is. Higher score coincides satisfaction and low score coincide low reliability. The N represents the number of items, C represent the covariance between item pairs and finally V represents the average variance. There is a like form of a scale to read the value of the alpha (Tavakol, & Dennick, 2019). The scale follows the rule of the thumb that is a table whose range of

alpha highlight a particular aspect of the method applied. For example, $\alpha > 0.9$ represents excellent and $0.5 > \alpha$ represents unacceptable or null.

3.2 Participants

The participants in this study were elementary and secondary teachers from Khebrat programme of Saudi Arabia. The sample comprised teachers aged 25 - 35 years. They were chosen to improve their skills, confidence and learning process by mobile learning which in turn would help in improving the overall quality of education. They have been chosen by the Ministry of Education from various school districts in different cities based on teaching experience. They started their learning at Kansas State University in Spring 2018 until Fall 2019. The first part of the program is to develop their language skills, and the second part is to enrich their teaching experience in collaboration with local teachers in various schools in Manhattan district.

3.3 Sampling Procedures

The participants were selected by convenience sampling from the desired population. It is a non-probability sampling in which those participants are selected who are easily available and willing to be studied. These participants represent some of the characteristics as desired by the investigator (Creswell, 2015). Thus, the response rate also affects the results (Levin, 2006). By the use of non-probability convenience sampling, only those Khebrat teachers were selected who were willing to participate in this study Khebrat teachers are sent from Saudi Arabia by the Ministry of Education to the United States to enhance their teaching skills and improve education in Saudi Arabia after completion of the program. Each participant was given an equal chance for getting selected if they were available and willing for the study. The final sample consisted of 54 Khebrat teachers.

3.4 Instrument

The survey instrument involved the use of 'structured surveys which consisted three segments:

- 1- Section one focuses on confidence in M-Learning tools.
- 2- Section two focuses on confidence in teachers using M-Learning effectively.
- 3- Section three focuses on confidence in the pedagogical efficacy of M-Learning.

The quantitative data was collected by using the structured questionnaires. It involves the use of standardized questions with a fixed scheme, in which the questions are arranged in specific order and exact words. Structured questionnaires were invented by Francis Galton and these are commonly used in collection of data nowadays. One such example is Census questionnaire by which the demographic information is collected from the people (Cheung, 2014). Questionnaires facilitate a quick collection of data (Kumar, 2019). Before administration, the data was collected anonymously to encourage openness and honesty. The study was carried out at Kansas State University with the consent obtained from the Institutional Review Board of Kansas State University. The terms confident and pedagogical efficacy has been defined to the participants to avoid any confusion or misunderstanding.

Application of the structured survey was perpetrated by the following benefits. In an internet distributed questionnaire, the only incurred cost is the design as printing is not necessary. The need to cover extensive university grounds influenced the application of the means of data collection. These structured surveys spread out faster between participants in less than a week after their strategic positioning. This minimized the cost and time that could have been applied in spreading these questions if interviews would have been used instead (Ally & Prieto-Blázquez., 2014).

The need for independent data formed the main reason for the selection. Self- completion questionnaires reduce biasing error induced by characteristics of the interviewer as well as the level of the interviewer skills. Anonymity of the respondent was important to tunnel out the diverse opinion posed by various respondents on the matter.

To ensure consistency of the results, the structured surveys were shared through a designed web-link and sent to teachers. This technique ensured homogeneity of variance and independence of the data so that the simple Cronbach alpha analysis formula can be employed.

The survey questionnaire comprising 22 closed-ended questions was created using a 4-point Likert scale having the following categories: *1: Strongly agree, 2: Agree, 3: Disagree* and *4: Strongly disagree*. The 22 questions were instantiated after a several modifications that aligned with the purpose of the study. They were divided into four main sections: confidence, pedagogical efficacy, areas of improvements and a section for general comment on M-learning. The language employed was simple and easy to comprehend. Clarity of the questions was ensured to avoid ambiguity of the question in place. The questions were short and precise. Explanation of the question was only added only if there was a dire need to it. The number of questions were minimized as possible to avoid boredom of the respondents. The questionnaire was designed and approved by the committee members.

3.5 Pilot Data

The nature of the structured survey underwent a series of testing to ascertain its productivity and reliability in the research. There was the preliminary distribution of the survey to the respondents to gauge their interest and if it was necessary to minimize the number of questions or increase them. A small group of fifteen randomly selected teachers were invited to the preliminary structured survey. Their response was discarded as the purpose of the exercise was to answer questions such as was it easier or harder than expected to get the feedback? Was the period accorded enough? Were the respondents' reactions as expected? Finally, what impact did the pilot study have on the selected method? Pilot studies provided means for improvement, inclusions, and adjustments of the final structured survey.

The instrument questionnaire has been tested going through trial data to test instrument protocols, responses, and collection and potential problems. In the beginning, the instrument was conducted with 45 questions that focused on factors such as language proficiency, M-Learning, confidence, pedagogical efficacy, motivation, behavior, learning, and social skills.

The instrument was sent online through a web-link and participants received an invitation to complete the survey. They were chosen voluntarily and given adequate time to read the questionnaire and submit their answers promptly. After the interruption of the data, several problems occurred and were detected in the results. Most of the questionnaire were left unanswered that relate to motivation and behavior because of the option to skip the question they don't feel comfortable with, the complicated long structure of the sentences, and the timing of the trial data that was on the midterms week of their learning experience in the school. Also, they were preparing for quizzes and presentations. Another problem that was identified is the length of the questionnaire that takes 6-7 minutes to go all over the questions and submit the survey.

The incurred difficulties led to a series of adjustments and inclusions in the final product of the questionnaire. Therefore, that led to minimizing the number of questions to 22 which can be answered in 3 minutes to be more reliable and understandable. This involved merging up of questions that were related and scraping off the unnecessary questions. The long-structured questions were split into two this allowed fast response and avoided boredom of the respondents. Personal questions such as their take at the final section of the questionnaire were scrapped since the submitted questionnaire had this section answered or unrelated responses.

The prior administered unstructured questionnaire was replaced by a structured survey to allow for standard responses to the questions. This allowed for easy parameterization for the Cronbach alpha analysis. The issuing of the structured survey was scheduled on a less busy week to get maximum

response. An issue arising within the responses that most of the teachers are not quite sure about the meaning of vocabulary such as efficacy, pedagogical and other words came into play. After concluding all the problems that occurred during the first trial process terms have been defined such as confidence, pedagogical efficacy, and M-Learning to ensure participants honesty and awareness of the questionnaire. The final instrument has overcome arising issues in the first trial to eliminate any confusion and ensure data credibility. The instrument is listed under (Appendix B).

I used the 4-point Likert scale in which there was no neutral option. This forces the participants to either agree or disagree with the statement. By this method, the participants cannot suppress their feelings about any statement.

The Likert scale is a quite reliable and valid method used for the measurement of variables related to opinions, feelings, or attitudes (Arnold et al., 1967). The scale mainly consists of ordinal multiple choices in which the responses can be ranked or rated but the distance between them cannot be measured. The main assumptions for the independent Cronbach alpha analysis are normal distribution and interval scale data. If these assumptions are met by the questions in Likert type data, then we can easily apply parametric tests on it (Sullivan and Artino; 2013). However, the Cronbach alpha analysis is used to measure the participants' responses average mean, which is suitable for the study. The survey was conducted online by using the "Survey Monkey" website. It is an online tool by which any kind of survey projects, polls, or quizzes can be launched. It has advanced and automated features by which real-time results are obtained and a huge amount of data can be easily analyzed. Additionally, there are various modes of collecting feedback from the respondents such as the web, mobile chat, email, social media, etc. Moreover, data can be integrated, and results can be exported into different formats (Survey Monkey, 2020). The online survey was developed on Survey Monkey and then a post was made to the participants carrying a link to the online survey which has the research

consent, definitions of terms, researcher contact information, survey time limit. Participants had adequate time to complete the survey, ask if there's any questions and submit their answers.

3.6 Limitations

The study has the following limitations that can be resolved in future research:

1. Participants should be categorized into age, gender, school districts, and types of devices should be identified. The present study lacks demographic data that could be descriptive of the findings. In other words, demographic data can describe the study outcomes with better precision concerning what population they are most and least applicable.
2. The methodology should be a mix-methods instead of cross-sectional descriptive. The present method may be insufficient to address the research question, so both quantitative and qualitative methods should be utilized.
3. The sincerity of the respondent's responses. It is important to include statistical tests that verify the internal consistency of the responses.
4. Awareness of using M-learning. This aspect is particularly critical, as Almusharraf and Engemann underline the importance of awareness and self-reporting for M-learning, once it produces better learning outcomes (2020).
5. The study was cross-sectional descriptive design. However, research suggests that user perceptions change over time as they gain experience and training (Mathieson, Peacock, & Chin, 2001; Venkatesh, et al., 2003). It's innately difficult to assess a direction of results at a single point in time.
6. The study is limited to the United States, and to the Khebrat teachers at Kansas State University.

Taking the nature of the study into account, it is possible to claim that the limitations mainly concerned individual perceptions of technology by teachers, affected by their educational background. It might be challenging for people to adopt new technologies if they used to apply teaching strategies through the prism of stereotypes. First, participants should be categorized into age, gender, school districts and types of devices should be identified. The diversity of ages might have a different view on the efficacy of M-Learning. For instance, younger teachers are more familiar with and exposed to modern teaching strategies than older teachers. Besides, females' and males' teachers might have different views as well. Classifying into school districts is important to make it easier for the Ministry of Education to know which districts have insufficient awareness of pedagogical efficacy and need further development. Second, the methodology should include mixed-methods quantitative and qualitative analysis to evaluate participants' thoughts and opinions with in-person interviews and online surveys.

The third limitation of the research is the sincerity of the respondent's responses. As the age group combines a group of individuals from two different decades, their perception of M-learning and class-based learning may be affected by the era to which they belong to. This may lead to a prejudiced response. A teacher in the 30s will assume the traditional learning worked out perfectly since it is what got them their current jobs. They have an established mentality and may appear stiff to change. The teachers in their 20s may tilt their opinion towards M-learning as they believe they belong to that era of technology. This already established mentality may cloud the certainty of their response. The key thing is to categorize their response based on the decade then compare their response as a whole. This will filter out any form of prejudice.

The fourth limitation of the research is the awareness of M-learning. The selected group needs to be familiarized with the M-learning before their survey is taken into consideration. The lack of

knowledge about the topic may distort participants answers. A larger pool of prejudiced pros can overwhelm the unknown cons. The 54 teachers need to be educated and trained on M-learning then allowed two to three days to be able to meditate on the two topics in question. Lastly, the study is limited to the United States, and to the Khebrat teachers at Kansas State University. Therefore, it considers that some of the observations presented in this research may not always apply to different countries and contexts. Country-specific factors need to be included in future research. Therefore, to generalize the results of this study, other locations should be included.

The reliability of the collected response is also in question. There were only 54 teachers who took part in the process out of the sampled 200 teachers. This is a minute contribution to motion that will affect many people. The research needs to be extended outside the United States to other countries then the overall opinion can be quantified, and a clear conclusion drawn. The research should also include the students as well as this matter involves providing a baseline for the teachers' response.

Various people are comfortable with the various operating system. Preference of one operating system may render one to be biased. There is a need to come up with software that will be compatible with all operating during the issuing of the survey.

Finally, the internet connection has a major role in providing experience in M-learning. A disturbing connection may create the illusion that the mode of learning is unsuited for practice. During the application of the survey, there is a dire need to install a fast internet connection to ensure that the comparison is at the same level. Despite this being one of the disadvantages of the practice. In general, the literature reviewed revealed that M-learning was supposed to have a positive influence on the efficacy of education. In such a manner, the researcher tested this assumption by conducting the survey.

CHAPTER 4. QUANTITATIVE ANALYSIS

4.1 Introduction

The study of the data which helps to summarize, show, or describe the data in a meaningful way is known as Descriptive statistics. The descriptive data helps to represent the data in a good and proper way. This also enables an easy interpretation of the data (Holcomb, Z. C. 2016). Teachers' personal beliefs in the effectiveness of one or more teaching strategies, based on the anticipated professional development program that focuses on teachers in Saudi Arabia regarding teaching improvement, it is important to ascertain whether the initiative is worth or not. Descriptive analysis and Reliability Analysis were used to demonstrate the importance of M-learning, since there's no age, group, gender preference or variables in the study.

The instrument consisted of three segments: Confidence of M-learning tools, Confidence in the pedagogical efficacy and teacher's overall confidence using M-Learning effectively.

Research Questions that guide this study are:

- 1- To what extent do international teachers have confidence in the pedagogical efficacy of mobile learning?
- 2- How effective is mobile learning pedagogically?
- 3- Do teachers gain confidence in using mobile learning effectively?

The Reliability analysis known as Cronbach Alpha was used to measure reliability of the data and in-depth internal consistency of items (Cronbach, 1951). Statistical distinction between a pattern capability and a recognized or hypothesized price of the suggestions in the population (Test, 2013). Statistical distinction between the pattern suggests and the pattern midpoint of the look at variables. Statistical distinction between the patterns implies the check elements and probability. The reliability

method calculates the Scale Mean if Item Deleted, Scale Variance if Item Deleted, Corrected Item-Total Correlation, Cronbach's Alpha if Item Deleted and overall scale statistics.

4.2 Descriptive Statistics

The descriptive statistics based on each question as follows, the table shows number of responses (N), the Means (M) for the sample population and the Standard Deviations (SD).

Table 1. Descriptive Statistics

	N	Mean	Std. Deviation
I believe smartphones can enhance pedagogical efficacy	54	1.9259	.74863
I am confident in using smartphones as a pedagogical tool	54	2.0926	.85271
I think the presence of Mobile learning improved my confidence in learning	54	2.0926	.95697
I think teaching is better by mobile learning	54	2.5556	.96479
I recommend Mobile learning to a friend.	54	2.4815	.96624
I consistently prefer using Mobile learning in pedagogical instruction	54	2.4444	.96479
I am confident using mobile learning to support pedagogical instruction	54	2.0926	.83029
I understand the dynamics of mobile learning tools.	54	2.1481	.89879
I believe smartphones enhanced my confidence in the course.	54	2.2222	.92485
I believe it is possible to integrate other courses in the mobile learning class	54	2.2963	.83845
I am confident that Mobile learning enhance social skills.	54	2.4630	.96569

I understand how mobile learning can be used pedagogically.	54	2.1481	.85578
I believe mobile learning has more efficacy than traditional learning.	54	2.5185	1.02314
I am confident that learning through smartphones equipped me with all the necessary knowledge	54	2.3333	.89020
I believe mobile learning affected my overall results.	54	2.2222	.81650
I believe my creativity has increased using smartphones as a pedagogical tool.	54	2.2778	.94003
I believe learning through smartphones reduce the degree of collaboration and group work.	54	1.9444	.85598
I am confident in technology to support pedagogical instruction	54	2.0185	.78885
I believe class contribution is affected by mobile learning.	54	2.2407	.84530
I believe Mobile learning enhanced my learning.	54	2.2222	.88310
I believe pedagogical efficacy contributed to the success of different skills.	54	2.0185	.85761
I am confident using smartphones in every class learning.	54	2.3704	1.03334
Valid N (listwise)	54		

Q1: 16 teachers strongly agree on this question, 1 strongly disagrees, 10 disagree, 27 agree, ($N = 54$, $M = 1.93$, $SD = 0.74$). Q2: 14 strongly agree, 3 strongly disagrees, 13 disagree, 24 agree, ($N = 54$, $M = 2.09$, $SD = 0.85$). Q3: 16 strongly agree, 6 strongly disagree, 9 disagree, 23 agree, ($N = 54$, $M = 2.09$, $SD = 0.95$). Q4: 8 strongly agree, 10 strongly disagree, 18 disagree, 18 agree, ($N = 54$, $M = 2.55$, $SD = 0.96$). Q5: 8 strongly agree, 10 strongly disagrees, 14 disagree, 22 agree, ($N = 54$, $M = 2.48$,

$SD = 0.96$). Q6: 9 strongly agree, 9 strongly disagrees, 15 disagree, 21 agree, ($N = 54, M = 2.44, SD = 0.96$). Q7: 12 strongly agree, 4 strongly disagrees, 9 disagree, 29 agree, ($N = 54, M = 2.09, SD = 0.83$). Q8: 12 strongly agree, 6 strongly disagree, 8 disagree, 28 agree, ($N = 54, M = 2.14, SD = 0.89$). Q9: 12 strongly agree, 6 strongly disagrees, 12 disagree, 24 agree, ($N = 54, M = 2.22, SD = 0.92$). Q10: 7 strongly agree, 6 strongly disagrees, 11 disagree, 30 agree, ($N = 54, M = 2.29, SD = 0.83$). Q11: 9 strongly agree, 9 strongly disagrees, 16 disagree, 20 agree, ($N = 54, M = 2.46, SD = 0.96$). Q12: 11 strongly agree, 5 strongly disagrees, 9 disagree, 29 agree, ($N = 54, M = 2.14, SD = 0.85$). Q13: 10 strongly agree, 11 strongly disagrees, 16 disagree, 17 agree, ($N = 54, M = 2.51, SD = 1.02$). Q14: 10 strongly agree, 5 strongly disagrees, 18 disagree, 21 agree, ($N = 54, M = 2.33, SD = 0.89$). Q15: 10 strongly agree, 3 strongly disagrees, 16 disagree, 25 agree, ($N = 54, M = 2.22, SD = 0.81$). Q16: 13 strongly agree, 5 strongly disagrees, 18 disagree, 18 agree, ($N = 54, M = 2.27, SD = 0.94$). Q17: 19 strongly agree, 2 strongly disagree, 12 disagree, 21 agree, ($N = 54, M = 1.94, SD = 0.85$). Q18: 12 strongly agree, 4 strongly disagrees, 5 disagree, 33 agree, ($N = 54, M = 2.02, SD = 0.78$). Q19: 10 strongly agree, 4 strongly disagrees, 15 disagree, 25 agree, ($N = 54, M = 2.24, SD = 0.84$). Q20: 10 strongly agree, 6 strongly disagrees, 10 disagree, 28 agree, ($N = 54, M = 2.22, SD = 0.88$). Q21: 14 strongly agree, 5 strongly disagrees, 5 disagree, 30 agree, ($N = 54, M = 2.02, SD = 0.85$). Q22: 13 strongly agree, 9 strongly disagrees, 15 disagree, 27 agree, ($N = 54, M = 2.37, SD = 1.03$).

4.3 Results

Reliability tests are subdivided into three major groups. These groups are the major ways of testing for reliability. They include internal consistency reliability, test retest reliability and parallel forms reliability. This study only focused on the internal consistency reliability. Internal consistency reliability involves measuring the level of individual item correlation that tends to focus towards one goal. For this study internal consistency was carried out on 22 items to assess how they correlated and

how reliable they were to the questionnaire. Internal consistency is therefore carried out to ensure that enough items have been captured in the questionnaire which will give enough and satisfactory information regarding the study in the questionnaire.

Questionnaire item consistency is measured using Cronbach's alpha to test for their internal consistency thereby showing the questionnaires' reliability. This test therefore focused on testing the reliability level of the questionnaire. Cronbach's alpha test is performed to measure the reliability. It is always used to show the level of the questionnaire's consistency.

The reliability statistics table shows the value of the Cronbach's alpha coefficient, based on Standardized Items and the number of items in the questionnaire which were viable for the test. Cronbach's Alpha Based on Standardized Items is used to identify inconsistent responses. The set standards for the Cronbach's Alpha Based on Standardized Items include standard deviation being equal to one as the mean equals zero. For the Cronbach's alpha coefficient, the set internal consistency for positive results interpretation should be > 0.7 . Therefore, the Cronbach's alpha coefficient should be > 0.7 to prove that the questionnaire is reliable. Therefore, the Cronbach's alpha coefficient measures the level of questionnaires reliability and consistency.

Table 2. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.994	.995	22

From the above results, the Cronbach's Alpha value obtained is 0.994. The Cronbach's alpha coefficient was excellent. Therefore, since $\alpha > 0.9$, we can conclude that the questionnaire is reliable due to its high internal consistency level

Table 3. Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Variances	.807	.560	1.068	.507	1.905	.018	22
Inter-Item Covariances	.719	.507	.993	.486	1.957	.009	22
Inter-Item Correlations	.895	.812	.990	.178	1.219	.001	22

Item Variances

Variance measures how apart are variables from each other. For this case, the variance was used to measure the extent to which the items under study were apart from each other. It was used to compare the relative item performance in the questionnaire. The item variance was obtained to be 0.018 which indicated a small variance between the study items.

Inter Item Covariance

This measures the extent to which the items under study vary with each other. The mean therefore indicates the average extent to which the tests vary together. The calculated inter item covariance mean was found to be 0.719 which shows that there is a strong relationship between the test items. The positive covariance means indicate that the items move together positively and relate positively.

Inter Item Correlations

Used in assessing the item analysis for several test questions. Inter item correlation is always directly proportional to the Cronbach's Alpha value. Therefore, a unit increase in the inter item correlation would reflect an increase in the alpha value. The set inter item correlation should be between a scale of 0.20 to 0.40 where items with correlation less than 0.2, show that the items are not of equal content domain while those with a higher inter item correlation of above 0.40 predict that the items only cover a handful range of the construct. Therefore, the inter item correlation means was

found to be positive meaning their values increased together. The item table also shows the different means of the different individual items under study. The means show that the items move towards the same direction when their variation from each other is minimal hence low reliability and efficiency. Therefore, when the means of the different individual items show a greater variation from each other, then the items are not pointing towards a similar goal. Thereby exhibiting low reliability. The items value showed a consistently small variation from each other therefore they were pointing towards one goal. This also improved the efficiency and reliability of the questionnaire. Since the reliability test does not only rely on the alpha test, one should consider checking other item values before deleting an item from the questionnaire to improve the item's reliability.

Table 4. Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
I am confident in technology to support pedagogical instruction	47.1111	323.157	.915	.994
I believe class contribution is affected by mobile learning.	46.8889	320.289	.950	.994
I believe Mobile learning enhanced my learning.	46.9074	318.765	.957	.994
I believe pedagogical efficacy contributed to the success of different skills.	47.1111	320.516	.928	.994
I am confident using smartphones in every class learning.	46.7593	313.620	.958	.994
I believe smartphones can enhance pedagogical efficacy	47.2037	324.467	.916	.994
I am confident in using smartphones as a pedagogical tool	47.0370	320.187	.945	.994

I think the presence of Mobile learning improve my confidence in learning.	47.0370	316.527	.948	.994
I think teaching is better by mobile learning.	46.5741	316.702	.935	.994
I recommend Mobile learning to a friend.	46.6481	316.232	.948	.994
I consistently prefer using Mobile learning in pedagogical instruction	46.6852	316.031	.955	.994
I am confident using mobile learning to support pedagogical instruction.	47.0370	320.867	.947	.994
I understand the dynamics of mobile learning tools.	46.9815	318.245	.957	.994
I believe smartphones enhanced my confidence in the course.	46.9074	317.104	.965	.994
I believe it is possible to integrate other courses in the mobile learning class.	46.8333	321.160	.928	.994
I am confident that Mobile learning enhances social skills.	46.6667	316.113	.952	.994
I understand how mobile learning can be used pedagogically.	46.9815	319.830	.953	.994
I believe mobile learning has more efficacy than traditional learning.	46.6111	314.318	.947	.994
I am confident that learning through smartphones equipped me with all the necessary knowledge	46.7963	318.731	.951	.994
I believe mobile learning affected my overall results.	46.9074	321.557	.940	.994

I believe my creativity has increased using smartphones as a pedagogical tool.	46.8519	317.110	.948	.994
I believe learning through smartphones reduce the degree of collaboration and group work.	47.1852	320.984	.914	.994

Scale Mean if Item Deleted

This column shows the value of the means if the items were deleted. The means show a constant correlation. However, for this study the above column was not of that importance since it just shows the mean values of the items if deleted.

Scale Variance if Item Deleted

This column shows the values obtained if the scale variance of an item was deleted. The values obtained show a constant correlation with the statistics mean obtained after the analysis which was 349.738. However, for this study the above-mentioned column was not necessary or rather was not that important. For the interpretation of the analysis done in the item total statistics above, the focus on two columns which are the Corrected Item-Total Correlation and the Cronbach's Alpha if Item Deleted.

Corrected Item-Total Correlation

Corrected Item correlations demonstrates the 22 items and the scale score that tends to eliminate the items under the study. We check for negative values which indicate a negative correlation between the items thereby it's essential to delete these items to increase the questionnaire's reliability. The relationship between the listed items and the questionnaire are shown in this table. Checking the Corrected Item-Total Correlation values, we can see that all the values of the items belong to the questionnaire scale.

Cronbach's Alpha if Item Deleted

This column gives the values of the Cronbach's Alpha in case each item is deleted from the survey. The values tend to increase or decrease the values of the reliability of the questionnaire. Interpretations are therefore made if the value increases after removing the item then the item should be deleted however if the alpha value decreases after deleting the item, then we should not delete the item. The Cronbach's Alpha was obtained to be 0.994. In the above case, deleting the items would leave the Cronbach's Alpha constant. Therefore, retaining the items should be considered.

Table 5. Scale Statistics

Mean	Variance	Std. Deviation	N of Items
49.1296	349.738	18.70127	22

The scale statistics table provides the overview statistics of the items in the questionnaire. Survey items in the study were 22, and a mean of 49.1296. The items also displayed a variance of 349.738 which measured the extent to which the items varied from each other. The items also exhibited a standard deviation of 18.70127. The standard deviation showed that the tests under study had a small level of variation.

4.4 Summary

Overall, the data shows that teachers at Kansas State University felt that M-Learning increased their teaching efficacy. In addition, their confidence has grown tremendously in M-Learning & technology to support pedagogical instruction due to the high professional program they enrolled in to support the education system transition in Saudi Arabia. Therefore, they believe it is possible to integrate other courses in the mobile learning setting. The reliability statistics tables showed the value of the Cronbach's alpha coefficient, Cronbach's Alpha Based on Standardized Items and the number of items in the questionnaire. Cronbach's Alpha Based on Standardized Items is used for inconsistent

responses. The overall test claims that the closer the alpha is to 1.00, the stronger the inter item consistency. According to George and Millery, on the rules of thumb, $\alpha > 0.90$ = excellent, $\alpha > 0.8$ = good and $\alpha < 0.5$ = unacceptable. The Cronbach's Alpha value obtained is 0.994. Therefore, since $\alpha > 0.7$, we can conclude that the questionnaire is reliable due to its high internal consistency level. The analysis showed that the $\alpha = 0.994$ which showed a high reliability level since the $\alpha > 0.70$. Secondly, investigation on the individual's items impact on the questionnaires reliability showed that deleting any of the items would lead to a constant alpha result therefore the elimination of the items was not to be considered. Therefore, the reliability of all the items was considered acceptable since $\alpha = 0.994$. Therefore, all the items in the questionnaire were reliable and consistent.

Teachers strongly supported the Professional Program initiative by the Ministry of Education in the Kingdom of Saudi Arabia. Furthermore, their opinion of smartphones has changed substantially positively. The realization of technology and its integration into educational reforms are important to the progress and advancement of students. Through their academic and practical experience in the most prestigious institutions, they believe that shifting all curricula from traditional education to M-Learning is essential in the education sector. In addition, improving the level of creativity, thought and constant desire to improve their pedagogical effectiveness in order to create an effective educational environment. A lot of teachers disagree with the tendency of smartphones to detract from collaboration and group work.

Therefore, teachers can integrate M-Learning with activities that improve the curriculum and empower educational efficiency. The advancement of technology has evolved exponentially over the last few years, making it impossible for teachers to adapt and adopt without an informed outlook. Furthermore, The Ministry of Education in the Kingdom of Saudi Arabia has enormous capabilities and expertise in the field of education and technology to address any potential obstacles in the field of

education. The data found interest among teachers from the Kingdom of Saudi Arabia in Mobile Learning. Results have shown that teachers empowered their understanding of the value of Mobile education and adapt to new educational technologies.

The Ministry of Education in the Kingdom of Saudi Arabia is experiencing an astounding growth and continues investment in technology to keep pace with digital education and to update curricula to assure the continuity of student’s education in exceptional circumstances. Continuity in the enhancement of teacher’s skills and confidence in pedagogical effectiveness are therefore necessary if the astounding growth is to be sustained successfully. Thus, it can be concluded that it is reported that higher mean scores.

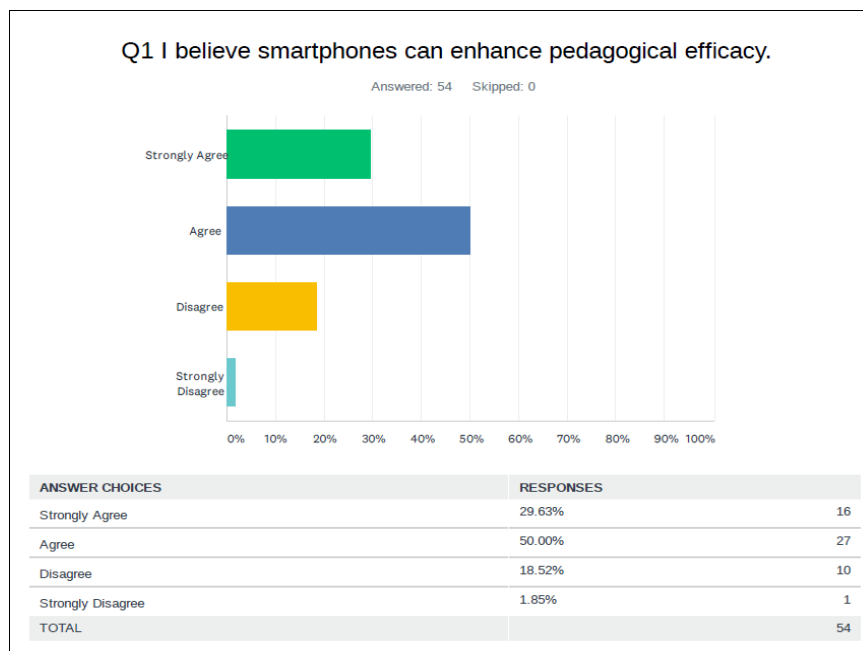


Figure 1. Smartphones enhance pedagogical efficacy

Based on the survey conducted, the respondents somewhat agree about the pedagogical efficacy of mobile learning. The key findings of the research are: It means 50% of respondents agreed with this statement in question one (Figure 1). Which means the effectiveness of M-learning is

resounding and the benefits of the study method have been seen by teachers as well as students who are willing to adopt its use in improving the study outcomes of the students.

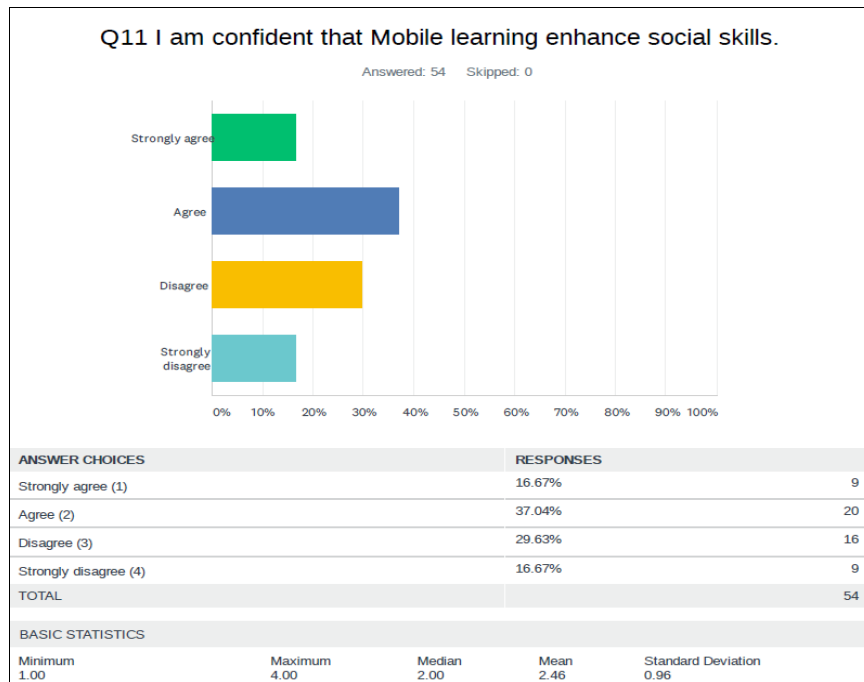


Figure 2. Mobile Learning enhance social skills

Notably, the mean value for using mobile learning to enhance social skills was 2.4, which based on the percentage statistical calculator means that 53% of respondents collectively agreed that mobile phones could be considered an effective learning tool in terms of improving students' socialization thus improving studying results (Figure 2). This could be achieved through more interactions with other students to understand the study content of the class.

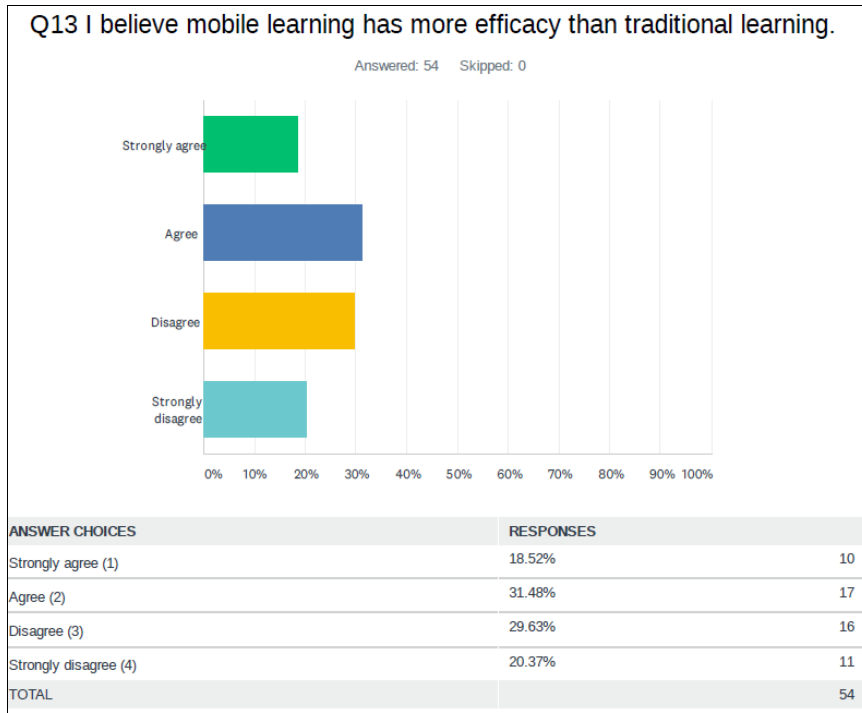


Figure 3. Mobile Learning has more efficacy than traditional learning

According to the Survey percentage statistical calculator 50% of participants collectively agreed that mobile learning was more effective than traditional learning (Figure 3), and about 55% of respondents collectively agreed that smartphones should be used in every class learning thus contributing to the improvement of the learning process (Figure 4).

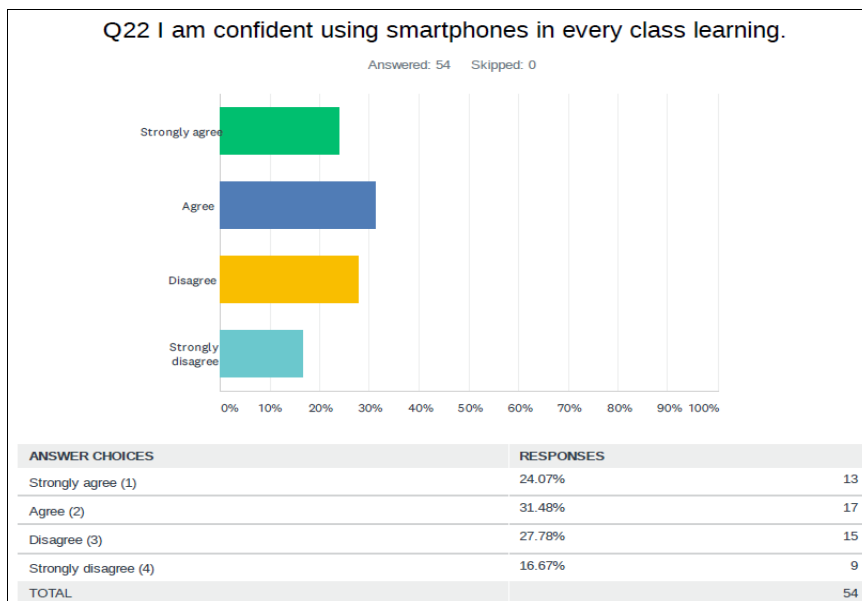


Figure 4. Using smartphones in every class learning

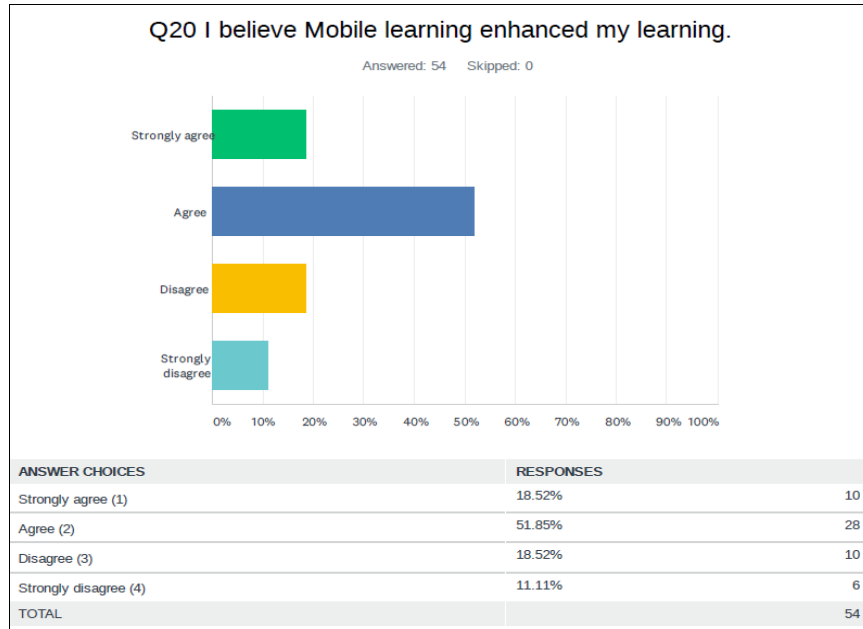


Figure 5. Mobile learning enhanced my learning

Overall, the findings showed extremely positive results in the effectiveness of M-Learning in education. In the descriptive statistics, the respondents believe that pedagogical efficacy contributes to success in the various skills that were tested. About 70% collectively confirmed that using a mobile phone for teaching contributed to positive teaching experience and could enhance both teaching and learning practices (Figure 5). The confidence of learners has also grown for M-learning thus supporting educational transition in Saudi Arabia. As the confidence level of teachers increases, student’s confidence also increases, which results in education improvement.

Teacher contribution is significant in determining the success of the student in achieving their desired results. Based on these conclusions, it is possible to integrate courses on M-learning. From the statistics it shows that M-learning has some desired positive attributes on learners. M-learning is likely to be more effective than traditional learning methods because of the possibilities it offers for learning integration between what is learnt and digital transformation.

The Ministry of Education in the Kingdom of Saudi Arabia focuses pedagogical effectiveness and it is continuing growth in order to enhance the trust of teachers in resolving students' problems and improving their actions in the classroom. Course materials will be easier to interpret because students can study the material at their own pace and where they feel they need clarification; they may seek it from their instructors via online platforms.

As a former student there was a lack of contact between the student and the teacher that M-Learning would solve this issue and improve communication between the students and teachers and enhance education quality. In addition, M-Learning can overcome the challenges of obtaining course materials and curriculum. The relationship between pedagogy and education is an interdependent relationship that cannot be separated from one another.

4.5 Clarification of the study's method

Overall, the study has constructed a highly reliable instrument and used it to investigate teachers' perceptions of M-Learning and its potential benefits. The results show that teachers felt that M-Learning had increased their teaching efficacy. Regarding pedagogical efficacy of M-Learning, the study reports high levels of agreement among teachers. Another emphasis is put on teachers' agreement, to a modest extent, pertaining to the effectiveness of M-Learning on students' socialization. Lastly, high levels of confidence among teachers in M-Learning are reported.

To clarify, the Cronbach's Alpha analysis indicates high levels of reliability of the study's instrument. However, it does not necessarily support the study's findings on teachers' perceptions pertaining to M-Learning. The main findings of the study are rather supported by the descriptive statistics, including mean scores, standard deviations, and percentages of participants agreeing on the statements (Table 1).

In terms of the interpretation of descriptive statistics, since the items recorded teachers' perceptions on a 4-point Likert scale, the lower the mean scores, the higher levels of agreement among teachers. For instance, the mean score of the first item is 1.9259 (Table 1), indicating a high level of agreement among teachers regarding the pedagogical efficacy of smartphones. On the other hand, the percentages of teachers strongly agreeing and agreeing on the statement of this item, 29% and 50% respectively (Figure 1), further support this conclusion. In the same vein, the mean score on the last item is 2.3704, whereas 24% and 50% teachers strongly agreed and agreed respectively, implying confidence among teachers in using smartphones in their classroom practices to a modest extent.

With respect to limitation, the major issue of the study's method is about generalizability. In particular, due to convenience sampling, the sample is not highly representative to the population of Khebrat teachers at Kansas State University. Moreover, all the main findings are supported only by descriptive statistics. As a result, such findings are not only limited to the Khebrat teachers at Kansas State University, but also limited to the sample. In this vein, further studies employing either inferential statistical tests or regression analysis are recommended.

CHAPTER 5. CONCLUSION

Confidence in the pedagogical efficacy of M-Learning has increased for teachers from the Kingdom of Saudi Arabia during their learning in the Khebrat program at Kansas State University. The purpose of the project was to assess confidence in the pedagogical efficacy of M-learning on K-12 teachers from the Kingdom of Saudi Arabia and the contribution of modern technologies to the efficiency of studying and improvement of students' social skills. It was found that teachers' confidence in pedagogical efficacy was significantly affected positively by the adoption of M-learning technologies.

5.1 Overview

The research proved that the perception by K-12 of the effectiveness of M-learning is high. This is based on the test parameters for the research. The research showed that there was significant evidence that M-learning would improve education standards. The findings uncover key aspects of teachers' satisfaction or dissatisfaction with educational technologies. The findings of this project complement the existing research by proving that the efficacy of learning grows due to adoption of modern technologies. Alternatively, if the technologies are poorly integrated, the efficacy of learning can decline, as people of generation 'z' are more likely to learn from digital and virtual information, rather than traditional teaching methods. The findings contradict the propriety of Traditional Activity Theory, which claims that the learning activity system is mediated best by traditional tools. In a digital world, the level of mediation may be still high, but it is expected to decline significantly over time. The results also revealed that the more technologies are integrated, the more dependent teachers and students become on the innovative technologies used.

5.2 Deductions of the Study in Relation to Benefits of Digital Transformation

With adoption of digital studies, performance of both students and teachers can improve and support teacher advancement. The method has, however, been more embraced by the younger generation as compared to older staff. This distinction is crucial because the benefits of digital transformation could be immense. Digitally, there would be a presence of recorded lectures and study materials. Consequently, teachers can come up with study material that is posted online, and readers can use it to study. Therefore, the reference material for missed class would be easily accessible. In circumstances when a student does not understand a topic, they can go to the digital platform to check previous material until their requirements are fulfilled. In the current form of study, when a student misses' certain classes, they experience problems. They either must consult their teachers or forego that material, and if they choose the second option, they may simply fail the class.

The digital transformation would be convenient to both teachers and students if in-building contact were not necessary. The learners can choose the study time that is convenient to them, be it daytime or evening. Therefore, it would allow them to use their concentration to the best, and their study time would not suffer from inconveniences, such as urgent needs. The students would not have to worry about laboratory and library hours since everything could be done online. Through lab simulations, for instance, they can understand various experiments performed.

Digital transformation would give rise to self-directed study, a form of education where a student undertakes studies without the direct control of their teachers. Such transformation means that students become the managers of their own time. It would enable them to realize the areas they are good at and areas they need to improve on. It is an active method of study since a student makes conscious decisions about their study habits and their study goals.

Research shows that when students take charge of their education, they are keener on improving their grades. Excellence in their area of study is dependent on personal initiative. It is, therefore, an empowering method of study, which is bound to give learners self-confidence that allows them to improve their mentality in education. When education is centered on them, they make efforts to ensure that they perform better. Apart from that, for the secondary school children, it lays the foundation for self-directed learning, which forms the basis of studies at high levels in undergraduate and postgraduate studies. If students get exposed to this form of study in their early age, they are more likely to be receptive to study material in later stages. It would reduce digital learning difficulties at graduate level.

Digital learning would transform the verbal and non-verbal cues of students. Communication between students and teachers would be based on a messaging platform. Therefore, for the learners to pass on their message, they would have to write it in a manner that is understood by another party. Consequently, the students would not rely on facial cues and hand gestures, as it is the case with traditional forms of study. The transformation of the study methods would create an interest in technology among the students. The method would introduce virtual learning for learners where they can share material with other peers or their teachers. It creates interest in students that they can continue to use in their careers in areas of virtual connectivity. The students would have plenty of experience in software use, and some employers already require such skills; thus, their transition from studies to careers would be easier.

The results of this study also show that M-learning builds teacher confidence in their effectiveness because it enables teachers and guardians to track the performance of students. Performance records would always be accessible online. The records cannot be altered by the students and can be viewed in real time. Therefore, the instructors and students can make informed

decisions on the performance and the areas where improvement is required. The instructors are also able to use trackers to highlight the matters of interest, which otherwise, would not be easy to put emphasis on in a class with many students. Progressive learning would be possible since stakeholders would have records against which the students' progress can be measured.

5.3 Reflection of the Study's Findings in Relation to the Literature Review

A research study is termed as successful when it provides tangible evidence that significantly impacts what was being researched. Researchers often determine the effectiveness of a survey through relating or comparing their findings with the information they acquired from other credible sources that form their literature review. Consequently, to accurately interpret the study's results, we must identify how the findings reflect the literature review's data on the relevance of Digital Transformation of Education in the Kingdom of Saudi Arabia and the rest of the world. Yes, mobile learning is essential for a successful transition from traditional education to digital learning, but do the study results support the current information about M-learning?

Although the literature review comprises different perceptions and data concerning the utilization of M-learning in an educational context, the common ground and knowledge are that mobile education is of substantial significance to student learning. The research question for our study included determining to what extent teachers both in Saudi Arabia and internationally have confidence in the pedagogical efficacy of M-learning. After a successful methodology and definitive study, the research findings indicate that teachers believe in the pedagogical effectiveness of mobile education.

Subsequently, the Ministry of Education in Saudi Arabia launched the Professional Program initiative, which sought to help lecturers easily learn how to use mobile devices to teach. As a result, most teachers in educational facilities have since supported the program due to its act of boosting teacher's confidence in M-learning. The findings from the research also identified that students, in

particular those that major in practical courses or subjects, prefer using technological apparatus such as phones to learn about a topic extensively. Similarly, art students from both Saudi Arabia and international schools state that mobile learning has enhanced their creativity and cognitive ability which are crucial aspects of the artwork.

Concerning the information in the literature review, the results support the argument posed by existing sources. For example, Yuktirat, Sindhuphak & Kiddee's (2018) article states that M-learning has played a significant role in helping shy students learn more about the Art of Drawing than they would have while in class. With mobile phones, they freely explore and represent their ideas without fear of judgment from others. Similarly, the research study findings state that Saudi Arabian students majoring in artwork preferred M-learning to traditional education because it provided them with the ability to present their ideas extensively.

Even though we have identified mobile learning as an effective way of conducting education, it is essential that before an institution or authority decides to incorporate it, they first ensure that teachers have adequate knowledge on how to perform M-learning. Rahmatullah et al. (2020) have conducted research in the King Khalid University and report that prior knowledge of digital teaching is necessary to handle unexpected situations and generally navigate the students throughout the M-learning system. What is more important, teachers appear to be self-aware of their digital competencies and ways they can make teaching more efficient. Therefore, it is essential for authorities to provide sufficient training to the teachers who are expected to teach students with digital instruments.

Failure to do so may lead to costly errors and consequences to both the students and their teachers. For instance, in the literature review, Qahmash, A. I. M. (2018) argues that the adoption of mobile learning skills by teachers comes first before offering it to students. The findings from the study also support this argument with the results indicating that the Professional Program initiative in

Saudi Arabia significantly helped teachers to strengthen their comprehension of M-learning and thus were able to teach effectively.

5.4 Policy Implementation for the Future Use of Technology

Efficacy of the M-learning platform would highly depend on government policies that the Ministry of Education would put in place. The policies are based on the implementation method that they adopt with training teachers and providing facilities for students to ensure that the policy succeeds. They need to come up with an implementation framework of M-learning. It would be a guide on implementation guidelines required for both students as well as teachers. The government should offer technological support of the system. Funds would be used to procure a system that would host the program as well as fund the support staff that would ensure it is online and working during the academic year. The government also needs to come up with an education policy that ensures all teachers are trained in Information Technology. It is the mandate of the government to ensure that all students have access to digital resources. Finally, the government should ensure resources, such as class texts, are also converted to digital form.

From these studies, it was established that older teachers are more resistive to M-learning as compared to younger teachers. It is due to the digital gap between them and technology. It is, therefore, the duty of the Ministry of Education to come up with study manuals that would help teachers understand how this system works. The older teachers need to be encouraged to embrace this form of education due to its immense advantages. The teacher training curriculum also needs to be reviewed to accommodate M-learning. Thus, the future graduates would have the necessary information and skill set to guide students on digital learning. Student curriculum should also be reviewed to accommodate digital learning. The Ministry of Education should spearhead consultative

meetings with education stakeholders to come up with a curriculum that is more geared towards digital literacy.

5.5 Implications of the Study

Greenwich stated that “Mobile phones are a huge distraction in lessons, with pupils thinking about text-messaging, Twitter or Facebook in class instead of their work” (Greenwich Free School, 2012). This study has certain implications in various fields, lessons distraction, education facilities, target audience, and application development. The education facilities would be transformed since there would be no need to establish physical contact between students and their teachers. It would necessitate the implementation of a new curriculum that is more focused on information technology. The infrastructure should be focused in providing stronger internet connectivity, since reduced physical interactions would raise anti-social tendencies among the students.

For the longest time, the focus has been on a teacher-student guided relationship. The M-learning setup would mean reduced physical interactions: even though there are few digital platforms in Saudi Arabia, Al-Ghamadi and Al-Ruwaily (2020) argue that it is particularly important to prepare both students and teachers for interacting throughout digital instruments, so the social aspect of learning should be also adjusted to these environments. It is, therefore, important to establish other forms of interactions that ensure social contacts are not forgotten.

The labor market in the education sector would be affected as well. With M-learning, the high capacity requirement for teachers would be reduced. Reduced physical contact between students and teachers means that a teacher can take up more classes at the same time. A teacher can pre-record classes, as the lessons do not have to be in real time, ensuring content consistency. While the system might look impressive for learners, it could reduce the labor market needs for teachers. Older teachers who are more likely to oppose the use of M-learning could also be adversely affected. Al-

Ghamadi and Al-Ruwaily (2020) argue that the lack of infrastructure is the main reason for resistance amongst teachers in Saudi Arabia, which is why creation of the relevant platforms and provision of the necessary resources will significantly improve the situation. Although, motivation and training of teachers are extremely necessary as well.

Based on the implementation of M-learning, there would be a need to develop smartphone applications. These are the applications that would guide various stakeholders, such as teachers, students, and guardians. The developers should come up with education material for use by the students. They must also come up with an integration platform that ensures the education process takes place effectively without information breakdowns.

5.6 Issues arising from the Research

The study was not able to establish the influence that different study subjects would have on the implementation of the M-Learning platform. For instance, the effects of social sciences on implementation of the M-learning platform would cause different results as compared to the desired results for a technical course, such as physics or biology. It is due to the fact that the material requirements for these studies are different. For example, the effect could be independently assessed for science, business, social classes, and other domains.

The sample size is a limiting factor to the results that were obtained. The study was limited to students in Saudi Arabia. The study in another country would offer an alternative insight into whether the factors affecting M-learning in Saudi Arabia are the same affecting other students. The sample chosen for the study should also be analyzed by using other factors, such as attitude to use of digital devices, gender, and age. It would be important to understand the individual opinions on technology because this is a contributing factor to how they are likely to answer the survey questions.

Gender is a major factor. In Saudi Arabia, the male gender may be more exposed to technology as compared to female students. It might offer a jaundiced view on M-learning if there is no gender balance in the studies. Younger students who are less exposed to technology are more likely to get excited about the options that M-learning provides. They may make this decision without a thorough understanding of its implications. It is unlike older students who may understand the implications of the study in a deeper way.

The state of respondents taking the survey is important. Some respondents may take the survey for the sake of it. It would be important to establish ground rules before taking the survey. Some respondents might participate without any clear intention, and thus, their responses might not be well thought out. It might affect the test results negatively, as the obtained results would not be based on honest opinion of the respondents. The integrity of the respondents also needs to be checked. Only individuals whose integrity is not in doubt should be used for the study.

5.7 Future Research

Given that the study had limitations, the researcher developed suggestions for future research:

1. Future research should evaluate the effects of M-learning on studying different sciences.
2. Future research should adopt a bigger sample that can be divided into several groups.
3. Future research should add more variables to M-learning and define constructs.
4. Future research should consider random sampling instead of convenience to include participants from multiple universities.
5. Future research should assess the confidence and pedagogical efficacy of teachers from different countries.
6. Future research could use the study instrument by adopting interview questions.
7. Future studies could examine the effects of M-Learning on students' social interactions.

The first suggestion was to elaborate on the findings of this study and explore the effect of M-learning on studying different sciences. For example, the influence could be independently assessed for science, business, social classes, and other domains. The second suggestion was to conduct a similar study but adopting a bigger sample. For example, the scholars could consider the same problem in another country or the same problem in the Kingdom of Saudi Arabia but adopting a different sample. Both approaches would allow validating the data derived from this research. The third suggestion is to evaluate the effects of M-learning from the students' perspectives and investigate whether the teachers' attitudes to the technologies are adequate. This way, the scholars will study the differences between students' and teachers' perspectives, which will enable them to present the best course of action to satisfy all stakeholders of education. Finally, the research could be developed by adding more variables to M-learning except for the use of modern devices. For example, scholars can examine the influence of modern learning platforms on education efficacy. Hence, a myriad of ways to elaborate on the present study was presented; they would essentially validate research results and create the basis for further studies.

Future research should assess the confidence and pedagogical efficacy of teachers from different countries. The rationale is that m-learning and other technology-based learning methods are being implemented in different countries across the world. Learning from the experiences of different countries provides an opportunity for the transfer of knowledge on best practices in m-learning. Learning from different countries also helps in pointing out challenges and pitfalls that educators and learners have encountered, how to avoid the challenges, and how to design the learning program for the generation of the greatest benefits from m-learning. Most importantly, assessing confidence and pedagogical efficacy of teachers from different countries provides the opportunity for evidence-based

practice. In addition, future research should consider random sampling instead of convenience to assess international teachers' self-efficacy on different programs at different universities.

The study also provides a platform to understand how M-learning should be implemented in the future. For instance, it can answer to what would be the requirements of establishing informal e-learning systems that are effective for various stakeholders. Women are an integral part of society, and the research should clarify how M-learning can work for them. Culture and cultural factors are very important in any setup, and the Arabic societies are no exception. It is important to explore the M-Learning platform that is acceptable by all. In doing this, it would also be important to engage studies from other Arabic communities because their education systems are similar.

Age is also an important factor to be addressed in M-learning research. It would be important for research to find out at what age M-learning should be implemented. Despite the opportunities that M-learning presents, conventional methods of education cannot be rejected. It is, therefore, important to establish at what age this form of education should be introduced. It would not be prudent to rely on M-learning fully since the learners would not develop skills that conventional learning provides. Skills, such as writing, communication, and interpersonal learning, cannot be replaced by M-learning. Moreover, the conventional curriculum should be shaped in a way to introduce M-learning. Thus, the concept of M-learning would not be strange to the learners, and they would embrace it with ease.

Despite the positive effects of M-learning, the study method may have negative effects on the students. The latter may develop antisocial tendencies because of reduced social interactions. It may slow down the development of students since they would not be able to interact with other learners and teachers. The increased exposure to devices may also mean that students would be exposed to inappropriate content.

Therefore, it is important for future research to establish how this exposure can be limited and how physical social interactions can still be maintained despite the lack of contact with other members of society. As stated previously, social interaction should be also considered for digital platforms of learning, so future studies need to pay attention to this domain as well (Al-Ghamdi & Al-Ruwaily, 2020). The devices need to be tracked to find out what learners' access on the internet and also restrict the content that is inappropriate to them. Al-Zahrani (2020) underlines that security of users is an important consideration, once it impacts on their experiences of use. Hence, this aspect requires research in the future as well.

5.8 Conclusion

M-learning can positively influence confidence in teaching efficacy if the perception of modern technologies is positive. In other words, the extent of education success is directly correlated with the ability of teachers to integrate technology productively. Notably, most respondents confirmed that M-learning positively correlated with confidence in teaching efficacy. One can suggest that the popularization of M-learning will grow over time since more technologies were integrated into the education process, the more dependent teachers and students became on the efficacy entailed by those technologies. Apart from the presented results, the study also defined possible areas for future research based on the limitations of the present study, which will influence the validity of data. Even though the hypothesis was proved, it is necessary to deepen the investigation of the topic by studying the effects of different components of M-learning on the teachers' perceived efficacy of education strategies. This way, one will be able to provide practical recommendations concerning the actions to be implemented to improve the efficiency of studying.

The benefits of technology and smartphones have been strongly supported by the teachers from the Kingdom of Saudi Arabia. Most of the responses indicate that there's a need in M-Learning in

Saudi Arabia Education system. M-Learning supports pedagogical efficacy and accelerates the learning process in such advanced progress.

Due to the affordability and easy access to mobile devices in daily social and work life of learners, there is a significant opportunity to upgrade teaching and learning. Mobile learning expanded in educational fields and has been met with acceptance by students. Despite the positive attributes noted in research and in this study, there are negative effects that deserve consideration. Social behaviors traditionally developed in the classroom may not be developed with the same feasibility, and devices can be misused by students. The latter issue can be minimized through tracking student use and keeping tabs on the learner's progress on their mobile device, syncing the data to a learning management system

The self-paced possibilities of M-learning learning reduces the pressure on the learner to understand a particular concept in real time and allows learning at their own pace. The efficacy of this technology, apparent to new educators, could appeal to veteran teachers if given professional learning opportunities and experience. Most teachers from the Kingdom of Saudi Arabia are aware of the benefits of technology and smartphones -- given the research that supports the efficacy of M-learning, the next step is developing systems that support the training of teachers, versatile delivery systems, and platforms that can connect even the most remotely located students to established instructors.

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APPENDIX A: IRB APPROVAL LETTER



TO: Dr. F Todd Goodson
Curriculum and Instruction
Bluemont Hall

A handwritten signature in black ink, appearing to read "Rick Scheidt", is positioned above the "FROM" line.

FROM: Rick Scheidt, Chair
Committee on Research Involving Human Subjects

DATE: 08/14/2020

RE: Proposal #10197.1, entitled "The Importance of Mobile Learning."

A MINOR MODIFICATION OF PREVIOUSLY APPROVED PROPOSAL #10197,
ENTITLED, "The Importance of Mobile Learning"

The Committee on Research Involving Human Subjects at Kansas State University has approved the proposal identified above as a minor modification of a previously approved proposal, and has determined that it is exempt from further review. This exemption applies only to the most recent proposal currently on file with the IRB. Any additional changes affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Unanticipated adverse events or problems involving risk to subjects or to others must be reported immediately to the IRB Chair, and / or the URCO.

It is important that your human subjects project is consistent with submissions to funding/contract entities. It is your responsibility to initiate notification procedures to any funding/contract entity of changes in your project that affects the use of human subjects.

APPENDIX B: SURVEY QUESTIONNAIRE

1. I believe smartphones can enhance pedagogical efficacy.
2. I am confident in using smartphones as a pedagogical tool.
3. I think the presence of Mobile learning improved my confidence in learning.
4. I think teaching is better by mobile learning.
5. I recommend Mobile learning to a friend.
6. I consistently prefer using Mobile learning in pedagogical instruction.
7. I am confident using mobile learning to support pedagogical instruction.
8. I understand the dynamics of mobile learning tools.
9. I believe smartphones enhanced my confidence in the course.
10. I believe it is possible to integrate other courses in the mobile learning class.
11. I am confident that Mobile learning enhance social skills.
12. I understand how mobile learning can be used pedagogically.
13. I believe mobile learning has more efficacy than traditional learning.
14. I am confident that learning through smartphones equipped me with all the necessary knowledge.
15. I believe mobile learning affected my overall results.
16. I believe my creativity has increased using smartphones as a pedagogical tool.
17. I believe learning through smartphones reduce the degree of collaboration and group work.
18. I am confident in technology to support pedagogical instruction.
19. I believe class contribution is affected by mobile learning.
20. I believe Mobile learning enhanced my learning.
21. I believe pedagogical efficacy contributed to the success of different skills.
22. I am confident using smartphones in every class learning.