Smart Mobile Learning During the COVID-19 Pandemic

Subjects: Computer Science, Information Systems

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Universities throughout the world are attempting to develop electronic learning (e-learning) and mobile learning (M-learning) systems in order to merge these educational systems with the traditional ones currently used. E-learning and M-learning systems have become critical in order to accomplish learning objectives in a successful way during the COVID-19 pandemic. It is critical for universities to take full advantage of e-learning in order to remain competitive in the globalised 21st century. The recent revolution in information and communication technology (ICT) has resulted in a move away from face-to-face learning, toward e-learning. During the COVID-19 pandemic, this technology has helped universities on a global scale to ensure the continuity of learning processes. It has also altered how students communicate and interact with instructors. This technological advancement has transformed the learning process through the use of e-learning systems and M-learning applications to achieve sustainable education.

mobile learning distance learning COVID-19 Saudi Arabia

1. Related Works on Mobile Learning Acceptance

With the increasing number of features offered by smartphones, there has been tremendous growth in interest in using mobile devices in higher education [1]. Hence, research interest in factors that affect M-learning acceptance among students has also increased. Several studies have been undertaken to explain the main drivers for the adoption of M-learning in different contexts [2][3][4][5]. According to previous studies [6][7][8][9][10][11][12][13][14][15][16][17][18], students' acceptance of M-learning is an essential step in guaranteeing the full usage of this system. To achieve such acceptance, the main aspects and factors of students' adoption of M-learning applications should be properly understood [19]. In addition, students' needs and requirements should be correctly determined by mobile service providers and designers from the outset. Several studies have addressed this issue. For example, For example, [2] found that information technology infrastructure (ITI) is one necessary component of M-learning acceptance. As a result, the ITI in Saudi universities requires extensive analysis. Providing adequate ITI is necessary when introducing new technologies such as M-learning applications, as insufficient IT resources and infrastructure can impede the acceptance and usage of any new technology [3]. Therefore, this research adopted this factor to investigate its effect on M-learning success in Saudi universities.

In addition, previous studies [4][5][6][7] have confirmed that university management support is vital to the development of M-learning system adoption and, thus, reflects positively on the actual use (AU) and acceptance of M-learning by students. According to [7], support by university management is associated with their willingness to

provide all necessary resources to ensure the development success of the M-learning project. In other words, a positive attitude among top management towards an M-learning project is a real indicator that a university will support the adoption of M-learning. Therefore, the researchers included this factor in the proposed model to investigate its effect on M-learning success in Saudi universities.

On the other hand, university culture could play a crucial role in how universities adopt M-learning systems. Information system researchers have found that university culture is predictive of technology adoption, including M-learning adoption [8]. According to [9], public culture development is qualitatively distinct from physical infrastructure development. The COVID-19 pandemic has led to cultural shifts in attitudes towards distance learning technologies, as well as possible resistance from students to the use of these new technologies [10][11][12][13]. Hence, this research investigates the effect of university culture on M-learning success in Saudi universities.

Moreover, several researchers have indicated that one of the main issues that should be addressed to increase the involvement and use of M-learning applications is inadequate awareness of the technology's existence [14][15][16][17][18]. Prior studies have shown that aware ness is crucial in the adoption of M-learning systems. Therefore, this research adopted this factor to investigate its effect on M-learning success in Saudi universities.

Finally, in the researchers' proposed model, they adopted two main constructs of the TAM model as predictors of acceptance and usage of M-learning, namely, perceived ease of use (EUS), and perceived usefulness (PUS). Previous studies [19][20][21][22][23] have confirmed that these two factors could play a crucial role in the success, usage, and acceptance of M-learning systems. In general, users do not like to use systems that require high levels of skill or are highly complex. Several studies have supported the belief that EUS influences users' intention to use a particular technology [23][24][25][26]. Similarly, previous research has indicated that users find M-learning technology useful and productive if its use does not require much time and effort [27][28][29][30][31]. Hence, it can be argued that students are more likely to use M-learning services if they find that doing so is not complicated. Similarly, the success of an M-learning system would increase if users realised the importance of such a system in improving their performance.

2. Overview of Mobile Learning as a Distance Learning Tool

During the COVID-19 pandemic, many universities around the world started to use distance learning platforms, such as M-learning platforms, Blackboard, and others [32]. For example, many universities in Saudi Arabia—such as King Faisal University (KFU)—used the Blackboard and M-learning systems as distance learning tools, as a result of the decision by the Saudi government to close all universities during the COVID-19 pandemic [33]. M-learning systems served as online classrooms in which smartphones could be used by instructors and their students to continue the learning process during the COVID-19 pandemic. An M-learning system enables instructors to upload all learning materials, learning activities, assignments, and quizzes. On the other side, students can access online classrooms and interact with instructors through online classes, download learning materials, and submit homework using the M-learning system. An M-learning platform is a distance learning platform with many features that support the learning and teaching processes for all education levels in

universities. It also contributes to ensuring that lesson plans are carried out and the educational goals of the curriculum are met [33][34][35][36]. An M-learning system features a package of educational tools to support the teaching and learning processes. It is a virtual classroom that enables learners and their teachers to meet simultaneously via virtual meetings, or at any convenient time through recorded lessons [37][38][39][40]. In addition, the platform includes excellent features for ease of communication between students and teachers, such as email service, Microsoft Teams, and a variety of channels for communication between students, teachers, and parents [41].

3. Factors Affecting the Mobile Learning Success Context

Several recent studies have examined a number of factors that could influence the acceptance, adoption, usage, and implementation of M-learning. For example, [42][43][44] found that information technology infrastructure (ITI) is one necessary component of M-learning acceptance. As a result, the ITI in Saudi universities requires extensive analysis. Providing adequate ITI is necessary when introducing new technologies such as M-learning applications, as insufficient IT resources and infrastructure can impede the acceptance and usage of any new technology [45]. Therefore, this research adopted this factor to investigate its effect on M-learning success in Saudi universities.

In addition, previous studies [46][47][48][49][50] have confirmed that university management support is vital to the development of M-learning system adoption and, thus, reflects positively on the actual use (AU) and acceptance of M-learning by students. According to [37], support by university management is associated with their willingness to provide all necessary resources to ensure the development success of the M-learning project. In other words, a positive attitude among top management towards an M-learning project is a real indicator that a university will support the adoption of M-learning. Therefore, the researchers included this factor in the proposed model to investigate its effect on M-learning success in Saudi universities.

On the other hand, university culture could play a crucial role in how universities adopt M-learning systems. Information system researchers have found that university culture is predictive of technology adoption, including M-learning adoption [51]. According to [52], public culture development is qualitatively distinct from physical infrastructure development. The COVID-19 pandemic has led to cultural shifts in attitudes towards distance learning technologies, as well as possible resistance from students to the use of these new technologies. Hence, this research investigates the effect of university culture on M-learning success in Saudi universities.

Moreover, several researchers have indicated that one of the main issues that should be addressed to increase the involvement and use of M-learning applications is inadequate awareness of the technology's existence [53]. Prior studies have shown that aware ness is crucial in the adoption of M-learning systems. Therefore, this research adopted this factor to investigate its effect on M-learning success in Saudi universities.

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