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Faculty's Attitudes Towards Integrating Technology and innovation in Higher Education in Saudi Arabian Universities from Literature Review Perspective

Monerah Abdulrahman Alduwairej
Assistant Professor of Instructional Design and Technology, University of Bisha
Saudi Arabia
Email: Mdoaireg@ub.edu.sa

ABSTRACT

To summarize, the majority of existing research on technology use in Saudi Arabian universities has framed faculty's use of technology in the classroom positively. However, each study contains a group of faculties with persistently negative attitudes toward using technology regardless of the reasons or experiences that led them to this attitude Alenezi (2012), in example, observed in his study that certain faculty members who hold unfavorable opinions on e-learning believe that it prioritizes memorization over real-world learning. According to the study's staff, pupils' chances for creativity were diminished by the online learning environment (Alenezi, 2012). Alghamdi and Bayaga (2016) looked at faculty perceptions regarding the use of LMS in their instructional activities. According to the report, even though their universities offer LMS services, some faculty members choose not to use them.

However, a lot of teachers are just unwilling to incorporate technology into their lessons, although there are a lot of other reasons for this. The group of faculties considered reluctant may include those who are technologically illiterate and those who believe that traditional teaching methods are preferable (Hagner & Schneebeck, 2001, p. 2-4). Carey and Dorn (1998) pinpoint a specific form of reluctancy as "technophobia," which describes the fear of using technology for reasons such as a perception that it does not align with their teaching strategies, a lack of usefulness, and a lack of control (p. 71). However, the authors suggested that faculty can overcome technophobia by having greater self-efficacy to use technology and practice with technology so that it may become "familiar, useful, and controllable" Carey & Dorn, 1998, p. 71). Therefore, as Mishra et al. (2007) posit, there are critical issues that face faculty in higher education, such as lack of experience with teaching with technology, as they integrate technology into their teaching technique. Ultimately, the research described throughout this literature review supports the claim that the majority of university faculty in Saudi Arabia perceive technology-based teaching negatively.

Keywords: Technology in education, Faculty using Technology, Technology in Saudi Arabia.

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Introduction

In this digital era, innovation is inevitable and essential for organizational efficiency and survival. Technology and innovation have become significantly impactful in higher education and the learning process. Currently, technology makes everything efficient, which creates new opportunities in the learning environment (Thirunarayanan & Perez-Prado, 2005, p. 49). Thus, educational institutions view technology as collaborative tools to increase knowledge among college. Currently, students exist in a digital world which is making educational institutions stems increased use of technology tools. Technology tools became essential in helping campus communities collaborate in order to get information, interact with classmates, and enhancing of competitiveness in their future careers. Previous studies have shown that technology tools help cultivate a variety of abilities, including teamwork, autonomous learning, communication, mastery of analytical thought, and resource optimization techniques (Roselle & Pinholster, 1999).

The purpose of this literature review is to examine faculty members' attitudes toward integrating innovation and technology in the institutions of higher learning, specifically focusing on Saudi Arabian universities. Additionally, I will review various materials and studies that can help in understanding some of the issues that relate to faculty members' attitudes toward innovation and technology both broadly and in Saudi Arabia particularly.

Saudi Arabia's system of higher education

Saudi citizens who choose to continue their study are given stipends by the Ministry of study; nevertheless, free higher education is only available to Saudi nationals, and there are few options for international students to continue their studies (Alamri, 2011). 1954 saw the founding of the Ministry of Education (Ministry of Education, 2007). In general, Saudi Arabia offers free education to all students from kindergarten through university, with the possibility of private education. The number of universities in Saudi Arabia is around 30 public universities and 13 private universities and 7 military colleges which these universities are geographically located within the various regions of Saudi Arabia (Ministry of Education, 2024).

Technology Integration in Saudi Arabia's Higher Education Institutions

The Saudi Arabian education plan of development has gone through various stages, yet the quick growth of education facilities and education policies has not met all expectations. The fourth national education plan (1985-1990) was focused on high quality in education outcomes, including the need for educators' beliefs in the significance of implementing instructional technology in all stages of education (Alqarni, 2015). The integration of technology and innovation in learning institutions has become increasingly popular given that countries around the world have dedicated significant resources to this objective. E-learning was adopted in Saudi Arabia in the early 1990s and was supported through the extension of using computer and technology tools (Al-Masaud & Gawad, 2014). Thus, Alqarni (2015) provides a brief

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overview of the history of e-learning in a few Saudi Arabian colleges. King Fahad University of Petroleum and Minerals and Aum Alqura University both launched e-learning centers in 2003. The center's sole responsibility was to help university employees and instructors use technology to enhance the teaching and learning process. Additionally, in 2004, King Abdulaziz University established the Deanship of e-Learning and Distance Education. In addition, in 2007, King Saud University established the Deanship of e-Learning and Distance Education. Additionally, there are number of universities in Saudi Arabia that have established Deanship of E-learning and Distance Education such as Aljouf University and Taibah University with the aim of facilitating the movement towards online education among higher learning institutions (Bajabaa, 2017; Alanazy, 2017). This department is also in charge of providing staff and instructors with training in electronic and technological learning products. Furthermore, according to Aljaber (2018), this department is in charge of overseeing smart and information technologies at the university as well as integrating training models, planning online courses, creating instructional materials, and improving online content. According to Aljaber (2018), creating a suitable online environment that enables collaboration between staff and students is the main duty of the Saudi Arabian universities' Deanship of e-Learning and Distance Education.

According to Al-Zahrani (2015), the Saudi pre-service teacher education curriculum is still based on the traditional vision of instruction and the integration of technology into the curriculum such as online instruction remains unknown. However, some researchers have noted that educational technology has been introduced and used through teacher training programs as well as through establishing and utilizing new instruction methods (Alqarni, 2015).

Notably, Saudi higher learning institutions have adopted blended learning, which entails combining face-to-face and online instruction (Alqarni, 2015). In other words, blended learning involves using both traditional and innovative learning to enable the distribution of communication and information. Whereas face-to-face learning is based on a traditional classroom setting and requires a teacher’s presence, blended learning emphasizes self-learning and interaction in an asynchronous environment (Alqarni, 2015). Blended learning can also be defined as an integrated method of interaction via the Internet and the meeting of learners and teachers through face-to-face sessions (Sheerah & Goodwyn, 2016). Therefore, the Ministry of Education has encouraged higher learning institutions to adopt blended learning with the aim of enhancing and supporting e-learning and ensuring the rapid growth of undergraduate students (Sheerah & Goodwyn, 2016). The majority of prior research has applied e-learning in Saudi Arabia. Al Khalaf, Drew, AlGhamdi, and Al Farraj (2012) investigated faculty use of e-learning in Qassim University and King Abdulaziz University which strongly suggests that the positive effect of using e-learning in teaching processes are helping improve faculty performances, think through the issues, and providing the best services. On the other hand, Al-fahad (2009) indicated that mobile-learning could be a new platform in Saudi Arabia institutions to enhance higher education. However, he argues that using mobile learning in education

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contexts is still in its incubation stage. Thus, there are gaps to clarify the effectiveness of integrating it into the teaching and learning process in higher education.

However, there are a number of obstacles that prevent educational technology from being fully adopted in Saudi Arabia. These include the absence of appropriate rules, the country's ongoing Internet user growth, and Saudis' attitudes regarding the technology (Alqarni, 2015). The views of Saudi faculty members are among the most crucial elements of innovation and technology integration in higher education. Faculty members' use of technology improves the quality of education by encouraging positive learning and exposing concepts in fresh ways through games, multimedia presentations, online classroom activities, and the establishment of blogs or wikis (Lebenicnik, Pitt, & Starcic, 2015; Lee & Markcy, 2014). They are aware that using technology well can lead to meaningful learning for students (Bajabaa, 2017). However, the use of technology in Saudi Arabian universities has helped them rise in the world academic ranking. When the global academic rankings were released in 2003, there were no Saudi colleges on the list. However, by 2016, four Saudi universities had made it into the top 500 worldwide (Abouelnaga, Metwally, Mazouz, Abouelmagd, Alsmadi, Aljamaeen & Hamad, 2019). Most of Saudi Arabian universities have adopted the e-learning and blended-learning model, and the staff, faculty, and students appreciate it by feeling interested in interactive learning (Aljaber, 2018). Lastly, Saudi Arabia now has the most active e-learning in higher education; the services provided there vary depending on the courses and faculty (Aljaber, 2018).

The Kingdom of Saudi Arabia places great emphasis and importance on education, as it is the field that prepares the future generations who are the nation's true fortune (Al-Mousa, 2010). The effort of the Ministry of Education in Saudi Arabia to adopt technology has always been a high priority. This literature review summarizes research on relevant types of technological use by faculty in Saudi Arabian higher education. This section begins with a brief review of the literature to introduce what types of technology faculty have used in the education process and how that technology has developed through the present day.

Computer and Internet Use by Faculty in the Classroom

This section provides an analysis of literature related to implementing and using computers and the Internet as well as the attitudes of faculty who use technology in the classroom. First of all, Because of, actual needing of using the Internet in higher education institutions the Internet has growly to assess the role of the future of education (Shaw & Polovina, 1999). It is becoming a crucial instrument for education. Teachers and students can now communicate with one another at any time and from any location thanks to the Internet (Bates & Sangrà, 2011, p. 31). Many institutions now see the use of technology as a means of encouraging student participation in the classroom. The surge in technology use in educational institutions can be attributed to the fact that the present generation was born into a digital age. They also supposedly pick up technology the fastest (BrckaLorenz, Haeger, Nailos, & Rabourn, 2013).

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Technology has been essential in helping campus communities work together to acquire information and interact with peers and creating a supportive environment for both teachers and students that supports the learning process (Resta, & Laferrière, 2007).

The first Saudi university to link to the Internet was King Fahd University of Petroleum and Minerals (KFUPM) in Dhahran in 1993 (Khalid, 2001). Internet access became available to the general public in 1997. In 1999, Saudi Arabia's government and colleges were able to access the Internet (Alqarni, 2015). The fact that Saudi Arabian universities were the first government institutions to employ technology and the Internet caused a distinctive change on campus (Alshawi & Alwabil, 2013). In Saudi Arabian institutions, 25% of faculty members were reluctant to utilize the Internet for instruction, according to Allehaibi's (2001) study on the assessment of faculty members' adoption and use of technology. However, 74% of faculty members use the Internet and related tools. This study was carried out at a time when Saudi Arabian universities were not authorized to utilize the Internet. In Saudi Arabia as a whole and in higher education in particular, the computer becomes a vital instrument. It is an effective tool that can support a student's preferred method of learning while also influencing how teachers use computers to support their instruction (Almuqayteeb, 2009). In a different study, Alsharidah (2018) examined how faculty members use computers in higher education and discovered that while 90% of faculty members think it's critical to use information computer technology in the classroom, only 18% of faculty members disagreed.

Faculty Use of Learning Management Systems (LMS)

The word "learning management system" (LMS) refers to the variety of platforms that give educators, administrators, and students access to online courses (Aldiab, Chowdhury, Kootsookos, Alam, & Allhibi, 2019). Over the last few years, though, there has been a movement, particularly by larger universities and government agencies, toward the development of using open resources in LMS such as Moodle (Bates & Sangrà, 2011, p. 33). In a case study in Saudi Arabia, Aldiab et al. (2019) found that across 28 public universities in Saudi Arabia, the most commonly used system was Blackboard at 89%. Two universities used Moodle (7%) and one used D2L (4%). Canvas has not been shown in Saudi Arabia. Access to LMS enables students to interact among themselves and educators to help students access the content and implement self-instruction (Alenezi, 2018). When Alghamdi and Bayaga (2016) investigated faculty attitudes towards using LMS, they found that the main barrier to entry was related to anxiety about LMS applications. Faculty members across educational areas felt anxiety about their ability to implement the features of LMS as a tool in the classroom. A few faculty members used LMS for teaching purposes.

Faculty Use of E-learning and Online Learning

E-learning has become a tool in the learning process in most universities around the

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world. E-learning is appropriate for all disciplines in the education process. E-learning is defined as the use of technology to facilitate learning by connecting to the Internet and utilizing online course materials to give instruction and learning from a computer, phone, or portable device through distance resources (Guri-Rosenblit, 2005). The increasing relevance of e-learning has led to the establishment of a National Center for E-learning and Distance Learning in Saudi Arabia. The National Center for E-learning and Distance Learning was established in 2007 to utilize educational technology platforms and raise the efficiency of the educational and training process in all forms (Alhabeeb & Rowley, 2017). Even with this advancement, Saudi Arabian universities still face obstacles and constraints when attempting to use e-learning. For instance, between 30 and 40 percent of teachers and students say they are not entirely satisfied with the way or content of e-learning (Alkhalaf, Drew, & Alhussain, 2012). Moreover, teaching experience and skill level of using computers both play a big role in faculty members' perceptions of using e-learning compared to other faculty who have less experience and knowledge of computer skills (Al-Sadoon, 2009). Previous studies have indicated that when it comes to e-learning, there are gender differences among instructors. These variations can be observed in how users react to e-learning platforms, how comfortable they are with them, and how they perceive them (Ramirez-Correa, 2010).

Faculty Use of Mobile Learning

Previous studies indicate that the definition of mobile learning, especially in higher education, has included a collection of multiple evolving concepts (El-Hussein & Cronje, 2010). Mobile learning includes learning that occurs by wireless technology devices that enable a learner's utilization anywhere and anytime (Attewell & Savill-Smith, 2005). Recent research has focused on the trend of mobile learning to explore how mobile learning could enhance the learning and teaching process in education policies in Saudi Arabia. A recent study in this area found that separating gender in higher education by using mobile learning would allow female and male students to share and discuss knowledge within the standards of Saudi society (Alharbi, Alotebi, Masmali, & Alreshidi, 2017). Previous research has also highlighted the impacts of mobile technology on the learning and teaching process compatible with social media such as Skype, Twitter, and blogs for learning (Gikas & Grant, 2013). Recently, people across the world have started using mobile phones more than any other technological device. As mobile learning continues to improve and increase, using RSS by mobile phones may become one of the simplest ways for faculty to alert students, send more information, and make announcements for assignments (Bates & Sangrà, 2011, p. 39). Additionally, Alfarani (2015) found that mobile-learning is in the infancy stage in Saudi universities, therefore faculty still exhibit a negative attitude towards mobile-learning and neither age nor experiences affects this attitude.

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Faculty Use of Digital Games

Game-Based Learning (GBL) is a concept adopted to enhance learning among students and adult learners in society. Simply put, this definition describes GBL as an approach where players gain knowledge they can transfer to real-life contexts while participating in an entertaining game (Bates & Sangrà, 2011, p. 40). These arguments by Wilkinson (2016) are supported by similar views in a study by Plass, Homer, and Kinzer (2015), who argue that the use of games in the educational and development contexts is not a new concept and it has been in existence for several years. The only new development is the use of technology, which has been influenced by increased acceptance of digital games that have been mainstreamed as a form of entertainment, prompting developers to incorporate GBL in computer games (Plass et al., 2015). In other words, this concept has existed for ages it has only been recently advanced to incorporate new technology.

An investigation by Yang (2012) found that GBL effectively supports students' problem-solving skills, which is a method of higher-order thinking. The use of digital games helps learners to acquire knowledge by themselves and improve their capacity from their experiences. One of the benefits of the game is that it helps in cognitive development. Cognitive neuroscientists have just recently put out a call to game developers to design new games for testing hypotheses about the specificity of cognitive advances and the particular mechanisms on which they are based (Bavelier & Davidson, 2013). Additionally, the motivation part of computer games comes from various sources, such as rewards after completing various levels, trophies, and badges for solving problems, and climbing up the leaderboard based on progress and achievements (Plass et al., 2015). Therefore, research has provided evidence for the effectiveness of using GBL in Saudi Arabia. However, most of these studies have been done in primary schools rather than in higher education (Alharbi, 2010; Al-Hadlaq, 2011).

Since Saudi Arabian universities and government agencies first connected to the Internet in 1999, institutions have made extensive efforts to incorporate modern technology and innovation into daily life (Alqarni, 2015). Despite these efforts, universities still have immense progress to make when it comes to realizing the full potential of technology in the classroom. As the literature demonstrates, Saudi Arabian educators, faculty members, and administrators seem to face steep challenges when it comes to the implementation of innovative technology into the learning process. Particularly compelling, however, is evidence that faculty attitudes, perceptions, and anxieties about technology in the classroom seem to be one of the greatest barriers to successful implementation (Alghamdi & Bayaga, 2016). Even though many faculty members use technology for communication on a daily basis, they have been reluctant to incorporate technology into research and teaching (Alshawi & Alwabil, 2013). Because faculty perception plays such an important role in the implementation of technology in the teaching-learning process, further study is needed to understand how faculty members' attitudes affect their use of technology in the classroom, particularly in Saudi Arabian universities.

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Innovation and Technology in Education

Education is a social institution that serves a crucial need of every society and the world at large. In other words, education is such a significantly important element in the growth and development of civilization that it is indispensable and performs a critical role in building society. Therefore, education should not only be comprehensive, sustainable, and excellent, but it should also evolve and meet the challenges of a transforming world, especially in this era of globalization where evolution is happening at a very fast pace (Serdyukov, 2017). It is undeniable that the world has moved from an era of industrialization to a new age of information and technology. In response, the education system has reconsidered how to best meet the needs of the population and generate a knowledgeable society (Mykhailyshyn, Kondur & Serman, 2018). The evolution of education has to include innovation, such as the use of technology, in order to ensure that learning institutions appropriately respond to the needs of society within a current moment. Although there are no available statistics showing that there is a direct relationship between education and learning outcomes, Pisanu (2014) argues that technology can increase the probability of learning. Substantially, innovation and technology are two critical advances that should be considered and incorporated in the evolution of the education system.

It is not the case that technology has been totally disregarded up to this point in favor of the integration of innovation and technology in higher education institutions. Conversely, in recent decades, pupils have started utilizing digital technologies (Marzilli et al., 2014). Notably, students use more technological devices in their personal lives than they do in their learning institutions. Technology companies have become aware of the need for innovation and technology in the education system and they have been spending billions of dollars to develop advanced technologies such as virtual reality and artificial intelligence that could be used in the education system (Martín-Gutiérrez, Mora, Añorbe-Díaz, & González-Marrero, 2017). However, despite the importance of technology in education and its frequent use among most students, technology and innovation in higher education have continued to fall short of developmental goals in the past few decades. This lack of progress in the integration of innovation and technology in higher learning institutions makes it essential to understand the challenges or issues that prevent integration, especially regarding faculty's attitudes, since they are the ones who determine its success or failure in the classroom.

Discussion

To summarize, the majority of existing research on technology use in Saudi Arabian universities has framed faculty's use of technology in the classroom positively. However, each study contains a group of faculties with persistently negative attitudes toward using technology regardless of the reasons or experiences that led them to this attitude Alenezi (2012), in example, observed in his study that certain faculty members who hold unfavorable opinions on e-learning believe that it prioritizes memorization over real-world learning. According to the study's staff, pupils' chances

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for creativity were diminished by the online learning environment (Alenezi, 2012). Alghamdi and Bayaga (2016) looked at faculty perceptions regarding the use of LMS in their instructional activities. According to the report, even though their universities offer LMS services, some faculty members choose not to use them. Even though these faculty had negative experiences with LMS that led to their negative attitudes, these faculty did not try to overcome those negative experiences and learn to incorporate LMS in their teaching (Alghamdi & Bayaga, 2016). Overall, previous studies have demonstrated that there are a number of reasons why faculty have a negative attitude toward the use of technology.

Furthermore, a number of studies have been conducted to look at the degree of integration and the obstacles that prevent technology from being fully integrated in higher education. Thirunarayanan and Perez-Prado (2005) argue higher education institutions should take on a greater role to provide faculty who use technology in the classroom with incentives such as rewards or tenure in order to encourage faculty self-improvement. However, a lot of teachers are just unwilling to incorporate technology into their lessons, although there are a lot of other reasons for this. The group of faculties considered reluctant may include those who are technologically illiterate and those who believe that traditional teaching methods are preferable (Hagner & Schneebeck, 2001, p. 2-4). Carey and Dorn (1998) pinpoint a specific form of reluctancy as “technophobia,” which describes the fear of using technology for reasons such as a perception that it does not align with their teaching strategies, a lack of usefulness, and a lack of control (p. 71). However, the authors suggested that faculty can overcome technophobia by having greater self-efficacy to use technology and practice with technology so that it may become "familiar, useful, and controllable" Carey & Dorn, 1998, p. 71). Therefore, as Mishra et al. (2007) posit, there are critical issues that face faculty in higher education, such as lack of experience with teaching with technology, as they integrate technology into their teaching technique. Ultimately, the research described throughout this literature review supports the claim that the majority of university faculty in Saudi Arabia perceive technology-based teaching negatively.

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