

The Developments of ICT and the Need for Blended Learning in Saudi Arabia

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Abstract

The provision of information and communication technology (ICT) to academic staff and university students is critical in order to offer them more effective learning environments. Investigating the current status of the developments of ICT may help decision makers and academic staff to employ them successfully by overcoming the needs and reinforcing the good aspects. This study focuses on the pertinent literature that intends to present the developments of ICT in the Saudi higher education context and the reasons behind the need for blended learning at Saudi universities. The findings indicate that the supply of ICT equipment appears to be adequate which might be due to the recognition of its importance, but that training in using ICT is required for some academic staff and students. Academic staff and students seem to be using ICT unevenly with different levels of skills and experiences that vary from one university to another across the country. The findings also indicate that learning style, the dominance of traditional learning, and the universal pedagogical demand are likely to be some of the reasons behind the need for blended learning. Implications of these findings are provided.

Keywords: Information and communication technology (ICT), the Internet, blended learning, higher education, Saudi Arabia

1. Introduction

This study is divided into three sections. The first two sections review the literature pertinent to ICT and the Internet use in Saudi Arabia in general and in the Saudi higher education context in particular. The final section justifies the need for blended learning at Saudi universities.

2. Information and Communication Technology (ICT)

In the 21st century, ICT is an integral part of our daily lives and plays an important role in human development, including the education field. Economically, Saudi Arabia is considered to be the largest ICT market in the Middle East (Al-Khalifa, 2010; Aljahni, Al-Begain, & Skinner, 2011). Consequently, the Saudi government has taken fundamental steps to enhance the use of ICT within the country. For example, the Ministry of Communications and Information Technology launched the National Plan for ICT¹ in 2008 which keenly sets out the vision of ICT in Saudi and how to implement it (Economic and Social Commission for Western Asia, 2009). As a result of the continuous developments of ICT in Saudi Arabia, the chairman of the Saudi Communications and Information Technology Commission (CITC) (2014) stated that:

...the Kingdom today has a strong ICT network infrastructure, capable of providing all modern services and accommodating the high data flow resulting from the use of these services and applications, thus supporting a knowledge-based economy, and achieving our government's goal of building an information society. (p. iii)

In addition, the Saudi Ministry of Education – Higher Education has conducted many projects that aim to build adequate ICT infrastructure. According to Alebaikan and Troudi (2010a, 2010b), the main ICT project of the ministry was to establish the National Plan for Information Technology, which attempts to improve the quality and extent of learning in higher education by encouraging e-learning and distance education. Consequently, based on the National Plan, The National Center for E-Learning and Distance Learning (NCEL) was established, which supplies tools and technical support to improve digital courses for a standardised university context (Alebaikan & Troudi, 2010b). The NCEL (www.elc.edu.sa) has established a number of projects such as a learning management system (LMS) called Jusur² to provide course materials that universities design. Jusur is an Arabic word that means bridges. Another example is the Saudi digital library (SDL) that has worked towards a knowledge-based society by providing electronic recourses for academic staff and students at Saudi universities such as doctoral and masters theses of Saudi students around the world.

¹ This plan was approved on 28/5/2007 and started in 2008. It went for five years and its vision was: "the transition to the information society and the digital economy, and the building of a strong industry in this sector to become one of the main sources of income" (Economic and Social Commission for Western Asia, 2009, p. 2).

² According to Albarak, Aboalsamh, and Abouzahra (2010), Jusur is an Arabic LMS adopted by the National E-learning center in Saudi Arabia which "has excellent localization features as it was developed mainly to be an Arabic LMS system and therefore, it has superb localization features. Moodle Arabic version is also there but with limited features compared to Jusur" (p. 674).

In addition to these projects, the ministry launched The Plan for the Future of University Education in the Kingdom (AFAQ) in 2011 (Al-Ghabban & Zaman, 2013). This plan is one of the major developments in higher education which is considered to be the strategic plan for the introduction of e-learning and other new technologies. This project was established to support and develop the quality of the higher education system in Saudi Arabia for the next 25 years. One of its strategic objectives is to enhance the use of ICT among academic staff and students at Saudi universities, as well as to adopt various learning styles that focus on the integration of ICT into teaching processes. Moreover, four international conferences of e-learning and distance learning were held in Riyadh, Saudi Arabia, in 2009, 2011, 2013, and 2015 respectively. These conferences were organised by the Ministry of Education - Higher Education, incorporated with NCEL (National Center for E-learning and Distance Learning, n.d.). These ministry developments urged the actual movement to deploy and enhance ICT in Saudi higher education.

Although ICT seems to be well developed within the country in general, as mentioned by the chairman of the CITC above, its developments at Saudi universities in particular are more required. Colbran and Al-Ghreimil (2013) stated that “information technology plays a central role in a modern university. If Saudi Arabia aspires to have a number of leading universities by world standards, it will need to invest heavily in technology, infrastructure, and skilled human resources” (p. 81). In addition, Alturise, Calder, and Wilkinson (2014) advised that if Saudi universities are planning for e-learning and the consolidation of required resources they “must improve their IT infrastructure, including the provision of suitable connection networks and formal training of staff in utilising IT resources” (p. 123).

Therefore, the use of ICT in Saudi universities is highly valued due to its impact on improving the quality of teaching and learning (Ageel, 2011; Alfahad, 2012; Saqlain & Mahmood, 2013), and this in turn necessitates the supplying of Saudi universities with ICT equipment. The literature review within the Saudi context suggested that the supply of ICT equipment within universities seems to be adequate, but that training in the use of ICT is required for academic staff and students (Ageel, 2011; Al-Zahrani, 2015b; Althobeti, 2013; Mulhim, 2014; Saqlain & Mahmood, 2013). For instance, 14 academic staff at Northern Border University in Saudi Arabia asserted that ICT was available to them at their university as with any other university, but that training and technical difficulties were the main concerns (Saqlain & Mahmood, 2013). Similarly, 16 academic staff at a leading university in Saudi Arabia revealed that the majority of them do not make use of ICT in their teaching, but were willing to use more ICT once training was provided (Ageel, 2011). However, this might be not the case with the academic staff of all Saudi universities and institutions of higher education. For example, assessing eight academic staff and 40 students at Yanbu University College in Saudi Arabia revealed shortcomings in ICT usage and applications for students, but academic staff were qualified to use ICT and that no training need be provided to them (Al-Alwani, 2014). Training on how to use ICT properly seems also to be a requirement that should be provided to Saudi university students, especially pre-service teachers. Mulhim (2014) asserted that “education colleges in Saudi universities do not pay great attention to training student teachers in using educational technology.” (p. 489). Therefore, it was concluded that “Saudi pre-service teachers are not being effectively prepared for the Information Age.” (Mulhim, 2014, p. 489).

However, investigating uses and experience levels at using ICT for students at Saudi universities and institutions was given high priority (Alfahad, 2012; Robertson & Al-Zahrani, 2012). For instance, Robertson and Al-Zahrani (2012) found that Saudi students at King Abdulaziz University generally had high skill levels with ICT, particularly with computers, in which almost two-thirds of them (63.4%) had more than three years experience and more than half of them (55.4%) reported that they had access to computers at university. In addition, investigating the different purposes for using ICT, from the laptops and computers of 161 female students at King Saud University based on weekly use or less, revealed that more than 60% of students were using ICT for course activities and writing documents for their course work, 56.6 % for accessing libraries at the university, 47.2% for creating presentations, and 21.7% for accessing learning management systems (Alfahad, 2012). The results of these studies showed that ICT is used frequently with an adequate experience level and that the supply of ICT seemed adequate at these universities.

However, the Saudi culture seems to be a hindrance to the use of global ICT in Saudi higher education (Ageel, 2011; Al-Zahrani, 2015c; Alturise & Alojaiman, 2013; Shaabi, 2010). For example, a recent study conducted by Al-Zahrani (2015c) revealed that integrating ICT into educational levels is important due to its advancements and global demand, but the domination of cultural-religious conservatism seems to be a substantial dimension behind the resistance to adopt best practice levels of ICT integration internationally. Al-Zahrani (2015c) stated that “as a result of conservatism, traditionalism is widely prevailing as the obvious model of education.” (p. 157). Thus, he concluded that the enforcement of innovative ICT pedagogical models is recommended for Saudi higher educational contexts.

These findings generally indicate that ICT equipment appears available within the Saudi higher education universities and institutions, which is in accordance with ministry objectives, though training in using ICT seems to be required for some academic staff and students. In addition, academic staff and students seem to

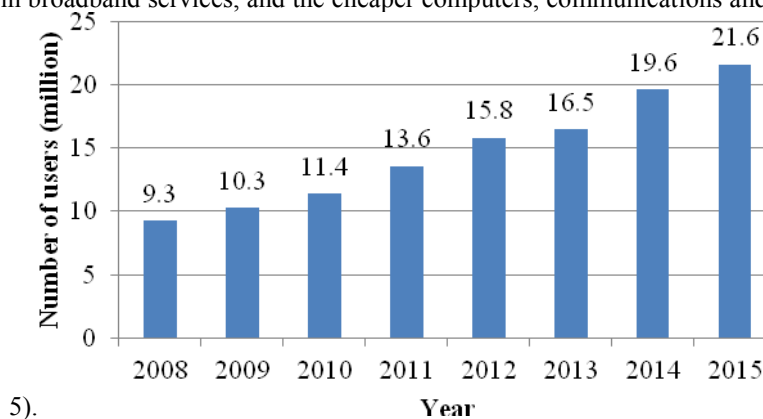
be using ICT unevenly with different levels of skills and experiences that vary from one university to another across the country. Moreover, the importance of using ICT in educational settings seems to be clear for decision makers, academic staff and students. Therefore, investigating ICT applications such as the Internet within Saudi higher education is an essential element.

3. Internet Use

Internet use is spreading rapidly into daily life, and directly affecting people's ideas and behaviour. In fact, the Internet influences most individuals' lives on a daily basis (Morse, Gullekson, Morris, & Popovich, 2011), which might be due to the rapid growth of communication technology. For example, the Internet in Saudi Arabia became officially available to the public in 1999 (Al-Gahtani, 2011; Alebaikan & Troudi, 2010a; Alshawi & Alwabil, 2013; Simsim, 2011), but the number of users has expanded dramatically. Saudi Arabia had a huge growth rate of Internet use during the last few years (see Figure 1).

According to the CITC annual report (2015), the number of Internet users in Saudi Arabia reached about 21.6 million at the end of 2015. Those users were more than two-thirds of the Saudi population of 31.7 million in mid-year 2016 (Central Department of Statistics & Information, n.d.). Figure 1 shows the number of Internet users based on the data revealed in the Commission's Annual Report (2015) during the last eight years.

The dramatic growth of Internet services and broadband was attributed by the CITC to the high use of social networking applications, video downloading and gaming. Prior to that, Alebaikan and Troudi (2010a) attributed the rapid growth of Internet users to the high proportion of young people among the Saudi population and their fast adaptation to new technologies. In addition, the Economic and Social Commission for Western Asia (2009) reported that "the reasons behind this growth are due to an increasing awareness regarding the benefits of the Internet, the growth in broadband services, and the cheaper computers, communications and Internet services" (p.



5).
Figure 1: The Number of Internet Users in Saudi Arabia

The number of subscriptions for the Internet services has also increased dramatically in Saudi Arabia (see Figure 2). The CITC report (2015) also revealed that the number of subscriptions at the end of 2015 was 3.56 million for the fixed broadband services¹ and 33.4 million for the dedicated mobile data subscriptions. Figure 2 shows the trend of dedicated mobile data subscriptions market growth based on the data revealed in the Commission's Annual Report (2015) during the last five years. The number of Internet users is expected to continue growing dramatically, as indicated by the statistics in the Saudi context. This also indicates an increasing number of users within higher education academic staff and student populations, pointing to their readiness to adopt new technologies.

¹ Including digital subscriber line (DSL), fixed wireless (WiMAX), fiber optics (FTTx) and other fixed lines.

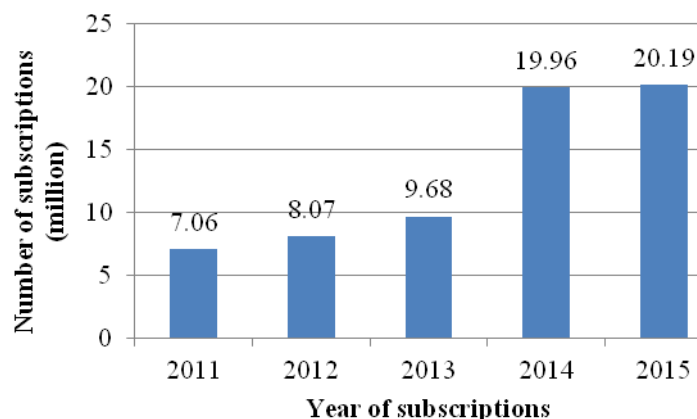


Figure 2: The Dedicated Mobile Data Subscriptions Market Growth in Saudi Arabia

Research in Saudi Arabian higher education showed that the Internet is being used extensively and is perceived as an essential element for teaching and learning (Aldebasi & Ahmed, 2013; Alshawi & Alwabil, 2013). For example, 71% of 504 academic staff (53% were males and 47% were females) from King Saud University, Imam Muhammad Bin Saud University, Prince Sultan University and Al-Yamamah College believe that the Internet plays an increasingly substantial role in academic careers, and more than four-fifths of them had been using the Internet for more than four years with moderate to high levels of proficiency (Alshawi & Alwabil, 2013). Alshawi and Alwabil (2013) found that male and female academic staff were using the Internet similarly with no significant differences, and that computer skills were found to be a strong predictor of Internet use. The main purposes of using the Internet were teaching, communication and research. There were some associated problems facing academic staff of which information inaccuracy was the highest rated Internet problem (Alshawi & Alwabil, 2013). Another example showed that 70% of 500 students (80% were males and 20% were females) at Qassim University used the Internet for information retrieval, and 72% to obtain knowledge related to their study due to time savings, currency of knowledge and easy accessibility (Aldebasi & Ahmed, 2013). Aldebasi and Ahmed (2013) concluded that the Internet produces an educational delivery system that is highly necessary for both male and female students. The high use of the Internet shows how students in Saudi universities such those in Qassim University perceived the Internet to be an important educational tool that is likely to enhance their learning.

The location university students used to access the Internet was given high attention by many researchers. The majority of studies revealed that home access to the Internet is most common for university students in Saudi Arabia (Al Otaibi, 2012; Aldebasi & Ahmed, 2013; Ali, 2013; Aljumah, 2012; Almalki, 2011; Hallila, Zubaidi, Ghamdi, & Alexander, 2014; Rahman, 2011). Al Otaibi (2012) found that home Internet access had a more significant and positive relationship with students' use of, and general attitudes towards, the Internet than Internet café access. Most importantly, students who had home Internet access were found to perceive online education positively (Al-Arfaj, 2001; Alaugab, 2007). Interestingly, Al-Zahrani (2011) found that students' familiarity with Internet applications¹, especially at home, had a positive impact on their use of technology at the university and lead them to use it more effectively. More recently, Alojaiman, Alturise, and Goodwin (2014) declared that recent research "shows that the students who do not have internet access at their homes have lower grades than the students who can access internet at their homes" (p. 182). These studies consistently indicated the positive effects of home Internet access.

However, as a result of the segregation of genders in Saudi Arabian culture (Madini & de Nooy, 2014) and its conservative context (Robertson & Al-Zahrani, 2012), Milianny (2014) found that Saudi female university students are "more likely to have their Internet access monitored and circumscribed by family members, with parents controlling the location and the amount of time spent using the Internet" (p. 3160). Similarly, Alebaikan (2010) pointed out that some female students had limited access to the Internet at home. Milianny (2014) also added that "females are more likely than males to face family restrictions on their use of the Internet" (p. 3166), while female participants in Milianny's study reported that "males frequent Internet cafés to access the Internet, due to the permissibility of males visiting and patronising them as they please" (p. 3165). This was demonstrated by the findings of Aldebasi and Ahmed's study (2013), when they sought the locations that university students used to access the Internet. The results revealed that while the Internet café was applicable to male students, it was not applicable to all female students (Aldebasi & Ahmed, 2013). This restriction of Internet access seems not only to be for female students, but it involves females over the country, as Alhareth (2013) stated that Internet access for females in the Saudi context "is really unavailable because of the culture of the society and negative male beliefs of using the Internet by females, which they could use in a wrong way" (p. 646). Most

¹ For example: Email, forums, blogs, social networks, etc. (Al-Zahrani, 2011, p. 135).

importantly, the findings of Alebaikan's study (2010) revealed that female students who did not have access to the Internet at home had poor ICT experiences, which ultimately may make them resistant to adopt blended learning.

Although female students seem to face some cultural barriers, the indicators of using the Internet within Saudi higher education institutions are in line with developments and the tendency of the Ministry of Education - Higher Education to use ICT as mentioned in the previous section. Ultimately, these changes in the Saudi context encouraged academic staff to look at new teaching and learning strategies that employ ICT, in which the Internet applications are used with traditional learning classes in what is known as blended learning environments.

4. The Need for Blended Learning

Blended learning, also known as hybrid learning and mixed learning, is a broad concept that can be defined differently based on many dimensions. However, Graham (2006, 2008) identified three major categories of blended learning: enabling blends, enhancing blends, and transforming blends. Some of the reasons behind the need for blended learning at Saudi universities might be related to the preferred learning style, the dominance of traditional learning and the changing universal pedagogical demand to improve the quality of teaching and learning.

The first reason is the increasing number of students within the Saudi higher education which is a challenge due to their different preferences towards learning that need to be fulfilled. According to the Education Statistics Center at The Ministry of Education (n.d.), the number of registered students during 2009-2010 academic year was 784,068 while during 2013-2014 academic year was 1,307,481 in Saudi public universities. This shows that the number of students is increasing more than 100,000 students annually. One of the most important characteristics of students is their preferred learning style, which plays a major role in their learning. Learning style can be defined as "the composite of characteristic cognitive, affective and physiological factors that serve as relatively stable indicators of how a learner perceives, interacts with and responds to the learning environment" (Furnham, 2012, p. 189).

In the Saudi higher education context, the literature indicated that learning styles have a great impact on student outcomes (Al-Saud, 2013; Nuzhat, Salem, Al-Hamdan, & Ashour, 2013; Nuzhat, Salem, Quadri, & Al-Hamdan, 2011). For example, 72.6% of 146 students (gender was almost equally distributed) at King Saud Bin Abdul Aziz University for Health Sciences preferred multiple learning styles (Nuzhat et al., 2011). The effect of learning style on students' achievement was investigated, and the results indicated that students who preferred multiple learning styles achieved higher results than those who preferred a single learning style, regardless their gender (Nuzhat et al., 2013). Similarly, more than half (59%) of 113 students (63% were males and 37% were females) at King Saud University preferred multiple learning styles, and a statistically significant association between the grade point average (GPA) and learning style preferences was found, suggesting that students with multiple learning style preferences had a higher mean GPA than those with a single learning style preference (Al-Saud, 2013).

It is likely that the learning style of each student tends to be different and, therefore, "a single mode of instructional delivery may not provide sufficient choices, engagement, social contact, relevance and context needed to facilitate successful learning and performance" (Singh, 2003, p. 51). Modifying the teaching styles according to students' preferences of learning styles may enhance the quality of education significantly (Marković & Jovanović, 2012). In addition, the results from the previous studies of Saudi students that addressed learning styles indicated that there is a need for blending traditional learning with online learning, which is likely to accommodate students' differences and enhance students' achievement. Consequently, academic staff members are encouraged to implement blended learning in order to create more effective learning environments.

Another reason for the need for blended learning is that, in Saudi higher education traditional learning, lectures seem to be the dominant teaching method, while modern teaching methods are used infrequently (Ageel, 2011; Al-Zahrani, 2015a, 2015b; Alebaikan & Troudi, 2010a; Colbran & Al-Ghremil, 2013; Hamdan, 2011, 2014b). However, academic staff found that online learning and blended learning contexts make students more active, and that they preferred these methods over traditional learning (Hamdan, 2014a). The literature review within the Saudi context showed that blended learning has a positive effect on students' achievement and satisfaction. For example, students' achievement was found to be better in blended learning environments than in the traditional learning environment (Al-Qahtani & Higgins, 2013; AlMahamoud & Elebiary, 2013; Alseweed, 2013; Alzahrani, 2017; Badawi, 2009; Makhdoom, Khoshhal, Algaidi, Heissam, & Zolaly, 2013; Riad, Saadat, & Badawy, 2013), and even better than in the e-learning environment (Al-Qahtani & Higgins, 2013; Alseweed, 2013). In addition, students' satisfaction was found to be higher in blended learning environments than in the traditional learning environment (AlMahamoud & Elebiary, 2013). The empirical investigation of AlMahamoud and Elebiary (2013) revealed that students' higher learning achievement and satisfaction "most likely were impacted by the more active classroom teaching approach utilized in the blended course format." (p. 4658).

Although the results showed that blended learning seems to be the most effective learning method, it is believed that its implementations are in an early stage in Saudi universities (Alebaikan, 2010; Almalki, 2011; Alshahrani & Ward, 2014). This made the need for effective learning environments high in the Saudi higher education context. Thus, the Saudi Ministry of Education - Higher Education has started to move with the international trend and encourage Saudi universities to move towards this as one of its rapid developments. Because blended learning aims to combine the advantages of online learning and more traditional contexts, it seems to be the coming trend in the delivery of courses at Saudi universities.

The third reason behind the need for blended learning is that higher education is universally changing due to the tendency of using technology to enhance teaching and learning, which involves offering learning environments that can meet the twenty-first century needs. Garrison and Vaughan (2008) stated that blended learning “addresses the issue of quality of teaching and learning. It is an opportunity to address pressing pedagogical concerns, while distinguishing and enhancing the reputation of institutions of higher education as innovative and quality learning institutions” (p. 153). Blended learning is an attempt to build on the strength of online learning without surrendering the advantages of direct contact between academic staff and students. Therefore, the pedagogical demand within the Saudi higher education institutions to provide more effective learning environments, such as blended learning environments, seems to be a necessity for improving the quality of teaching and learning.

Pedagogically, blended learning could be the best solution for improving higher education in many countries including Saudi Arabia. The literature appeared to be undecided regarding the most effective learning approach, either fully traditional learning or fully online learning, and perhaps blending both environments will produce the most effective courses. According to the Güzer and Caner (2014) review and analysis of the 28 most frequently cited articles/books from Google Scholar on blended learning that were published from 1999 to 2012, blended learning is perceived as useful, enjoyable, supportive, flexible and a motivator of students. However, they asserted that planning the implementations of blended learning precisely, and encouraging student participation, are important components for obtaining more positive blended learning environments.

The stated reasons behind the need for blended learning in the Saudi higher education context, make this pedagogical change an essential issue that needs to be considered seriously by decision makers and academic staff.

5. Conclusion and implications

This study described the developments of ICT and Internet use as well as justified the need for blended learning at Saudi universities. It is clear that the Saudi government has made many efforts to enhance the use of ICT. For example, the noticeable efforts made by the Ministry of Education – Higher education are likely to lead the country to a better knowledge society. The ministry’s efforts have focused on the supplement and utilisation of ICT in higher education universities and institutions in order to create effective learning environments such those can be found in blended learning. However, training on using ICT more effectively might be required for some academic staff and students. In addition, the literature review showed that using ICT tools has a great effect on university students. Therefore, it is important for academic staff to understand the blended learning environments that employ ICT and to take advantage of best practices worldwide in order to properly apply them in the Saudi higher education context. Researchers also are advised to conduct further studies on blended learning and to investigate which blended learning category could be best for the Saudi universities and how that can be achieved. Finally, the Saudi community must become aware of the benefits brought by the Internet, particularly in the educational field. For example, Alturise and Alojaiman (2013) argued that “the advent of the Internet had enormous implications for ICT in Saudi Arabia and its universities started to use ICT, especially in the task of developing e-Learning” (p. 28). Therefore, the responsible person in each family within the Saudi context should allow their family members to access the Internet at any time, while still monitor their usage. If equal access to the Internet is offered for both genders, adopting ICT for educational purposes might be perceived as being more effective for university students regardless of their gender.

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