Adaptation of Mobile Learning in Higher Educational Institutions of Saudi Arabia

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ABSTRACT

Mobile learning (m-learning) is a new learning approach, relatively new research concept, has become an emerging learning trend for education system with mobile devices, internet and wireless technologies. M-learning is the next generation of E-learning, which will provide easy access and wide availability to students with more collaborative learning opportunities and activities. This study aims to investigate the students' awareness of m-learning and its aspects, the adaptation of m-learning in education and the disclosure of m-learning services. Data was collected through the questionnaire, 300 under graduate students from various departments of Jazan University were participated successfully in this research. The results indicated that students have an adequate knowledge and awareness in m-learning and provided the strong evidence on readiness of students to accept mobile technologies for their learning process. This result also showed an indication of students' expectations towards university services via mobile phones in higher educational institutions.

General Terms

Mobile learning, Jazan University

Keywords

Mobile learning, educational services

1. INTRODUCTION

Mobile learning is a technique that uses handheld devices, together with wireless and mobile phone networks, to facilitate, support, enhance and extend the reach of teaching and learning [1]. M-learning is expected to be delivery of electronic learning material on mobile computing devices and offer the advantages of learning anywhere and anytime with mobile devices [6]. M-learning as one of the up-and-coming educational and training method seems to be fastest developing in educational market. M-learning enables students to merge their learning experiences in a shared collaborative environment [2]. To adopt and utilize this m-learning technology in higher educational institutes must need to understand the students' awareness of m-learning and its impacts with expected services. The main reason for choosing mobile learning in our research is its popularity especially with young students today. Almost every person in Jazan University owns at least one mobile phone. The cost of mobile devices and calling rates are quite affordable and the mobile infrastructure in Saudi Arabia is well established resulting in most people acquiring mobile devices with improved features every year.

2. BACKGROUND

Generally, Mobile learning has been defined as learning that takes place via wireless devices such as mobile phones, personal digital assistants (PDAs), or laptop computers [2]. Elliott Masie defines mobile learning quite broadly as, "Mobile learning is defined as all 'knowledge in the hand.' It includes the use of mobile / handheld devices to perform any of the following: Deliver education / learning, Foster communications / collaboration, Conduct assessments / evaluations, Provide Access to performance support / knowledge". John Traxler [7] defines mobile learning as, "Mobile learning can perhaps be defined as any educational provision where the sole or dominant technologies are handheld or palmtop devices." A definition of mobile learning [8] should therefore be widened to include, any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies. M-learning is an emerging form of e-learning that offers the opportunity for both teachers and students to interact with educational material and services using mobile devices, independent of time and space. Availability and innovations of mobile technology such as wireless infrastructure, high bandwidth and mobile devices moved e-learning to m-learning era [6].

2.1 Technologies of m-learning

Mobile learning utilizes various technologies such include mobile devices, mobile software applications, mobile operating systems, transport of data and delivery options for contents. Figure 1 shows the technologies clearly.

Mobile Technologies				
Transport options	Devices options	Delivery options	Software options	Operating system options
• GPRS • GSM • Blue-tooth • 3G • 4G	• Mobile phones • Smart phones • PDA • Palm computers	• SMS • MMS • E-mail • WAP • HTTP	• J2ME • API • MIDP • XML • ASP.NET	• Symbian OS • Mobile Windows • Palm OS • iPhone OS • Android

Fig 1: Mobile Technologies

2.1.1 Mobile transport options

The Advances in computer technology, intelligent user interfaces, context modeling applications and recent developments in the field of wireless communications, including Wi-Fi, Bluetooth, multi-hop wireless LAN and the

global wireless technologies such as GPS, GSM, GPRS, 3G, 4G and satellite systems have created a wide array of new possibilities for technology users [3].

2.1.2 Mobile Devices options

There are several devices that support mobile learning – camera phones, smart phones, and personal audio players – the most popular being PDAs, which are wallet-sized computers designed as a combination of digital calendars and address books. These are also generically known as Palm computers [8].

2.1.3 Mobile data delivery options

Mobile technologies potentially promote, facilitate, and enhance student collaboration and interaction, processes that serve as a means for accessing, discovering, discussing, and sharing environmental concerns via multimedia messaging services (MMS), short messaging services (SMS), electronic mail, or messengers [4]. Students can converse with each other, question each other, and share opinions about environmental concerns. Collaboration could also occur outside the classroom, unlimited by geography, space, or time, although traditional classroom instruction infrequently supports collaboration [5].

2.1.4 Mobile Software

Sun Microsystems designed the Java 2 Micro Edition (J2ME), an Application Programming Interface (API) to develop software for small and resource constrained devices. The key element of J2ME is Mobile Information Device Profile (MIDP) which provides a standard Java runtime environment for popular mobile information devices, such as cell phones and PDAs. MIDP is a widely adopted platform of choice for mobile applications, deployed on millions of cell phones and PDAs globally, and is also supported by leading integrated development environments (IDEs). Microsoft Visual Studio 2008 and ASP.NET 3.5 include support for working with XML and creating mobile Web applications [9].

2.1.5 Mobile operating systems

There are many players in the area of mobile device operating systems (OS) such as Symbian OS, Microsoft Windows for Mobile, Palm OS, Mac OS X, Linux, iPhone OS and Android. Many operating system providers have also developed SDK platform compliant to their operating system [10].

2.2 Advantages

M-learning through a mobile device makes learning truly personalized. The learners have the option to choose learning content based on their interest, thus making learning very learner-centric [4]. The flexibility to access immediate job-specific information using mobile devices helps to increase the productivity of an individual. The advantages of m-learning are listed as follows - content consistency, collaborative learning, personalized learning, , learner centric, increased productivity, on demand content, continuous learning support, multimedia content delivery, enhance interaction, simple , intuitive, low physical and technical efforts [8].

2.3 Limitations

M-learning presents unique challenges like slow download speed and limited internet access, small screen sizes with poor resolution, color and contrast awkward text input, limited memory, small screen size of mobile device, limited computational capabilities, limited battery life and need more time to find information [4].

2.4 Applications

The number of Mobile Learning content applications has exploded over the last two years. The applications are grouped as follows [10], language learning, travel and tourism, academic test preparation , general education, study guides, and reference , how-to manuals and guides, simulation and game-based learning , location-based learning , medical, health, nutrition, and fitness, business, sales, and finance , handheld decision support and performance support, professional licensure, continuing education , continuing medical education, professional training and development. Even in the presence of an education category in a store, Mobile Learning apps are spread out among several categories including games, travel, reference, medical, and health. For example, a large percentage of learning apps designed for children are game-based and often tagged as games instead of education [4].

2.5 Services

While m-learning is growing rapidly in the higher education environments, the focus is still on two types, learning material services and administrative services. M-learning services have two main types. Pedagogical services such as learning materials and Informative services such as admission and registration [3].

3. METHODOLOGY

In this study the questionnaire was used as a main instrument for data collection. 300 questionnaires were distributed to students of various departments of academic campus for girls, Jazan. The study and its importance were briefly explained. The questionnaire contains 8 sections.

- ✓ Section 1: Student's profile
- ✓ Section 2: Awareness on mobile devices
- ✓ Section 3: Awareness on mobile technologies
- ✓ Section 4: Usage of mobile applications
- ✓ Section 5: Knowledge on mobile limitations
- ✓ Section 6: Knowledge on mobile advantages
- ✓ Section 7: Expected mobile services
- ✓ Section 8: Expectations on m-learning

4. DATA ANALYSIS & RESULTS

The analysis and survey results are presented based on these 300 valid respondents.

4.1 Student's profile

Table 1. Student's profile

Profile	Classification	No	Percentage
Department	CS & IS	110	37%
	Arch	70	23%
	Business	120	40%
Level of studying	Level 1	80	27%
	Level 2	50	17%
	Level 3	90	30%
	Level 4	50	17%
	Level 5	30	10%
Age	< =18	10	3%
	19- 21	250	83%
	22 - 24	40	13%

As shown in Table 1, 37% of participants from Department of Computer Science, 23% from Department of Architecture, 40% from Department of Business administration. Out of 300 participants, 27% from level 1, 17% from level 2, 30% from

level 3, 17% from level 4 and 10% from level 5. 83% of participants are in the age between 19 -21.

4.2 Awareness on mobile devices

As shown in Figure 2, all the students have the experience to use mobile phones. 80% of participants own smart phones, 73.3% of participants own basic mobile phones. PDA and Tablet PC have owned by 30% of students. This result shows that students have adequate awareness on mobile devices, which used in m-learning environment.
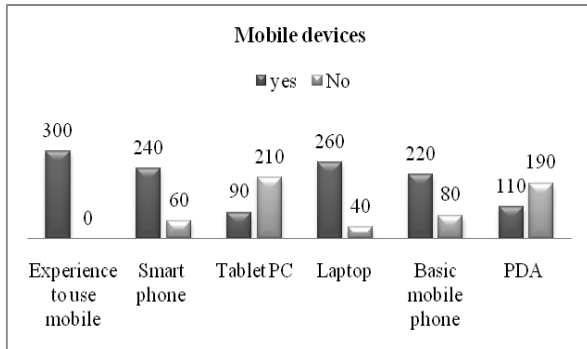

Fig 2: Awareness on mobile devices

4.3 Awareness on mobile technologies

As shown in Figure 3, 90% of participants using Wi-Fi, 97% of them using internet in mobile, 97% of them using blue tooth, 53% of participants using GPRS, 63% of them using WAP and 40% of them using 3G. This result shows that students have quite awareness on mobile technologies, which used in m-learning environment.
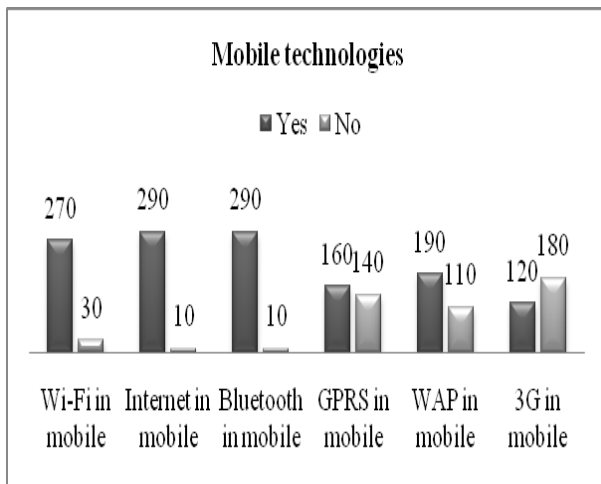

Fig 3: Awareness on mobile technologies

4.4 Usage of mobile applications

As shown in Table 2, almost all the applications are used by participants. SMS has been used extremely, 66.67% of participants used it. Online services used frequently by 63.33% of participants. Video calling, Sending emails, Word Processing, Dictionary, Notes, Calendar, Social networks are not used by participants more than 20%. This result shows that the students use almost all the above listed application. Students have fair knowledge to use the mobile applications.

4.5 Knowledge on mobile limitations

As shown in Table 3, slow data connection (83.33%) and unsecure internet connection (80%) are the highest ranked limitations. The other limitations also concerned by participants very closely percentages.

Table 2. Usage of mobile applications

Mobile application	Not used	Rarely used	Frequently used	Extremely used
SMS	3.33%	16.67%	13.33%	66.67%
MMS	6.67%	40.00%	30.00%	23.33%
Games	6.67%	53.33%	36.67%	3.33%
Calendar	20.00%	40.00%	30.00%	10.00%
Word processing	23.33%	40.00%	26.67%	10.00%
Chat	13.33%	26.67%	36.67%	23.33%
Sending emails	33.33%	20.00%	33.33%	13.33%
Online services	13.33%	3.33%	63.33%	16.67%
Video calling	50.00%	30.00%	13.33%	6.67%
Social networks	20.00%	33.33%	33.33%	13.33%
Dictionary	23.33%	40.00%	26.67%	10.00%
Calculator	0.00%	40.00%	23.33%	36.67%
Notes	20.00%	40.00%	40.00%	0.00%

Table 3. Knowledge on mobile limitations

| Mobile limitations	Affect	Not affect	No idea
Need training to use mobile phone	36.67%	36.67%	23.33%
Need training to use mobile applications	56.67%	23.33%	16.67%
Unsecure internet connection	80.00%	13.33%	6.67%
Small screen size	76.67%	13.33%	10.00%
Small Keypad	53.33%	33.33%	13.33%
Limited memory	63.33%	30.00%	6.67%
Limited battery	73.33%	20.00%	6.67%
Slow data connection	83.33%	3.33%	13.33%
Need more time to find information	53.33%	26.67%	20.00%

4.6 Knowledge on mobile advantages
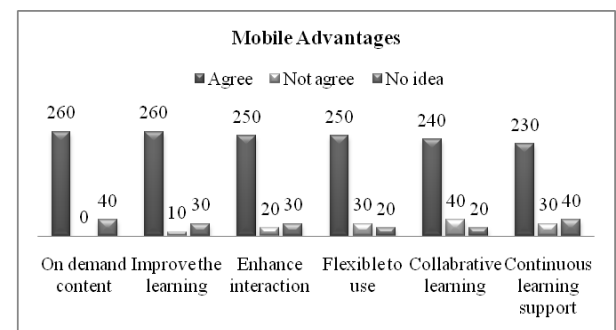
Fig 4: Knowledge on mobile advantages

As shown in Figure 4, participants have fair knowledge about all mobile advantages. In which on demand content (86.67%) and improve the learning (86.67%) are highly ranked advantages. Enhance interaction (83.33%) and flexible to use (83.33%) ranked in next place. Collaborative learning (80%) and continuous learning support (76.67%) ranked at last. This

result shows students have very good knowledge about mobile advantages.

4.7 Expected mobile services

As shown in Table 4, feedback to teachers (93%) is highly ranked expected service. Course schedule (87%) and exam results (87%) are ranked next. Alerts & warnings (80%) got ranked in third position. All the mobile service expected by above 50 % of students. This result shows that students are interested to get the university services via mobile.

Table 4. Expected mobile services

Classification	Interested	Not interested	No idea
Course registration	63%	30%	7%
Time table	73%	20%	7%
Academic calendar	53%	23%	23%
Course weekly schedule	87%	10%	3%
Alerts & Warnings	80%	17%	3%
Video lectures	63%	27%	10%
MP3 audio lectures	60%	37%	3%
Soft copy of study materials	60%	17%	23%
Exam time table	70%	27%	3%
Exam results	87%	7%	6%
Feedback to teachers	93%	3%	4%

4.8 Expectations on m-learning

As shown in Figure 5, 77% of participants expected secure network connection, 73% of participants expected high speed data connection and efficient support system. 70% participants expected special trainings for m-learning. 67% of participants are expected special Wi-Fi zone for implementing m-learning. This result shows that almost 72% of students expected m-learning in their educational environment.
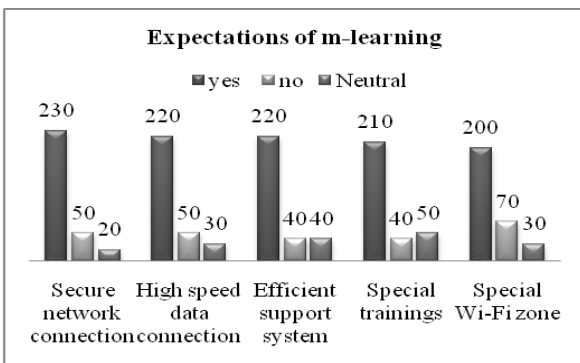
Fig 5: Expectations on m-learning

5. CONCLUSION

Nowadays, m-learning is a rising learning trend and a new vital platform for the higher education environments. This study is investigated students' awareness of m-learning and its aspects and adaptation of m-learning based on Jazan University. The findings represented opinions of different levels of students from academic campus for girls, Jazan. The results indicated that Jazan University had the required infrastructure to utilizing m-learning services. Furthermore the results showed that the students had ample knowledge and awareness to use such technology in their learning process. It was also demonstrated that students were quite aware of mobile technologies which used widely in m-learning environment. The results indicated that the students' perceptions of various limitations. The study also found that the most beneficial aspects and advantages of using mobile technologies for learning services were to give students an immediate access to information regardless of place. Students highly ranked several informative m-learning services. This study indeed provides unambiguous evidence on the readiness of students to accept and use m-learning in their educational environment. This may give a hand in supporting and utilizing m-learning services in Jazan University. This study is part of research to investigate adoption and diffusion of m-learning services among students in the higher educational Institutions. This study shows only the students' adaptation, the required infrastructure and architecture to implement m- learning will be discussed further.

6. ACKNOWLEDGMENTS

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