Opportunities for Utilizing Mobile Learning Services in the Palestinian Higher Education

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Abstract: *During the last decade, Palestinian higher education institutions had a successful experience in utilizing e-learning services. E-learning services are currently engaged in all aspects of higher education institutions. Students access university services anywhere regardless of time. Mobile learning (m-learning) enables students to accomplish their education anywhere and anytime. This study aims to understand the Palestinian students' awareness of m-learning and its aspects. This understanding will provide a strong evidence on the readiness of students to accept and use m-learning in their education environment. Furthermore, this will support the utilization of such technology in Palestinian higher education institutions. 378 participants out of five Palestinian higher education institutions in Gaza participated successfully in this research. The results indicated that the higher education environment had the required infrastructure to utilize m-learning services. The results also showed that the students had an adequate knowledge and awareness to use such technology in their education environment. Nearly half of the participants (50.3%) revealed that their university provided a wireless network or Wi-Fi zone in the campus. On the other hand, 79.1% showed that their university did not provide m-learning services. In general, 85.2% of the respondents had eagerness that their university provides them m-learning services. This study also found that the Palestinian higher education institutions had the potentials for using m-learning.*

Keywords: *m-learning Services, Mobile Technology, e-learning, Mobile Commerce, Higher Education*

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1. Introduction

Nowadays, the most concerns are paid to m-learning rather than e-learning. E-learning and m-learning have the most similar elements [1]., M-learning is the next form of e-learning using mobile technologies to facilitate education for teachers and learners anywhere and anytime [2] .

M-learning is an undeveloped area; so far its power and potentials have not been completely discovered. Technology is one of the significant aspects that able to affect m-learning business [1]., Indeed, several studies showed that m-learning had the capabilities to be fully utilized and diffused.

M-learning as one of the latest education and training method seems to be the fastest developing in education market compared to the traditional e-learning market. A study [3] listed ten types of packaged applications and content are utilized successfully in United States' m-learning market that are: language learning; travel and tourism; academic test preparation; general education, study guides, and reference; simulation and game-based learning; medical, health, nutrition, and fitness; business, sales, and finance; handheld decision support, professional licensure, continuing education, and continuing medical education; and professional training and development.

Trend of m-learning adoption goes to more collaboration instead of just learning. However, to reach this level of adoption or diffusion it is crucial to be ready to utilize m-learning technology. That may lead to understand the infrastructure state and the user (students) knowledge (awareness) of such technology.

Over the last decade, Palestinian higher education institutions utilized e-learning services. This study aims to comprehend the Palestinian students' awareness of m-learning and understanding its aspects. This understanding will give a potent evidence on the readiness of the Palestinian students to accept and use m-learning in their education environment. Furthermore, this will support the utilization of such technology in Palestinian higher education institutions. It may be useful to consider some learners with particular learning and mobility needs separately, like those who travel and would, at the same time, want to learn, those with no access to universities or an e-learning system, or learners need urgent learning, such as healthcare. Moreover, the geographical separation of Palestine is an obstacle for students to communicate frequently, with his/her university. As a result, students need to access university services anytime and anywhere.

As noted in [4] mobile device has been available for a several years without significant attention to its capability for education. Mobile technology offers a new generation of learning for people of all ages anywhere and anytime. Regardless of the fact that e-learning has not reached the highest growth figures

which were commonly predicted in the mid-1990s, scholars and industry representatives are now turning their attention towards the m-learning [5] which could overcome the limitations of e-learning [6].

2. M-Learning's Key Features

M-learning have several key features that made it in the sight of researchers to focus on. These features comprise:

- M-learning reduces the barriers of time, place, and distance. It provides learning opportunities to individual learners and institutions.
- Mobile technologies potentially create a wide variety of uses and limitations that differ significantly from desktop and laptop technologies.
- Some expected benefits from using the mobile devices such as mobility which is a primary component of m-Learning hardware.
- Several access technologies provide Internet access to all kind of learners via mobile phones.
- Higher Education institutions' flexibility in the face of rapid change.
- Mobile network operators probably play the most important role in enabling m-learning.
- Universities need m-learning as a complement for their education method.
- There are strong proponents of the notion that developing countries could find m-learning attractive simply because of the ubiquity of the mobile phone.
- The majority of people live in deep rural areas or far from campuses with little or no fixed line telecom infrastructure where everyone can have a mobile phone.
- The rapid evolution of powerful convergent and connected wireless mobile devices with mobile Web browsers.
- The availability of advanced mobile operating systems, robust mobile application software, and rich client interfaces.
- User interface technology that overcomes the limitations of the small device footprint of most mobile devices.
- M-learning products not only are demanded by educational institutions but also by individual and autonomous learners focusing special learning objectives.

3. Mobile Learning Services in the Higher Education

M-learning is considered as the next form of e-learning using mobile technologies to enable teachers and learners to conduct their learning process anywhere and anytime. However, the main difference between e-learning and m-learning is set in the add-on capabilities and limitations in the evolution aspects [7]. M-learning services have two main types of services that are pedagogical services such as learning materials and informative services such as admission and registration (see Figure 1).

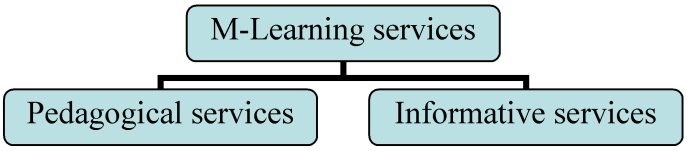

Figure 1: M-learning services types

while the use of m-learning is growing rapidly in the higher education environments, the focus is still on two types, learning materials services and administrative services [8].

A study [9] investigated the importance of university mobile services among Malaysian higher education students found that exam results and course registration were the highest rank, followed by Calendar and Schedule services, Library services, Treasury, and Admission status where the international students' services had the lowest rank.

Figure 2 shows that the m-learning's infrastructure that could be used in the higher education environment. The two main components of such infrastructure are mobile devices and wireless networks.

4. Limitations of M-Learning

Limitations of m-learning services are considered as one of the issues that should be taken care of when discussing m-learning implementation. Over the m-learning innovation, scholars have noted that mobile devices have some limitations such as memory size, battery life, high line cost, and small screen [10], [11]. Nevertheless, study [12] highlighted some considerations that need to be taken into account when exploring the adoption of m-learning range from limitations of the wireless technologies themselves, to broader issues such as safety and security, as well as training.

However, these limitations can be reduced by time based on the enhancement of mobile phones capabilities. Developments in technology provide new facilities and interfaces for students and staff of universities. Thus, to improve the organizational infrastructure for students and staff, every new technology arriving to the market has to be investigated for its benefit for daily use.

5. Methodology

In this study, a questionnaire was used as a main instrument for data collection. The questionnaire was

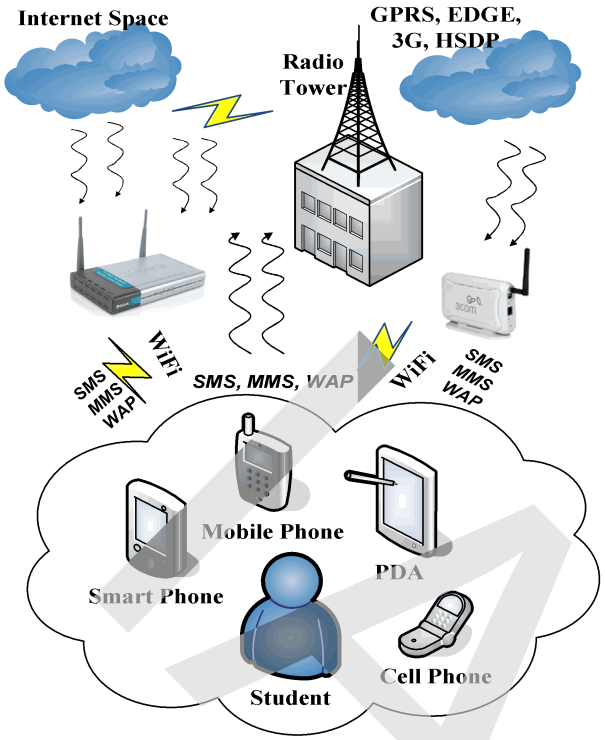

Figure 2. M-learning infrastructure.

adapted from three studies, which are [9, 13, and 14].

The questionnaires were distributed by hand in the classrooms with cooperation from some lecturers [15]. All the respondents were given a brief about the study and its importance.

The questionnaire comprises three sections: general information, awareness of m-learning services aspects, and using internet technology. Section "A" focuses on the users' profile such as gender, age, and education background. Section "B" covers six dimensions that include student's awareness of specific mobile technologies names, student's access to university learning resources, applications that student like to use through mobile, student's view on limitations of mobile devices, mobile technologies for learning services, and the university mobile services that student like to use through mobile technologies. For this section a 5-point Likert scale anchored by "Strongly Disagree" (1) and Strongly Agree (5) was used. For the ranges of five point Likert-scales were categorized into equal sized categories of low, moderate and high. Therefore, scores of less than 2.33 [4/3 + lowest value (1)] is considered as low; scores of 3.67 [highest value (5) - 4/3] is considered high; and those in between considered moderate. Finally, section "C" investigates the current student's usage of mobile technologies such as student's mobile experience, using WAP, and real usage of wireless space.

400 questionnaires were distributed to students at five of palestinian higher education institutions in Gaza. The universities were Islamic University of Gaza (IUG), Al-Quds Open University (QOU), Al-Azhar University–Gaza, University of Palestine (UP), Al-Aqsa University. The sampling was based on convenience and 378 participants successfully answered with response rate of 94.5%. The analysis of the survey results is presented based on a valid response of 378 respondents from the five mentioned universities.

6. Data Analysis and Results

6.1. Respondents' Profile

As shown in Table 1 54.8% of the respondents were male. The majority (69%) of the respondents were aged between 20 – 25 years. Business students made up the smallest group of respondents with 14.6%, while respondents studying arts were 45.2%. In terms of study level, most of the respondents were in the 4th year or in the last year in their study, depending on the study program four years or five years. This indicates that the findings represent opinions of different levels of students from different universities.

Table 1. Demographic Profile of the Respondents.

Profile	Classification	N	(%)
Gender	a) Male	207	54.8
	b) Female	171	45.2
Age	a) below 20 Years	80	21.2
	b) 20 – 25 Years	261	69.0
	c) 26 – 30 Years	22	5.8
	d) Above 30 Years	15	4.0
University	a) Islamic University of Gaza (IUG)	97	25.7
	b) Al-Azhar University – Gaza	90	23.8
	c) Al-Aqsa University	52	13.8
	d) University of Palestine (UP)	46	12.2
	e) Al-Quds Open University (QOU)	93	24.6
Education Background	a) Science	152	40.2
	b) Business	55	14.6
	c) Arts Studies	171	45.2
Study Level	a) 1st year	56	14.8
	b) 2nd year	76	20.1
	c) 3rd year	85	22.5
	d) 4th year	94	24.9
	e) Last year	67	17.7

Registered Students in the year 2009/2010 were 196,625 (44% male, 56% female) [16].

6.2. Awareness of Mobile Technologies Names

This study explored the students' awareness of the various mobile technology names (refer to Figure 2). The abbreviations used for this section are NA= Not Aware, SA= Somewhat Aware, NS= Not Sure, A= Aware, VA= Very Aware. The participants are highly aware of wireless technologies such as WAP, Wi-Fi, GPRS, and 3G. They have some knowledge about Tablet PC, and PDA. Furthermore, participants, have a good knowledge about smart phone. This indicates that students are quite aware of the mobile technologies which used widely in m-learning environment.

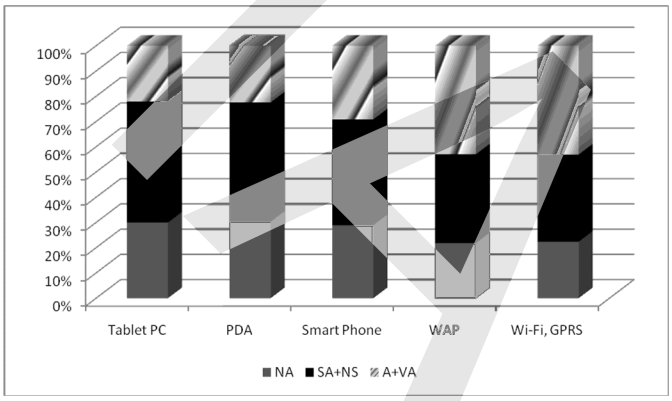

Figure 2. Students' Awareness of Mobile Technologies Names.

The abbreviations used for the following sections are SD=Strongly Disagree, D= Disagree, N= Neutral, A= Agree, SA= Strongly Agree.

6.3. Access to University Learning Resources

The study found that the participants were highly in favor of the access to learning resources for admission and registration(34.4% A, 47.6% SA) and, distance access to the University learning resources is important for their studies (37% A, 36.8% SA). Furthermore, the results indicated that the students' perceptions of various barriers and obstacles they face when accessing university online learning resources were low. While the poor of awareness of how to use were 62.2% SD or D; had not an access to a University academic service by distance means were 58.2% SD or D.

However, the difficulty in accessing electronically the University learning resources from workplace or home was 56.3% SD or D followed by difficulty in accessing the University learning resources 44.5% SD or D.

6.4. Applications Like to Use Through Mobile

Participants were also asked about the mobile applications that they like to use through mobile technologies (refer to Figure 3). Using normal mobile phone (calling, SMS, and MMS) was the highest rank (80.9%), followed by internet access (79.9%) and university online services (79.1%). Moreover, participant expressed their desire for using calendar (73.6%) and word processing (69.1%) on the mobile devices. However, using it for games was as low as (46.8%).

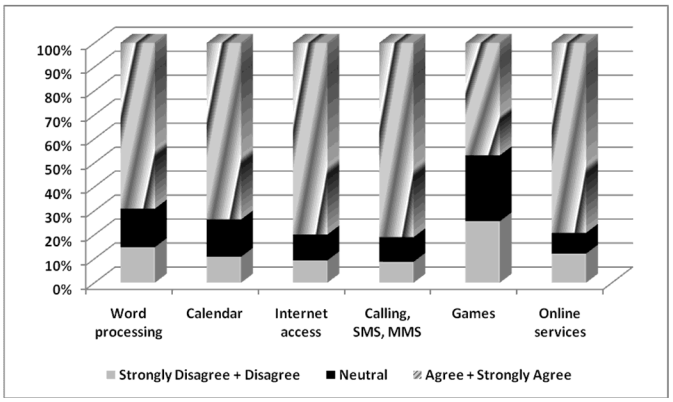

Figure 3. Mobile applications that participants like to use through mobile technologies.

6.5. Views on Limitations of Mobile Devices

The perceived limitations of mobile technologies were also investigated. The cost of transaction (64.3%) and limited battery life (62.1%) were the highest ranked limitation. The other limitations were also concerned by participants in very closely percentages (See Table 2).

Table 2. Participants' view on limitations of mobile devices.

Item	Percentage (%)		
	SD+D	N	A+ SA
Need for training to use device	34.7	16.4	49
Poor ability to connect to networks	21.2	23.8	55
Slow data connection speed	23.5	21.4	55.1
High cost of transaction and connection	18	17.7	64.3
Unsecure connection	24.9	28.6	46.6
Small size of the screen	24.9	23.5	51.6
Limited keypad	29.3	18.5	52.1
Low quality of data	24.6	25.9	49.5
Limited memory	29.6	18	52.4
Limited battery life	24	13.8	62.1
Long time to find an information	28.1	24.1	47.9

6.6. Mobile Technologies for University Services

The participants' view on the use of mobile technologies for learning services was examined (refer to Figure 4). The most beneficial aspects of using mobile technologies for learning services were to give students an immediate access to information (76.7%) and increased contact with place of study (76.2%); followed by increase contact with other students (76.1%). Furthermore, participants highly agreed that using such technology will increase their contact with other students and give them current information anywhere and anytime.

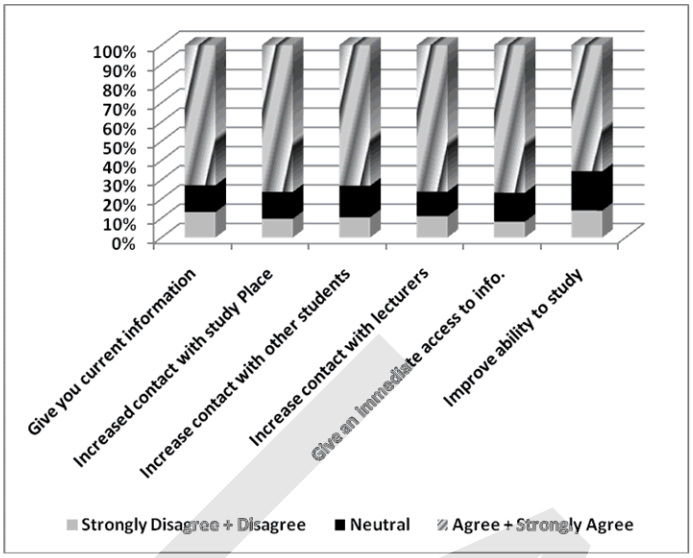

Figure 4. Participants' View on the Use of Mobile Technologies for Learning Services.

6.7. University Mobile Services Like to Use Through Mobile Devices

Figure 5 shows the university mobile services that participants would like to use on their mobile devices. Exam result was the highest rank (86.7%); then, services of calendar, timetable, or schedule were (81.8%). Besides, participants highly ranked of course registration (76.7%), treasury (76.5%), and admission status (75.2%). However, alert system (67.4%) and library services (56.4%) were in moderate rank while campus facilities (41%), was the lowest.

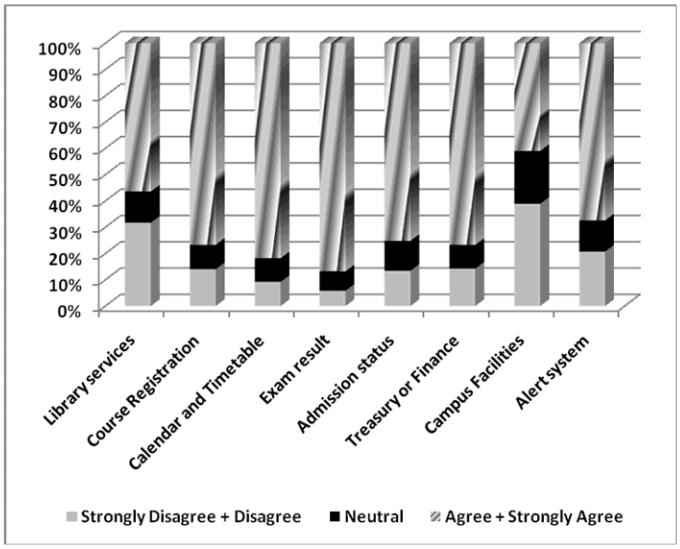

Figure 5. The Important University Mobile Services.

Participants were asked to suggest more university mobile services. They noted that "the provided services are quite enough" and "valuable". Other respondents suggested having the same service but with a different name. This indicates that the eight services are very required by Palestinian higher education students.

6.8. Internet Usage

This study (refer to figure 6) also demonstrated shows that 39% of participants used internet from 5-9 years ago, 37% used it since less than 5 years. Only 5% of them had never used it before. In addition , out of 95% internet users, 45% use internet, daily, 4 hours or more (refer to figure 7)., On the other hand, only 9% of participants did not use internet daily. This indicates that students, to some extent, had an experience in web navigation and its online services.

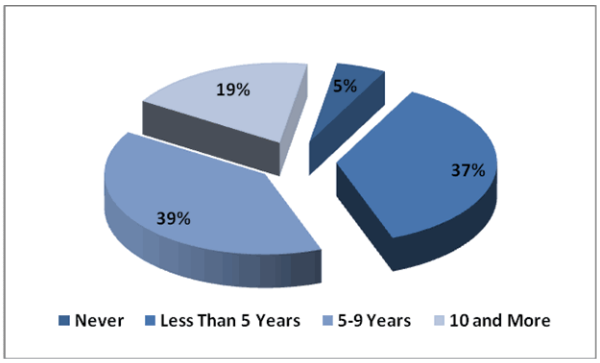

Figure 6. Years of internet use.

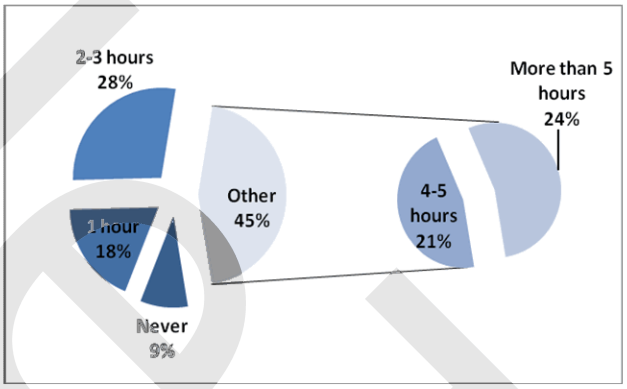

Figure 7. Hours of Internet use daily.

Figure 8 shows that the most internet activities and services that accessed by participants were e-mail (79.8%) followed by search (63.2%), download (63%). While e-learning had only (44.2%), and lastly news gained a round (57.9%) of usage by the students.

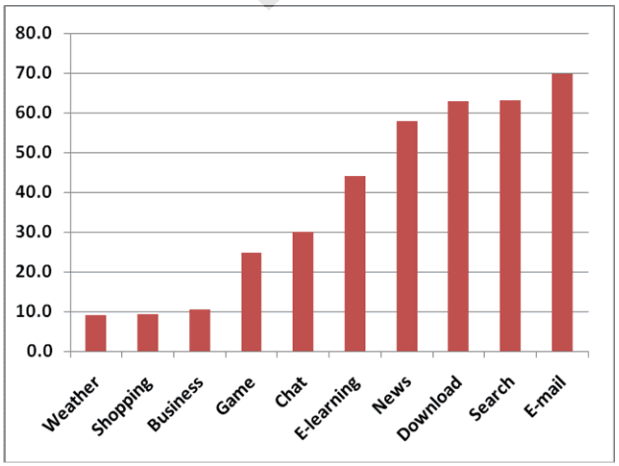

Figure 8. Internet Activities daily usage.

6.9. Availability of Mobile Device

This research revealed that 97.4% of participants owned a mobile device. In a sense that 65% of them had normal mobile phones, while 31% had smart phones, and merely 4% had PDAs.

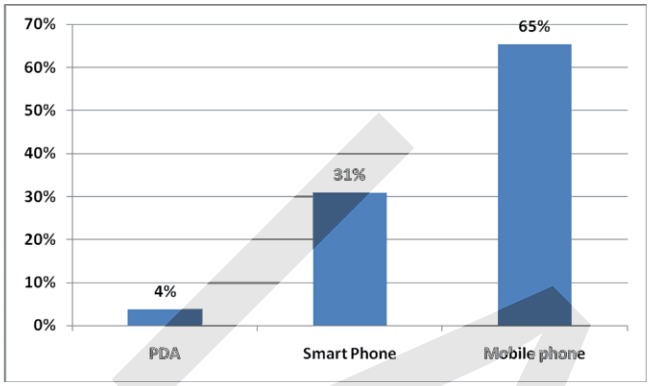

Figure 9. Participants' availability of mobile device.

6.10. Mobile experience and usage

Regarding experience, almost 97.6% of participants had a long time of mobile usage. 45.5% of them used mobile phone for 5-9 years; 36% used mobile phone less than 5 years; and 16.1% used it 10 years or more. In terms of mobile applications experience, 90.7% of participants had an experience. 47.9% used mobile applications for less than 5 years; 32% between 5-9 years; and 10.8% for 10 years or more.

6.10.1. WAP and SMS Usage

While 36% of respondents used WAP services daily, 25.7% had never used it before. Furthermore, 14% used it weekly or sometimes, and 10.3% had a monthly use of it.

In terms of SMS sending, 59.5% sent 1-3 SMS daily; 11.6% sent 4-6 SMS, 5.8% sent 7-9 SMS, and 8.2% sent 10 SMS or more.

6.10.2. Wireless Usage

For wireless use, 69.8% of participants accessed internet using a mobile device. While 37.3% used GPRS to access internet, 31.7% used Wi-Fi.

It is critical to mention that 88.9% of participants would like to have a mobile device that supports internet access which indicates the real readiness of the Palestinian students for using the latest technology in the world.

6.11. Availability of m-learning

Half of participants (50.3%) believe that their university provided a wireless network or Wi-Fi zone in the campus. Where 79.1% did not think that, 85.2% would like their university to provide m-learning for them.

7. Conclusion

In m-commerce era, m-learning is the choice that could engage students with their learning environment anywhere and anytime. This study investigated the Palestinian students' awareness of m-learning and its aspects.

The findings represented opinions of different levels of students from five universities in Gaza. The results indicated that the higher education environment had the required infrastructure to utilize m-learning services. Furthermore, the results showed that the students had adequate knowledge and awareness to use such technology in their education environment.

It was also demonstrated that students were quite aware of the mobile technologies which used widely in m-learning environment. They highly agreed that access to learning resources and services were very important to them. The results indicated that the students' perceptions of various barriers and obstacles they face when accessing university online learning resources were low. In terms of limitations of mobile devices, students had a concern over that.

The study also found that the most beneficial aspects of using mobile technologies for learning services were to give students an immediate access to information and increased contact with their learning environment anytime regardless the place. Students highly ranked several informative m-learning services such as exam result, timetable, course registration, and treasury.

Half of participants (50.3%) believed that their university provided a wireless network or Wi-Fi zone in the campus. Furthermore, 79.1% did not think their university provides any m-learning services. However, 85.2% would like their university to provide m-learning for them.

This study indeed provides a clear evidence on the readiness of students to accept and use m-learning in their education environment; which may give a hand in supporting the utilization of such technology in Palestinian higher education institutions.

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