

PRELIMINARY STUDY FOR EXPLORING THE MAJOR PROBLEMS AND ACTIVITIES OF MOBILE LEARNING SYSTEM: A CASE STUDY OF JORDAN

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ABSTRACT

Acceptance of new system or technology has become a prior step for a successful implementation of any system. Previous studies revealed that the acceptance of mobile learning system among students in Jordan is still very low. Few studies have investigated what the actual challenges influencing acceptance of mobile learning system in Jordanian universities. The current study investigates the main challenges that impede acceptance of mobile learning in Jordanian universities. This study also determines the activities and services of mobile learning system based on potential needs of students. In this study, we employed the questionnaire and interview approaches, targeting students from five universities across Jordan. This paper presents two portions of the findings; qualitative findings identified four main challenges that include the quality of services, availability of learning content, design and technical issues and students' requirements. In contrast, quantitative findings presented the most important services that students would like to perform on mobile learning system.

Keywords: Mobile learning system, Acceptance, Qualitative, Quantitative, Students' perceptions.

1. INTRODUCTION

In the recent years, the great advances in mobile technologies have allowed the mobile devices are not only as a tool for voice communication but also support many features such as store and transfer multimedia contents, camera to capture, browsing internet and emails. These advances in mobile technologies as well as increasing ownership of mobile devices have motivated many universities to move towards employing mobile applications as learning aids which known as mobile learning. Mobile learning is defined as the integration of mobile handheld devices together with wireless network technologies to enhance the learning and education through facilitates students' access to the learning contents anywhere and anytime [1]. Basically, mobile learning is based on the use of mobile devices at any time and in any place [2]. In this research, mobile learning refers to a new

technology for learning, which uses the mobile devices to support students' learning activities [3, 4, 5], which it allows them to easily access to learning materials (e.g., courses, lectures, assignments, and tests). Mobile learning has a positive impact on learners, whether teachers or students in that it positively affects on their attitudes towards learning, and enhances their perceptions to easily access learning activities in a real time [2, 1]. Al-Emran [6] argued, when mobile learning is integrated in higher education, it offers many advantages for both students and educators such as learning in anytime and anywhere, assists educators to deliver any information in anytime and anywhere, and enable them to perform their learning activities in more flexible and comfortable. Dahlstrom, Walker, and Dziuban [7], noted that 67% of the students involved in mobile learning they expressed that mobile learning is very necessary in educational context and they favour of using



this technology because of flexible access regardless of time and place, easily online collaborative learning, and assists teachers to deliver information in anytime and anywhere. In contrast, Jaradat [8], indicated that majority of students in Jordan have some concerns about using mobile learning and that the percentage of students' acceptance of mobile learning is (39%), and the barriers and problems that impede students' acceptance of mobile learning are still unclear [9], still the need for further research on the actual problems affecting mobile learning acceptance [10, 11, 9, 12]. This study is focused on Jordan as one of the developing countries in the Arab world, which registers a large penetration rate of mobile phones over 140% in 2013, ranking Jordan second in the Arab world in terms of mobile Internet users aged 18-29 according to [13]. Therefore, this study aims to improve mobile learning acceptance by achieving two objectives namely:

1. To investigate the main challenges that impede students' acceptance of mobile learning system.
2. To improve and expand the activities and services of mobile learning system based on students' perceptions and needs.

The structure of this paper is organized as follows: section 2 presents the literature of mobile learning. In section 3 the contribution of the study to the literature in the area of mobile learning is presented. Sections 4 and 5 describe the methodology of research and data analysis. Findings from quantitative and qualitative data analysis are presented in section 6 and section 7 presents the discussion. Finally, the conclusion in section 8 summarizes this paper.

2. LITERATURE REVIEW

2.1 MOBILE LEARNING

In the literature, mobile learning has many definitions from different perspectives: learners' mobility, handheld devices and the relationship between mobile learning and electronic learning. By broad definition, mobile learning in terms of its technologies is the integration of mobile handheld devices together with wireless network technologies to enhance the learning and education [14]. In terms of learners' mobility, Huang, Lin and Chuang [15] fined mobile learning as a kind of learning tools that allows users to access learning material anytime and

anywhere. Mobile learning is the technology that facilitates students' access to the learning materials anywhere and anytime [16]. From these definitions, there is one obvious advantage of mobile learning that is the mobility of contents that enables learning to take place in any location, at any time. Whereas, Trifonova and Ronchetti [17], stated mobile learning as a new technology that complements electronic learning by allowing learners' to interact with learning materials. Mobile learning is the next generation of electronic learning that uses mobile technologies [18]. Through these definitions, we can realize there is new era of learning which will start through moving from electronic learning to mobile learning. Other viewpoints in the literature have defined mobile learning based on handheld devices. Mcconatha, Praul, and Lynch [19] expressed that mobile learning is the accessing of educational materials by the use of small mobile handheld devices. Mobile learning is often confined in the literature to the descriptions of learning applications through the use of small mobile devices such as smart phones, PDAs, iPods and MP3 players [20, 21].

On the other hand, many researchers have focused on the future of mobile learning rather than the definition. For instance, [6] indicated that mobile learning could be one of the best technologies that will contribute to the future of higher education. Liu, Han and Li [22] suggested that mobile learning could possibly be the newest reliable channel for higher learning that would help students to gain information and knowledge by the use of mobile technologies. Mobile learning will contribute by adding another platform to the learning processes in the future [23]. In addition, several studies in the literature have offered the benefits and importance of mobile learning in the universities environment. Mobility is one of the important characteristics of mobile learning. Where the mobility gives learners the freedom to do their learning activities at their preferred time and place, and keep the communication between learners and instructors outside the classroom [24]. Sarrab et al., [25] stated the benefits of mobile learning in the universities environment as follows: access to learning contents anytime, access to learning contents anywhere, a communication tool for learners to communicate and collaborate with their peers and instructors, enhance student-centered learning and support distance learning.



Despite unique advantages of mobile learning, there are some limitations to the success of mobile learning implementation, which should be taken into consideration. Past studies have identified some challenges of mobile learning in the advanced countries such as United Kingdom, USA, Australia, Malaysia and Japan. For example, the technological aspects are the main challenge of mobile learning in USA and Europe. In Malaysia, the higher education is working very hard to integrate mobile learning in their learning programs as well as to motivate their students to use mobile learning due to the cultural barriers to accept mobile learning [26]. In Middle East, majority of countries are still facing many of problems in mobile learning acceptance [27]. For example, in Jordan, the students' acceptance of mobile learning system is still very low in universities [9]. But, seldom research has been conducted to determine the main challenges of mobile learning acceptance in the universities in Jordan.

2.2 MOBILE LEARNING IN JORDAN

To date, Jordan already has witnessed a very excellent development and significantly booming in mobile telecommunication infrastructures, due to the strong commitment of the Jordan government [28]. With highly developed information and communication technologies, as well as, mobile telecommunication, the mobile technologies find its way into the field of education in Jordan as well, and thus; Jordanian universities are exploiting mobile learning for enhancing learning and educational setting [29]. Besides, with the development of new generations of mobile devices, mobile learning has emerged as a new trend in Jordanian universities [29]. In addition, mobile phone devices are the most widely used in Jordan, because Jordan has registered the penetration rate of mobile phones over 140% in 2013, according

to statistics issued by the Telecommunications Regulatory Commission (TRC). Also, Jordan scored a second rank in terms of mobile Internet users aged 18-29 in the Arab world, which approximately 95% [13]. Furthermore, the mobile learning applications have the promising potential to provide learning activities to Jordanian students [9].

Mobile learning is still in early stage of implementation in Jordan [30, 9]. Previous studies revealed that the acceptance of mobile learning system among students in Jordan is still very low. According to Althunibat [9], confirmed that the mobile learning is still lack in acceptance among students in Jordanian universities. Al-Debei and Al-Lozi, [31], presented clear evidence that the adoption of full capabilities of mobile learning services were yet to be realized in higher education institutions of Jordan. Jaradat [8], indicated in his study that the percentage of students' acceptance and use of mobile learning in Jordanian universities was 39%. Whereas, another study conducted by Al-Zoubi et al., [32] to investigate the implementation of mobile learning in engineering education of Jordan. The study revealed that there is an unsatisfactory indication about the future implementation of mobile learning in Jordan. The study of Khwaileh and AlJarrah, [33], aimed to provide a clear picture about students' perspectives towards mobile learning. The study indicated that the mobile learning in all the Jordanian universities has not been implemented successfully yet. Table 1 summarizes the studies which depict the current state of mobile learning in Jordan.

Table1. Mobile Learning In Jordan

Literature	Results for the current state of mobile learning in Jordan
Althunibat (2015)	The researcher confirmed that the mobile learning is still lack in acceptance among students in Jordanian universities.
Al-Debei and Al-Lozi, (2014)	The study presented clear evidence that the adoption of full capabilities of mobile services were yet to be realized in higher education institutions of Jordan.
Jaradat (2014)	The results indicated that the percentage of students' acceptance and use of mobile learning in Jordanian universities was 39 %.
Al-Zoubi et al., (2010)	The study revealed that there was an unsatisfactory indication about the future implementation of mobile learning in Jordan.
Khwaileh and AlJarrah (2010)	The study indicated that the mobile learning in all the Jordanian universities had not been implemented successfully yet.

3. THE PROPOSED CONTRIBUTION OF STUDY

Based on Table 1 which presents the comparison between different studies for the current state of mobile learning in Jordan. We notice that all of the above studies agreed that the acceptance of mobile learning among students in Jordanian universities is still very limited. But, the researcher found that these studies have ignored the reasons that causes to low level of acceptance of mobile learning by students. Based on these facts, this study provides two types of findings that contribute to improve the acceptance of mobile learning:

1. Qualitative findings that help Jordanian universities for understanding the main challenges that affect students' to accept and use mobile learning system.
2. Quantitative findings that helps designers in making better decisions regarding mobile learning services that meets students' needs.

4. RESEARCH METHODOLOGY

In this section will present the pilot test, participants, data collection, measurement, final research instrument, and analysis methods used in this study.

4.1 Research Instrument

In this paper, a mixed instrument of questionnaire and interview questions was

designed to understand the perceptions of the Jordanian students towards accepting mobile learning, as shown in the appendix A. Johnson and Christensen [34] noted that a mixed method in a single study is an appropriate, efficient, accurate, and effective approach for collecting data in research investigations. The use of mixed method to collect data may increase the trustworthiness of the research design approach [35]. The primary aim of this study is to identify students' perspectives towards services of mobile learning and the main challenges that might impede the acceptance of this technology. The original survey instrument contains two parts. The first part contains a questionnaire which was adapted from Trifonova, Georieva and Ronchetti [36] with the essential modifications to fit the context of this study. Students were requested to fill a questionnaire which comprises of three sections. Section 1: aims to collect data about students' demographic background (e.g. gender, age, academic major and level of study). Section 2: contains closed format questions, which cover seven multiple-choice questions in order to find out about the availability of mobile devices (e.g. What kind of mobile device do you own?), students' experience of using mobile devices, cost of accessing the internet via mobile devices, and students' opinion about mobile learning system. Prior studies have applied this kind of questions format [10, 36, 37]. Section 3: students were asked to select which the services are useful for learning by giving them a list of services of mobile learning (e.g. to access learning content online such as PPT slides), with three scales,

ranging from useful to not useful. This scale was applied in several studies in this area [10, 38]. In contrast, the second part of the survey instrument contains the interview questions which were developed and discussed by the faculty members of Computer Science Department, University Malaysia Terengganu and by the faculty members of Computer Science Department, University of Jordan with the researcher in order to identify the main problems that impede the acceptance of mobile learning in Jordanian universities.

4.2 Pilot Test

Pilot test is an important step to ensure and obtain initial indications about the content validity, face validity and reliability of the instrument [39]. The term pilot test can refer to a small scale version or feasibility study which is done in preparation for the main and final instrument. In this study, the purpose of pilot test was to evaluate reliability of the instrument before accomplishing the final instrument.

4.3 Participant

This study was conducted at five universities in Jordan: Yarmouk University (YU), University of Science and Technology (JUST), University of Jordan (UJ), Hashemite University (HU), and Mutah University (MU), in June 2015. According to Sekaran and Bougie [40], the sample size is determined by the target population. From a total population size of 112797 students from five Jordanian universities; 392 students from different subjects participated in filling the questionnaire. According to Hunt, Sparkman, and Wilcox [41], a minimum sample size for conducting a pilot test is 30 participants. For the qualitative data, the sample size of qualitative data is usually small; the minimum acceptable sample size is 5 participants [42]. Based on that, the researcher chose 25 participants for the interview questions, and they were among the students who were involved in filling of the questionnaire. Table 2 presents background information of students; where 47.2% of students were male and 52.8% were female; and 50.1% were between the ages 21-24. The respondents' study level was reported as follows: 66.6% undergraduate and 33.4% postgraduate.

4.4 Measurement

The survey instrument was validated in terms of reliability and validity. For reliability that tests the internal consistency among items in the same construct. In this research, reliability was conducted for examining the internal consistency on the data collected in the pilot test using reliability coefficient of Cronbach's alpha. The values of cronbach's alpha (α) should above 0.7 to be an acceptable as suggested by Hair, Black, Babin, and Anderson, [43]. This means, if reliability coefficient of Cronbach's alpha greater than 0.7 indicates a highly reliable instrument. Reliability analysis was assessed on the original survey instrument that contained questions. Based on that, the results revealed that the cronbach's alpha values for all items ranged between (0.774) to (0.979), which means the alpha value is greater than 0.70. Thereby, this indicating that the internal consistency is acceptable; and thus the instrument is a highly reliable. In term of validity that refers to test how an instrument that is developed, measures the particular concept that what it is supposed to measure [43]. In the pilot test, the researcher examined the validity in terms of face and content validities. Face validity is referred as the degree to which the instrument measures what it claims to measure, and content validity is defined of how well the instrument adequately measures the subject domain [43]. To ensure face and content validities of the survey instrument, a copy of the questionnaire was circulated for academic experts in the domain of Computer Science as reviewers to evaluate the questionnaire and to provide any suggestions and comments to improve the quality of the questionnaire. This process was an iterative for many times that resulted in rewording many of the questions for clarity, appropriateness, and enhancing the quality of the questionnaire. The instrument was modified according to the feedback. Therefore, this pilot test revealed that questions in the survey were clear for students and students did not face any problems in terms of language and clarity.

Table 2 Students Background Information

	Classification	Frequency	percent	cumulative percent
Gender	Male	185	47.2	47.2
	Female	207	52.8	100.0
Age	18-20	114	29.1	29.1
	21-24	200	51.0	80.1
	Over 24	78	19.9	100.0
Level of study	Undergraduate	261	66.6	66.6
	Postgraduate	131	33.4	100.0

5. DATA ANALYSIS

In this study, the questionnaire analysis was performed using descriptive statistics approach by applying SPSS 18. In contrast, thematic analysis method was used to analyze the interview questions.

6. STUDY FINDINGS

This section presents two portions of the findings; quantitative findings on students' preferences of learning activities and services that they would like to perform on mobile learning application, and qualitative findings on students' perceptions about the main challenges that might impede the acceptance of mobile learning.

6.1 Quantitive Findings

This research provides two types of quantitative findings based on the type of questions that included in the questionnaire.

● Findings From Closed Format Questions

Table 3 shows the results of the responses of Jordanian students for six closed questions. The first question asked students about the mobile device ownership. Based on Table 3, mobile devices ownership statistics revealed that, 96.4% of Jordanian students owned smart phones. This indicates that the availability of mobile devices among Jordanian students is high. In addition,

this indicates that students are most likely preferring this type of mobile devices. The second question was focused on experience of using mobile devices. A majority of Jordanian students (90.1%) reported having more than three years of experience using mobile devices, which is indicative of prevalence of using mobile devices among students. Also, 98.0% of the students chose to access internet using mobile devices, as asked in the third question. This may indicate that students have preferences for accessing the internet using their mobile devices. In terms of prices of accessing the internet via mobile devices in the fourth question, a large number of students (95.4%) reported that the cost of accessing the internet via mobile devices is reasonable. This gives an indicative that the cost is not an influence on Jordanian students' acceptance of mobile learning. Students also asked if they utilized mobile learning application before, and their opinions of mobile learning application provided by their universities. As shown in Table 3, the percentage of Jordanian students who utilized mobile learning application was (86.7%). However, (83.2%) of them would not like to use mobile learning application in the future. Based on this finding, a qualitative study was conducted in order to explore the problems and challenges that impede Jordanian students to use mobile learning, and their influence on students' acceptance of mobile learning.



Table 3 Results of Closed Questions

Questions	Frequency	Percent
Q1 What kind of mobile device do you own?		
1.Mobile phone for calls and text	6	1.5
2.Smart phone	378	96.4
3.PDA	4	1.0
4.Tablet PC	4	1.0
Q2 Years of experience of using mobile devices?		
1. (Less than 1 year)	2	0.5
2. (1-3 years)	37	9.4
3. (3-6 years)	353	90.1
Q3 Do you access the internet using your mobile device?		
1. Yes	384	98.0
2.No	8	2.0
Q4What is your opinion on the price of accessing the internet via your mobile device?		
1. High price	14	3.6
2. Normal price	374	95.4
3. Low price	4	1.0
Q5 Have you ever utilized mobile learning system?		
1. Yes	340	86.7
2. No	52	13.3
Q6 What is your opinion of mobile Learning system?		
1. I would like to use it.	57	14.5
2. I would not like to use it.	326	83.2
3. I do not think it is a good idea.	9	2.3

●Findings From Students’ Preferences For Mobile Learning Activities And Services

To explore learning activities and services that Jordanian students' would like to perform on mobile learning application, students were asked to select which the services are useful for learning by giving them a list of services of mobile learning. Table 4 shows that a large number of students (92.7%) chose for receiving guidance on learning activities from course instructors, followed by (89.5%) for accessing

and delivering learning materials, (86.9%) for viewing exam grades, (85.3%) of students chose to keep in touch with course instructors, (84.6%) for reading and keeping track of assignments, (82.1%) for registering courses, and (81.6%) of students chose for undertaking multiple choice quizzes, (78.8%) for receiving administrative messages from the university, (70.2%) for accessing audio and video recordings of lectures, while more than half of students (65.2%) chose for sharing information, and (33.2%) for checking information.

Table 4 Results of students' preferences for mobile learning activities and services

Activities	Frequency	Percent
Access and deliver learning materials and contents such as PPT slides	350	89.5%
Access audio and video recordings of lectures	276	70.2%
Read and keep track of assignments	332	84.6%
Keep in touch with course instructors	335	85.3%
Receive guidance on learning activities from course instructors	364	92.7%
Receive administrative messages from the university	309	78.8%
Share information	256	65.2%
Check information	131	33.2%
Undertake multiple choice quizzes	320	81.6%
Exam grades	335	85.3%
Courses registration	322	82.1%

6.2 Qualitative Findings

A follow-up interview was conducted in order to provide more understanding on students' perceptions on mobile learning and to explore the main challenges influencing acceptance of mobile learning in Jordanian universities. This study used thematic analysis method to analyze the data obtained from the interview questions by twenty-five respondents. According to Braun and Clarke [44] identified six steps for conducting thematic analysis; these steps are: familiarization with data, generating initial codes, searching for themes, defining and naming themes, and producing the final report. The researchers used the same steps to analyze the data. This style of analysis method was used in several studies in this area [e.g. 10]. Table 5 summarizes the responses given to the questions in the interview.

Based on above, students were asked four questions. The first question asked students 'how would you describe services offered by mobile learning system?'. Majority of students expressed according to their comments that the 'mobile learning system provides limited services'. Students indicated that they used the mobile learning system 'only for some administrative services such as courses schedule, dates of registration, university announcements, and calendar'. Some students commented the 'the mobile learning is still new' and 'unfamiliar system'.

The second question was focused on investigating their level of satisfaction with the current services offered by the mobile learning system. The students' comments indicated that the level of services was very low such as

'services not enough', 'quality of services not good', and 'services do not meet their requirements'. In addition, students also expressed the reasons behind their negative responses, which could be summarized as follows:

1. *Lack of learning contents and materials.* A high percentage of the students thought that the availability of learning contents and activities is the critical aspect of the acceptance of mobile learning system. Their comments were as following 'not contain the learning materials such as PPT slides', 'not support the access and download courses items like e-learning system'.

2. *Lack of learning activities.* Students reported that the mobile learning system does not support online learning activities; based on their responses 'not contain learning activities', 'the system only for viewing information'.

3. *Lack of communication with course instructor.* Three students stated that the nature of mobile devices as an effective communication tool between users. In contrast, they indicated that the mobile learning system 'not offer contact with instructors for some questions', and 'not contain discussion board to share learning content like blackboard'.

In the third question, students were asked 'from your view point, what are the main challenges that impede the acceptance of mobile learning?'. Based on the responses from students to this question, students indicated to some challenges of acceptance of mobile learning, which could be summarized as follows:



1. *Design and technical issues of mobile learning system.* A lot of the students thought that the design and technical issues are the main challenges and barriers that impede the acceptance of mobile learning. Students reported that there are some obstacles concerning to the design and technical issues such as 'the pages are not designed for small screens of mobile devices', 'difficult to use', 'lack of multimedia features', 'security and privacy aspects', and 'not contain the learning content items like courses content, lecture notes and assignments'.

2. *Lack of Compatibility.* Some students stated that they will not be able to use mobile learning application because 'not compatible with their mobile devices' and 'do not have suitable devices with the application (e.g. Android, iPhone etc.)', 'students do not have the same type of mobile devices'.

3. *Lack of availability learning contents and activities by the mobile learning system.* A lot of the students confirmed that the availability of learning contents is the primary factor to encourage students for accepting this new system.

4. *Mobile learning system is a new tool for learning, and it is still unfamiliar for students like e-learning system.*

5. *Lack in meeting students' requirements and needs.*

In the last question, students were asked on how mobile learning system could better address their learning needs; 'how does mobile learning system address your learning needs?'. The responses reflect different viewpoints of students

on their needs and requirements, which could be summarized as follows:

1. *Providing more specialized mobile learning applications that related to learning materials and activities.* Students provided their comments as follows: one student stated 'I think mobile learning would be best for students through easy access to course contents such as PPT slides by mobile learning application'. Some students described an interesting view of mobile learning application, they commented 'Allowing students to download course content items to be available on their mobile devices and this would enable them to study anytime and anywhere they want for example on planes and trains and etc'.

2. *Improving services that offered by mobile learning applications.* An interesting view point provided by two students, their comments was 'Students do want just mobile devices; they want high quality services which satisfies their needs'. Another students expressed that 'A very high percentage of students have mobile devices such as smart phones and they use it continuously; services of mobile learning application can may encourage them to use it for learning via their mobile devices.

3. *Some opinions of students from software engineering department indicate that 'Students' requirements of mobile learning applications should be fully determined before being implemented'.* Also, they stated 'It is better to be tested on a small prototype before it is considered as an application to use by students'.

Table 5 Summary Results of Interview Questions

Objectives	Interview questions	Results
To describe and identify the services offered on mobile learning system.	How would you describe services offered by mobile learning system?	Students expressed that the mobile learning system provides limited services include: <ul style="list-style-type: none"> ● Courses schedule ● Dates of registration ● Financial status ● University announcements ● Calendar ● Contact information



<p>To investigate the students' satisfaction of mobile learning system offered by the university.</p>	<p>Are you satisfied with the level of mobile learning system offered by your university? Why?</p>	<p>All students stated that their satisfaction of mobile learning system was very low.</p> <ul style="list-style-type: none"> ● Lack of learning contents and materials ● Lack of learning activities ● Lack of communication with course instructor ● Lack of personalized services, and learning contents and activities ● Lack of multimedia features ● Lack of system functionalities
<p>To explore the challenges and barriers faced students' while using mobile learning system.</p>	<p>Did you encounter any challenges and problem while using mobile learning system?</p>	<ul style="list-style-type: none"> ● Difficult of use ● Low of service quality ● Design of system interface ● Access speed ● Does not support all mobile application platforms ● Network accessibility ● Lack of security and privacy
<p>To identify students' needs for improving mobile learning system.</p>	<p>How does mobile learning system address your learning needs?</p>	<ul style="list-style-type: none"> ● providing more specialized academic applications related to learning materials and activities ● Providing personalized contents and activities (e.g., student profile) ● Providing quick communication with course instructor ● Improved multimedia features ● Improved access speed ● Improved security ● Support multiple mobile application platforms (e.g., Android, and IOS) ● More services offered on mobile learning system

7. DISCUSSION

This study represents two portions of the findings. Firstly, the findings obtained from the quantitative indicate that very high percentage of Jordanian students own smart phones (96.4%). A majority of Jordanian students have more than three years of experience in using mobile devices (90.1%), which is indicative of prevalence of using mobile devices among students. 98.0% of Jordanian students prefer to access the internet using mobile devices continuously and their perceptions about the price of accessing the internet; a large number of students (95.4%) indicate that the cost of accessing the internet via mobile devices is reasonable and not expensive.

The findings also show that (86.7%) of Jordanian students who used mobile learning application before; they have negative attitudes towards the usage and acceptance of mobile learning. Furthermore, these negative attitudes indicate that Jordanian students are facing several challenges and barriers that impede to accept this new technology.

Secondly, the findings obtained from the qualitative study can be summarized as follows:

1. The majority of students indicate to their dissatisfaction with the level of services due to the limited services provided by mobile learning system.

2. Four main challenges that prevent the acceptance of mobile learning in Jordanian universities that include the quality of services, availability of learning content, design and technical issues and students' requirements. Some of the results confirm with previous studies [45, 46].

3. A high percentage of students suggest that Jordanian universities should pay extra attention to improve mobile learning system in terms of services, learning contents, design and technical aspects to enhance the acceptance of mobile learning system. These results agree with past studies that conducted by [47, 48].

8. CONCLUSIONS

This study investigates and explores main challenges faced by the students' universities precisely in Jordan in acceptance of mobile learning system. There are a number of challenges that still exist today that impede the students' acceptance of mobile learning. With determining these challenges can help the universities in Jordan to overcome all problems that face them in implementing mobile learning system in order to avoid possibility of failure in post-implementation in the future. Services of mobile learning are also another important issue that should also be highlighted and considered. Using and implementing services of mobile learning may be possible but uncertainties may arise to success this technology because it may not meet students' needs and requirements. Thus, comprehensive research is essential to determine the most important services that students would like to use on mobile learning system. With identifying these services can help designers in making better decisions regarding mobile learning services that meet students' needs.

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APPENDIX A. INSTRUMENT SURVEY

A.1 Survey Questionnaire

Section One. Background Information					
Please answer to the following options by marking (√) in a box:					
1.	Age	<input type="checkbox"/> 18-20	<input type="checkbox"/> 21-24	<input type="checkbox"/> over 24	
2.	Gender	<input type="checkbox"/> Male	<input type="checkbox"/> Female		
3.	Level of Study	<input type="checkbox"/> Undergraduate	<input type="checkbox"/> Postgraduate		

Section Two. Multiple-choice questions

Please answer to the following questions by marking (√) in a box:

- What kind of mobile device do you own?
 - Mobile phone for calls and text
 - Smart phone
 - PDA
 - Tablet PC
- Years of experience of using mobile devices?
 - 0-1 year
 - 2-3 years
 - 4-6 years
 - More than 6 years
- Do you access the internet using your mobile devices?
 - Yes
 - No
- What do you use mobile devices for?
 - Searching for information
 - Education
 - Shopping
 - Entertainment
- What is your opinion on the price of accessing the internet via your mobile device?
 - High price
 - Normal price
 - Low price
- Have you ever utilized a mobile learning (m-learning) system?



- Yes
- No

7. What is your opinion of m-Learning system?

- Good idea and I would like to use it.
- Good idea but I would not like to use it.
- I do not think it is a good idea.

Section Three. Students' preferences for mobile learning services.			
Direction: Please respond to the following statements by marking (×) on options from [(1) useful to (3) not useful].			
Mobile learning services	Useful	Neutral	Not useful
1. Access and deliver learning materials and contents such as PPT slides	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Access audio and video recordings of lectures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Read and keep track of assignments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Keep in touch with course instructors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Receive guidance on learning activities from course instructors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Receive administrative messages from the university	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Share information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Check information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Undertake multiple choice quizzes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 Exam grades	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Courses registration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

A.2 Interview Questions

The below are face to face interview questions:

1. How would you describe services offered by mobile learning system?
2. Are you satisfied with the level of mobile learning system offered by your university? Why?
3. Did you encounter any challenges and problem while using mobile learning system?
4. How does mobile learning system address your learning needs?