

The Effect of Mobile Learning on the Development of the Students' Learning Behaviors and Performance at Jordanian University

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Abstract: *This research study was conducted on 153 students from the Jordanian University. A researcher-made Likert-type questionnaire was adopted. A five-question questionnaire was formulated to measure the effect of mobile learning at the University's students focusing on different aspects. The reliability of the questionnaire was at 91% through the use of Chronbach's Alpha. T test was adopted to find out significance of differences among the different used variables that supported the effect of mobile learning on the student's development in learning behaviors and performances. ANOVA was embraced to examine the student's learning behaviors on mobile learning. The results showed that mobile learning accrues positive effect on motivating the students towards learning. There was also a positive correlation mobile learning to increased academic performance. Finally, the results indicated that M-learning changed student's learning habits for the better.*

Keywords: *M-Learning, E-Learning, learning behaviors, student performance.*

I. Introduction

The current technological advancements in the education sector have resulted to advanced learning approaches. For instance, students born within this digital technology era are used to having access to instantaneous and multiple sources of information, being able to multitask as well as being socially connected to other students and their peers through mobile technology devices. The conglomeration of the new mobile technologies and the modern generation's digitally-improved social and cognitive skills will require new solutions in today's learning concepts. The likely solution is mobile learning. According to vanikaloo&Permanand, (2012) mobile learning refers to the exploitation of ubiquitous handheld device, together with mobile phone and wireless networks, to expedite, enhance, support as well as extend the reach of learning and teaching.

Furthermore, mobile learning offers a great potential as a learning tool to be used in learning situations where the students are geographically dispersed, to foster collaborative learning, engage the students with adequate content, it can be used as an alternative to computers or books. Furthermore, it can also be used as an alternative to attending university lectures. Moreover, it can be used for just in time dispatch of content. Moreover, with the aid of mobile technology, we can pull and push information and provide learning to any student or person at any place at any given time. M-learning, therefore, simply offers a just-in-time form of learning or on the go kind of learning. As opposed to the conventional kind of learning, mobile learning is arguably cheaper. It is even much cheaper than the use of personal computers. Furthermore, mobile devices can be used by many people since they are easily available and are relatively cheaper thus affordable. As a result, e-inclusion is much more possible through the use of mobile phone devices for content downloads and even for learning purposes.

Despite the existing literature and studies on technology and student learning, there is no research study that exists that looks into the effect of Mobile learning on the development of the Students' learning behaviors and performance at Jordanian University. It is, therefore, in this regard that the primary the purpose of this paper is to examine the impacts of mobile learning on student learning behaviors and performance. This study is based on the following hypotheses;

Hypothesis 1: Mobile learning has a positive effect on increased motivation of learning.

Hypothesis 2: Mobile learning has a positive effect on students' participation in learning.

Hypothesis 3: Mobile learning positively affects student learning behaviors.

II. Literature Review

Over the last few decades, there has been a development in the wireless and mobile technologies which has greatly fostered this new kind of learning, mobile learning. Various scholars have tried to have a universal definition of M-Learning. However, there is no one fixed explanation of the term M-Learning as it can be manipulated in different ways to fit the situation under which it is being used. There have been similar definitions of the term some saying that it is a form of e-learning through the use of mobile phones. Many scholars seem to agree with this definition. However, what comes out common is that M-Learning is an

extension of e-learning. Furthermore, E-Learning can be defined as any education that is rendered with the main or dominant technology are palmtop devices or handheld.

M-Learning has been viewed from both the pedagogical perspective as well as the technological perspective. This is because there is a group of thought that defines M-Learning as any learning activity that goes on when the learner is not at some fixed position or learning activity that a student is subjected to while at the present of the mobile technology. M-Learning has also been defined as any process that gives the learner the opportunity to be more interactive when interacting with, applying or creating information through some digital portable device that one has easy access to and carries it in most of the places that he/she goes to. From the explanations, it is clear that M-Learning is a new form of e-learning that is offered to the students through the application of mobile technologies.

Through the mobile learning approach students are motivated and can engage their attention while placing much precedence on solving problems, enhancing their reading, memory and also writing skills. Furthermore, another advantage over the conventional classroom contexts, the use of mobile technology in the assessment and learning process through mobile-learning tests enables the students to prioritize their time based on their needs by personalizing their experience (Abbass&Hussien, 2016). Moreover, m-learning seems favorable to students since it has the capability of accommodating a diverse range of sections and features which provide an interactive learning experience. It also offers a stress-free environment which is enhanced by uniquely designed user-friendly interphase. Similarly, the text layout and design layout can eliminate the confusion and frustration and make the information a much easier source of learning.

Learning besides providing the students with the requisite knowledge and skills, it is also an essential in a tool that can be used by students to solve problems in their daily lives. They need to be able to implement the lessons learned in class and apply them in real life situations. Learning a student is needed to change the nonfigurative concept into particular ideology and be able to understand while doing it (Gloria &Oluwadara, 2016). Technology comes in here in the sense that it helps the learners not only to be concretizing complex abstract concepts, but it also fosters the configuration in the learner's mind through recognizable multidimensional studies and theorem concepts. A lot of researchers have ascertained that mobile learning tools in teaching different concepts have been fostered not only with learning different subjects but also increasing student motivation and also their trust.

Mobile learning can, therefore, be said to significantly complement the internet or rather online learning by creating an additional platform of access for mobile device users. Some of these mobile devices include PDAs, headphones, MP4 and MP3 players, tables as well as a laptop. Personal computers and tablet pcs have the capability of changing the dynamics of a normal classroom interaction and engagement through wireless communication integrated with pen-based computing technology which is best suited for solving as well as analyzing different learning problems. Research by Amelito G. E (2009) indicates overwhelmingly positive student perception on the impacts of using the tablet in their learning experience. The findings also indicated student learning development through the use of mobile technologies.

Researcher ascertains that mobile learning has accrued both beneficial and detrimental impacts on student learning. However, it has been established that the positives outdo the negatives. It has simply been highly successful in different contexts and with different target groups. Research also points out that student attitudes towards mobile technology in supporting their learning have been more positive.

Mobile phones have shown to enhance or rather to improve student achievement. For instance, students with mobile phones and using it for learning purposes have shown significant differences in study habits. These students affirm that the mobile technology has helped them with classroom assignments, has helped them in research, in communication, and email. Some of the trust build factors that have been able to influence learners for mobile learning technology include information quality, to trust mobile learning were familiarity, goal setting, interaction, third party recognition, feasibility and attractive reward. Similarly, some of the factors that contributed these factors to be sustained include factors such as reliability, consistency, integrity, experience sharing, security, open communication, community building, control, time, feedback, site quality, feedback and also external auditing. Furthermore, a research study conducted by Shin & Mills (2011) to examine the impact of game technology students learning development and performance. In their study, students were made to engage in a game technology. It was found out that learners who had indulged in or rather played the game technology performed much better than students who did not engage in the game.

This clearly, indicated that the technology to some extent had positively impacted their learning development and also fostered their academic performance. Similarly, substantial research looking into the impacts of using communication and information technology on student learning indicates that utilization of communications and information technology is efficient and effective in transforming the stability as well as the attitude of learners in teach their subjects (In Keengwe, In Maxfield& IGI Global, 2015). Furthermore, it has been determined that it also enhances their creativity, their reasoning as well as learning development. Similarly, a study on the effect of game-based studying, personalization as well as diverse learning strategies in conglomeration with mobile

learning enables students to improve their academic learning thus enhancing their academic development and performance (Donaldson, 2016).

It can, therefore, be deduced that student's attitude and perception towards learning and technology have been improved and fostered in an effective manner especially after engaging in the activities through technology-supported interactive learning. This implies that technology based supported collaborative learning settings can be embraced to foster student learning development.

III. Evolution Of M-Learning

M-learning was adopted at the beginning of the first century. In the recent past before M-Learning was adopted, there was the use of novels. However, since technology cropped in, there has been a lot of research that has been conducted over it with the main focus being on how the human being has received and are applying the modern technology. This entails the use of various theories to explain the student behavior development as well as their application. Technology Acceptance Model (TAM) can be used to explain how technology has been accepted in the school environment and how it has impacted on the students' behavior, their learning development as well as their performance (Hwang, et al. 2015). TAM has a perceived mobility value as an external variable of perceived external variable of usefulness to explain the acceptance of the technology. Reasons coming out clear for the embracement of the M-Learning is the fact that it creates an easy environment for the student to learn.

The student does not have to strain him in a library for long hours as he can easily do that from the comfort of his couch through the use of mobile phones. Indeed, accessibility of information to the students has been so easy courtesy of the mobile devices. However, various studies still show that there are a lot of disruptions with this kind of learning and therefore self-discipline through M-Learning is very important (Clark & Mayer, 2016).

According to the study that was conducted by (Abachi, 2014), to determine the determinants of M-Learning acceptance, the facilitating conditions were not considered though they were perceived playfulness, as well as self-management of learning, was both included. Another main objective that the study focused on was to discuss if either gender differences or age in acceptance of M-Learning. It was evident that the performance expectancy, social influence, effort expectancy, self-management, the playfulness of learning are important determinants of the behavioral intentions in the application of M-Learning (Hamari, et al. 2016). The study conducted also show that age differences moderate the consequences of social influence and self-management. Attitude, subjective, perceived behavioral influence while using M-Learning in universities is an issue of concern.

The use of mobile phones in learning intensifies when the student joins universities just from high school. This shows that most of the high school students do not use the M-Learning technology (Collins & Watson, 2016). However, it is evident in most universities that the numbers of students that visit the library to read physical books have gradually dropped in the last decade. This is because of the increased use of M-Learning. It is because of this that some universities have introduced online libraries where students can access the universities books online. This has a lot of advantages as it is economical and also gives good returns. Mobile learning has indeed changed the development student learning behaviors and performance.

The performances recorded by most universities in the recent past after introduction of M-Learning are better. This is an indication that M-Learning is contributing positively to students despite the limitations associated with it.

3.1 Benefits of m-learning to students

It is indeed evitable that the application of mobile learning in school institutions has impacted on the development of the student's learning behavior as well as their performances. This is because it plays a role in boosting the learners' numeracy and literacy skills as it incorporates both the collaborative and independent learning experiences. In the modern generation, technology has been the core of everything. It is, therefore, an achievement to the education center if they have embraced the M-Learning technology as one of the ways that they can enhance the learning activity at universities. The use of mobile technology in education leads to collaboration and communication of practice. Some of the other benefits that can be derived from the use of M-learning are that it impacts on the student's social interaction, communication, motivation, mobility, and collaboration.

A lot of studies have been conducted on the benefits that accrue to students using mobile technologies to carry their academic resources as opposed to carrying heavy books while going at the learning institution. Being that mobile phones are personal, they offer rich potential for both collaborative and personal learning. The use of mobile learning also plays the role of reducing the physical gap that exists between the learner and the teacher. The learner can feel free to ask the teacher any academics question even if the teacher is not physically present at the moment. This is one way in which mobile learning is impacting on the behavior of the student. Through consulting the teacher online, there is saving of time as the student does not waste time walking to the tutor. As a result of this, the performance of the student is bound to increase. Mobile is learning also enhances face-to-

face learning in a formal learning set-up. Furthermore, they offer management applications to students to enable them to improve on how they are organized while they are learning. Both the teachers and the students that have the mobile technology are not limited to wire-based communication while they are in the learning environment.

3.2 Limitations of Using M-Learning

Despite the many positive attributes of M-Learning to the students' development and performance, there are still a lot of drawbacks and limitations that are associated with it. One of the main problems linked to it is usability problems. The usability problems can be categorized into four main divisions. They include software application limitations, physical attributes, network connections as well as physical environment like the challenges in adding applications, no enough memory, small screen size, short battery life, reliability network, lack of built-in functions, lack of user competence and challenges of using the mobile devices under circumstances when it is raining or when excess privacy is needed. There has also been the issue that these mobile devices emit radio frequencies which are harmful to the students.

Furthermore, most of the scholars argue that the battery life and the screen size of the mobile device or the inclusion of power embedded browser are the main challenges that are associated with M-Learning. Mobile devices also cause a lot of disruptions during the learning process.

Firstly, a call made during the class session interrupts the whole class. Secondly, when a student is learning through mobile devices, personal messages and ads that come on the internet may affect the student (Mtebe, 2014). The ability to access the social media which is also so addictive and time-consuming is a challenge to the application of mobile learning as it impacts negatively to the students learning development and performance. M-Learning has also increased cases of cheating in the examination. Being that there are mobile phones that the students can easily hide during the examination period and Google the answers on the internet leads to false results. Some of the students have mastered the act of cheating in the examination using the smartphones.

This is a real challenge as the results that are posted by this caliber of students are not a true reflection of what they are. M-Learning, therefore, has both technological and pedagogical limitations (Tarhini, 2015). The high cost of being able to afford the high-end mobile technology is the main challenge in the developing nations which limits the popularity of the mobile devices applications.

IV. Methodology

The current survey that was conducted to find the impacts of mobile learning to the students of Jordanian University was well planned to get the actual results. Being that the study was quantitative study; the survey questionnaire was used as the main tool for data collection. Therefore, a well-structured, self-completion questionnaire was designed founded on the literature review and was afterward distributed to a random sample. Participation was voluntary during the study as no one was forced to fill in the questionnaires.

In order to get the random sample, it was necessary for one of the team members to find the list of classes at the Jordan University for both the post-graduate and undergraduate level from the registration department of the Jordan University. After this, the number of these classes was chosen randomly for the distribution of the survey questionnaire. This was done so that there can be no cases of biases. The results that will be obtained will be a general indication of what is in the university.

A total of 200 questionnaires were prepared for the distribution. However, only 155 questionnaires were returned. Others were not submitted by the students. This was a good response which was in line with the original plan. Out of the 155 questionnaires that were returned, only two questionnaires were not used because they contained multiple mistakes that could only have confused the team that was recording and analyzing the results. This means that 153 questionnaires were used in the study and the data in them was valid. Following the fact that M-Learning is a new concept in Jordan University, the respondents that are reflecting in the questionnaires can be categorized as potential early adopters of the M-Learning innovation.

The constructs of interest in this study are effort expectancy, performance expectancy, behavioral intention, facilitating conditions and the social influence. The questionnaire that was used during the study and distributed to the students is shown in the below table.

Construct	Item	Opinion
Performance Expectancy	PE1	Use M-Learning to get educational resources to boost my productivity such as quick accessibility of information
	PE2	M-Learning is constructive in my day to day academic life
	PE3	Utilizing M-Learning to finish up my academic asks more quickly
	PE4	Utilizing M-Learning so in order to accomplish things that are so meaningful to me.
Social Influence	SI1	People that I look after for my academic success use M-Learning
	SI2	Important people in my life prefer it when I use M-Learning
	SI3	People having opinion over my life prefer it when I use M-Learning

Effort Expectancy	EE1	It is quite easy to learn how to use M-Learning
	EE2	I find M-learning convenient to use
	EE3	It is easy for me to use M-Learning
	EE4	My interaction with M-Learning is understandable and clear
Facilitating Conditions	FC1	I have the knowledge required to use M-Learning
	FC2	I have the resources required to use M-Learning
	FC3	There are nearby people who can help me use M-Learning when I come across any difficulties
	FC4	M-Learning s in line with the technology that I use
Behavioral Intentions	BI1	I believe that I will use M-Learning in future
	BI2	I expect that I would use M-Learning in the coming days
		I plan on starting to use M-Learning very soon
		I intend to use M-learning in the future.

Table 1: A five-question questionnaire

The survey showed that 47% of the respondents were females while 53% were males. The majority of the population from the Jordan University was between ages 19-24 years old. However, there was also older population (people above 30 years) that responded to the questionnaires. The majority of them were people doing their masters, and Ph.D. ANOVA was used to determine the development of student behavior and performance on different aspects of M-Learning.

V. Results Of The Study

Before the distribution of the questionnaire tool, the questionnaire was validated by two colleagues who are experts in the field of electronic learning and mobile technologies. Furthermore, five students, 3 doing their undergraduate course and two pursuing post graduates filled in the questionnaires at their will as a pilot study. Several other students were asked to give their opinions on the format of the questionnaire, terminologies, and length. The results showed that the data were normally distributed so as to run the regression analysis successfully. This was met as Jarque-Bera test was conducted to gauge the satisfactory scale. A value that was ranged between + or -.6 when p was less than or equal to 001 for each of the Kurtosis and Skewness was considered acceptable so that the data was normally distributed. The normality test result was as shown in the table below.

Construct	Kurtosis	Skewness
Facilitating Conditions (FC)	-0.356	-0.296
Performance Expectancy (PE)	-0.551	-0.405
Social Influence (SI)	-0.193	-0.824
Behavioral Intention (BI)	-0.544	-0.602
Effort Expectancy (EE)	-0.699	-0.477

Table2: The normality test result

The results from ANOVA showed that the effect of M-learning on the Learning behavior of the Jordan University and their performance are closely related and the experience of the student in the use of M-learning and the self-discipline is highly recommendable. Figure 1 below shows the statistical diagram results from the questionnaire.

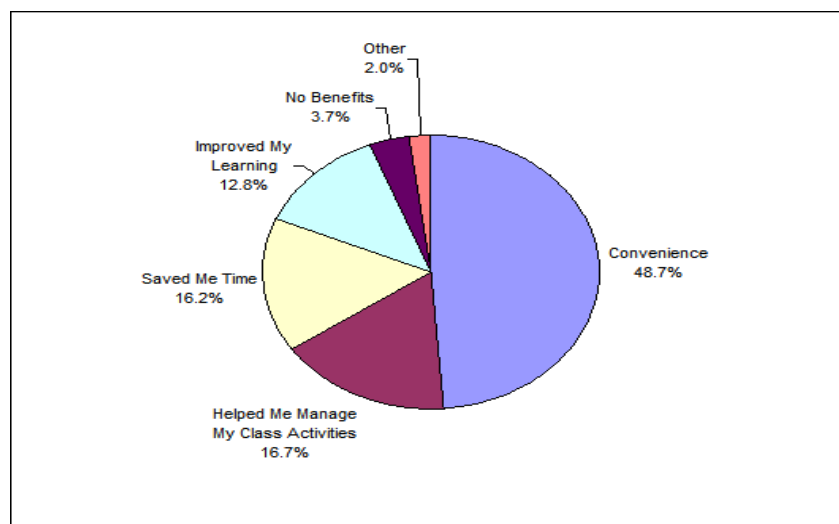


Figure 1: Statistical diagram results based on the questionnaire

VI. Discussion And Conclusions

It is a fact that we have stepped into the digital era where we can learn from anywhere in the world at any given time. As at now, the utmost necessity is to have the capability and the know-how of how to embrace and utilize these ubiquitous technology devices in our learning environments to the gain of our advantage, specifically to foster our learning behavior as well as our learning performances. It is undeniable that there are a variety of devices that are embraced and mobile learning with its abilities is to provide solutions to learning problems. This paper has examined the effect of Mobile learning on the development of the Students' learning behaviors and performance at Jordanian University.

From the results obtained from the study, it has been determined that utilization of mobile devices enhances student motivation. This directly implies that there is a direct and a substantial correlation between utilization of mobile devices and learner's motivation towards learning. These findings are congruent with the current existing literature done by past researchers. For instance, the results are consistent with the research done by Akcakin (2010), shine (2007) shin & Mills (2011) which indicates the relationship between learning and mobile technology. These results are similar to the findings of this research study regarding the fact that students gain a higher motivation for learning when they use mobile technology. They ascertain that lessons are more enjoyable when they learn through the mobile technology. Increased student motivation positively influences the student's learning behaviors. Notably, with mobile learning students can learn at any given time and any location. They do not have to be in specific learning environments. Therefore, this technology enables them to have learned and reading culture since they do not have to go to the library or a specified class to learn. This is not the only convenience to them but also promotes their learning culture.

Furthermore, mobile learning technology enables the students to do research online thus enhancing their research skills. This aspect of research skills foster their learning behavior in the sense that, they do not have to go the library to source for information from different journals and learning materials as they can just be able to do online researchers in e-journals and e-books which are much more convenient and faster to attain information as compared to manual research. Moreover, mobile devices are relatively cheaper and can easily be afforded by many students thus making it highly appropriate for tutors to use. They can also make an online submission and even hold an online discussion with other students through learning platforms provided by mobile phones. Through mobile applications such as WhatsApp and Facebook pages students can form groups and have an online discussion where they can post their questions, and other students who have a solution to the problem can provide the solutions. When the queries and all other needs of the students are met, it means that they have gained knowledge thus increasing their learning performance.

The results also indicate that mobile learning has a positive influence on student participation in learning. This is congruent with current research findings. It positively enhances student participation in learning as it complements the conventional learning techniques (Lu, 2012). Through online discussions and the fact that mobile learning provides a good research platform students can gain more knowledge than they could have acquired through the conventional learning process.

The findings from this research study also indicated that mobile learning positively influenced student learning behaviors. Mobile learning technology has been determined as a motivation tool to student learning. This denotes that students enjoy learning through the use of this technology. Unlike the conventional learning, mobile learning makes the student have more urged of learning thus changing their learning behaviors.

In conclusion, it has been ascertained that mobile technology plays an integral role in enhancing student learning. It specifically helps in positively enhancing student learning behaviors and student performance.

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