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The Degree of Smart Phones Use in Education among the Students of Educational Technology at the Middle East University

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ABSTRACT

The study measures the degree of smart phone use in education among the students of educational technology at Middle East University. To achieve the objective of the study, a questionnaire, comprising (20) items, was developed concerning the use of smart phones in education. The descriptive method was employed in the study through the distribution of questionnaires to all members of the study society for the academic year 2017/2016. The total number of completed questionnaires was (58). The results of the study showed that the degree of smart phones use for education among educational technology students at the Middle East University was medium. They also showed no significant differences at the level of ($\alpha \leq 0.05$) in the degree of smart phone use in the educational process from the students' viewpoint that can be attributed to the variables of the study: gender and academic level. The study recommended holding courses for students to employ and use all the tools available in smart phones during the educational process.

Keywords: Degree of Use, Students of Educational Technology, Smartphone, Middle East University.

INTRODUCTION

The great development in the field of communication and information has been largely reflected in all areas, especially education. This has resulted in the emergence of software to manage the process of learning and teaching. During the past decade, various computer-based learning tools surfaced. Also, the concept of e-learning was innovated and its tools used the internet. However, new investments in wireless technology are shining in the horizon, introducing a new concept of smart phone systems.

Learning via smart phones represents a philosophy of remote learning. It expands the educational opportunities before learners and achieves flexibility in teaching and interaction with teachers at any time and any place. This tool depends on providing educational content to learners using interactive communication techniques. The learner follows his learning according to his educational abilities and deepens his understanding of the concept of self-learning. Learning via smart phones represents a pattern of e-learning (Bader, 2012).

The theory of learning by smart phone is based on the social constructivist theory of learning using technology. The theory emphasizes that learning is a dialogue within a social context that is largely shaped by the learner's behavior, the careful recruitment of knowledge tools and

their sources, research, questioning, and contemplative thinking to link current experience with previous knowledge and construct new interpretations (Khudary, 2008).

In addition, learning with smart phones in educational systems has emerged as a form of remote learning. It is a unique e-learning pattern that complements the teaching process by using modern mobile devices and methods in education. Such new addition to education suits the changing circumstances and current developments that have resulted from globalization, and it fits the characteristics and needs of learners as well as courses with minimal costs (Al-Mahdi, 2008).

Mobile phones can be used in the teaching/learning process through its content of technologies and services that provides new opportunities for learning in the classroom. And in order to use mobile phones efficiently and effectively, there is a need for infrastructural and financial support. Moreover, the parties involved in the educational process should be educated on the potential role mobile phones can play in the educational process. (Al-Dahshan, 2010)

Abu Gadi (2008), Cagan, Unsal, and Celik (2014) point out that the introduction of smart phones into the lives of individuals is a real revolution that has brought about structural changes in the construction of communications operations. It has also provided its users with the freedom to communicate and interact by shortening the distances between them and help them better invest their time.

Problem of the Study

The number of smart phone users has increased in all social and economic sectors in Jordan. Young people, especially university students, are among the most popular groups in the society who are known for their uncontrolled use of smart phones (which can even be described as an addiction in many cases), making them an easy prey to the negative influences of these devices. Based on the recommendations of some conferences (e.g. the first conference on smart learning, Al Quds Open University, October 2, 2017, and the International Conference "Education: Challenges and Future Prospects", Yarmouk University) on the need to use technology and its tools in the educational process, and the need to attend to the scientific skills of students, and based on the recommendations of (Al-Omari, 2013) and (Hammer et al. 2010) to conduct studies on smart phones and their use in teaching and learning with university students, the researchers conducted a survey to explore the degree of smart phones use in education. The study was also conducted to discover the opinions of some students on their possession and use of smart devices in learning, and follow up their academic procedures within the university (attendance, absence, advertisements, assignments, etc.) via the university's website and Moodel application.

Based on the above, the motive of the current study becomes clear, which is to determine the degree of smart phone use among students in educational process at the Middle East University. To conduct this study, the following questions were asked:

1. To what degree do Education Technology students at The Middle East University use smart phones in education?
2. Are there any statistically significant differences at ($\alpha \leq 0.05$) between the arithmetic mean of the scores of Education Technology students at the Middle East University regarding their use of smart phones in the learning process that can be attributed to the variables: academic level and gender?

Importance of the Study

The importance of this study stems from the importance of the topic in question, which is related to discovering the degree to which education technology students at The Middle East University students use smart phones in education. The results of this study are designed to:

1. Enrich the field of educational research on the topic of smart learning, especially in university education;
2. Shed light on how to exploit cell phones to help create a dramatic change in the field of teaching and learning, rather than limit its use to sending and receiving phone calls only.

Purpose of the Study

The study aims at identifying the degree to which education technology students at The Middle East University students use smart phones in their learning process, and discover if there are significant differences at the level of significance ($\alpha \leq 0.05$) between the arithmetic means of the students' score regarding their use of smart phones in their learning process that are attributable to the variables of academic level and gender.

Terminology

Smartphone

Sharahbli (2013) identifies a smartphone as “the phone that offers the advantages of surfing the internet, synchronizing e-mails, opening Microsoft Office files, and contains a full keyboard”. However, the more correct and more acceptable definition nowadays is “A mobile operating on one of the following operating systems: Windows Mobile, Symbian or derivatives, Linux or derivatives, or BlackBerry”.

Al-Dulaimi (2006) identifies a smartphone as "An educational tool that is used in many schools. It helps students pursue follow up on their academic courses; scientific homework; lecture dates; classes; and academic grades, resolutions, and instructions in various collages and faculties, thus saving student and faculty members’ effort and time, and facilitating the process of technical communication between all parties in the educational process”.

The researchers identify a smartphone contextually as "The smart device carried by education technology students at Middle East University's and other groups of society to communicate with others and share information and ideas. This device uses a computer-like operating system that contains many computer applications, including multimedia, Bluetooth, etc.”

Students of Education Technology

Students of the bachelor's and master's degree who study education technology at the Middle East University.

Middle East University

A private university, established in 2005 south of the city of Amman. It comprises 9 faculties and 27 different disciplines/majors, and is attended by about 4,000 students. (Middle East University, Yearbook, 2016/2017).

Limitations of the Study

Human limitations: The study was limited to bachelor's and master's students majoring in education technology.

Spatial limitations: The study was limited to Middle East University.
Time limitations: The second semester of the academic year 2017/2016.

THEORETICAL LITERATURE AND PREVIOUS STUDIES

This section comprises a presentation of the theoretical literature, educational research, and previous studies related to the use of smart phones in education.

First, theoretical literature: This section includes a presentation of theoretical literature on the following topics:

Smart Phones in Education

Some researchers have used the term "learning via smart devices" to describe the use of smart phones for learning purposes. Learning via smart phones is a form of e-learning. It is a meeting point or intersection between e-learning and mobile computing. Campeanu (2012) argues that advanced mobile devices can deliver e-learning content using internet and Bluetooth connectivity.

Conversely, (Parsons, Ryu & Cranshaw, 2006) oppose assumptions that learning via smart phones is done using e-learning activities, and agree that this form of learning is done via a mobile device. They believe that learning via smart phones and e-learning are different concepts that require different inputs in practice. It is simply not possible to apply the design requirements related to e-learning, in general, to the context of smartphone learning.

Jad (2014) presents a conciliatory viewpoint between the two former views. He suggests that smartphone learning is the direct and natural expansion of e-learning, taking into consideration the differences between the two concepts. E-learning is a restricted learning process that takes place in an organized and formal format, while smartphone learning is not restricted.

Justifications for Using Smart Phones in the Education Process

Ashi (2016) and Jade (2014) points out that there are several justifications for the need to use and employ smart phones in the process of education, since this endeavor:

- Provides a web-like system to manage the educational process and content in e-learning. The system allows teachers to locate the students who view the educational material. They can also add a password for each student and manage new and old students;
- Has a high ability to reach people and provide opportunities for cooperation and participation among individuals in the educational process without the need to meet face-to-face, which contributes to the provision of better learning;
- Can store a large amount of information and makes learning fun by combining learning and playing, as smart phones provide audio, video, and picture files.

Smart Phone in the Educational Process

Smart phones enable teachers to distribute work easily to students, while students can easily interact with each other and with the teacher, instead of sitting behind large screens. Smart phones can be used anytime, anywhere, etc. They may also be used to solve the problem of students dropping out of school, since these students can enjoy using a smart phone in learning. This process increases their motivation and commitment, as they will take the device home at any time.

Smart phones have an SMS service that facilitates the transfer of information and e-mail about the schedule of lectures or tests. It also helps students who have learning difficulties. This service also helps achieve a kind of direct communication between the student, parents, and the educational institution. It enables parents to check on their children's status, results,

academic development, and some urgent notes about skipping or being late to classes. (Ahmed, 2006)

Advantages of Smart Phones and the Services They Can Offer to the Educational Process:
Smartphone features

Smart phones have invaded homes and even schools. It has become necessary to exploit this modern technology to help our students in their academic career, especially if we take into consideration how motivated they are to use their personal devices in classrooms. Ali (2009) and Baumfield (2006) summarize the most important features of smart phones that can be useful in the learning and teaching process:

- *Increase the student's motivation*: Use of smart devices and technology facilitates the process of responding to lessons, and increases the students' actual understanding of the taught materials on the long run;
- *Create a sense of independence in the learner*: Students can learn in a pace that suits them and choose their favorite educational materials according to their tendencies, abilities, and leisure time;
- *Smart phone encourages communication between the learner and the teacher*: This ensures the continuity of the process of learning and the acquisition of knowledge and skills, both within and outside the classroom;
- *No spatial or time limitations*: Most students today have a smart phone, which are sophisticated and relatively low-cost devices compared to desktop computers. This forms a unique feature for mobile learning, as learners are able to learn anywhere and anytime, independently or within participatory social environments.

Second: Previous Studies

This section includes a review of the previous studies related to the subject of the study. These studies include the study of (Chu, 2014), which aims to determine the impact of mobile learning on the achievement of students and increasing the level of knowledge burden on them. This study was conducted on a sample of 5th grade students in an elementary school in Taiwan. The results showed that the control group was superior to the experimental group in the achievement test. The effect of this finding clarifies that the use of a learning strategy based on the formative evaluation in the framework of the mobile learning has had a negative impact on students' achievement outcomes compared to the conventional method.

Suki (2011) aimed to determine the extent to which learners accepted the idea of using smart technology in education, entitled "Using Smart Devices to Learn from a Learner's Perspective." The researcher designed a questionnaire of five open questions, distributed to a sample of 20 students of the University of Selangor in Malaysia. The results showed that learners did not care about the use of smart learning technology, and that they were more in harmony with learning using smart phones. The study concluded that learners do not see that any improvement in education is possible as a result of smart learning. Learners also showed a negative response towards this technology.

Hazani (2013) prepared a study to identify how female students of the Faculty of Education at King Saud University use social networks in the processes of teaching and learning. The study focused on the use of social networks in the development of students' learning and the extent to which they differ in their view of the effectiveness of using social networks in the process of teaching and learning according to (specialization - level). The results of the study showed that 73% of female students use social networks, while 27% do not use them.

Al-Omari (2013) attempted to reveal the degree to which postgraduate students use smart learning applications in Yarmouk University and the obstacles they face in this regard. The researcher used the descriptive method. The sample consisted of (342) students from the Faculty of Education. The researcher designed the questionnaire to contain (43) items. The results of the study showed that there are significant differences in favor of the daily use of smart learning, and that there were no statistically significant differences in the rest of the study variables.

Jones (2014) explored the views of undergraduate students at the University of Elon on smart phone addiction and their behavior in this area. The results showed that 64% of students in the study were addicted to their smart phones. They pointed out that the need for personal satisfaction achieved by the intensive use of smart phones has negative psychological effects on them.

Hammer et al. (2010) conducted a study aimed at measuring the attitudes of faculty members and students towards the use of mobile learning in lectures for non-academic goals. The study sample consisted of (157) individuals (30 faculty members and 127 students) in a technical college providing wireless internet access on campus. The researcher developed a questionnaire to measure the responses of the study sample. The results of the study indicated that students use mobile devices for communication with friends, games, and non-curricular activities during lectures. The attitudes of the students and the faculty members towards the use of mobile devices for non-curricular purposes during lectures were conflicting. Some of them opposed the use of mobile devices for non-curricular purposes during lectures, while others considered it all right. The percentage of faculty members who encouraged the use of laptops in classrooms was (7%). On the other hand, (44%) encouraged the use of laptops in accordance with the teaching subjects of the lecture, while (21%) rejected the use of laptops altogether.

Kim et al. (2006) conducted a study at the University of Mississippi in Oxford. The study aimed at learning the types of mobile wireless technologies used in higher education, technologies used to access mobile wireless resources, the benefits of mobile wireless technology in higher education, and the study of current information about mobile wireless technologies. The researchers studied three of the most popular mobile technologies used in higher education, namely laptops, Personal Digital Assistants (PDAs), and mobile phones. The study showed that these devices shared many common benefits for higher education institutions, such as access without spatial or time limitations, wireless service, simplicity and flexibility of installation, cost reduction, communication improvement, etc. The study confirmed the importance of shedding light on some of the issues and challenges facing mobile wireless devices before the adoption and use of technology. The study also highlighted that there is currently no safety features for wireless technology. However, many higher education institutions have begun to adopt the use of mobile wireless technologies, because the main objective of these institutions is to provide a mobile learning environment.

Cagan, Unsal, & Celik (2014) conducted a study aimed at assessing the level to which the students of Osmangazi University, Faculty of Health in Turkey are addicted to smart phones, and identify the relation between addiction and the students' level of depression. The study population consists of (700) students and the results showed that the students in the midwifery section suffer from a degree of addiction to smart phones. The results also showed that the higher the daily use of smart phones, the higher the level of addiction. It further revealed a negative correlation between addiction to smart phones and academic success, and that there is a positive correlation between addiction and the level of depression among

students. The two most important reasons students use their smart phones are: communicating with family and sending text messages. The study pointed out that university students' addiction to smart phone is an important health problem, since greater addiction means less academic success and increased level of depression.

METHODOLOGY OF THE STUDY

The researchers used the descriptive method in this study due to its relevance. Also, a questionnaire was used to collect the study data.

Study Society

The student society consists of 60 students majoring in education technology at Middle East University.

Study Sample

The study sample consisted of (58) male and female students studying education technology at The Middle East University distributed according to Table (1).

Table (1)
Distribution of study sample in universities according to the Middle East University and Jadara University in Jordan

Academic level	No. of students (Male)	No. of students (Female)	Total
Bachelor	8	30	38
Master	4	16	20
Total	12	46	58

Study Tool

To achieve the objectives of the study, a questionnaire was developed by the researchers which included a set of demographic variables as the first part of the questionnaire. The second part consisted of items to determine the degree to which education technology students use smart phones in education. This part was also based on previous studies related to the use of social media tools and smart phones, such as (Al-Omari, 2013) and (Hammer et al., 2010). The following section contains a description of this tool, which consists of (20) items that were arbitrated by experienced and competent professors. The researchers took all the observations and notes of the arbitrators into account.

Tool Validation

In order to verify the validity of the study tool, the researchers presented the questionnaire in its initial form to a number of specialists in the field of education technology, curriculum, teaching, and information technology in order to obtain the views and suggestions of these specialists on the relevancy and accuracy of the questionnaire's vocabulary, the soundness of the lingual and scientific phrasing of the items, and the overall suitability of the questionnaire to the study subject

Stability of the Study Tool

The stability of the study tool was determined using two methods: the internal consistency method using the Kronbach alpha equation. The internal consistency coefficient was found to be 0.84. The questionnaire was applied to 20 individuals from outside the study sample, and then re-applied to them two weeks later. Afterwards, the stability coefficient of the test was determined using the Pearson correlation coefficient between the results of the two applications. The internal consistency coefficient was found to be 0.81.

Study Variables

Independent variables:

1. Gender: two levels (male and female).
2. Academic level: (bachelor and master).

Dependant Variables:

1. Degree of smart phones use in the educational process.

Statistical Processing:

After unloading the responses of the sample and entering the data using the computer, the data was coded using the SPSS program.

1. To answer the first question, arithmetical means, standard deviations, and ranks were used;
2. To answer the second question, T-test was used in relation to the gender variable. As for the academic level, arithmetic means and standard deviations were extracted, and the one-way analysis of variance (ANOVA) test was applied, too.

RESULTS

Question 1: To what degree do Education Technology students at The Middle East University use smart phones in education?

To answer this question, the arithmetic means and standard deviations of the degree to which education technology students at The Middle East University use smart phones in education was calculated. Also, these elements were calculated for each item of the study tool. Table (2) shows the process.

Table (2)
The arithmetic means, standard deviations, and ranks for the degree to which education technology students at The Middle East University use smart phones in education (From lower to higher)

#	Item	Arithmetic mean	Standard deviation	Degree	Degree of use
11	I view the university announcements on the university site.	4.01	0.58	1	High
2	I use my smart phone to share emails.	3.96	0.55	2	High
3	Extent of smart phone use to access social networks.	3.90	0.69	3	High
20	Use of education via smart phones is more beneficial than the traditional method.	3.86	0.67	4	High
19	Use of smart phones to ensure continuous interaction in the educational process	3.77	0.75	5	High
18	Using a smart phone achieves freedom of learning.	3.69	0.91	6	High
1	I use a smart phone to access search engines and digital libraries	3.41	0.84	7	Medium
12	Using a smart phone supports the learning process and takes into account individual differences.	3.39	0.88	8	Medium
7	I use a smart phone to share text messages with students.	3.37	0.85	9	Medium
16	I use a smart phone to record lectures with audio or video.	3.32	0.88	10	Medium
4	I use a smart phone to access blogs, forums, and sites for educational purposes.	3.28	0.97	11	Medium
10	I save the educational information I need on my smart phone.	3.27	0.97	12	Medium
15	I use a smart phone to record courses.	3.26	0.94	13	Medium
14	I use a smart phone to coordinate lecture and test dates.	3.24	0.84	14	Medium
6	I use a smart phone to take pictures and educational video tutorials.	3.23	0.87	15	Medium
8	I use a smart phone to browse books in PDF or Word format	3.17	0.74	16	Medium
17	Using a smart phone makes it easy for the learner to access information	3.04	0.68	17	Medium
9	I use a smart phone to send announcements and news to my colleagues.	2.84	0.93	18	Medium
13	I use a smart phone to deliver assignments and follow up on feedback.	2.52	0.59	19	Medium
5	I use a smart phone for presentations and educational movies.	2.31	0.76	20	Low
Total		3.34	0.28		Medium

Table (2) shows that the total degree to which Education Technology students at The Middle East University use smart phones in education was moderate. Items yielded high, medium, and low degrees. Item 11, which states that "I view the university announcements on the university site," came first and scored an average of (4.01), a standard deviation of (0.58), and a high degree. This result can be attributed to the students' interest in viewing the university's site and its components, such as university calendar, the existence of courses, and dates of examinations. This result is consistent with the results of Hammer (2010). The second rank was for item (2), which states: "I use my smart phone to share emails," with an average of (3.96), a standard deviation of (0.55), and a high degree. This highlights the skill of the students and their reliance on using smart phones to share electronic messages, information,

and data between each other. This result is consistent with the results of (Al-Omari, 2013). The penultimate rank was for item 13, which states that "I use a smart phone to deliver assignments and follow up on feedback," with an average of 2.52, a standard deviation of 0.59, and a medium degree. This result may be due to the low interest of students in delivering their homework electronically, as they appear to rely on the traditional method more. This result is consistent with the results of Hammer et al. (2010). The last rank was for item 5, which states: "I use a smart phone for presentations and educational movies," with an average of 2.31, a standard deviation of 0.76, and a low degree. This is probably due to the low number of students who use smart phones to watch presentations and educational movies, which can be attributed to the small size of the smart phones' screens. This result is in line with the findings of the Al-Omari study (2013) and Hazani study (2013).

Question 2: Are there any statistically significant differences at (α ≤ 0.05) between the arithmetic mean of the scores of education technology students at The Middle East University for their use of smart phones in the learning process that can be attributed to the variables: academic level and gender?

This question was answered as follows:

Gender Variable:

Arithmetic means and standard deviations of the study sample scores, regarding the use of smart phones in the learning process, were calculated. T-test was also used as demonstrated in table 3.

Table (3)
Arithmetic means and standard deviations of the scores of education technology students at Middle East University's technology regarding the use of smart phones in the learning process and t-test according to the gender variable.

Gender	Number	Arithmetic Mean	Standard Deviation	T-Value	Significance level
Male	12	2.32	0.32	- 0.818	0.415
Female	46	3.36	0.27		

The results in Table (3) indicate the absence of any statistically significant differences at (α ≤ 0.05) for the score of education technology students at The Middle East University regarding the use of smart phones in their learning process, in relation to the gender variable, and based on the t-value (-0.818) and the significant level (0.415).

Academic level variable

Arithmetic means and standard deviations of the study sample scores, regarding the use of smart phones in the learning process, were calculated (in relation to the academic level variable). Table 4 demonstrates the results.

Table (4)
Arithmetic means and standard deviations of the scores of Education Technology students at Middle East University's technology regarding the use of smart phones in the learning process (in relation to the academic level variable).

Academic level	Number	Arithmetic Mean	Standard Deviation
Bachelor	38	2.39	0.19
Master	20	2.34	0.25
Total	**58**	**2.37**	**0.26**

Table 4 shows the existence of apparent differences between the arithmetic means of the study sample regarding the use smart phones in their learning process, and in relation to the academic level variable. Undergraduate students had the highest mean score of (2.39), while postgraduate students came second with a mean of (2.35). In order to determine whether the differences between the averages were statistically significant at the level of ($\alpha \leq 0.05$), ANOVA was applied. The results of this test are shown in table (5)

Table (5)
One-way analysis of variance (ANOVA) to find the significant differences in the scores of Education technology students at the University of the Middle East regarding the use the smart phones in the process of learning, and in relation to the academic level variable.

Variance source	Sum of Squares	DF	Mean Square	F value	Significance level
Between Groups	0.06	3	0.020	0.249	0.862
Within Groups	7.679	96	0.080		
Total	7.739	99			

The results in Table (5) indicate the absence of any statistically significant differences at ($\alpha \leq 0.05$) for the scores of education technology students at The Middle East University regarding the use of smart phones in their learning process, and in relation to the academic level variable, based on the f-value (0.249) and the significant level (0.862).

The results of the study showed that there were no statistically significant differences at the level of ($\alpha \leq 0.05$) for the scores of Education Technology students at The Middle East University regarding the use of smart phones in their learning process, and in relation to the gender variable. The results also showed that there were statistically significant differences at ($\alpha \leq 0.05$) in relation to the academic level variable and in favor of the Master's degree students compared to the bachelor's degree students. This result can be attributed to the students' knowledge of the importance of using smart phones in education. It was observed that the higher the students' academic level is, the more they use smart phones in education. These findings correspond to the results Jones (2014), Al-Omari (2013), and (Hammer et al., 2010).

RECOMMENDATIONS

Based on the results of this study, the researchers recommend the following:

- Hold special courses for both students and teachers to employ and use all available tools in the educational process;
- Conduct pilot studies that demonstrate the importance of using smart phones in teaching and learning;

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