AN EXPLORATORY STUDY ON STUDENTS' MOBILE TECHNOLOGY USAGE AS LEARNING TOOL AT ALJOUF UNIVERSITY IN SAUDI ARABIA

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ABSTRACT_ *Mobile technologies in education or mobile learning (M-learning) are friendly modes of delivering education virtually anywhere using electronic devices, such as computers, notebooks, audio players, mobile phones, and tablets. It is therefore not much different from distance education. However, its role is expanding rapidly in recent years worldwide in transition to find a more effective interaction medium in the higher education system. Therefore, it is important to redefine the manner of how mobile technologies are used in the context of Saudi's educational ambiance. The main objective of this research is to investigate whether mobile technologies such as tablets, PDAs, iPads, and smartphones being used currently are useful and easy to use for instructional purposes and to what extent the students perceived mobile technologies as a self-independent learning tool and as an integration and interactive tool in classrooms. Moreover, students' usage of social networks for educational purpose was investigated. For this purpose, 114 students from the graduate diploma of education program in the first semester of 2016 participated in the study. Triangulation methods of research were applied, including questionnaire, interview, and discussion analysis. The research indicated that students were utilizing unceasingly their mobile devices in order to improve their knowledge and learning in a new way and the students indicated energetic attitude toward using mobile technology for education purposes and information sharing. M-learning apps were found to be interactive and easy to use in accessing the course content and interaction with the instructor. Several suggestions for future research directions were proposed.*

KEYWORDS: *mobile technologies; mobile learning (M-learning); E-learning; Saudi Arabia.*

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I. INTRODUCTION

Currently, mobile technologies are so pivotal in higher education. It is restructuring the style of education and learning, which originates under some guidelines for its learners. Innovations and rapidly growing technologies in information communication technology (ICT) is changing the shape of every environment, whether it is a social circle or a working environment in an educational and organizational set-up, particularly in Saudi Arabia [12,22,23]. We have to replace all our existing systems from the classroom to the performing arts and so on, circling every sphere using computer-aided programs and interactions following websites that provide assistance to the learner in his desired field. It is now giving us the concept of "anytime and anywhere education". It is now beyond limitation but provides a selective parameter according to the requirement through.

proper education in e-learning using the mobile devices and terminals connecting with the network to make the idea of anywhere and anytime education possible. In contrast, the mobile device has become part of the learner and hence sounds to break the barriers of distance as nullified.

II. LITERATURE REVIEW

There are numerous definitions of mobile technologies in education and learning that describe mostly hardware with handling mobile sets, for example, the latest introduction of tablets, such as iPads, PDAs, and smartphones [1,6,17]. Mobile learning (M-learning) is defined as learning tools and devices that can be used outside of the traditional classroom anytime, anywhere (laptops, tablets, iPads, and mobile phones) [1,6].

Here, we briefly review the concept of M-learning in a broader spectrum. In this era, mobile devices have basic and fast change in designs and package with more functions of multimedia to attract the aesthetic feelings of people to attach with this their maximum time for entertainment, communication, and knowledge. These also include a new milieu of enjoyment with sports, language, and business and evaluating the idea of policing and studies using different templates to design modules suitable to them. These include using the phone to check their social networks, using the devices as a computing machine, making schedule of activities and corresponding to E-mails, using the GPS of the mobile phone for texting messages and conveying and receiving instruction, and taking notes of the studies to share with others through social media. Then, it is M-learning accessible via mobile devices in the fulfillment of the concept of information "anywhere, anytime". This makes the role of education more vibrant to bring changes in the education for interaction in three domains, i.e., student, teacher, and M-learning [7,20,22].

Foti and Mendez's [8] conducted a research on mobile learning in order to investigate forty six students usage of mobile –supported learning in their classroom. The research was utilized quantitative methods to obtain an insight into their students' usage of mobile learning in supporting learning. The findings showed that students were significantly using their mobile in order to enhance learning and interact with their instructors [8].

III. SIGNIFICANCE OF RESEARCH

The enormous support given to mobile learning and e-learning at Aljouf University is noticeable. The restriction rules of using the mobile technologies inside and outside the classrooms have positively changed. As new experience to the students, there was a need to conduct a research in order to investigate the students' perception in using their mobile technologies as instructional tool to support and enhance their study. The study practically gives an insight and understanding into the successful implementation of using mobile technologies as self-independents tool. The research would also provide in depth information about using social networks for learning purposes and measure the students 'perceptions on it. The study would help the learning management system developers to integrate web 2.0 applications to be accessible through the system itself.

IV. RESEARCH OBJECTIVES AND QUESTIONS

The main objective of this study is to explore students' mobile technology usage as learning tool from quantitative and qualitative perspectives and to what extent the students perceived mobile technologies as a self-independent learning tool, as integration, and interactive tool in classrooms. Therefore, in order to achieve study objectives, the research question are formulated as:

1- How frequently students used their mobile technologies for learning purposes?

2- What types of mobile technologies students used to access Blackboard?

3- How do students perceive the mobile technology usage as useful tool and as self-independents learning tool?

4- What are students' perceptions in using social media apps for educational purposes?

V. METHODOLOGY

The main tools of collecting primary data were personal interviews with the graduate diploma students and distributing questionnaires containing Likert scale among 120 students during the first semester of 2016 at Aljouf University, Saudi Arabia. A systematic random sampling technique was utilized in this research due to the nature of study and limitation of targeted population which includes only graduate students who exposure to mobile learning experience. One of the options was afforded to the students to submit the data via personal interviews, Blackboard discussion form, or questionnaires. The collected data were incessantly monitored regarding consistency, accuracy, and completeness and then screened for accuracy, completeness, and validity. All the collected data of interview were coded to classify and categorize the students' responses. Majority of the information was based on the subjective review from personal interviews and thread discussions in Blackboard.

Subjectivity was considered as truthful as the students were oriented to use Blackboard. The analysis was confirmed by both interviews and discussion threads even if they were based on students' subjective matter. The questionnaire was adapted from Foti and Mendez's [8] research after obtaining permission from them which includes 12 adapted items.

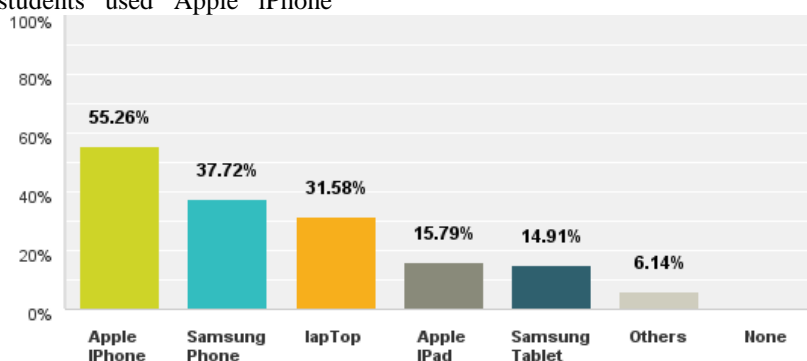## VI. RESULTS

A. Analysis of Quantitative Data

The analysis of quantitative data revealed that 114 out of the 120 total participants reported that the main usage of their mobile devices in classes was for academic activities. Table 1 shows a variety of age groups of the participants. Majority of the students' ages were between 24 and 30 years, which represent about 60.53% of the total participating students.

TABLE I
FREQUENCY AND PERCENTAGE OF STUDENTS' AGE

Age categories	Frequency	Percentage
<24 years	22	19.30%
24–30 years	69	60.53%
31–35 years	14	12.28%
>35 years	9	7.89%
Total	114	100%

In the questionnaire, students were requested to indicate the types of mobile technologies they used to access Blackboard as depicted in Figure 1. As shown in Table 2, more than half of the students used Apple iPhone (55.26%), whereas 37.72% of the students used their Samsung phone. Only 31.58% used their laptop to access the Blackboard learning management system (Table 2).

Fig. 1
Types of mobile technologies used to access Blackboard.

TABLE 2
FREQUENCY AND PERCENTAGE OF TYPES OF MOBILE TECHNOLOGIES

Types of mobile technologies used to access Blackboard	Frequency	Percentage
Apple iPhone	63	55.26%
Samsung phone	43	37.72%
Laptop	36	31.58%
Apple iPad	18	15.79%
Samsung tablet	17	14.91%
Others	7	6.14%
Total	114	100%

Table 3 presents how the students used mobile technologies in a daily basis. Students were asked to indicate their mobile usage in multiple choices. As indicates that majority of the students used mobile technologies to access Blackboard (84.21%), browse the Internet (71.05%), and use social network (64.91%). Table 3 indicates the frequency and percentage of mobile technology usage by students.

TABLE 3
FREQUENCY AND PERCENTAGE OF MOBILE TECHNOLOGY USAGE

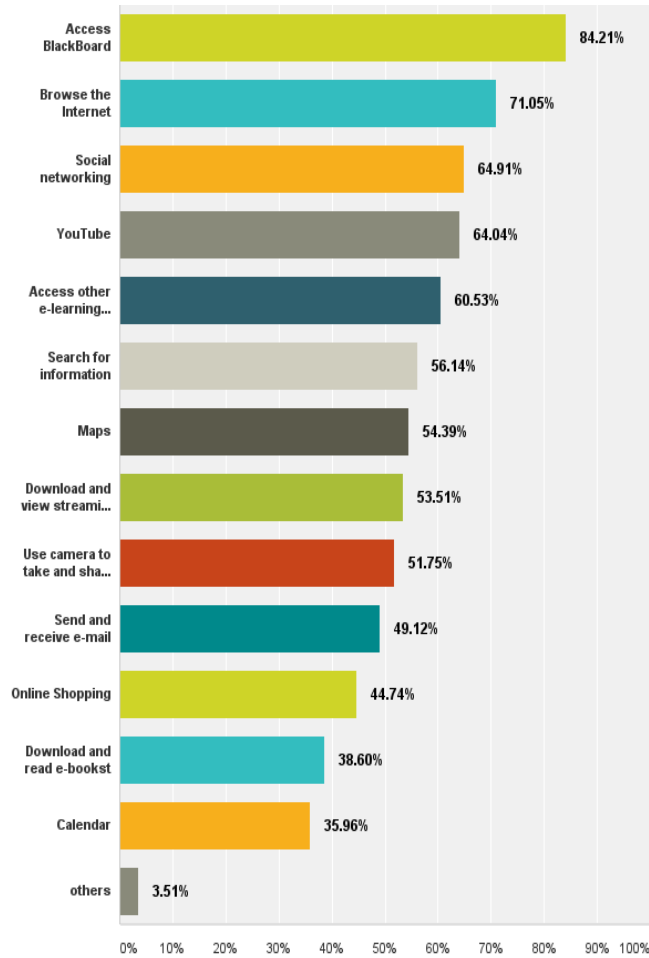| How do you use mobile technologies	Frequency (multiple)	Percentage
Access Blackboard	96	**84.21%**
Browse the Internet	81	71.05%
Social networking	74	64.91%
YouTube	73	64.04%
Access other e-learning tools	69	60.53%
Search for information	64	56.14%
Maps	62	54.39%
Download movies/video clips	61	53.51%
Use camera to take pictures	59	51.75%
Send and receive E-mails	56	49.12%
Online shopping	51	44.74%
Download and read E-books	44	38.60%
Calendar	41	35.96%
Others	4	3.51%
Total respondents		**100% (114)**

Fig. 2
Different types of usage of mobile technologies

As presented in Figure 2, mainstream of the students utilized their mobile technologies for academic purposes multiple times a week (74.56%), 13.16% used mobile technologies thrice a week, and 11.40% used mobile technologies once a week (Table 4).
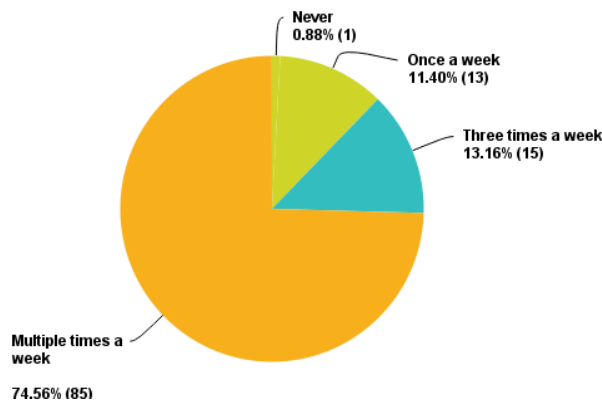

Fig. 3
Different types of usage of mobile technologies
TABLE 4
FREQUENCY AND PERCENTAGE OF MOBILE TECHNOLOGIES ACCESS FOR STUDY PURPOSES

How regularly do you use mobile technologies for study purposes?	Percentage
Never	0.88%
Once a week	11.40%
Five times a week	13.16%
Many times a week	74.56%
Total	100% (114)

Up to 35.96% of the students is indicated how extremely important using mobile technologies as an instructional and educational tool in improving their learning performance. Furthermore, up to 47.37% of the students consented that using M-learning apps (Blackboard) is useful and flexible as an instructional tool. Almost 37% of the students showed positive attitude on using mobile technologies to access the course content and submission assignment. Students' perceptions of the importance of using mobile technologies in accomplishing

their tasks and submission their assignment were high, as indicated in Table 5. Unfortunately, majority of the students agreed somewhat in using mobile technologies as a self-independent study tool. Up to 61% of the students believed that using mobile technologies enables them to study interactively anytime, anywhere. Moreover, students' intention to use mobile technologies for learning purposes was high and more motivated. Finally, students' usage of social networks and apps such as WhatsApp for educational purpose was very noteworthy. Figure 5 shows the line analysis of the degree of importance of the provided statements. The results indicated that majority of the students' perceptions were between extremely important and very important.

TABLE 5
PERCENTAGE OF STUDENTS' PERCEPTIONS OF USING MOBILE TECHNOLOGIES AS EDUCATIONAL TOOLS

Items	Least important	Important	Somewhat important	Very important	Extremely important
Using mobile technologies as an educational tool improves learning performance	0.88%	15.79%	13.16%	34.21%	35.96%
Using M-learning apps (Blackboard) is useful and flexible as an instructional tool	0.00%	8.77%	5.26%	47.37%	38.60%
Using mobile technologies to access the course content and submission assignment is important	1.77%	8.85%	18.58%	37.17%	33.63%
Using mobile technologies allows me to accomplish learning tasks more quickly	0.88%	7.02%	10.53%	39.47%	42.11%
Using mobile technologies as a self-independent study tool is obvious	4.39%	10.53%	30.70%	28.07%	26.32%
Using mobile technologies to access the course content is comfortable	0.00%	7.89%	10.53%	42.98%	38.60%
Using mobile technologies enables you to study anytime, anywhere	0.88%	3.51%	3.51%	30.70%	61.40%
Using mobile technologies as an integration tool in classrooms is useful	4.39%	11.40%	10.53%	35.09%	38.60%
Using mobile technologies in the classroom is significant in searching information during the class	4.39%	8.77%	17.54%	28.07%	41.23%
Using mobile technologies as social networks for educational purpose is very significant	5.26%	7.02%	14.91%	35.09%	37.72%
Mobile technologies provide an attractive learning environment during the class	7.02%	7.89%	14.91%	25.44%	44.74%
I intend to take more courses using M-learning in the future	0.88%	7.89%	14.91%	26.32%	50.00%

B. Analysis of Qualitative Data

Qualitative data analyses for mobile devices were conducted on account of the following reasons of mobile usage as an instructional and educational tool, self-independent study tool, integration tool in classrooms, social networks for educational purpose, and students' perceived mobile use as useful and easy-to-use tool, which are consistent with Foti and Mendez (2014) [8]:
- Uses mobile technologies as an useful learning tool
- Uses mobile technologies as a self-independent study tool
- Uses mobile technologies as an integration tool in classrooms
- Uses mobile technologies as social networks for educational purpose
- Uses mobile technologies as an easy-to-use tool

a) A Students use mobile technologies as an learning tool

In terms of using mobile technological as learning tool, students found to use mobile technologies as educational and learning tools through provided apps. Majority of the students indicated their attention in M-learning as a better and flexible study tool. M-learning is an application provided by Blackboard Company, which facilitates the students' access to Blackboard through different mobile technologies. With its use, students are well conversant and able to submit their assignments and able to access the study material, discussion board, PowerPoint slides, and any other details. In this direction, students were found enthusiastic to use often mobile technologies for studying purposes more than the traditional way of learning. Students said that studying through Blackboard enables them to interact with their classes' instructor anytime, anywhere, particularly when they have sudden questions.

In this context, the use of M-learning apps proves to be a useful resource, which provides students faster and more efficient access directly and keeping them away from accessing the course from the main website. Unlike web resources, these applications require very few steps in selecting the required material, with the use of limited buttons on the keyboard to have full access and collect the information accordingly on the content of study demands.

b) Students use mobile technologies as a self-independent study tool

Through the use of M-learning apps, almost for every subject specifically in the discipline of education, students expressed that they are capable enough to use their mobile devices with the help of application tools to interact better for two-sided communication. Students indicated the importance of being independent and get free access to the study materials, which allow them to study based on their pace and place. Computer-oriented applications such as Blackboard facilitates an easy access in finding the course content and getting information about grade viewing, viewing board threads, and discussing any changes with the academic point. In addition, they may get information via mobile devices about everything on the instruction, which tends to acquire the attention of any group of people in an interactive way, and they do not need to check the physical announcement board to be updated. Not only this, they also expressed that the announcement features were always keeping them informed about any possible changes that could be suddenly happen. Students also revealed that

M-learning apps always keep them notified about any direction of their lecturer. The ability to check E-mails via mobile devices keeps students informed of all circumstances regarding any changes in deadlines of submitting assignments, modification in course syllabus, attending class meetings and lectures, and information on the schedule for any incoming extra lectures whether they are moved elsewhere for some reason; similarly, they are in close contact with the faculty to receive their abrupt replies to streamline the things of priorities. Students' reflections on the independence of accessing the study materials are emphasized. However, only a few students indicated that the courses should be fully online to perceive it as an independent study tool. This is consistent with the quantitative data reported earlier.

c) Students prefer having permission to use mobile technologies in the classroom

In this research, students were found more enthusiastic to have their mobile devices permitted in classrooms for dual learning at the same time. Students also perceived using mobile devices in classrooms as very useful when they have any technical issues with the data or the projector. Findings indicated that integrating mobile technologies into the courses creates more interactivity and dynamics. Students emphasized that there is a need to allow keeping mobile devices under personal response system to generate a classroom environment that is more interactive and lively. Students also indicated that using M-learning allows them to answer the posted questions synchronously and anonymously during lectures via the assignments features. Allowing supposed devices in this manner would welcome the participation of students with full energy, which in turn makes the spirit high for learning more interactive phenomena, creates an eager feeling with a sense of liberty, and breaks the barriers of shyness and hesitation while being engaged in an interactive mode of study. There was also a suggestion from students on using online classroom tools and programs to include supplementary lectures of other institutions through portal connectivity, which would, nevertheless, allow them to study independently and provide exposure experience of internationally well-known institutions in learning. Students also deciphered that the use of these devices during lectures, from the author's point of view, would be an added advantage to getting familiar with another possible learning tool not only for students but also simultaneously of equally importance for the faculty staff. This would increase the interactivity between students and their instructors for a comprehensive discussion on every on-going activities throughout the world related to the subject of their interest in terms of sharing knowledge, and any other future perspective with regards to inventions and innovative themes related to the students related filed. Students also expressed that the permission of this learning process would improve their abilities and enable them to be more capable of taking initiatives for self-preparation in their future teaching; they expressed the importance of using tablets and iPads in teaching the kids in the future.

d) Social networks: WhatsApp and M-learning

Students reported to have vigorous use of social networks, specifically WhatsApp, as their first choice to communicate with each person in the classroom and occasionally with many outsiders too. The students reported that using social networks groups for learning purposes has facilitated their interaction and exchange the information freely. These social media apps provide the group a free atmosphere where they may discuss class lectures, manage video conferences, and share different types of documents to plan their projects. Therefore, students reported that every project group had created a WhatsApp group to discuss their project and shared ideas and information. We here append the statement of one of the students who said that, "other software such as WhatsApp created opportunity to discuss the matter of our projects by creating small groups and keep updated for any guideline by the lecturer as well as sharing the documents". Students already have an experience in using such apps to discuss challenging topics and express their views.

e) Students use mobile technologies as an easy-to-use tool in the classroom

Students' responses and feedback were further partitioned out for the preference of using laptops over tablets. Students who preferred tablets cited that tablets are handy and do not require any specific arrangement while moving and offer comforts with its features of storage capacity, light weight, and compactness with required multimedia than laptops. Those who are in favor of laptops specified that its better screen and letter keys on the keyboard made it the better choice for typing with speed and free from negligible errors while taking notes of all kinds of materials they have to edit further for last submission of their manuscripts. Furthermore, some students who reported using an attached keyboard to their tablets mentioned that previously their first priority is the laptop because its offers the fast track of doing all kinds of work with extra facility of using multiple USB and printing ports, which some tablets do not support. Hence, during class, students were allowed to use any type of mobile technologies such as tablets, mobile phones, and laptops based on their personal preferences.

VII. DISCUSSION

The results derived from this study conducted on a short scale of one selective district in Aljouf University campus show that students are using mobile devices equally for educational and social interaction purposes. The findings are not much different from previous studies conducted earlier in this direction to investigate the use of mobile devices in higher academic settings. The competences of these devices encourage learning and social interactivity engagement [4,8,13,17,20]. This is evident from students' retorts who mentioned the usefulness of using mobile devices as a great help toward accessing the course content in detail with the help of using "apps" such as M-learning in support of improving their learning abilities. These devices are programmed with a lot of efforts of the experts having a vision that, by introducing the "apps", they may combine technology with formal education in its best way toward attaining quality in education, as these days without understanding computer-based technologies one cannot be a good professional. Thus, it is the time to adopt this learning medium to introduce on all levels of our educational system. Students are already familiar with most of the features of its learning, playing a substantial role individually to generate activities that this learning obtains. Moreover, majority of the students indicated positive intention in using mobile as

a better and flexible study tool, which is consistent with previous studies [8,17,19].

Students also admired that the use of the updated M-learning app supported different mobile operating systems, as made available by Blackboard, which adopted the learning management system used by Aljouf University. The finding on using such app is consistent with other research [3,8,13,21], which indicated positive attitudes and perceptions toward using mobile technologies in the learning process. However, students reported using tablets over laptops much better, confirming the concept of anytime, anywhere. This resource of application provides an opportunity to access the lecture material spontaneously to induce key concepts that may appear in their exams.

It is obvious from the responses of students that they are seeking out electronic resources as an additional source side by side for better learning methodology in their respective classroom studies. The effectiveness of mobile devices for fast access is coupled with the processing speed of the application and therefore has become the optimal medium of students for accessing to study in and out of their classroom. Students also stated about sharing their data and other slides of studies with their classmates for advice on any productive change. Hence, in this context, it can be assessed that the usage of mobile phone devices contributes a vital role to encourage indirectly in sharing knowledge and collaboration among students [2,8,13,20]. These findings are consistent with other findings [4,8,19,22], which reported that M-learning usage encourages engagement and participation between students as well as their instructors. Moreover, using apps such as mobile learn, students are capable of cooperate by sharing the information and materials regarding their study and projects [3,8,12,13,19].

Sharing and collaboration among students have always been in practice and still practiced widely to share the written and typing notes with each other. There is a need to enlarge the canvases of this idea through the use of mobile devices toward creating online communities, and for this purpose, open systems are the best operating tool that provides clarity in the desired parameter of students' interest. This online resource is being used phenomenally by many groups and provides a platform for the students to make their own forum for bilateral exchange of negotiating the study material along with activities of mutual interest in the context of academic maneuver.

These social media apps such as WhatsApp were found to be an effective tool to facilitate group meetings in a free atmosphere, where they may discuss class assignments and share different types of documents for project completion purposes. According to Schuler, the concept of 'anywhere, anytime' is achieved through using mobile technologies to facilitate the learning. The findings is in line with earlier research that found M-learning usage encourages team work [2,4,5,8,17,20].

VIII. CONCLUSION

This research used triangulation methods, which include quantitative, qualitative, and discussion analysis techniques, to get in-depth information regarding this matter. This was carried out with students from graduate diploma of education, who were exposed for first time to M-learning practice. Students in the graduate program may fulfill the expectation to be exposed to the self-independent education method and direct themselves based on the provided criteria and not based on the instruction restriction once. The efforts in this study were attempted to encourage mobile technologies as instructional motivating tools for our students to use their mobile devices for learning purposes and eliminate any hesitation on either side, particularly among the academic staff. M-learning is a significant tool to create a friendly atmosphere in and out the class by delivering a good lecture and involving students to be fully attentive. In this direction, more studies are deemed necessary to include with greater sample and more areas throughout the country to explore whether the use of mobile device has any positive impact on academic performance or up to what extent these devices can support self-directed learning and create an interactive once.

IX. FUTURE RESEARCH

This is a topic of another research, and without introducing this, delivering quality education would be a dream to meet the 21st century challenges. It is equally important for both instructors and students in the academic field and for all instructional technologists and professionals in the area of electronic learning. There is the need of time to design refresher courses to inaugurate everyone in the process of M-learning; otherwise, we will be way behind in the atmosphere of competition with all our complements we are to face in the world. Mobile technology is now encircling us as a permanent companion as the most devastating devices not as an option but as a necessity for the future education. If the stakeholders of the Ministry of Education abandon the power of M-learning, it would be a setback in the educational quality. There must be an introduction of M-learning by publishing bulk of researches and inviting partners from corporate organizations to collaborate in inducting courses, seminars, and workshops for all those who come under their leading positions. We must consider that every organization from now on should move forward in mobile technology learning and training. For this purpose, here in Saudi Arabia, there is a need to introduce M-learning as a subject from the start of higher secondary classes in public schools. Experts should be invited to develop standards for M-learning programs so that learning materials can be shared among institutions across the Kingdom. Future research should be directed in the area of quality of technology mediated learning, creating a guideline of quality assurance of online learning and studying the readiness of teachers in public schools in embracing such technologies.

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