Int J Edu Sci, 18(1-3): 56-64 (2017)
DOI: 10.31901/24566322.2017/18.1-3.06

Implementation of Smartphones, Tablets and their Applications in the Educational Process Management at Northern Border University

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KEYWORDS Digital Education Resources. E-learning Education. Smart Education Management. Smart Education Tools. Smart Mobile Applications

ABSTRACT This research identifies the effectiveness of implementing tablets and smartphones at Northern Border University (NBU) in Saudi Arabia for its educational process management. It identifies their uses for skill enhancement through training faculties to hone skills. Research sample consisted of 200 NBU faculties from Medicine, Sciences, Education and Arts to Business Administration and Economics colleges. Randomly selected and divided into three experimental groups out of which each consisted of 25-30 people, study variables were according to the experimental design research. Researchers found differences of functions between averages of faculties in two applications (pre and post) to achieve test in favor of Posttest and Observation cards in tablets and smartphones uses as dimensional applications. Correlating positively with statistically significant differences between scores of teachings in the achievement test of faculties, observation was of positive impact. Statistically significant tablets and smartphones applications in NBU urged faculty members to use them efficiently.

INTRODUCTION

E-learning is the most modern learning method to emulate progresses in the modern era. It uses latest communication technologies like computers, networking tools, and portals, either online or in classrooms, and rest technology-oriented tools for information deliveries. The uses are meant to support learners to learn in the shortest possible time, that too through less effort and to gain greater benefits. It became possible due to the recent information revolutions in technology and other related sectors. The world has been witnessing such resurgence now from even small electronic screens emerged to much larger ones before the Information Technology boom, and prior to the huge transformation that occurred recently. Due to digitization and fast use of various electronic tools, exchange of news and information through computer networking supports became a reality. Its benefits in the education sector have a causal relation with the easy access to several effective things especially with sciences and knowledge centers to the world's biggest libraries, which simplify doing the moment-by-moment assessment of anything and everything.

According to Jan et al. (2016), e-learning supported through smart devices remains an enhanced and highly effective learning source. Mobile learning is one such type of e-learning, which uses mobiles, tablets and smartphones in multiple forms of applications in the educational procedures to increase the knowledge level of each and every learner.

Mobile learning, as an e-learning method in the educational process management, improves the outcomes though enhanced motivation of learners. It supports the faculty members to take new decisions and thus reach out to the students at any point of time. It is equally helpful to increase the skills of faculty members in specific developmental steps with the maximum possibility to use e-learning options in educational process. According to Traxler and Kukulska-Hulme (2005), it is expected that users of this educational style would certainly double in the coming years.

Use of tablets and smartphones for educational process management benefits higher education institutions for an assured e-learning expansion. It brings a greater degree of positive attitude transformations through inculcating positivity (Al-Emran et al. 2016). By an evaluation of performance levels to use specific techniques, benefits are unbound that higher education institutions can avail (Melhuish and Falloon 2010).

Such evaluations consistently help convert the number of decisions and educational materials. Thus, e-learning gets flawlessly implemented through the use of different educational software tools to websites, which enable the students to enroll in their respective chosen programs of study without any restriction of place or time, which is the key purpose of e-learning.

The subject of this research refers to a case study entitled, "Mobile Learning and English Language Learners: A Case Study of Using iPod Touch as a Teaching and Learning Tool" by a group of scholars at the Department of English at the Faculty of Arts at The University of Texas at Austin, the United States of America. It measured the impact of a program based on the use of tablets (iPod Touch) and their applications through e-learning to teach English language.

It meant to develop a collective environment through the group of learners as a research sample formed of 12 students, and which assigned access to learning environment for the users of tablets (iPod Touch) to measure the academic achievements. Luis et al. (2014) studied the two major factors of social networking and gamification and their correlation in e-learning.

The researchers at the Deanship of e-Learning and Distance Learning (DEDL) at Saudi Arabia's Northern Border University (NBU) observed a significant progress in the learners' achievements through mobile learning based on tablets (iPod Touch) and smartphone uses to enhance the achievement levels. The implementation was followed by training NBU faculty members to prepare them for the training programs, and to make them abreast of the numerous advantages, which such technologies offered for their fruitful application (Raghunath et al. 2016).

It was further observed after providing tablets (iPads) and smartphones to roughly about 300 NBU faculty members for the educational purpose that 200 of them used such devices for that particular purpose and involved them in their educational process management as well. Follow-up initiatives were taken by the researchers after their constant observation on why faculty members owning such devices either did not use them for specific purposes or required further trainings to ensure they made best use of such tools they were entrusted for.

While trainings were undergoing, it was noticed that faculty members having received the smart devices had reasonably good progress in their educational process due to the easy operation of smartphones (Pegrum et al. 2013). Most of them activated the functionalities and availed benefits, especially their experiments with the students. Issues, which brought setbacks, were that there remained least educational feasibilities in some cases to affect the performance levels.

Researchers' personal interviews with some faculty members, who had already received such devices, further clarified how those owning devices found them useful in the educational process, and thus they understood their importance. Shortcomings like some of them having no sufficient skills to activate the devices also came into the forefront. It was pointed out to judge the importance of trainings to take advantage of such devices in the educational process, especially how benefits reflected in the positive terms as far as they were related to student achievements. Hendrik et al. (2013) researched about the faculty perception during e-learning staff development and evaluated their uniqueness through their research.

Based on the above was determined the problem of the current research. It was due to the inability of all NBU faculty members and their failing to use the tablets and smartphones for multiple applications in the educational process management. Despite providing all such advanced technology tools to the faculty members for them and for the students to benefit from, something lacked due to the absence of proper application.

The researchers were prompted to design the training programs for them to use tablets and smartphones to ease the educational process management. Baran (2014) studied the effectiveness of mobile learning besides focusing on the limitations, which faculty members often encountered.

This research thus replied to the following question:

How effective is the use of tablets and smartphones for their application in NBU's educational process management?

The sub-questions following the main question were:

- What were the training requirements for NBU faculty members to use tablets and smartphones for their application in the educational process management?
- What were the management procedures to hone necessary skills of NBU faculty members to use tablets and smartphones for application in the educational process management?
- What was the perception of the proposed training program based on the use of tablets and smartphones and their application in NBU's educational process management?
- What was the effectiveness of proposed program to develop skills and to hire new faculty members at NBU to use tablets and smartphones in this university's educational process management?

Research Objectives

The research objectives and the goals of the current research is as following:

- Identify faculty training needs to use tablets and smartphones and their applications in NBU's educational process management.
- Identify the most important skills required and the availability of faculty members at NBU to use tablets and smartphones for their application in the educational process.
- Develop suggested training programs, which are based on the use of tablets and smartphones to their applications in NBU's educational process management.
- Disclosure of effectiveness of proposed program to develop skills to hire the faculty members for tablets and smartphones use in NBU's educational process management.

METHODOLOGY

Research Design

An experimental approach to research was used. The researchers used developmental research methodology through applying the educational development option to build and develop training programs to train NBU faculty members. Researchers thus preferred models for the use of tablets and smartphones for application in this university's educational process management.

Research Hypotheses

The validity of the current research has checked on the following hypotheses:

- There is a statistically significant difference at the level 0.05 between the mean scores of performance of experimental group as a whole before and after the application of the proposed training program for testing grades for post-performance.
- There is a statistically significant difference at the level 0.05 between the mean scores of performance of experimental group as a whole before and after the application of the proposed training program for the benefit of multidimensional performance in the procurement of tablets and smartphones for their application in the educational process management skills.
- The proposed training programs achieve effectiveness for the development by using tablets and smartphones with skilled application in the educational process is not worthless administration (1.2 for the revised gain for BlackBerry and 6.0) while measured in the percentage efficiency of Mac OS.

Research Sample

The research sample consisted of 200 NBU faculty members from its Colleges of Medicine, Sciences and Arts, Education and Business Administration and Economics, where the sample was randomly selected and divided into three experimental groups. Each group consisted of 25 to 30 individuals and the study variables were according to an experimental design research.

Variables

1. Independent Variable

The training programs were based on the use of tablets and smartphones and their applications in NBU's educational process management.

2. Variable Subsidiaries

Cognitive aspects and the aspects of skills among the NBU faculty members were variable subsidiaries.

Experimental Research Design

The current research supports seven design trial groups with the measurement of pre and post for the seven groups. Pre-test and Post-test groups selected respondents randomly, dividing them into seven prototype groups. Then, the measurement tools were applied tribally to the seven experimental groups, and then trained through the proposed training programs after the completion of experiment, as shown in Table 1.

Table 1: The experimental design to search

Post	*Process Program*	*Pre*
Cognitive Test The Observation Card	Group (1) Group (2) Group (3) Group (4) Group (5) Group (6) Group (7)	Cognitive Test The Observation Card

Search Tools

The researchers used the following research tools:

- Achievement Test (prepared by the researchers)
- Observation Card (prepared by the researchers)

Research Importance

Theoretical Importance

- Identify the faculty-training needs to use tablets and smartphones for their application in NBU's educational process management, which could be generalized further to the level of the Kingdom of Saudi Arabian university management system.
- Identify the most important necessary skills as acquired by the faculty members at NBU to use tablets and smartphones for their application in the educational process management.
- A proposal based on the use of tablets and smartphones for their application at NBU's educational process management to manage the training programs.
- Developing teaching methods through the proposed programs to train the staffs to use tablets and smartphones for skill development to succeed in the educational process management.
- Search the offers on how a product can benefit those who prepare online trainings, build and guide programs on the procedural level to develop the training programs.
- To guide the researchers to develop studies and researches in the fields of designing e-learning based tablets and smartphones for their applications to enhance the faculty skills. It remains the easiest choice to set the theorems, lemmas, definitions, examples or proofs.

Applied Popularity

- Provide NBU a budget through taking the advantage of available resources for the faculty members, and for their exploitation for the educational process management.
- Assist in the development of the status of training all NBU faculty members by urging them to pursue for technical developments in the field of e-learning through tablets and smartphones applications.

Research Procedures

Over the current research, following are the actions:

1. Access to research literature, studies and conferences of the Arab and from the foreign relevant research topics.
2. Derivative card needs assessment training to faculty members as tablets and smartphones' types to applications and uses in the educational process and training needs management.
3. Identification of faculty training needs to use tablets and smartphones for their applications in NBU's educational process management, and through applying the listed needs, sample of faculty members and the group of experts.
4. Identify the most important skills required from the available NBU faculty members for the possibility to hire more for tablets and smartphones applications in its edu-

cational process management, and for the application management with list of skills on a sample of faculty members and group of experts.
5. The design of training programs in the light of actual training needs of faculty members, in the light of the instructional design, chosen from both researchers' models.
6. Provide tablets and smartphones for their applications and necessary trainings to use them in the educational process management in the light of the teaching staff's training needs.
7. Build the tools of study, which are as follows:
a. Electronic Test Achievement: To measure the cognitive skills associated with tablets and smartphones, and their applications, which can be used in NBU's educational process management.
b. Observation Card to Measure the Performative Aspects: The associated skills to use for tablets and smartphones' applications that could be used in the educational process management.
8. Choose the exploratory sample members to gauge their sincerity for research tools, and to identify the problems faced by the researchers during their applications.
9. To select a sample of the basic research of faculty members and randomly assigned ones according to the experimental design research.
10. The application of research tools tribally for the research sample.
11. Perform the basic experiment on the research sample sets.
12. Resulting from the two applications of pre and post, appropriate ways to reach to the statistical results and interpreted in the light of theoretical framework and research findings related to the research hypotheses and data processing.

Search Terms

Tablets

In the computer groups working run: Android, Apple, Windows, which enables the users to surf Internet and email, and use different applications system (Liu et al. 2014).

Smartphones

Are those phones that work running: Android, Apple, Windows, which enables the users to surf Internet and to use email and applications in addition to telephone services such as communication and short messaging system (Qiang et al. 2012).

Tablets and Smartphone Applications

It is intended to search the current applications used in the tablets and smartphones.

Educational Process Management

It is intended in the current research that all transactions, which take place inside and outside the colleges between the faculty members and the student halls.

RESULTS

Application Card Estimate Training Needs

The researchers applied the card estimate training needs at 200 faculty members (including male and female) at different colleges of NBU. The sample was divided into 7 groups, and each group had 25 to 30 individuals, as shown in Table 2.

Table 2: Male and female ratio

Faculty	*Gender*		*Total*
	Male	*Female*	
Medicine	15	14	29
Medical Sciences	14	13	27
Sciences	15	14	29
Education and Arts	18	12	30
Business Management	14	12	26
Home Economics	15	14	29
Arts and Sciences	18	12	30
Total	109	91	200

Then, the processing application card estimates of faculty training needs were skillfully employed for tablets and smartphones for their application process in the teaching skills, as shown in Table 3.

Post training skill assessments in the first, second and third factors brought subsequent high percentage of result. This highly satisfied

Table 3: Post training skill assessment

Item	*Sub Skills*	*Need Percentage (%)*
First: Associated with both tablets and smartphones for applications concepts	9	95
Second: The cognitive aspects	18	98
Third: The skill aspects	14	96

outcome is seen in the context of faculty members' using tablets and smartphones for their application concepts in educational process management. Likewise, assessment levels of cognitive and skill aspects too remained highly satisfactory due to their high percentage. Such skill enhancements became possible through the training programs, which eased the observation of performance levels and skill enhancements.

Workout Achievement Test and Control

What were the identified achievement test questions, and which included the following, as shown in Table 4.

The researchers then calculated the internal consistency of the test grades coefficient (alpha á) Cronbach using the SPSS program on the post-test scores, as shown in Table 5.

Table 5: Internal consistency of the test grades coefficient

Reliability	*Sample*	*Test Items*	*Value*
alpha á	200	24	0.95

It is seen from Table 5 that the height of achievement test, the stability coefficient (0.95) shows test accuracy in the measurement and consistency, as it provides information on the collection of individual research sample, along with the cognitive training.

Followed by the observation card, performance skill to employ tablets and smartphone for the educational process management purpose, and the stability of phones calculates reliability coefficient (alpha á) Cronbach using the SPSS program on the post application scores, as shown in Table 6.

Table 6: Post application scores

Reliability	*Sample*	*Test Items*	*Value*
alpha á	200	24	0.95

It is evident from Table 6 that a high stability of observation skill performance card coefficient (0.967) shows card in the measurement accuracy and consistency, as it provides information on the performance of research sample level (NBU faculty), for skills training.

Application of Statistical Treatment Material Tools and Calculation Results

Calculating the average and standard deviation of scores of experimental sample members of research (n = 200), in the tribal application and post-test, and the proportion of year gain in the achievement of training program, as shown in Table 7.

Table 7: Average and standard deviation of scores of experimental sample members

Scale	*Time*	*Average*	*St. deviation*
Test	Pre	11	11.13
	Post	23	11.19
Observation card post		73	15.84
General earning rate		89.321	11.65

The members of the experimental group (NBU faculty) were able to receive ninety percent test grades, as the highest scores. Their arithmetic average of the test post-test was 23 degrees thus greater than ninety percent of the final grade for test at 24 degrees. Researchers obtained the result of more than average higher at eighty percent. Their performance skills card in the con-

Table 4: Workout achievement calculation assessment

Level	*Memory*		*Understanding*		*Implementations*		*Aims*	*Questions*	*Aims' Weight*	*Questions' Weight*
	Aims	*Questions*	*Aims*	*Questions*	*Aims*	*Questions*				
3	8	8	8	8	8	8	24	24	34.78%	41.06%

text of the arithmetic average of application at 73 showed the efficiency of training programs to enhance the skills through the use of tablets and smartphones for educational process management.

Test the Validity of the First Hypothesis

Researchers' application (t-test) for independent samples to denote the differences between the average gain of the experimental group in the post application of test grades was by using the software package SPSS, as shown in Table 8.

The average height gain degrees of experimental group in the achievement test was 24. Value of the t-test calculated in the achievement test equaled to 2.64 while the degree of freedom was 27. Significance calculated was 0.04, and where the significance less than 0.05, it was accepted as the first hypothesis, which read as follows:

There was a statistically significant difference at the level 0.05 between the mean scores of the performance of experimental group as a whole before and after the application of the training programs proposed based test grades for the post-performance.

Test the Validity of the Second Hypothesis

The researchers preferred the application t-test for independent samples to see differences between the average gains of experimental groups in the post application for Skill Performance Card for the production of the electronic courses over the Web, as shown in Table 9, using the software package SPSS.

Higher average members from the experimental group (NBU faculty) equaled to 73 out of the total score from the skill performance card. They used tablets and smartphones for educational process management. The t-value calculated in the card equaled to 2.61 while the degree of freedom was at 27.54, and significance calculated at 0.015. Thus, the significance was less than 0.05. T value favored the use of tablets and smartphones to enhance the skills for educational process management. The research hypothesis therefore stated statistically significant with level (0.05) between the mean scores of the performance of experimental groups.

Overall educational process management skills of NBU faculty members witnessed thorough and multidimensional performance enhancement after the proposed training programs. They demonstrated effectiveness of tablets and smartphones uses for the said purpose.

Test the Validity of the Third Hypothesis

The researchers calculated adjusted rate of gain in the increase of tablets and smartphones uses for educational process management by keeping in consideration the need for mobile skills. Thus, the efficiency ratio for the sample (NBU faculty), as shown in Table 10.

The average percentage of 1.21 is higher than the value specified at 1.2 (Black factor). It indicated that training programs immensely helped achieve an effective result with respect to develop the cognitive skills through tablets and

Table 8: Differences between the average gain of experimental group

Sample	*Average*	*St. Deviation*	*T value*	*DF*	*Sig*	*Sig*
200	24	12.66	2.64	27	0.04	0.05

Table 9: Difference between average gain of experimental group in post application for skill performance card

Sample	*Average*	*St. Deviation*	*T value*	*DF*	*Sig*	*Sig*
200	73	15.37	2.61	27.54	0.015	0.05

Table 10: Third hypothesis validity assessment

Max	*Pre Test*	*Post Test*	*Black Factor*	*Sig*	*MC Gogian Factor*	*Sig*
75	12	23	1.21	0.004	0.75	0.004

smartphones uses for the educational process management purpose. With the achievable effective ratio equaled 0.75, it proved higher than the spoken value of 0.6 (Mac Gogian), thus merit to accept the third hypothesis.

DISCUSSION

After obtaining results, the researchers found positive differences in the performance levels of faculties participating in the training programs to those missed out. Mostafa et al. (2016) investigated the attitudes towards use of mobile learning in higher education. It was found that large chunk of faculty members was already in the verge of using various smart mobile tools including tablets and smartphones to manage academic schedules under provided infrastructure.

NBU witnessed highest level of sophistication and efficiency in its faculty team once training programs were concluded. Their endeavors to use such tools for the educational process management in this university were outstanding. Modern educational environments cannot ignore the integrated roles of tablets and smartphones (Çukurbasi et al. 2016).

Post trainings, NBU faculty members attained further skills. They were groomed to manage their academic assignments through the use of tablets and smartphones, which eased the university's educational process management. They found it easy to upload assignments and quizzes. They could also chat with their students to solve the problems via available mobile applications.

Al-Ani et al. (2013) studied the use of smartphones and tablets in the context of faculty members as well as students in the Arabian universities. Many Saudi Arabian universities have been already successfully using e-learning and m-learning programs in their campuses now. Several Gulf Cooperation Council (GCC) universities have already initiated doing research in this field for further awareness about the effectiveness of such alternate education infrastructure. The University of Bahrain did good research in mobile learning to assess the student perceptions about it in the Arabian Peninsula. Other universities have started following similar trends.

The researchers studied the transformations from traditional to digital education system and their acceptances in the Arabian Peninsula. Asli (2017) studied similar impact in Turkey through the resurgence in digital literacy trends.

Tablets and smartphones are now brought into use in the educational pursuits in multiple ways. The researchers focused on their educational management process at NBU through their dedicated uses by faculty members. The trainings held at this university prepared them for such roles. They sought total motivation to fulfill the set goal of digitized education management plan. Karim et al. (2016) studied the technology uses for large-scale education plans at the level of making decisions to peruse for the educational process management.

The researchers in the current research concentrated on using tablets and smartphones by NBU faculty members. It is suggested to train the faculty members to feel at home while using such digital technologies. Their variances in the educational levels were kept into consideration before suggesting the training plans.

CONCLUSION

This research concludes with the findings that the use of tablets and smartphones in the educational process management is going to prove a boon in disguise for NBU. It also offers greater scope for the implementation of proposed training programs at various stages at other universities in the Kingdom of Saudi Arabia in particular and other regions in general. Researchers realized during the training programs, especially while tablets and smartphones were being used, that some faculty members were reluctant and thus not feeling at home to use those tools for the educational purposes. They sought some guidance but thoroughly analyzed that such tools had a greater impact in NBU's educational process management, thus became the need of the hour.

RECOMMENDATIONS

The future researchers should focus on the factors in the context of locations where they initiate research and also to make an assessment of how much abreast of the ideas they are in the subject to use such technology tools for educational purposes. There is no doubt in it that its impact would be stimulating enough to literally bring a renaissance in the higher education sector in the Kingdom of Saudi Arabia. Thus, future

training programs must shift towards the more focused steps, and especially after identifying each and every factor.

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Paper received for publication on December 2016
Paper accepted for publication on March 2017