

Effect of (Mobile Based Learning Program) on Postgraduate Nursing Students' Satisfaction and Attitudes in Faculty of Nursing Damanhour University

Abeer Abd El Fattah Abou Shosha^{*}, Hala Eid Mohamed, Sally Abd El hamid Fayed

Nursing Education Department, Faculty of Nursing, University of Damanhour, Egypt

^{*}Corresponding author: abirshosha@yahoo

Received November 12, 2019; Revised December 20, 2019; Accepted December 29, 2019

Abstract Technology is evolving more rapidly than ever. The younger generations, including nursing students, live daily lives equipped with extremely advanced mobile technology, challenging nursing educators to integrate mobile technology in education to increase the level of involvement. **Aim of the study:** is to determine the effect of Mobile Based Learning Program on postgraduate nursing students' satisfaction and attitudes in faculty of nursing Damanhour University, Egypt. **Method:** A quasi -experimental one group pretest-posttest was adopted. The study was conducted at Faculty of Nursing Damanhour University, Egypt. Purposeful sample, all post graduate nursing students (N = 36), registered at three department Administration, Community health nursing & Nursing Education departments. The study was done during the academic year (2018-2019). **Two tools were used: Tool I: Students Satisfaction Scale** to identify students' satisfaction level. **Tool II: Mobile Learning Attitude Scale (MLAS)** to investigate students' attitudes of mobile learning in their education. **Results:** The study reveals that postgraduate nursing students, were satisfied and positive attitude after utilizing MBL. A significant positive intermediate correlation was found between different phases of the study, between pre & post satisfaction test, also between pre & post attitude test, and between post satisfaction and attitude test. **Conclusion:** Post graduate nursing students exhibit more satisfaction and positive attitude after utilizing MBL. **Recommendations:** More workshops are needed for both teachers & students in utilizing more mobile application to enhance learner motivation in learning.

Keywords: Mobile based learning, mobile technology, postgraduate nursing students, Younger generation, Mobile applications in learning, students' satisfaction & students' attitude

Cite This Article: Abeer Abd El Fattah Abou Shosha, Hala Eid Mohamed, and Sally Abd El hamid Fayed, "Effect of (Mobile Based Learning Program) on Postgraduate Nursing Students' Satisfaction and Attitudes in Faculty of Nursing Damanhour University." *American Journal of Nursing Research*, vol. 8, no. 1 (2019): 114-121. doi: 10.12691/ajnr-8-1-12.

1. Introduction

In the 21st century, technology is growing more rapidly than ever. The younger generations, including nursing students, live daily lives equipped with extremely advanced mobile technology, challenging nursing educators to integrate mobile technology in education to increase the level of involvement and advance the learning outcomes of students [1].

Mobile based learning is defined as the personalized, linked, and interactive use of hand held computers in classrooms, in cooperative learning during fieldwork, and in counseling and guidance. It supports learning that is more situated, experiential and contextualized within specific domains and affords the creation and use of up-to-date and authentic content [2].

Mobile based learning has been playing a progressively a vital role in education, allowing learning to occur beyond geographical obstacles and time

constraints. It supports learners who are studying "on the move" to access learning materials in various contexts, with different cultural and environmental cues essential for understanding the learning contents [3,4]. It also facilitates social interaction among learners and teachers through mobile applications such as text messaging or student response tools [5].

Furthermore, **Mobile based learning** is used in numerous areas. Information can be replayed, and learners can work at their own pace; learning space is expanded owing to its high portability; simulation learning is also possible, using a user's location-based information; and a self-directed learning can be accomplished, where students can practice certain target knowledge and skills repetitively without spatial limitations [6]. Specially, smartphone-based mobile learning is believed to be suitably applied to nursing education. With its great level of movability and accessibility, smartphone makes it probable to facilitate self-regulatory and active learning by motivating students and to promote collaboration and communication among students [7].

The concept of **mobile based learning** has arisen with the rapid development in computer technologies, mobile devices, and wireless technologies. Mobile technologies have great educational potential with mobile learning becoming an appealing trend [8]. According to the EDUCAUSE 2012 report, college students remain to bring their own devices, preferring small, portable ones, and desire access to academic progress information and course material through their mobile devices. Mobile learning is also called m-learning [9].

Moreover, Lall et al (2019) [10] stressed that the movability of mobile devices can permit interactions between learners and educational material, fellow learners, and educators in the health professions. Also, practitioners, and also as learning support tools for learners. Use of mobile phones and other mobile devices can have a positive impact on education by enabling student learning, facilitating teachers do their work more competently, and simplifying the improvement of education systems across the world [11,12].

Mobile based learning activities improved students' engagement in the classrooms and switched students from being passive learners to being actually engaged learners who are behaviorally, intellectually, and emotionally involved in their learning tasks [13]. According to the American Distance Education Consortium (ADEC), student satisfaction is the most important key to continue learning. Student satisfaction is defined as a student's perceived value of his or her educational experiences at an educational institution or how comfortable the user feels with educational system to accomplish his or her goals. In the field of human – technology interaction, user satisfaction refers to the feeling of affection experienced by interacting with the system; consequently, satisfaction is a subjective set of interactive experiences influenced by effective elements. Successful implementation of Mobile based learning is frequently measured by students' satisfaction and attitude of such technology [14,15].

Mobile learning is gaining remarkable attention as a key learning platform due to its uniqueness in facilitating learning at all levels of education at anytime and anywhere. It's successful adoption however highly depends on availability of the underlying mobile technologies to students, and students' attitude towards the use of the technologies as an alternative learning platform. Many researchers found that the students have positive attitude towards mobile learning and would like to use their mobile devices for both learning and administrative services [16,17]. In an open-ended question, the participants were asked to state in general terms on how they use mobile technology(ies) for learning. That is, which service or application are they using mobile devices to access for. Only 35 students responded to this question as follows: 15 stated that they use the technologies for accessing and downloading online journals (15), sharing knowledge with other students (18), communicating through email (32), accessing related sites and applications such as Mendley (7), dictionary (19), Encyclopaedia (28), Edmodo (4), Translation (11), Google scholar (9) and UPM online library (22). Other students stated that they use mobile technologies to discuss assignments (14), searching for information on various things and issues (29), downloading notes from Putra

LMS (20), taking down notes (8) and writing down assignments (31) [17].

Mobile have different learning applications as edX, Mindly, mMind, xMind, Socrative, FormsApp, Kahoot, XRecorder. Edmodo and google classroom. The researchers use two of these application which are google classroom and Kahoot.

1.1. Significance of the Study

There was a lack of research concerned with the satisfaction and attitudes of higher education students on **mobile based learning**. Since the growth of technology is seen to be significant it is important also to study the experiences of the students who use mobile technology since there is no point in using a learning tool such as mobile technology if the students do not accept it and are not motivated to use it. Therefore, the experiences and consequences of the usage are significant to explore how the integration of technology is succeeding into nursing education. Besides, MBL help remove some of the formality from the learning experience especially for the post graduate students, stimulate hesitant learners, help learners remain attentive for longer periods, help increase students' self-esteem and self-confidence. Many studies have indicated that mobile, wireless device technology supports teaching and learning [18,19]. The purpose of this study is to determine postgraduate nursing students' satisfaction and attitudes of mobile based learning.

2. Materials and Method

2.1. Materials

2.1.1. Research Design

A quasi-experimental pretest- posttest study design was adopted to carry out this study.

2.1.2. Aim

Determine postgraduate nursing students' satisfaction and attitude regarding the use of mobile based learning.

2.1.3. Research Hypothesis

1. Post graduate nursing students' post satisfaction 'scores are higher than the pre one after using mobile based learning.
2. A higher post attitude scores of post graduate nursing student after using mobile based learning.

2.1.4. Setting

The study was carried out at Faculty of Nursing Damanhur University, Egypt. The faculty has nine different scientific nursing departments. Three Scientific departments started postgraduates' programs which are community health nursing, nursing administration, and nursing education out of six departments did not open for post graduate studies.

2.1.5. Subjects

It included all postgraduate students in the three departments who were enrolled in postgraduate curriculum

of the autumn 2018 and spring 2019. The total sample of the study was 36 students enrolled in diploma, master, and doctorate programs.

2.1.6. Tool for Data Collection

In order to fulfill the objectives of the study two tools were used to collect the necessary data:

Tool I: Students Satisfaction Scale, it was developed by researchers to identify students' satisfaction level which consists of fourteen statements related to:

" academic data and satisfaction with the use of smart phone usage, interaction in curriculum by smart phone etc. in addition to, students' personal data such as: age, sex.

Each item will be scored according to a 3-point Likert scale. Each subject's total score will range from 14-42. As following: less than 23 low satisfaction, 23-24 moderate satisfaction and more than 23 high satisfaction level.

Tool II: Mobile Learning Attitude Scale (MLAS). This is self-reported scale, was developed by the researchers based on Uzunboyly and Ozdamli (2003) [7] and Allyn J. Roche (2013) [20]. The aim of the tool is to investigate students' attitude of mobile learning in their education. This tool divided into three sub-dimensions. **Firstly**, Aim-Mobile Technologies Fit (A-MTF) that has eight items, describe the Sub-appropriateness of mobile learning. **Secondly**, Appropriateness of Branch (AB) that has nine items, contains appropriateness statements of mobile learning to students' content area. **Thirdly**, Forms of M-Learning Applications and Tools Adequacy of Communications (FMA/TSAC) that has nine items, contains statements regarding the applications of mobile learning for communication and sufficiency merits in education. Each participant responded to each item on a 3-points Likert scale. The total score for each one will range from 26-78 as follows: less than 43 negative attitudes, 43-60 neutral attitude, more than 61 positive attitudes.

2.2. Method

2.2.1. Administrative Process

Approval from the responsible authorities was obtained from, Nursing Administration, Community health nursing and Nursing Education departments after explanation of the purpose of the study.

2.2.2. Study Tool

Content validity for Tool (I) and (II) was established by jury of five experts' professors from Nursing Education Department. Accordingly, necessary modifications were done. Tool (I) was tested for their reliability using Cronbach's alpha was (0.968). Tool (II) was tested and the results of the Kaiser-Meyer-Olkin (KMO) was (0.968) and Bartlett's Test of Sphericity (BTS) ($X^2 = 10163.312$; $P < 0.001$) sums the MLPS under three components of the tool.

2.2.3. Nursing Intervention (Mobile Based Learning Program)

I- Preparation for Mobile Based Learning:

A work shop was done to all post graduate students to acknowledge them with the objective of the study. The

work shop was on how to use the mobile in leaning, different mobile app. as google classroom, edX, Mindly, mMind, xMind, Socrative, FormsApp, Kahoot, XRecorder, Edmodo.

II- Developmental Phase: Students were asked to apply google classroom app. on their mobile. A Short video lecture was recorded by researcher for 15 min including basic concepts (<https://support.google.com/edu/classroom/answer>).

Google Classroom is a free web service, developed by Google for schools, that aims to simplify creating, distributing, and grading assignments in a paperless way. The primary purpose of Google Classroom is to streamline the process of sharing files between teachers and students [21].

Kahoot! is a game-based learning platform, used as educational technology in schools and other educational institutions. Its learning games, "Kahoots", are multiple-choice quizzes that allow user generation and can be accessed via a web browser or the Kahoot app [22].

III-Implementation phase: MBL were applied on the three departments Nursing Administration, Community health Nursing and Nursing Education.

The researcher divided students into groups by departments and assigned activities to them and follow them with the mobile program using google classroom and kahoot apps. Every researcher follows one department from the three departments. Students and researchers can reach out to one another and connect by sharing ideas, problems, activities and helpful tips. Classroom helps students and teachers organize assignments, boost collaboration, and enhance better communication.

- The class activities were designed with adequate time for application of knowledge and skills in the class based on the objectives of the topic.
- Each group was assembled into 2 subgroups and case studies were distributed to each group and each subgroup tried to solve problems and fill the questionnaire about extent of satisfaction and students' attitude.
- Each group was encouraged to work individually on solving relevant quizzes (on the lecture) as received in their mobile. The results of the quizzes had shown immediately on their mobile, it was motivated for them. These sessions usually take 30-45 minutes.
- Each group presented their case study, their result and appropriate management.

IV. Evaluation phase:

Evaluation of the Postgraduate nursing students' prior the program was done in the form of pretest administered to them using tool (I) & (II). At the end of the program, a post test was carried out using the same tools as in pre-test.

- The researchers used google classroom, Kahoot in questioning students.

2.2.4. Pilot Study

Pilot study was conducted on (10 %) of students and they were excluded from the total number of students to insure the clarity and comprehensiveness of the tool.

2.2.5. Data Collection

Data were collected through self-administered Likert scale that was distributed among the post graduate students nursing students 2018-2019. The study tools were distributed before starting study to investigate their attitude before applying the smart phone in education process, at the end of autumn semester and finally at the end of spring semester. Each subject took a period around 25 minutes.

- Approval from Faculty of Nursing Damanhur University was obtained to carry out the study
- Meetings were held with the head of the three departments to clarify the purpose of the study and to gain the cooperation and support during data collection.
- Tool (I) was developed by the researchers after reviewing the recent relevant literature and (II) was translated and modified.

2.2.6. Ethical Considerations

All students and educators were informed about the purpose of the study and given brief explanation; oral informed consent was obtained from each of them. The right to refuse to contribute or withdraw from the study was stressed after reassuring students that their answer would have no effect on their marks. Data anonymity and confidentiality were respected.

2.2.7. Statistical Analysis

Data was fed to the computer and analyzed using IBM SPSS software package version 20.0 (Armonk, NY: IBM Corp). Quantitative data was described using number, percent, mean and standard deviation. The given graph was constructed using Microsoft Excel software. Significance of the obtained results was judged at the 5% level.

The used tests were:

- 1 - Student t-test for normally distributed quantitative variables to compare between two studied groups.
- 2 - F-test (ANOVA) For normally distributed quantitative variables to compare between more than two groups.

3. Results

Table 1 show the distribution of the study subject according to their demographic characteristics. The mean and SD of age was 28.514±2.356. As most of them 86.1%

were females. The highest subject education level 38.9% was Bachelor level. The education specialist was for administration (61.1%) and 52.8% of them were had perfect level of practicing technology.

Table 2 shows the changes in satisfaction level from pre to post phase as it observable from the table. Studied students had statically significant differences for Aim-Mobile Technologies Fit (A-MTF), Appropriateness of Branch (AB), Forms of M-Learning Applications and Tools Adequacy of Communications (FMA/TSAC, and Total satisfaction level where (P= 0.000) and the total satisfaction level changed from (25.00±3.594 to 34.17±6.372).

Figure 1 illustrate the change in satisfaction level after using mobile application in education. As 72.2% of postgraduate students had neutral satisfaction level compared to 19.4% had the same satisfaction level changed to 72.2% had positive satisfaction level compared to 0% before using mobile.

Table 1. Distribution of the studied participants according to their demographic characteristics

smetI	Total N=36	
	No	%
Age		
20-	2	5.6
25-	26	72.2
30+	8	22.2
Sex		
Male	5	13.9
Female	31	86.1
Level of education		
Bachelor	14	38.9
Diploma	11	30.6
Master	11	30.6
M±SD 28.514±2.356		
Education specialist		
Nursing education	8	22.2
Nursing administration	22	61.1
Community health nursing	6	16.7
Level of practice in technology		
Basic	12	33.3
Perfect	21	52.8
Advanced	3	13.9

Table 2. Comparison between mobile use satisfaction pre and post-test by mean score (N=36)

Items	Pre- Test		Post- test		Test of significant
	Min – Max	M±SD	Min – Max	M±SD	
- Aim-Mobile Technologies Fit (A-MTF)	8-32	19.36±4.217	12-40	30.56±6.483	t= 8.689 P= 0.000*
- Appropriateness of Branch (AB)	10-34	20.69±6.065	11-45	33.19±8.349	t= 8.689 P= 0.000*
- Forms of M-Learning Applications and Tools Adequacy of Communication (FMA/TSAC)	11-32	19.67±4.916	9-45	34.81±7.593	t= 8.689 P= 0.000*
- Total satisfaction	17-31	25.00±3.594	14-42	34.17±6.372	t= 8.689 P= 0.000*

t: test value, Statistically significant at p ≤ 0.05.

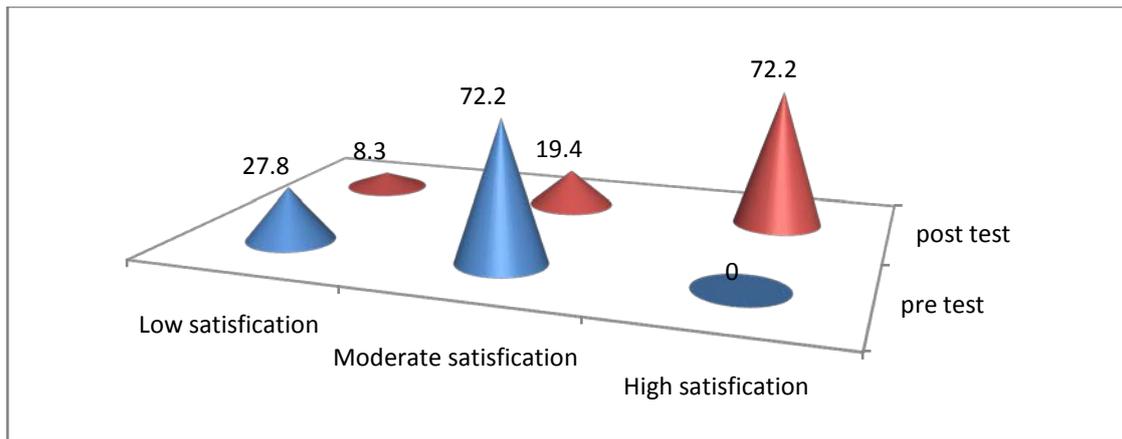


Figure 1. Distribution of postgraduate student satisfaction level during different study phases

Table 3. Comparison between Pre and Post Mobile Attitude Level Among the studied

Items		Pre N= 36		Post N= 36		Test of significant
		No	%	No	%	
- Aim-Mobile Technologies Fit (A-MTF)	- negative	17	47.2	3	8.3	X= 37.788 P= 0.000*
	- neutral	18	50.0	7	19.4	
	- positive	1	2.8	26	72.2	
- Appropriateness of Branch (AB)	- negative	17	47.2	3	8.3	X= 41.364 P= 0.000*
	- neutral	17	47.2	4	11.1	
	- positive	2	5.6	29	80.6	
- Forms of M-Learning Applications and Tools Adequacy of Communications (FMA/TSAC)	- negative	21	58.3	3	8.3	X= 54.441 P= 0.000*
	- neutral	15	41.7	2	5.6	
	- positive	0	0.0	31	86.1	
- Total Attitude	- negative	17	47.2	3	8.3	X= 54.132 P= 0.000*
	- neutral	18	50.0	1	2.8	
	- positive	1	2.8	31	88.9	

* Statistically significant at 0.05 X²= Chi square.

Table 4. The relationship between the Mobile learning practice pre- test and their demographic characteristics

Items	Mobile learning practice pre test						Total N=36		Test of significance
	Negative N=17		Neutral N=18		Positive N=1				
	No	%	No	%	No	%	No	%	
Age (years)									
- 20-	1	50.0	1	50.0	0	0.0	2	5.6	X= 1.243 P= .871
- 35-	11	42.3	14	53.8	1	3.8	26	72.2	
- 30	5	62.5	3	37.5	0	0.0	8	22.2	
Sex									
- Male	3	60.0	2	40.0	0	0.0	5	13.9	X= .478 P= .787
- Female	14	45.2	16	54.6	1	3.2	31	86.1	
Level of education									
- Bachelor	8	57.1	6	42.9	0	0.0	14	38.9	X= 4.214 P= .378
- Diploma	6	54.5	5	45.5	0	0.0	11	30.6	
- Master	3	27.3	7	63.6	1	9.1	11	30.6	
Education specialist									
- Nursing education	3	37.5	5	62.5	0	0.0	8	22.2	X= 2.238 P= .692
- Nursing administration	12	54.5	9	40.9	1	4.5	22	61.1	
- Community health nursing	2	33.3	4	66.7	0	0.0	6	16.7	
- Level of practice in technology									
- Basic	6	50.0	6	50.0	0	0.0	12	33.3	X= 3.469 P= .483
- Perfect	9	42.9	12	57.1	0	0.0	21	58.3	
- Advanced	2	66.7	0	0.0	1	33.3	3	8.3	
- Pre total satisfaction									
Low	3	30	7	70.0	0	0.0	10	27.8	X= 2.362 P= 0.307
Fair	14	53.8	11	42.3	1	3.8	26	72.2	

P: One Way ANOVA, * P < 0.05 (Statistically significant) X²= Chi square.

Table 3 illustrate the changes in attitude level from pre to post phase as it noted from the table that there a significance changes among studied students for Aim-Mobile Technologies Fit (A-MTF), Appropriateness of Branch (AB), Forms of M-Learning Applications and Tools Adequacy of Communications (FMA/TSAC, and Total attitude. Post graduate nursing students were positive attitude after utilizing MBL with statistically significant difference where $p = 0.000$.

Table 4 reveals the relationship between the attitude about mobile use in education and their demographic characteristics at pre phase of the study, it was found that there no a statistically significant difference regarding all demographic characteristics.

Table 5 illustrated the relationship between the attitude about mobile use in education and their demographic characteristics at post phase of the study, it was found that there a statistically significant difference regarding level of practice in technology where $p= 0.011$, in addition to, a statistically significant difference regarding post total satisfaction where $p= 0.000$.

Table 6 shows correlation matrix between the attitude and satisfaction level as it was found that, a significant positive intermediate correlation between different phases of the study, between pre & post satisfaction test ($r= 0.643$, $P=0.050$), Also between pre & post attitude test ($r= 0.374$, $P=0.025$), and between post satisfaction and attitude test ($r=0.471$, $P=0.004$).

Table 5. The relationship between the Mobile learning practice post- test and their demographic characteristics

Items	Mobile learning practice post test						Total N=36		Test of significance
	Negative N=3		Neutral N=1		Positive N=32		No	%	
	No	%	No	%	No	%			
Age (years)									
- 20-	0	0.0	0	0.0	2	100.0	2	5.5	X= 1.731 P= .785
- 35-	3	11.5	1	3.8	22	84.6	26	72.2	
- 30+	0	0.0	0	0.0	8	100.0	8	22.2	
Sex									
- Male	0	0.0	0	0.0	5	100.0	5	13.9	X= 0.726 P= .696
- Female	3	9.7	1	3.2	27	87.1	31	86.1	
Level of education									
- Bachelor	0	0.0	1	7.1	13	92.9	14	38.9	X= 4.118 P= .390
- Diploma	1	9.1	0	0.0	10	90.9	11	30.5	
- Master	2	18.2	0	0.0	9	81.8	11	30.5	
Education specialist									
- Nursing education	0	0.0	0	0.0	8	100.0	8	22.2	X=7.057 P= .133
- Nursing administration	3	13.6	0	0.0	19	86.4	22	61.1	
- Community health nursing	0	0.0	1	16.7	5	83.3	6	16.7	
Level of practice in technology									
- Basic	1	8.3	0	0.0	11	91.7	12	33.3	X= 13.059 P= 0.011*
- Perfect	1	4.8	1	4.8	19	90.5	21	58.4	
- Advanced	1	33.3	0	0.0	2	66.7	3	8.3	
Post total satisfaction									
- Low	1	33.3	0	0	2	66.7	3	8.3	X=40.709 P=0.000*
- Fair	1	14.3	0	0	6	85.7	7	19.4	
- Good	1	3.8	1	3.8	24	92.2	26	72.2	

Statistically significant at 0.05, $X^2=$ Chi square.

Table 6. Correlation matrix between pre and post total attitude and satisfaction scale

Items		Pre attitude	Pre satisfaction	Post attitude	Post satisfaction
Pre attitude	R				
	p				
Pre satisfaction	R	0.163			
	p	0.343			
Post attitude	R	0.374	0.223		
	p	0.025*	0.192		
Post satisfaction	R	0.056*	0.643	0.471	
	p	0.747	0.050*	0.004*	

r: Pearson coefficient.

*: Statistically significant at $p \leq 0.05$

Interpretation of r:

Weak (0.1-0.24), Intermediate (0.25- 0.74), Strong (0.75-0.99).

4. Discussion

Today most of students are using smartphone as a mean of communication and to be interactive on social media because it enables them to connect internet, and it has many features. They can gain benefits which smartphone offering as internet access, e-mails, global positioning system and personal digital assistance [23]. In addition to, health care system is increasingly becoming dependent on technology; consequently, nurses and/ or student nurses in all regions of the world are expected to develop their skills in information and communication technology [24].

The results of this study throw the light on two important issues. The first one comparing satisfaction level which changed to a higher level after using mobile applications in learning process instructions. The second one is the comparison of students' attitude level regarding using mobile in education.

The current study, revealed that the **satisfaction level** had increased after using mobile in learning with highly significant difference among postgraduate students for all Aim-Mobile Technologies Fit (A-MTF), Appropriateness of Branch (AB), and Forms of M-Learning Applications and Tools Adequacy of Communication (FMA/TSAC). This can be explained as students nowadays are interested in technology and internet. In addition to, social media and they attached to their mobile most of time all over the day as they carry their phones consciously at all times check their phones frequently, as soon as they arise in the morning. So that, they found mobile using as perfect method to interact with their colleagues and teachers. Additionally, it improves their learning abilities. The same result was found in Sulaiman and Dashti 2018 [25], as they found that their studied subjects were satisfied with smartphones for educational purposes. Moreover, their studied subjects were satisfied with factors as Internet speed, smartphone portability, smartphone skills, screen size, gender, nationality, and college.

Furthermore, Epstein and Bertram 2019 [26] found that students in their study ensured that mobile learning helped them to reflect and relate to self, others and their environments which increase their satisfaction level. Similarly, Jeong (2017) [27] study the satisfaction level regarding use of mobile learning, found that a significant increase in satisfaction in the experimental group, whereas the control group did not exhibit any significant changes.

As regards mobile use attitude, the present study show that the studied group attitude changed after using mobile application in education with highly significance as $P= 0.000$, among all attitude domains as perceived by the post graduate nursing students, this may be resulted from these applications improve their writing, reading, internet searching, communication among themselves. Besides, teachers' interaction at any time regardless of time and place, which facilitate their work and learning. This result was agreed with Bartholomew, and Reeve 2018 [28] who study middle school students and found that more 80% of their subjects had positive attitude to use mobile during class and they believe that is a great opportunity to improve students' abilities This result was also agreed with Patil et al 2016 [29], who study medical students and found that 80% of them had positive attitude towards

mobile-learning and 76.7% of students had perceived the importance of mobile –learning. Also, in Wyatt et al (2010) [30] & Iqbal S, et al. 2017 [31] they found that overall, students have a very positive attitude towards mobile learning; however, the attitudes of Arts and Engineering students were found significantly different from those of Medical and Business students. Based on that, educators and developers need to keep in mind these differences when designing any m-learning curriculum.

In the present study, having perfect level in practicing technology was significantly difference with those who had positive attitude regarding mobile use in learning. This can be explained as having perfect level of practice and positive attitude gives the students the chance to have access to use technology as mobile application in learning and overcomes barriers. Congruently, Foster & Sethares, 2017 [32] reported that postgraduate nursing students use technology application as part of their learning process which enables them from improve their work. Contrary to this result Harerimena and Matshali (2019) [33] do not found a relation between the level of practicing technology and using mobile in learning. Lastly, adoption of mobile in learning is promising educational strategies but it has many challenges and barriers regarding learners, teachers, content and technical. Faculty administration should try to overcome these barriers and facilitate using mobile application in learning to get better educational quality.

5. Conclusion

The current study findings concluded that, Hypothesis (1) Post graduate nursing students' post satisfaction 'scores are higher than the pre one after using mobile based learning is accepted.

Hypothesis (2) a higher post attitude scores of post graduate nursing student after using mobile based learning is accepted. This can be described as post graduate nursing students currently are attracted to technology and internet. So, we can use this attraction to make students enjoy learning.

6. Recommendations

Based on findings, the study recommended:

- Create new mobile applications to be used in both theoretical and clinical curriculums.
- Introduce adequate training programs to both instructors and students on using mobile application in education.
- Provision of E-courses and blended courses wherever possible in nursing education.
- Further studies to evaluate the effect of mobile-learning on nursing education with larger number of subjects.

Acknowledgments

The researchers are appreciative to all the post graduate nursing students who participated in the present study.

References

- [1] Lee H, Min H, Oh S, Shim K. *Mobile Technology in Undergraduate Nursing Education: A Systematic Review*. Health Inform Res. 2018; 24(2): 97-108.
- [2] Risling T. *Educating the nurses of 2025: technology trends of the next decade*. Nurse Educ Pract. 2017; 22: 89-92.
- [3] Richard F, Jocelyne M, Kenny V, Park C, Burton P, Meiers J. *Mobile Learning in Nursing Practice Education: Applying Koole's FRAME Model*. International Journal of E-Learning & Distance Education. 2009; (23)3: 75-96.
- [4] Kukulska-Hulme, A., Traxler, J. *Mobile teaching and learning*. In A. Kukulska-Hulme, A. & J. Traxler (Eds.). *Mobile learning: A handbook for educators and trainers*. London: Routledge. 2005. 25-44.
- [5] Kam Cheong Li, Wong S, Yau L, Wong B. *Mobile learning in nursing education: catering for students and teachers' needs*. Asian Association of Open Universities Journal. 2017; (12) 2: 171-183.
- [6] Koole, M.L., "A model for framing mobile learning", in Ally, M. (Ed.), *Mobile Learning: Transforming the Delivery of Education and Training*, AU Press, Athabasca, 2009: 25-47.
- [7] Uzunboylu, H., Ozdamli, F. *Teacher attitude for m-learning: scale development and teachers' attitudes*", Journal of Computer Assisted Learning, 2011; (27) 6: 544-556.
- [8] Kim JH, Park H. *Effects of Smartphone-Based Mobile Learning in Nursing Education: A Systematic Review and Meta-analysis*. Asian Nursing Research 2019; 13: 20-29.
- [9] Dahlstrom, E. *The ECAR study of undergraduate students and information technology, 2012*. Louisville CO: EDUCAUSE Center for Applied Research. Retrieved from <https://net.educause.edu/ir/library/pdf/ERS1208/ERS1208.pdf>.
- [10] Lall P, Rees R, Law G, Dunleavy G, Cotica Z, Car J. *Influences on the Implementation of Mobile Learning for Medical and Nursing Education: Qualitative Systematic Review by the Digital Health Education Collaboration*. J Med Internet Res 2019; 21(2): 28-95.
- [11] Kwon S, Lee JE. *Development of prototype for a prototype of mobile learning with 3G mobile phone*. J Lifelong Learn Soc. 2011; 7(2): 41-69.
- [12] GUO Z. *Exploring Chinese International Students' Acceptance of Mobile Learning*. Published PhD dissertation. Department of Educational Leadership, Policy, and Technology Studies School. The University of Alabama, 2016: 33-34.
- [13] Gomez JE, Huete JF, Hernandez VL. *A contextualized system for supporting active learning*. IEEE Trans Learn Tech. 2016; 9(2): 196-202.
- [14] Kivist M. *Nursing students' experiences in learning with mobile technology Literature Review*. Published Thesis. Helsinki Metropolia University of Applied Sciences, 2017: 1-2.
- [15] Alqahtani, M., & Mohammad, H. *Mobile applications' impact on student performance and satisfaction*. Turkish Online Journal of Educational Technology, 2015, 14, 102-112.
- [16] Shen, C., Wang, M. P., Wan, A., Viswanath, K., Chan, S. S. C., & Lam, T. H. *Health information exposure from information and communication technologies and its associations with health behaviours: Population-based survey*. Preventive Medicine, 2018, 113, 140-146.
- [17] Said U. *The Prevalence and Students' Attitude on Mobile Learning: The Case for UPM's Faculty of Education Proceeding of the 3rd Global Summit on Education GSE 2015* p 515: 525 (e-ISBN 978-967-0792-01-1), 9-10 March 2015, Kuala Lumpur, MALAYSIA. Organized by World Conferences.net.
- [18] Harerimana, A., & Mtshali, N. G. *Facilitation strategies used in e-learning by nurse educators in Rwanda*. Journal of Nursing Education and Practice, 2017, 8(1), 24-32.
- [19] Harerimana, A., & Mtshali, N. G. *Internet usage among undergraduate nursing students: A case study of a selected university in South Africa*. Journal of Nursing Education and Practice, 2018, 8(8), 75-96.
- [20] Allyn J. Roche. *M-Learning: A Psychometric Study of the Mobile Learning Attitude Scale*, Theses and Dissertations, Lehigh University Lehigh Preserve, 2013, p 90:99.
- [21] <https://support.google.com/edu/classroom/answer>.
- [22] <http://play.kahoot.it>.
- [23] Almaiah M, Jalil M. *Investigating Students' Attitudes on Mobile Learning Services*, International journal of interactive mobile technology 2014, 8(4).
- [24] Glasgow, M. E. S., Colbert, A., Viator, J., & Cavanagh, S. *The nurse-engineer: A new role to improve nurse technology interface and patient care device innovations*. Journal of Nursing Scholarship, 2018, 50(6), 601-611.
- [25] Sulaiman A., Dashti A. *Students' Satisfaction and Factors in Using Mobile Learning among College Students in Kuwait*. 2018 EURASIA Journal of Mathematics, Science and Technology Education, 2018, 14(7), 3181-3189.
- [26] Epstein I., Bertram M. *Using students' smartphones to learn a nursing skill: Students' perspectives*. Journal of Nursing Education and Practice, 2019; 9(5): 24-31.
- [27] Jeong H. *Effects of Nursing Students' Practices using Smartphone Videos on Fundamental Nursing Skills, Self-efficacy, and Learning Satisfaction in South Korea*. Eurasia, Journal of Mathematics, Science & Technology Education. 2017; 13(6): 2351-65.
- [28] Bartholomew, Scott R. and Reeve, Edward M., "Middle School Student Attitudes and Actual Use of Mobile Devices: Highlighting Disconnects in Student Planned and Actual Usage of Mobile Devices in Class" (2018). Applied Sciences, Technology and Education Faculty Publications. Paper 54. https://digitalcommons.usu.edu/aste_facpub/54.
- [29] Patil R. *Attitudes and Perceptions of Medical Undergraduates Towards Mobile Learning (M-learning)*, Journal of Clinical Diagnostic Research, 2016, 10(10): 6-10.
- [30] Wyatt TH, Krauskopf PB, Gaylord NM. *Cooperative m-learning with nurse practitioner students*. Nursing Education Perspectives. 2010; 31(2): 109-12.
- [31] Shakeel Iqbal, Muhammad Naem Khan and Imran Riaz Malik. *Mobile Phone Usage and Students' Attitude towards M-Learning: A Case of Undergraduate Students in Pakistan*. International Journal of E-learning and distance education; 2017, 32(1).
- [32] Foster, M., & Sethares, K. *Current Strategies to Implement Informatics into the Nursing Curriculum: An Integrative Review*. On-Line Journal of Nursing Informatics, 2017, 21(3).
- [33] Harerimana, A., & Mtshali. *Types of ICT applications used and the skills' level of nursing students in higher education: A cross-sectional survey*. International Journal of Africa Nursing Sciences, 2019; 11.

