INDONESIAN JOURNAL OF EDUCATIONAL RESEARCH AND REVIEW
Volume 5 Nomor 1 2022, pp 158-168
E-ISSN: 2621-8984; P-ISSN: 2621-4792
DOI: https://doi.org/10.23887/ijerr.v5i1.46159

Pre-Service Teachers' Integration of Mobile Learning Technologies for Instruction

Kehinde Muritala Nuhu[1*], Nafisat A. Adedokun[2], Shadrach Omotayo Aderele[3], Gboyega Ayodeji Aladesusi[4]
[1,2,3,4]Department of Educational Technology. Faculty of Education. University of Ilorin, Nigeria, Adeyemi College of Education, Ondo
**Corresponding author: nuhu.km@unilorin.edu.ng*

Abstrak

Penggunaan perangkat seluler untuk pembelajaran dapat memperbesar cakupan pendidikan tinggi dan memungkinkannya menjangkau siswa dengan lebih baik. Tujuan dari penelitian ini adalah untuk menganalisis integrasi guru prajabatan teknologi mobile learning untuk pengajaran. Populasi untuk penelitian ini terdiri dari semua guru pra-jabatan di metropolis. Teknik Proportional Sampling digunakan untuk memilih 150 responden berdasarkan perkiraan populasi mereka menggunakan Model Israel. Instrumen pengumpulan data adalah angket yang diadaptasi. Statistik deskriptif dan inferensial digunakan untuk menjawab pertanyaan penelitian dan menguji hipotesis yang diajukan dengan bantuan statistik product and service solution (SPSS) versi 20.0 pada taraf signifikansi 0,05. Temuan menunjukkan bahwa guru prajabatan mengintegrasikan teknologi seluler untuk pembelajaran di universitas Ilorin. Tidak ada perbedaan signifikan dalam integrasi teknologi seluler guru pra-jabatan untuk pengajaran berdasarkan jenis kelamin mereka. Studi ini menyimpulkan bahwa pembelajaran dapat ditingkatkan di antara guru pra-jabatan jika teknologi seluler yang sesuai digunakan untuk pembelajaran. Oleh karena itu, disarankan agar guru Prajabatan didorong untuk menggunakan teknologi seluler untuk pembelajaran terlepas dari jenis kelamin mereka.

***Kata kunci*:** *Guru Prajabatan, Teknologi Mobile Learning, Integrasi, Smartphone*

Abstract

The use of mobile devices for learning can broaden the scope of higher education and enable it to reach students better. This study aimed to analyze the integration of pre-service teachers in mobile learning technology for teaching. The population for this study consisted of all pre-service teachers in the metropolis. The Proportional Sampling technique selected 150 respondents based on their estimated population using the Israeli Model. The data collection instrument was an adapted questionnaire. Descriptive and inferential statistics were used to answer research questions and test the proposed hypothesis with product and service solution statistics (SPSS) version 20.0 at a significance level of 0.05. The findings show that pre-service teachers integrate mobile technology for learning at Ilorin university. There are no significant differences in pre-service teacher technology integration for mobile learning by gender. The study concludes that pre-service teachers can improve learning if appropriate mobile technologies are used for learning. Therefore, it is suggested that Pre-service teachers apply mobile technology for learning regardless of their gender.

Keywords: Pre-service Teachers, Mobile Learning Technologies, Integration, Smarphone

History:
Received : January 19, 2022
Revised : January 23, 2022
Accepted : April 07, 2022
Published : April 25, 2022

Publisher: Undiksha Press

1. INTRODUCTION

In the networked era, mobile devices (smart phones, tablets) are growing and penetrating into everyone's life. Users use mobile devices for many purposes such as making phone calls, surfing the Internet, checking email, setting up work schedule in the calendar, making notes, watching movies and TV shows, listening to music, using GPS function, using utility applications, and playing games (Barnes et al., 2019; Fathi et al., 2018). These functionalities make mobile devices become so popular that someone believes mobile devices can actually replace laptops due to their sufficient functionalities and portability (García-Martínez et al., 2019; Mahdi, 2018; Pindeh et al., 2016). University students represent one of the largest groups of mobile device users. They are very receptive to new technologies and are always among the first users of the latest model of mobile devices (N. Churchill, 2020;

Mayer & Mayer, 2005). The main question is that whether pre-service teachers have used mobile devices to enhance instruction. The answer for this question lies within the applications of those devices.

Research shows that mobile devices promise a great potential in education (Nikolopoulou & Kousloglou, 2019; Romero-Rodríguez et al., 2020). Mobile learning allows students acquiring their learning materials anywhere and anytime using mobile technologies and the internet (Liu et al., 2016; Narayan et al., 2019). Definitions of mobile learning are numerous. Mobile learning is a learning that happens when students are not on a fixed location, or a learning that happens when students use learning possibilities of mobile technologies. Other definition describes m-learning as learning through different contexts, through social and content interactions, using personal electronic devices (García-Martínez et al., 2019; Nikolopoulou & Kousloglou, 2019). Context in this definition means learning that is formal, self-directed and spontaneous (Pogrebinskaya et al., 2021). There are some differences when comparing m-learning with e-learning. Mobile learning allows learning "on the go", while e-learning demands a classroom, a computer lab or a place for a computer with the internet connection to attend or hold the lecture. In instructor to student communication, mobile learning allows instant, synchronous and spontaneous communication, while with e-learning there is a time-delayed, passive and asynchronous communication. Mobile learning enables taking assignments and tests at any location independent of in advance agreed time, E-learning, on the other hand, demands dedicated time of taking the tests, standard tests and restricted amount of time to answer the questions, with usually delayed feedback (Sidiq & Nuswantoro, 2021; Suprayogie & Hakim, 2021). The recent advances in mobile technology are changing the primary purpose from making or receiving calls to retrieving the latest information on any subject. M-learning focuses on the mobility of the learners, interacting with portable technologies.

Using mobile tools for creating learning aids and materials becomes an important part of informal learning. M-learning is convenient in that it is accessible from virtually anywhere. Sharing is almost instantaneous among everyone using the same content, which leads to the reception of instant feedback and tips (Arsyad & Lestari, 2020; Parsazadeh et al., 2018). M-learning also brings strong portability by replacing books and notes with small devices, filled with tailored learning contents. The use of mobile technology as a tool for enhancing students' learning and teachers' instruction is indispensable. Recognizing the impact of mobile technology on the workplace and everyday life, teacher training institutions try to undergo a rapid change in the structure and content of their training and delivery method of their courses (Imelda & Astuti, 2019; Lai & Hwang, 2014). Mobile tools were found to have potential for helping pre-service teachers understand and develop new literacy (Wetcho & Na-Songkhla, 2022).

Since technology are so present in the daily lives of teenagers, a class without their use would be completely uninteresting (Liao et al., 2021; Simsek & Can, 2020). Over the past decades, it has been recognized the added value of the use of technological tools in the classroom and, since then, efforts have been made by different stakeholders in the field of education, including scientific community and governments in order to generalize its use and consequently improve the teaching learning process (McGarr & Gallchóir, 2021; Nurtanto et al., 2020; Weng & Chen, 2020). While the emerging political economy of higher education suggests an increase in the diversity of educational contexts, technology assisted learning could indeed offer an important toolkit with which to increase choice and respond to the needs arising (Shrivastava & Shrivastava, 2014). With the numerous technologies available, teachers and students can access a multitude of information and make use of it, exploring their potential. The use of these technologies in the classroom provides a closer relationship between teacher and student promotes their interaction and leads to a joint and more active

learning (Bergdahl et al., 2020; McGarr & Gallchóir, 2021; Weng & Chen, 2020). The constant presence of tools awakens in student's greater interest in looking for new ways, allowing a larger and more consolidated acquisition of knowledge. The ability to easily share information with others, creatively utilize a wide variety of resources and critically evaluate the veracity and value of sources are just a few examples of the activities implicit to everyday use of mobile technology in education.

There is an urgent demand for other forms of education delivery such as m-learning and e-learning in order to make use of high availability of mobile devices as well as to leverage the students' academic usage patterns of their portable device and realise the goal of the education curriculum (Eze et al., 2018; Liu et al., 2016; Zimmer et al., 2021). Although mobile learning is being introduced gradually in universities across Nigeria, it is a growing form of knowledge delivery and it faces many challenges such as integration of m-learning into the existing educational curriculum and development of highly rich m-learning content. Technology has been integrated into society at an exceptional rate, and schools are not immune to the expanded use of mobile devices in classrooms (Simsek & Can, 2020; Smith & Santori, 2015; Tetzlaff, 2017). The use of mobile devices for learning can enlarge the scope of tertiary education and allow it to better reach students (Smith & Santori, 2015). The use of these technologies for learning is equally capable of providing a more interactive and effective type of learning to meet individuals' learners needs. Other research said that mobile technology can be beneficial for higher education due to its ubiquitous nature and ability to shape information processes (Darmaji et al., 2019; Schepman, A. et al., 2012). Mobile technology offers the ability to engage in learning activities such as communication and content material sharing between students and lecturers, students and subject experts, and among students and their environments. It was also attested that mobile learning "has attracted a great deal of attention from researchers in different disciplines who have realized the potential to apply mobile technologies to enhance learning. Researches have shown that students were very positive concerning the use of tablets in higher education, stating these devices are beneficial for immediate access to information and enhancing learning experiences, according different learning styles and preferences. The purpose of this study is to analyze the integration of pre-service teachers of mobile learning technology for instruction at the University of Ilorin.

2. METHODS

This study is descriptive research using cross-session survey method. The population for this study will consist of all pre-service teachers in university of Ilorin. The target population consists of pre-service teachers in university of Ilorin. The selected educational zones consist of Zaria, Kaduna, Sabon Tasha and Giwa. Proportional sampling technique will be used to select 150 respondents using the Israel Model (2013) sample size at ±5% precision level. Descriptive research type was adopted, using four-point Likert scale response modes: Strongly Agree (SA=4), Agree (A=3), Disagree (D=2), and Strongly Disagree (SD=1). The instrument was validated by the researcher's supervisor and three other lecturers in the Department of Educational Technology, Faculty of Education, University of Ilorin, Nigeria. They helped to review the questionnaire to check the clarity of language and ensure it is relevant to the study. Their suggestions and corrections were noted for the final draft of the instrument. The reliability of the instrument was determined by administering 40 copies of the questionnaire to pre -service teachers in Kwara state university and Cronbach Alpha technique of reliability statistics was used to analyze the result. The reliability of the instrument was determined based on sections of the variables in the instrument. In all the instruments yielded 0.89 coeficient.

The researcher will collect a letter of introduction from the Department of Educational Technology before visiting schools in the four educational zone to administer the questionnaire to the teachers. The researcher will seek permission from the authorities of the schools concerned before administering the instrument. The researcher and four research assistants will administer the questionnaire to the respondents and retrieve the completed questionnaire for further analysis. The respondents will not be coerced and their statement will be kept confidential. Also, the researcher will not ask the participants to mention their names in order to preserve their privacy. The data obtained through the questionnaire will be analyzed and interpreted using descriptive and inferential statistic. Means and percentage will be used to answer research questions. Hypotheses will be tested using independents t-test. Data collected will be coded and analyzed using IBM Statistical Package for Social Sciences (SPSS) version 20.0 at 0.05 level of significance.

3. RESULTS AND DISCUSSION

Results

The types of mobile technology owned by pre-service teachers are presented in Table 1. Based on data analysis indicated the type of mobile devices owned by pre-services. Item 1 with mean score 1.95 revealed that majority of the pre service teachers owned a Smartphone. Item 2 with mean score 1.25 showed that few of the pre-service teachers owned a PDA. Item 3 with mean score 1.23 indicated that majority of the pre-service teachers do not own an IPod. Item 4 with mean score 1.77 indicated that majority of the pre-service teachers owned a Laptop. Item 5 with mean score 1.50 indicated that many of the pre-service teachers do not own anMP3 Player. Item 6 with mean score 1.65 indicated that majority of the pre-service teachers owned a Tablet Pc. Item 7 with mean score 1.45 indicated that many of the pre-service teachers owned a Bluetooth Headset. Item 8 with mean score 1.33 indicated that majority of the pre-service teachers do not own a Smart watch. Item 9 with mean score 1.27 indicated that majority of the pre-service teachers do not own a Palmtop. Item 10 with mean score 1.55 indicated that majority of the pre-service teachers owned an E-book reader. The grand mean was 1.49. It can be deduced that the pre-service teachers owned smart phones.

Table 1. Types of Mobile Technologies Owned by Pre-Service Teacher

Mobile Devices	Mean	Standard Deviation
Smartphone	1.95	0.212
PDA	1.25	0.433
IPod	1.23	0.424
Laptop	1.77	0.420
Mp3 player	1.50	0.540
Tablet Pc	1.65	0.491
Bluetooth	1.45	0.512
Smart Watch	1.33	0.512
Palmtop	1.27	0.487
E-book-reader	1.55	0.512
Grand Mean	**1.49**	

Based on data analysis, the different mobile devices used by pre-service teachers for instructional puposes. Item 1 (Smartphone) with mean score 3.93indicated that majority of the pre-service teachers make use of Smart phone for instruction. Item 2 (PDA) with mean score 3.19 indicated that majority of the pre-service teachers do not make use of PDA for instruction. Item 3 (IPod) with mean score 3.22 indicated that majority of the pre-service

teachers do not make use of IPod for instruction. Item 4 (Laptop) with mean score 3.79 indicated that many of the pre-service teachers make use of Laptop for instruction. Item 5 (Mp3 player) with mean score 3.47 indicated that many of the pre-service teachers make use of Mp3 player for instruction. Item 6 (Tablet Pc) with mean score 3.58 indicated that majority of the pre-service teachers make use of Tablet Pc. Item 7 (Bluetooth headset) with mean score 3.39 indicated that majority of the pre-service teachers make use of Bluetooth headset for instruction. Item 8 (Smart watch) with mean score3.27 indicated that majority of the pre-service teachers do not make use of Smart watch for instruction. Item 9 (palmtop) with mean score 3.23 indicated that majority of the pre-service teachers make use of palmtop for instruction. Item 10 (E-book-reader) with mean score 3.50 indicated that majority of the pre-service teachers make use of E-book-reader for instruction. The grand mean was 3.46. It was deduced that the pre-service teachers make use of mobile devices for instruction. The integration of mobile learning technologies for instruction shown in Table 2.

Table 2. The Integration of Mobile Learning Technologies for Instruction

ITEM	SD	D	SA	A	Mean	Standard Deviation
There's a smooth communication between the learners and instructor	2%	13.3%	42.7%	42%	3.25	0.761
Teaching with mobile technologies makes learning more effective	7%	6.7%	40%	52.7%	3.32	0.6227
I make use of MLT to mark learners attendance	4%	28%	29.3%	38.7%	2.93	0.857
Learners productivity increase when I use MLT for instruction	2%	10.7%	36.7%	50.7%	3.22	0.713
I use MLT for instruction anytime	4%	18.7%	30.7%	46.7%	3.04	0.810
I use MLT to keep record of learners assignment	3.3%	15.3%	32.%	49.3%	3.10	0.775
The use of Mobile Learning technology create an easy communication within the students and their instructor	2%	9.3%	34%	54.7%	3.21	0.688
Learners concentrate more when I use MLT for instruction	4.7%	19.3%	35.3%	40.7%	3.07	0.857
I use MLT to give an instant access to information	2%	10%	44.3%	44%	3.30	0.730
Learners concentrate more when using MLT for instruction	4%	18.8%	32.9%	44.3%	3.06	0.824
Grand Mean				**3.15**		

Table 2 showed the integration of mobile learning technologies for instruction. Item 1 with mean score 3.25 showed that 42.7% of the pre-service teachers strongly agreed that there's a smooth communication between the learners and the instructor when they use MLT for instruction. Item 2 with mean score 3.32 indicated that 52.7% of the pre-service teachers agreed that teaching with mobile technologies makes learning more efficient. Item 3 with mean score 2.93 showed that 38.7% of the pre-service teachers agreed that they use MLT to mark learners attendance. Item 4 with mean score 3.22 indicated that 50.7% of the pre-service teachers strongly agreed that learners productivity increase when they use MLT for instruction. Item 5 with mean score 3.04 showed that 46.7% of the pre-service teachers

strongly agreed that they use MLT for instruction anytime. Item 6 with mean score 3.10 indicated that 49.3% of the pre-service teachers strongly agreed that they use MLT to keep record of learners assignment. Item 7 with mean score 3.21 showed that 54.7% of the pre-service teachers strongly agreed that the use of MLT create an easy communication within the students and their instructor. Item 8 with mean score 3.07 indicated that 40.7% of the pre-service teachers strongly agreed that learners concentrate more when they use MLT for instruction. Item 9 with mean score 3.30 showed that 44.3% of the pre-service teachers agreed that they use MLT to give an instant access to information. Item 10 with mean score 3.06 indicated that 44.3% of the pre-service teachers strongly agreed that learners concentrate more when they use MLT for instruction. Distribution of respondents perceived Contribution of Mobile learning technologies for instruction shown in Table 3.

Table 3. Distribution of respondents perceived Contribution of Mobile learning technologies for instruction

Item	SD	D	A	SA	Mean	Standard Deviation
MLT encourages learners to learn	7%	2.7%	56%	40.7%	3.52	0.588
MLT arouse the interest of learners	7%	6%	54.7%	38.7%	3.31	0.615
MLT encourages individualized learning	1.3%	6.7%	49.2%	42.7%	3.40	0.676
MLT encourages learners to learn in motion	3.3%	14%	38%	44.7%	3.17	0.792
Learners concentrate a lot when using MLT in comparison with other visual educational multimedia available in the class.	2.7%	26.7%	25.3%	45.3%	2.93	0.791
Item	**SD**	**D**	**A**	**SA**	**Mean**	**Standard Deviation**
I feel learning via MLT increase isolation in educational environment	4%	25.3%	26.7%	44%	2.93	0.825
MLT environment is quiet comfortable	7%	10%	32.7%	56.7%	3.21	0.641
MLT use in class is quiet comfortable	2%	10%	40%	48%	3.26	0.718
MLT motivates learners to learners to learn at their own pace	1.3%	6.7%	47.3%	44.7%	3.38	0.672
MLT has made learning portable	2%	5.3%	41.3%	51.3%	3.32	0.669
Grand Mean			**3.24**			

Table 3 showed the pre-service teachers' perceived contribution of mobile learning technologies for instruction. Item 1 with mean score 3.52 revealed that 56% of the pre-service teachers agreed that MLT encourages learners to learn. Item 2 with mean score 3.31 showed that 54.7% of the pre-service teachers agreed that MLT arouse the interest of

learners. Item 3 with mean score 3.40 indicated that 49.2% of the pre-service teachers agreed that MLT encourages individualized learning. Item 4 with mean score 3.17 showed that 44.7% of the pre-service teachers strongly agreed that MLT encourages learners to learn in motion. Item 5 with mean score 2.93 indicated that 45.3% of the pre-service teachers strongly agreed that learners concentrate a lot when using MLT in comparison with other visual educational multimedia available in class. Item 6 with mean score 2.93 showed that 44% of the pre-service teachers strongly agreed that learning via MLT increases isolation in educational environment. Item 7 with mean score 3.21 indicated that 56.7% of the pre-service teachers strongly agreed that MLT environment is quiet comfortable. Item 8 with mean score 3.26 showed that 48% of the pre-service teachers strongly agreed that MLT use in class saves time and effort. Item 9 with mean score 3.38 indicated that 47.3% of the pre-service teachers agreed that MLT motivates learners to learn at their own pace. Item 10 with mean score 3.32 showed that 51.3% of the pre-service teachers strongly agreed that MLT has made learning portable. The grand mean of the distribution was 3.24. Using the average bench mark of 2.5, it can be concluded that mobile learning technologies used by pre-service teachers has a significant influence on instructional delivery. Based on data analysis, it can be deduced that there was significant difference between male and female student on the assessment of pre-service teachers integration of mobile learning technologies for instruction. This was reflected in the results of the hypothesis tested; df (123) t = -159, 0.874 > 0.05. This means that the hypothesis which states that there is no significant between male and female student on the assessment of pre-service teachers integration of mobile learning technologies for instruction is rejected.

Discussions

Student interest is one of the most questioned facets of pre-service teachers' integration of mobile learning in recent studies. In fact, several studies found that mobile learning generated strong interest among the students (Dashtestani, 2013; Mahdi, 2018; Matzavela & Alepis, 2021). In addition, students reported having a strong, positive reaction to integrating mobile learning for instruction. Students also recognize the potential for future mobile learning opportunities as new technologies are integrated into education (Nuryadi et al., 2020; Piñero Charlo et al., 2021). Research has shown that mobile learning and teacher education generally considered mobile learning a beneficial approach in extending teachers' learning experiences and enhancing their mobile technology integration skills. In addition to conducting professional development via mobile tools, researchers also investigated the impact of such programs on teachers' inclusion of these technologies in their classrooms.

In other words, with the use of mobile devices, learners can learn anywhere and at any time (D. Churchill et al., 2013; Romero-Rodríguez et al., 2020). Mobile learning is considered to be the ability to use mobile devices to support teaching and learning. Mobile learning is certainly not merely the conjunction of 'mobile and learning'; it has always implicitly meant mobile Electronic-Learning and its history and development have to be understood as both a continuation of conventional Electronic-Learning and a reaction to this conventional Electronic-Learning and to its perceived inadequacies and limitations. It is the mobile aspect of mobile learning that makes it stand apart from other types of learning, specifically designing learning experiences that exploit the opportunities that mobility can offer us (Y. Chen et al., 2019; Su & Cheng, 2013). This is because mobile devices have features and functionality for supporting learners (Darmaji et al., 2019; Sigut et al., 2020). For example, podcasts of lectures can be made available for downloading. Learners are to expect to engage with these learning resources whilst away from the traditional learning spaces. Over the past ten years mobile learning has grown from a minor research interest to a set of significant projects in schools, workplaces, museums, cities and rural areas around the

world. The mobile learning community is still fragmented, with different national perspectives, differences between academia and industry, and between the school, higher education and lifelong learning sectors. Mobile learning using handheld computers is in its infancy in terms of both technologies and pedagogies (Bipinchandra et al., 2014; C. H. Chen et al., 2016). It has been found that after being exposed to teacher educators, pre-service teachers began to utilize mobile technologies in their own practices. By encouraging mobility, the teacher educators' role shifted from a content provider at the centre of instruction to a facilitator, engaging pre-service teachers as they collaboratively constructed meanings around content.

This study had sought to investigate the assessment of pre-service teachers' integration of mobile learning technologies for instruction, University of Ilorin. Education and the use of emerging technologies in education are two inseparable entities because education is dynamic, so is technology fast growing with dynamism (David & Schwaninger, 2021; Huang et al., 2020). The use of computer technologies in homes, offices, for research and scientific purposes has revolutionised human culture. Undoubtedly, part of the innovative technologies was the development of pulse size mobile devices such as Tablet Pc, Iphones, android phones, blackberry phones etc. which as well are capable of doing virtually all the wonder works a big computer does. Mobile devices have precipitated phenomenal changes in our daily lives, work and society. The prevalence of these technologies among students is transforming the educational system in Nigeria which is regarded as one of the third world countries. The continued growth of mobile technology as an educational tool is as a result of its flexibility and pervasiveness (Hanifah et al., 2020; Smith & Santori, 2015). The point of discussion that this study has raised is how these technologies can be effectively incorporated into teaching and learning process in and outside the classroom. The numerous advancement in the advancement in the capabilities of mobile devices unavoidably an important tool that should be legally accepted into classroom instruction to foster the needed development in education. Although students abuse of the open opportunities is expected, but check-mate measures would also be put in place to counter up-rising abuse of these opportunities.

4. CONCLUSION

In conclusion, this study has examined the assessment of pre-service teacher's integration of mobile learning technologies for instruction in University of Ilorin. The result obtained from the findings revealed that most of the pre-service teachers' integrate mobile learning technologies into instruction; it also reveals that the use of mobile learning technologies for instruction arouse the interest of learners. It is concluded that there's significant difference on the assessment of pre-service teachers integration of mobile learning technologies for instruction based on their gender.

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