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Effect of Blended Learning on Teaching Large Classes in Faculty of Education University of Maiduguri

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Abstract
The aim of this study is to examine the effect of blended learning on the teaching and learning large classes in among ore-service teachers in a Nigerian University. The study adopted Ex-Post Factor design to determine the effect of blended learning on teaching a large class size among pre-service teachers at the University of Maiduguri. A purposive sampling technique was to draw a sample of 1,608 from the two separates test. The data obtained were analyzed using descriptive statistics (mean and median) and an independent sample t-test to analyzed the results. The results of the study show that there is a significant difference in the mean scores of pre-service teachers taught through blended learning and those taught with the conventional approach in large classes. Similarly, there is not much difference between the mean scores of male and female pre-service teachers taught with blended learning in a large class. The findings of the study revealed that blended learning enhances the management of large classes and improve pre-service teachers' achievement test. Therefore, blended learning integrated pedagogy is the effective strategy to manage large classrooms. The study recommends that there is a need to deploy teachers with adequate skills of handling large classes through the application of blended learning instructional strategies. Also, lecturers should be trained to develop skills and master the arts of integrating technology into their classroom teaching and management of classrooms with large population.
Keywords: Information and Communication Technology, Blended Learning, large classes, Teacher Education Programme, Pre-service Tauchers

Introduction

The rapid growth of human population around the world seems to have elicited a drastic increase in student enrollment in teacher education. It brought about large classes. Teacher Education Programmes in Nigeria are faced with influx of enrollees that resulted on issues of class size this prevailing situation has been grossly affecting the production of a world class standard teachers. Teaching and learning in a large class may affect the quality of information presented, hence, the advent of Information and Communication Technology (ICT) hopes to rectify such challenges. (Ajayi et al., 2021, Vajargah et al., 2010). The emergence of blended learning has proffered solutions to several pedagogical issues. Among which is online teaching and learning. Full online courses have some advantages which are flexibility, student-centred and promotion of self-directed learning among students. However, fully online learning tends to limit teacher-learner interactions and students may feel alienated. This could contribute to lower ratings for some courses (Herbert et al., 2017). The use of ICT in education has been categorized into several approaches such as Blended learning, Mobile learning, flipped learning, Web-based learning, Online learning, Networked learning, Distributed learning, and Flexible learning, among others. Blended learning is emerging as one of the important components for the education sector and has attracted some attention to the sector (Amenduni, & Ligorio, 2022).

Blended learning is a mixed mode of instruction that the combines both face to face and online instruction methods of teaching and learning. Numerous studies revealed how blended learning gradually gaining significance in the education industry. Blended learning is perceived to be a better approach that enhanced pedagogy, access, flexibility, learner engagement and participation, and improved classroom management (Ma'arop & Embi 2016; Papo

2001) This method is believed to have made teaching effective. Blended learning is still an emerging trend in higher education as it combines synchronous and asynchronous learning approaches to meet specific educational goals (Levin, Whitsett, & Wood, 2013).

Large class in a teacher education programme poses many challenges including promoting disengagement among pre-service teachers, difficulties in providing feedback, and monitoring students' learning among others. Large classrooms when not properly managed may affect quality of teaching and learning. With the numerous advantages of blended learning aforementioned, the use of ICT technology can be used to augment classroom teaching and learning especially where the class size is large. While considering the role of gender in a large class size, particularly in a teacher education programme, (Mohammed Ibrahim et al., 2017) indicates that gender is being one of the major factors in determining the avenue of creating competition among male and females. This paper observes that whether having large class size affect gender's performance. In a study conducted by (Crombie et al., 2003) on the role of gender in a small class and large class size shows both genders outperformed their counterparts in large class size. Similarly, class size has a considerable role to play in addressing gender differences in higher schools (Apata, 2013; Ho & Kelman, 2014). The study further suggested that much work need to be done to understand the nature of the class size the differently affect gender of learners. Thus, this study aims to examine the effect of blended learning usage on teaching a large class size in a Faculty of Education, University of Maiduguri.

Review of Related Literatures

Large class size

Globally, Massive enrollment of students has been trending in a teacher education programme (Hornsby & Osman, 2014, Bati et al., 2015). This may be attributed to the growing number of students wishing to be admitted annually. Numerous researchers have tried to define large class. However, it is obvious that there is a convention as to what constitute of normal class size, at least the desired class size should be between 25 to 40 students in a class, however, the majority of teacher education class sizes here in Nigeria may likely exceed the conventional class size. Todd (2006) construed that the concept of a large class is loosely defined with several interpretations depending on the settings, place, or country.

A large class is one in which the population of the student hinders and deters the teacher's performance and competence (Sharndama, & IJemofwu 2013). There are instances whereby the number of students surpasses the physical structures and learning materials available. In Nigeria, the maximum recommended ratio of teacher-learner for effective teaching and learning in primary school is 1:35, While in secondary school is 1:40 and for teacher education programmes and undergraduate studies according to NUC teacher student ratio for education department is 1:30, this in accordance with the Nigerian Policy on Education (NPE, 2014). Nevertheless, these ratios tend unrealistic due to a large number of enrolled. Several schools and institutions in Nigeria have much more learners in a classroom. Hence creating a large class. Students, as many as five hundred, often gather in a small hall and receive lectures (Bati et al., 2014). In some instances, the class becomes so congested without proper ventilation making the atmospheric condition unsuitable for effective teaching and learning. this is a common scenario in Nigerian high institutions (Rienties et al., 2013). Perhaps, it can be inferred that any extra number of learners above the stipulated ration could be constituted as large class. Of course, it can be looked from different perspective that large class be categorized as medium, large and extra-large classes. This depends on the number of learners in each stream. A population of learners above five hundred can be considered as extra-large; two to four hundred as very large and fifty-one to a hundred and fifty as large (Bati et al., 2014). This arbitrary grouping is contestable, taking into cognizance environment, infrastructure and facilities.

Large classes in many cases create several challenges for teachers and present negative effects on the students as well. It is obvious that small classrooms are easier to manage,

organize, control, and observe, which is alien to large classrooms realities (Masembe et al., 2007). Biggs (1999) maintains that an increase in class size contributes to the increase in the difficulties faced by the teacher and students. The students face problems in a large class that have negative effects on their learning (Anny, et al., 2020). In most cases the students lack proper communication and exchange of views in their learning, as they are anonymous and passive during classroom learning (Biggs 1999). (Wilsman, 2013) argued that an Overcrowded classroom promote student disengagement and feelings of isolation, which can erode students' sense of responsibility and may lead to behaviours that show lack of engagement. (Shan, 2020) in his study classified the problems of large classes into three categories pedagogical problems, management-related issues, and affective concerns. According to Shan (2020), some of the issues outlined are difficulties in monitoring student learning and providing feedback, Handling students' grades, dealing with cheating, discipline, classroom and time management. These issues have rendered the transmission and receiving of knowledge in a classroom daunting task.

Blended Learning

The term "blended learning", also referred to as "hybrid learning" has been defined by scholars using different interpretations. Garrison & Vaughan (2008) defined blended learning as a student-centred, self-paced, flexible, and multi-modal approach to learning. Blended Learning has also been defined as "combining online delivery of educational contents with the best features of classroom interaction and live instruction (Adaobi et al., 2019). A common definition of blended learning incorporates the blend of computer-mediated and face-to-face teaching and learning (Ma'arop & Embi 2016). Herbert et al., (2017) postulated that a blended course employs a combination of the traditional classroom method and distance learning through the Web. According to (Eddy et al., 2014), the most common definition of blended learning is the combination of physical classroom learning and a virtual environment. Hence, blended learning could be defined as a teaching and learning method that combines online teaching and learning approach and face-to-face communication.

Blended learning encourages students to be independent learners and has also revealed significant positive outcomes in the teaching and learning process (Alebaikan & Troudi, 2010). Mal & Adhya (2020) argued that blended learning has been consistent with the constructive theoretical model and interactive learning, precisely with collaborative knowledge construction, this is because the learning model gives emphasis to learners' active involvement during the instruction and the teachers' role is mostly facilitation. Blended learning based on constructivism, emphasized learning through, interactive learning, cooperation among teacher/learner, critical thinking, purpose-oriented learning and performance in a group, and multidimensional interaction among the group members important tool in large classroom instruction Gharacheh et al. 2016, Mal & Adhya 2020, Francis 2012). A blended approach may improve the effectiveness of classroom management, especially for large classes (Papo 2001) It is also believed to increase the rate of student-paced learning, student confidence and satisfaction with the overall learning experience (Sancho 2006). This study is out to examine the impact of blended learning on teaching in large class sizes in higher institutions of learning in Nigeria.

Research Questions

The following research questions were answered in this study:

1. What is the mean difference in the achievement test score of pre-service teachers taught through blended learning and conventional approach in large classes?
2. What is the mean difference in the achievement test score of male and female pre-service teachers taught with blended learning in large classes?

Research Hypotheses

Two null hypotheses were formulated for this study:

1. There is no significant difference in the mean achievement test of pre-service

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teachers who are taught through Blended Learning and Conventional Approach in large classes.

2. There is no statistically significant difference in the mean achievement test of Male and Female pre-service teachers who are taught using Blended Learning in large classes.

Methodology

This study was conducted to generate evidence for proposing solutions on how to deliver lectures in a large class via integrating technological tools into the classrooms. The Educational Technology course was offered by over (800) eight hundred pre-service teachers with the through blended learning. The use of both face to face and online components has made learning ubiquitous, hence, online communication was also employed concurrently. Telegram application platform was used by lecturers and students to collaborate which made the course interactive. The study deployed an ex-post factor research design to determine a cause-and-effect relationship between teaching EdTech group taught through blended learning and M & E group taught without the application of any form of technology (measurement and evaluation group). The study comprised pre-service teachers who are enrolled to study a teacher education programme at the Faculty of Education, University of Maiduguri. A purposive sampling technique was used to select a sample of nonequivalent 1608 pre-service teachers of two intact sets of pre-service teachers undergoing their studies at the University of Maiduguri.

The researchers used the end-of-semester results of pre-service teachers who were taught in technology enhance classrooms (Blended Learning) and conventional approach without technology during the classroom sessions. Both set of the selected sample for the study belong to two different set of large classrooms. The pre-service teachers in the EdTech group are selected from an Educational Technology 300 level Class (457 {57.1%} Females, and 344 {42.9%} Males) while the M & E group were selected from the 300-level pre-service teachers of Measurement and Evaluation class (425 {52.7%} Females, and 381 {42.3%} Males), using a purposive sampling technique The study used mean and standard deviation to answer the research questions. A t-test was used to analyze the null hypotheses at 0.05 level of significance. Statistical package SPSS version 25 was used to analyze the results.

Table 1: Gender Distribution

Gender	EdTech Group		M & E Group		Frequency	Percent
Male	344	42.9 %	381	42.3 %	725	45.1%
Female	457	57.1 %	425	52.7 %	882	54.9%
Total	801	100%	806	100%	1,607	100%

Table 1 above shows the gender distribution of the EdTech and M & E groups. In the EdTech group 42.9% are males while 57.1% are female pre-service teachers. The M & E group comprised of 42.3% males and 52.7 female pre-service teachers. in total, the gender distribution in the study is amounting to 45.1% are males and 54.9% are females. This indicate that there is almost 5% difference between the two genders with female taking the lead.

Results

Research Question One

What is the mean difference in the achievement test of pre-service teachers taught through blended learning and conventional approach in large classes?

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Table 2: Mean and Standard Deviation of Blended learning (EdTech Group) and conventional approach (M & E Group) in Large Classes.

Group	N	Mean	Standard Deviation
EduTech	801	58.36	10.95
M & E	806	44.20	12.30
Total	1,607		

Table 2 above revealed the mean achievement scores of pre-service teachers in a Blended Learning class taught and those in a conventional approach both of which are taught in a large class. Based on the findings of the result, the mean achievement scores of the EdTech group and the M & E group were 58.36 and 44.20 respectively, while the standard deviation was 10.95 and 12.30 respectively. Thus, indicates that the mean of EdTech group is found to be higher than that of M & E group. Therefore, the instruction with blended learning performed better than the M & E group. This shows that pre-service teachers in the blended learning approach performed better than those in the conventional approach in the large classes.

Research Question Two

What is the mean difference in the achievement test of male and female pre-service teachers taught with blended learning in large classes?

Table 3: Descriptive Statistics showing the Mean and Standard Deviation of Blended learning (EduTech Group) in a Large Class.

Gender	N	Mean	Standard Deviation
Male	344	57.92	11.03
Female	457	58.69	10.89
Total	801		

Table 3 above indicates the mean achievement scores and standard deviation of male and female pre-service teachers in the blended learning of the large class. The mean achievement scores of male and female pre-service teachers were 57.92 and 58.69 respectively and their standard deviation was 11.03 and 10.89 respectively. This indicates that there is not much difference between the mean scores of male and female pre-service teachers taught with blended learning in a large class.

Testing of Hypothesis

Hypothesis One

There is no significant difference in the mean achievement test of pre-service teachers taught using Blended Learning and Conventional Approach in large classes.

Table 4: t-test of Mean Achievement of pre-service teachers who are taught using Blended Learning (EduTech Group) and those in Conventional Approach (M & E Group) in large class.

Group	N	Mean	SD	Df	t	CV	Sig.	Decision
EduTech	801	58.36	10.95					
				1605	24.37	1.96	.000	Rejected
M & E	806	44.20	12.30					
Total	1,607							

Table 4 shows the t-test analysis of the difference between the mean achievement scores of pre-service teachers in blended learning classes and that conventional approach both in the large class. The results show that the t-value (24.37), at 1605 degrees of freedom at 0.05% level of significance, is greater than the t-critical value (1.96). This indicates that the null hypothesis was rejected. This means that a significant difference exists in the mean scores of pre-service teachers taught in the EdTech group

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and those of the M & El group in the large classes.

Hypothesis Two:

There is no statistically significant difference in the mean achievement test of Male and Female pre-service teachers who are taught using Blended Learning in large classes.

Table 5: t-test Summary on the Mean Achievement test of Male and Female pre-service teachers who are taught using Blended Learning in large classes.

Gender	N	Mean	SD	Df	T	CV	Sig.	Decision
Male	344	57.92	11.03					
				799	-.978	1.96	.328	Accepted
Female	457	58.69	10.89					
Total	801							

Table 5 shows the t-test analysis of the difference between the mean achievement scores of male and female pre-service teachers in blended learning classes in a large class. The results show that the t-value (-.978), at 799 degrees of freedom at a 0.05% level of significance, is less than the t-critical value (1.96). This indicates that the null hypothesis was accepted. This means that there is no statistically significant difference between the mean scores of EdTech and M & E groups in the large classes.

Discussions

The findings of the study on research question one and hypothesis one revealed that the achievement scores of those who received instruction with blended learning techniques performed better than the group taught using the conventional approach. This shows that pre-service teachers in the blended learning approach performed better than those in the conventional approach in the large classes. Therefore, the null hypothesis was rejected. The findings concurred with studies by (Bada et al., 2020, 2020; Bati et al., 2014; Kusi & Manful, 2019; Sheu & Eleanya, 2020; Yoon & Lee, 2010). The studies found that the application of blended learning in a large class size enhances students' academic performance. For instance, Kusi & Manful (2019), in a study on the effect of large classes discovered that the implementation of a blended learning approach enhances the student's motivation and self-regulated learning. Also, Bati et al., 2014 states that the application of blended learning in large class sizes improves classroom participation among learners, they further revealed that learners are motivated in a hybrid classroom that engages both online and face-to-face instruction.

On the contrary, Alvarez Jr (2020), Baepler et al. (2014), Bains et al. (2011), Berga et al. (2021), Ferriman (2013), and Köhler (2022) found that the application of blended learning in a highly congested classroom may seem to be boring due to excessive usage. Furthermore, in a study to examine the effect of blended learning and the conventional approach in large class sizes by Berga et al. (2021), found that both approaches do not suit enhancing learner outcomes due to the overcrowded nature of the classroom. They revealed that technology enhances large class sizes and might serve as a great burden to a teacher to control the large crown. It is important that educators should stick to the recommended number of students to teacher ratio to achieve the desired learning outcomes.

Based on the data generated, it appears, there is no clear-cut distinction on whether a technology-driven classroom may advance learners' academic performance or otherwise. Most of the studies that aligned with the present study are predominantly conducted in third-world countries, where the convention of student-teacher ratio is not adequately adhered to. In this regard, despite obtaining a positive result, there is still the need to consider that large class sizes may have a negative impact on learners' outcomes. Although, the use of technology might help in reducing over-lonesomeness especially the one attributed to a teacher who uses a traditional approach to teach without technological facilities like public address systems, may find a large class size to be boring. This may affect teachers' productivity and health. Thus, the need to

strike balance and introduce stringent quality control measures to reduce class size and employ more teaching and supporting staff to manage the education system.

The findings on the gender component of the study indicates that there is not much difference between the mean scores of male and female pre-service teachers taught with blended learning in a large class. This suggests the null hypothesis was accepted. Since there is no statistically significant difference between the mean scores of EdTech and M & Egroups in the large classes. The findings are in congruence with Kuo et al. (2014), Lin et al. (2016), and Yoon & Lee (2010), who found gender does not play a significant role in a blended learning environment. Conversely, studies conducted by Snowball (2014), Vo et al. (2020), and Zhang et al. (2022) revealed that gender plays a significant role in large class sizes. Vo et al. (2022), found that there is a relationship between female achievement tests and large class sizes and disciplinary differences. This, according to them, the level of females' comprehension and concentration while in a crowded area surpasses that of a male counterpart. They further stressed that females' brains can absorb multiple pieces of information at a time and that large class sizes may have a minimal negative impact on their achievement test.

The above finding is not limited to a single gender, this is because according to Snowball (2014) and Zhang et al. (2022) gender difference was found in large class sizes with blended learning instruction, both studies were conducted to implement blended learning among students of diverse background and gender was considered as one of the variables to assess students' performance during the implementation of the course. The results of the studies indicate that male students outperformed their female counterparts at the end of achievement tests. On that note, it is evident that gender does not plays a significant role in a blended learning environment. Perhaps, considering the findings of the present studies conducted in a mixed institution, which revealed there is no significant difference in the achievement tests of female and male pre-service teachers. Further exploratory studies may be conducted focusing specifically on the influence of large class sizes on gender.

Conclusion

This study examined the impact of blended learning instruction in large-sized classes. It is concluded that blended learning environment may likely influence pre-service teachers' performance in a large class. It has been concluded that the achievement test of pre-service teachers who underwent instructions with blended learning outperformed those who do not. Therefore, blended learning when carefully considered would prove to be a powerful teaching approach. Especially, when learning experiences are well-designed, selected, utilized and implemented. The study also conclude that the application of blended learning is a teacher education programme enhances pre-service teacher scores. Similarly, pre-service teachers have reacted positively and preferred the us blended learning instructions during their classroom interactions. Therefore, blended learning instruction has a promise of unsurpassed strategy to manage large classrooms.

Recommendations

1. In order to achieve the desired results of producing an up-to-date teacher that can compete with the current realities, there is a need to deploy blended learning instructional strategy in teacher education programme.
2. There is a need to employ more lecturers in teacher education programme to implement the student-teacher ratio.
3. Lecturers should be trained to develop skills and master the arts of integrating technology into their classroom teaching and management of classrooms with large population.
4. Large and well-ventilated classrooms should be constructed to conveniently accommodate ever growing desired for higher education among the citizenries.

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