



**EFFECT OF FLEX BLENDED LEARNING ON UNIVERSITY STUDENTS'
PERFORMANCE AND INTEREST IN RESEARCH METHODS COURSE IN
OSUN STATE**

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Abstract

Ameliorating University students' performance and interest in research methods course using was investigated at the University of Ilesa, Osun State, Nigeria. The study evaluated the effect of Flex Blended Learning (FBL) on university students' performance and interest in the research methods course. Pre-test, post-test, non-equivalent quasi-experimental and analytical survey designs were employed. One hundred five (105) 300-level students from two intact groups formed the sample. Two instruments, the Research Methods Performance Test (RMPT) and the Research Project Skills Interest Rating (RPSIR), were used to collect the data. Experts in the field of Research Methods and Statistics validated the instruments. A reliability index of 0.76 for RMPT was obtained using Pearson's product-moment correlation, while 0.72 for RPSIR was obtained using Cronbach's alpha. The data collected were analysed using the mean, standard deviation, and analysis of covariance (ANCOVA). The findings revealed a significant difference in the performance and interest of students between the experimental group and the control group. Moreover, gender does not significantly affect students' performance in flex-blended learning groups. It was recommended, among other things, that lecturers adopt FBL to improve university students' performance in research methods courses.

Keywords: Flex blended learning, Interest in research methods, Undergraduate's performance in Osun State

Introduction

University education plays a transformative role in personal growth, cultivating essential skills such as problem-solving, critical thinking, and effective citizenship. Through a comprehensive learning experience, education nurtures intellectual growth, technical proficiency, and moral character, equipping individuals with the skills and values necessary to become self-sufficient, socially conscious, and engaged citizens who drive

positive change and national progress. The ultimate purpose of education, according to Nwafor and Osuala (2024), is to empower an individual to excel in a chosen field of endeavour or career and to impact their environment positively. This can be achieved through the number of courses students are exposed to while pursuing their chosen career at the university.

The research methods course as offered in the teacher education programme is expected to equip students with the necessary research project skills that can enable them to carry out their project independently as part of the University requirement before graduation. According to Echebe (2022), research methods courses expose students to a systematic and rigorous process of designing, conducting, analysing, and reporting research. The course emphasises ways of choosing and applying appropriate methods and techniques to collect and interpret data, as well as evaluating the validity, reliability, and ethical implications of the research findings. Abe (2023) asserted that research methodology is not a one-size-fits-all approach. It depends on the research question, purpose, scope, and context of the research. Additionally, different types of research require distinct methodologies, including quantitative, qualitative, mixed, or action research. Moreover, different disciplines employ distinct research methods, particularly at the undergraduate level.

In the research methods course, students learn a clear and logical framework for conducting and evaluating research, which helps them to plan, organise, and execute their research systematically and consistently. It also allows students to justify and explain their choices and decisions regarding the research design, methods, and techniques. A well-taught research methods course facilitates the advancement and dissemination of knowledge, preparing students to contribute to the existing body of knowledge in their field and beyond.

However, it is essential to recognise that teaching and learning in the 21st century have taken a distinct shape due to the emergence of technological resources, and education cannot be overlooked. The twenty-first century is a digital era in which technological resources significantly influence human actions and perceptions of relevance. Technological tools have greatly enhanced human life in society. These tools have definite potential to educate the mind and reshape learning capacities. The use of technology in education has brought efficiency and convenience in literacy and numeracy. To teach more effectively, Adibe (2021) suggested that teachers need to acquire a deeper understanding of digital pedagogy, new learning theories, and the differences in students associated with digital tools and activities, as well as a broader understanding of various learning styles in the 21st century. Present-day students are profoundly influenced by their digital environment. The environment they are exposed to is media-rich, electronic, and digital (Abe, 2023). This environment provides a communication medium with instant gratification. These students are referred to as Digital Natives (Owolabi, 2022). Therefore, Teachers are expected to migrate to a digital world to be relevant in the educational system.

Meeting the diverse needs of individual students has always been a challenge for teachers and educators. With only so many minutes in a class or hours in a day, teachers have struggled to provide for gifted, average, and struggling students and honour all learning styles. Adding online learning experiences to face-to-face (traditional classroom) delivery has been one solution to these challenges, and research suggests that these hybrids are successful. Therefore, blended learning is no longer an option for classrooms; it is necessary. The combination of face-to-face instruction and online learning opportunities allows for individualisation, flexibility, and a greater chance for student success. Twenty-first-century learning has evolved from traditional methods to digital pedagogy. Learning styles, which refer to students' approaches to learning, problem-solving, and information processing, are also evolving. The way students learn is significant in any teaching-learning situation because if students are to learn content knowledge to facilitate remembering, understanding, applying, analysing, evaluating and creating then educators can be assured that teachers are scaffolding learning by building on a basis of knowledge recall and comprehension to desired outcomes and consequences, which would enhance creativity and innovation.

The low-level interest cum the performance of students in research methods course could be attributed to the teachers' wrong use of instructional strategies. Students must be engaged in the classroom for learning to be meaningful. One of the ways to do this is through the implementation of technology-enabled learning (blended learning). Okoro (2022) investigated a comparative analysis of flex-blended learning and the guided inquiry method on students' interest in science. The results showed that: (a) students in the FBL group demonstrated a significant increase in interest in science compared to the GI group, (b) the FBL group showed higher mean scores on the interest in science survey compared to the GI group, and (c) there was a significant positive correlation between students' interest in science and their academic achievement in science.

The present study, therefore, adopted the Flex Blended Learning instructional strategy, which combines online learning with traditional classroom instruction to create a personalised learning experience for students. According to Shank (2023), flexible-blended learning improves student autonomy and provides individualised learning goals. Adolphus (2020) asserted that in a flex-blended learning strategy, students learn by using personal laptops and Android phones connected to the internet, while in a face-to-face classroom, teachers only provide guidance and support, such as one-on-one tutoring or group sessions. This type of technology-enabled learning facilitates students' active participation in the teaching and learning process. Therefore, this study investigated ways to improve the performance and interest of university students in research methods courses using Flex Blended Learning in Osun State.

Statement of the Problem

The traditional classroom instruction is characterised by the teacher standing in front of students to dictate notes. In this teaching and learning process, students only memorise

information without internalising the significant concepts. Research methods courses cannot be taught this way. Empirical investigations show that students remain passive in this type of learning situation throughout the lesson. The output of this type of classroom teaching is poor performance and an inadequate interest. Again, the 21st-century students are digital natives. The traditional method of teaching is no longer adequate for problem-solving. This has been a worrisome situation for stakeholders in education. Teaching in the 21st century must emphasise understanding how to use information technologies. On this note, teachers must instruct students on computer usage, legitimate internet research methods, and how to identify helpful information using technological tools. Based on this, the study focused on enhancing the performance and interest of university students in research methods courses using Flex Blended Learning.

Research Questions

The following research questions guided the study:

1. How does FBL affect University students' performance in the research methods course?
2. What is the performance of male and female university students taught in research methods courses using FBL?
3. How does FBL affect University students' interest level in research methods courses?

Hypotheses

- Ho₁: There is no significant difference in the performance mean scores of University students taught research methods courses using the FBL and the Lecture Method (LM).
- Ho₂: There is no significant difference in the performance mean scores of male and female university students taught research methods courses using FBL and Lecture Method (LM).
- Ho₃: There is no significant difference in the interest level mean scores of University students taught research methods courses using the FBL and the Lecture Method (LM).

Methodology

The study employed a pre-test, post-test non-equivalent quasi-experimental design and an analytical survey, and was conducted at the University of Ilesa, Osun State, Nigeria. One hundred five (105) 300-level students, divided into two intact groups, A and B, formed the sample size. The researchers used 300-level students in the Faculty of Education because they would start their practical project writing in 2025. Two instruments were used for data collection: the Research Methods Performance Test (RMPT), comprising 30 multiple-choice questions, and the Research Project Skills Interest Rating (RPSIR), which consisted of 20 positive item statements. Research Project Skills Interest Rating (RPSIR) was designed on a four-point Likert scale of (Strongly Agree = SA, Agree = A, Disagree = D, Strongly Disagree SD) rated 4, 3, 2, and

1, respectively. Experts in the field of Research Methods and Statistics validated the instruments. The corrections were incorporated into the final format of the instrument. A reliability index of 0.76 for RMPT was obtained using Pearson's product-moment correlation, while 0.72 for RPSIR was obtained using Cronbach's alpha. The experimental group (A) was taught a research methods course using a flex-blended learning approach, while the control group (B) was taught the same course using the traditional lecture method. In the experimental group, students were given websites concerning the topics under study. They used their laptops and Android phones to connect to the internet (online) in the classroom. A post-test and questionnaire were administered to both groups of students to assess the treatment's effectiveness. The mean and standard deviations addressed the research questions, while ANCOVA was used to test the hypotheses at a 0.05 significance level.

Results

The results of the statistical analysis of the research questions and the null hypotheses are presented in the following tables:

Research Question 1: How does FBL affect University students' performance in the research methods course?

Table 1: Mean and Standard deviation of pre-test and post-test performance of students in the research methods course using FBL

Strategies Groups	n	Pretest	SD	Posttest	SD	Mean Difference
FBL A	51	67.80	3.57	78.50	7.20	10.7
LM B	54	64.60	4.52	67.80	5.60	3.2

Table 1 presents the pre-test and post-test mean scores of the experimental group, which are 67.80 and 78.50, respectively. In contrast, the control group's pre-test and post-test means are 64.60 and 67.80, respectively. This result indicates that the experimental group had higher mean performance scores in the research methods course than the students in the control group.

Research Question 2: What is the performance of male and female university students who are taught research methods courses using FBL?

Table 2: Mean and Standard deviation of pre-test and post-test performance of male and female students in the research methods course using Flex Blended Learning

Gender	N	Pre-test mean	SD	Post-test Mean	SD	M/G
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Male	19	65.15	2.65	71.10	7.24	5.9
Female	32	71.30	4.29	75.20	7.26	3.9

MG= Mean Gain

Table 2 shows that the pre-test and post-test means for males are 65.15 and 71.10, respectively. For females, the corresponding means are 71.30 and 75.20. This result indicates that males had a higher mean gain of 5.9 than the females in the research methods course. This shows that male students performed better than female students in this study.

Research Question 3: How does FBL affect University students' interest level in the research methods course?

Table 3: Summary of summative means and standard deviations of interest level scores of university students based on FBL and Lecture Method (LM)

Strategies Groups	n	Pretest	SD	Posttest	SD	Mean Difference
FBL A	51	53.70	4.57	81.50 7.50		27.8
LM B	54	51.40	3.72	57.40 6.50		6.0

Table 3 presents the mean interest scores of the experimental group before and after the test, at 53.70 and 81.50, respectively. In contrast, the control group's mean interest scores were 51.40 and 57.40. This result indicates that the experimental group had higher mean interest scores in the research methods course than the students in the control group.

H₀₁: There is no significant difference in the performance mean scores of University students taught research methods courses using the FBL and the Lecture Method (LM).

Table 4: Analysis of Covariance (ANCOVA) on Performance of University Students Taught Research Methods Course using FBL and Lecture Method (LM).

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1145.148 ^a	2	572.574	13.726	.000
Intercept	1966.662	1	1966.662	47.147	.000
Prep	80.009	1	80.009	1.918	.169
Group	974.532	1	974.532	23.362	.000

Error	4296.513	103	41.714
Total	40002.000	105	
Corrected Total	5441.660	104	

Table 4 shows that the F-value of 23.362, obtained at 1 and 100 degrees of freedom, had a corresponding p-value of 0.000, which is less than the chosen alpha of 0.05 ($0.000 < 0.05$) for the study. This means there is a significant difference in the performance of university students who are taught research methods courses using the FBL method and the lecture method (LM).

H02: There is no significant difference in the performance mean scores of male and female university students taught research methods courses using FBL and Lecture Method (LM).

Table 5 Analysis of Covariance of Performance of male and female University students taught research methods course using FBL

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	99.649 ^a	1	24.912	.518	.723
Intercept	2493.335	1	2493.335	51.861	.000
Gender	4.685	1	4.685	.097	.756
Error	5144.270	50	48.077		
Total	57145.000	51			
Corrected Total	5243.920	48			

Table 5 summarises the ANCOVA on the performance of male and female University students taught research methods courses using FBL. There was no significant difference in the performance of male and female students ($P = .756 > 0.05$). The null hypothesis was accepted at the 0.05 significance level.

H03: There is no significant difference in the interest level mean scores of University students taught research methods courses using the FBL and the Lecture Method (LM).

Table 6: Dependent Variable: Posttest Interest Scores. Covariate: Pretest.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1145.148 ^a	3	572.574	13.726	.000
Intercept	1966.662	1	1966.662	47.147	.000
Pretest	80.009	1	80.009	1.918	.169

Groups	974.532	2	974.532	23.362	.000
Error	4296.513	103	41.714		
Total	40002.000	105			
Corrected Total	5441.660	104			

In Table 6, the calculated F-value of 23.362 is significant at .000 ($P < 0.05$). The null hypothesis that there is no significant difference in the mean interest level scores of university students taught a research methods course using the FBL and Lecture Method (LM) was not accepted. Therefore, there is a significant difference in the interest level mean scores of university students who were taught a research methods course using the FBL and the Lecture Method (LM).

Discussion

The results in Table 1 show that flex-blended learning has a greater effect on students' performance in research methods courses than the lecture method. The result in Table 4 revealed that FBL had a significant effect on the mean performance of students in the research methods course. This result is in line with the findings of Balogun (2020), who studied the effect of Flex Blended Learning on Geography students' academic performance in Port Harcourt Local Government Area, Rivers State and found that students taught with Flex Blended Learning performed better than those taught with the Demonstration method with a high mean gain. The results further showed that male students had higher mean scores than female students in terms of academic performance. The findings of Bates (2023), who studied the effect of the Flex Instructional Strategy on the academic performance of Chemistry students in Electrolysis in secondary schools in Owerri metropolis, Imo State, Nigeria, revealed that students taught using the Flex instructional strategy recorded higher academic performance than those taught using the conventional method.

The results in Table 2 showed that FBL had a more significant effect on the performance of male students in the research methods course than that of female students. Table 5 showed no significant difference between the performance of male and female students taught research methods courses using FBL. This result aligns with the studies of Adebayo (2019) and Ibrahim (2020), which found no interaction effect between male and female students on performance based on instructional methods. However, the result disagrees with that of Nwagbo and Okoro (2018), which showed that male physics students achieved better than their female counterparts in an interaction pattern group. The results in Table 3 also indicated that FBL has a greater effect on students' interest level in research methods courses than the lecture method. The result in Table 4 revealed that FBL had a significant effect on the mean performance of students in the research methods course. This result aligns with Okoro's (2022) findings, which indicate that the interest of students taught using Flex blended learning was higher than that of those taught using the guided inquiry method. It is necessary, therefore, to agree that FBL can

be applied in all lessons. Although there are other instructional strategies, FBL can help improve students' performance and interest in any subject matter if applied effectively.

Conclusion and Recommendations

The study investigated ameliorating University students' performance and interest in research methods courses using Flex Blended Learning (FBL) in Osun State, Nigeria. The study builds on the use of 21st-century innovative and learner-centred instructional strategies that encourage active participation, higher-level thinking skills in students, and engagement. The study showed that flex-blended learning proved more effective than the lecture method (LM) in understanding the research methods course. The lecture method was found to be weak in ameliorating students' performance and interest. The study also provided empirical evidence on the relative efficacy of an interactive strategy in enhancing teaching and learning outcomes in research methods. Based on the study's findings, it was concluded that the use of flex blended learning has a significant impact on students' performance and interest in the research methods course. The study recommended that:

1. Lecturers should adopt FBL to ameliorate university students' performance in the research methods course.
2. Lecturers should enrol in, attend, and participate in workshops and conferences to improve and update their knowledge of technology-enabled learning.
3. Lecturers should also adopt flex blended learning to ameliorate students' research project skills in the research methods course

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