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EFFECT OF SLACK ON ACADEMIC PERFORMANCE OF MATHEMATICS STUDENTS IN COLLEGES OF EDUCATION IN NORTH-CENTRAL NIGERIA

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ABSTRACT

This study examined the effect of Slack on academic performance of Mathematics students in college of Education in North-Central Nigeria. Specifically, it investigated the difference in the post-test performance of students taught Mathematics using Slack and those taught using the PowerPoint package, the difference in academic performance between male and female students taught using Slack, and the interaction effect of gender and use of Slack on students' academic performance. The study adopted a quantitative research approach using a quasi-experimental pretest-posttest non-equivalent group design and a descriptive approach. The target population comprised NCE II Mathematics Education students in Colleges of Education in Kwara and Niger State. Purposive sampling was used to select the participants, while the mathematics Performance Test served as the instrument for data collection. Data were analysed using descriptive statistics, an independent -sample t-test, and Analysis of Covariance (ANCOVA) at the 0.05 level of significance, with SPSS version 27.0. The findings revealed that students taught using Slack obtained a higher mean post-test score (M=67.4, SD= 7.66) than those taught using PowerPoint package (M=58.8, SD= 8.45). Although female student recorded a higher mean score (68.3) than male students (62.0), the difference was not statistically significant, t(19)= -1.981, p= 0.062. Furthermore, the interaction effect of gender and use of Slack on students' on academic performance was not statistically significant, F(1, 15) = 1.398, p= 0.255. The study concluded that Slack-supported instruction may enhance mathematics students' academic performance compared with PowerPoint-based instruction, with no statistically significant gender difference in achievement. It was recommended that lecturers in Colleges of Education should integrate Slack into Mathematic teaching to promote collaborative learning and improve students' academic performance.

Keywords: Slack, Academic Performance; Mathematics

Introduction

Education is the process of facilitating learning or the development of knowledge, skills, attitudes, beliefs, and habits. Education is one of the most essential catalysts for eradicating poverty and creating shared prosperity. Education is the process of acquiring knowledge, skills, values, morals, beliefs, and habits, and facilitating personal development. It is a potent tool for social, economic, and political progress, without which neither an

individual nor a society can achieve professional development (Oyedokun & Adeolu-Akande, 2022). Tertiary education is the third tier of Nigeria's educational system, following secondary education. Tertiary education is the education provided after secondary school in universities, colleges of education, polytechnics, monotechnics, and institutions offering correspondence courses (Federal Republic of Nigeria, 2014). These types of educational institutions equip individuals not just for appropriate and relevant professional skills, but also for active participation in their communities and societies.

There are diverse academic fields within education, and these can be broadly categorised into art, science, and social science. Science education refers to the teaching and learning of science and its allied disciplines at all levels of schooling, including the science courses at universities. It is geared toward achieving scientific literacy. It is widely considered one of the most integral parts of today's education. It is a field of acquiring knowledge, skills, and attitudes necessary to understand and address the complex scientific and technological challenges facing society (United Nations Educational, Scientific and Cultural Organisation (UNESCO), 2017).

Science education is a field of study that develops students' understanding of the natural world, acquires scientific literacy, and prepares them to participate in scientific inquiry and make informed decisions about scientific knowledge. It has various disciplines, in which Mathematics education is one of them. Mathematics education is viewed as a science that builds logical thinking and mathematical knowledge in students. Mathematics is a systematic application of numerical values to resolve intricate problems. Its significance for individual and societal development cannot be overstated. It is a mandatory subject studied at primary, secondary, and most tertiary education levels in Nigeria. The attainment of mathematical knowledge is essential for scientific and technical advancement and is a pivotal element in a nation's socioeconomic development. Obafemi et al. (2023) described mathematics education as a crucial subject for societal progress, just as protein is vital for the growth of an individual.

Mathematics is the science that studies and clarifies quantities, numbers, measurements, and the connections between them. Mathematics as a subject can be described as an instrument for the development of any science-based discipline, such as graphics, technology, astronomy, analytical reasoning, and industry. Hence, its significance cannot be underrated in human endeavours. Mathematics is often referred to as a fundamental discipline that explores the structure, patterns, and relationships inherent in the universe. Rooted in ancient civilisations and continuously evolving, mathematics serves as a powerful tool for understanding and solving problems across various domains. It encompasses a diverse array of branches, each with its own distinct focus and applications. The importance

placed on the subject is derived from the fact that it would help the nation meet its quest for scientific and technological advancement (Oloda et al., 2024).

Mathematics is widely recognised as the language of science, and it is often referred to as the mother of science. It is a tool for technological development; hence, no nation can grow technologically without a sound mathematical foundation. The significance of Mathematics has made it indispensable in the curriculum in both the Ordinary level and the Advanced level of studies. There are numerous branches of Mathematics, whereby Calculus is one of them, with subdivisions. Calculus, as a branch of Mathematics, has very wide areas of application in the physical sciences and engineering. It is essentially divided into integral calculus and differential calculus (Adamu et al., 2022). Integral calculus depends on two fundamentally important concepts: that of a continuous function and that of the derivative of a continuous function.

Integral calculus is one of the main courses in mathematics, which is compulsory in Mathematics education in tertiary institutions. The topic of integrals is the primary material to support other courses and will impact mastery or understanding of the material in other classes, such as numerical methods, fundamental analysis, differential equations, analytical geometry, and others. For students, mastering this material also helps make it easier to understand other materials, such as proving the area of a plane and the volume of a rotating object and its application in the fields of physics and economics (Listiana & Wirevenska, 2020). Students' academic performance is directly related to their growth and development of knowledge in an educational situation where the teaching and learning process takes place. Garba and Musa (2019) maintained that students' academic performance is the accomplishment in terms of grades obtained in a given test. Academic performance is a direct assessment indicator of student learning achievement that aims to predict future learning outcomes based on historical student behaviour data.

In the Nigerian education curriculum, Mathematics is an indisputable and essential subject offered to students in educational institutions from primary to tertiary levels, owing to its significance in learning processes and daily activities. Mathematics education is offered in colleges of education in Nigeria through the Nigerian Certificate in Education (NCE) program. Mathematics education is the specialised training given to would-be teachers in a formal school system, to equip and nurture them for the great task of teaching. Teachers' education connotes the process of preparing teachers for professional roles as reflective practitioners. Mathematics education is critical because quality education cannot be attained by any nation if the quality of teachers is not enhanced (Adedeji, 2018).

It has been reported that students' performance in Mathematics in Nigerian higher institutions has been subpar (George et al., 2020; Owan et al.,2020). Wonu &

Zalmon (2019) reported that most Mathematics students in tertiary institutions in Nigeria graduate with third-class and second-class honours (Lower division). Obafemi et al. (2023) underlined that the situation of Mathematics education is currently a subject of concern, considering its essential significance in different aspects of life. The integration of a wide range of relevant technology tools for teaching mathematics is essential. The integration of technology in teaching mathematics, often referred to as digital pedagogy, aims to enhance students' learning engagement and academic achievement. The use of technology has become a necessity for schools and teachers to meet the needs of students' learning. The utilisation of ICT in education is crucial for enhancing teaching and learning, as it can increase students' learning outcomes in tertiary education (Makinde et al., 2023). ICT allows students to communicate with one another through email, mailing lists, chat rooms, and other means. It allows for faster and easier access to more comprehensive and up-to-date information.

Educational approaches have undergone major changes as a result of the advent of digital technology and the internet. The rapid improvements in ICTs resulted in the emergence of Electronic learning (E-learning). E-learning emerged to address the increasing demand for flexible, accessible, and interactive educational experiences. E-learning platforms advanced online as internet access increased, allowing educators and students to participate in webinars, virtual classrooms, and collaborative online settings. E-learning seeks to employ contemporary technology to disseminate information to the student, surpassing the limitations of time and location (Daas & Ali, 2024). E-learning is a collection of synchronous and asynchronous learning experiences that are provided through various devices, including computers and cellphones. While asynchronous learning uses different learning platforms like Moodle, Blackboard, and Google Classroom, synchronous learning uses live sessions to allow for real-time interaction between the teacher and students.

Singh and Thurman (2019) stated that within the framework of online learning, students engage in a learning experience that is implemented in both synchronous and asynchronous modes, utilising communication devices such as smartphones and computers with an internet connection. A synchronous learning environment facilitates student engagement in live lectures, real-time communication with educators and peers, discussions regarding stress and course activities, and enables prompt feedback from instructors and classmates. However, in an asynchronous learning environment, students can learn at any time and at their own speed through recorded lectures, stored files, and questions posted by instructors and peers. In an e-learning environment, participants or learners rely on themselves rather than on teachers as the only source of information. Through the use of texts, videos, audio, collaborative learning, and

captivating graphics, e-learning ensures that students are completely involved in the educational process.

The emergence of smartphones and mobile devices further influenced e-learning in tertiary education. Mobile learning (m-learning) allows students to access instructional content anytime, anywhere. Mobile apps and adaptable e-learning platforms offered seamless learning experiences on numerous devices, suiting the hectic lifestyles of modern learners. Additionally, social collaboration became a key aspect of e-learning systems (Galagedarage & Indrasena, 2023). Online forums, virtual classrooms, and collaborative platforms promote active engagement and knowledge exchange beyond the traditional classroom setting.

The terms online learning, distance learning, remote learning, virtual learning, and mobile learning are used interchangeably. However, they have different meanings and usage. Online learning is a planned and systematic manner of instruction offered mostly through internet-based platforms. It is defined by the use of Learning Management Systems (LMS), digital content, and online communication technologies to facilitate teaching and learning. Distance learning is a broader educational framework that stresses the physical separation of learners and instructors, regardless of the medium of instruction. Historically, distance learning included correspondence courses and broadcast media. Remote learning is applied when learners are unable to attend face-to-face classes, frequently as a response to emergency or crisis conditions such as pandemics, strikes, or natural disasters. Unlike online learning, remote learning is often transitional rather than deliberately designed.

Virtual learning is instruction given in digitally simulated environments that replicate or augment traditional learning spaces. These settings may include virtual classrooms, simulations, or immersive systems such as virtual laboratories. M-learning is supported through portable digital devices, like smartphones and tablets. It stresses ubiquitous access, flexibility, and learner-centred interaction. The similarity between these terms is that they use technology to support teaching and learning, enable learning outside the traditional classroom, promote flexibility in time, place, or pace, support learner–instructor interaction digitally, and are relevant in modern education and lifelong learning. Slack is one of the applications supported by smartphones. Slack is a communication platform for peer support and cohesion in a project-based methodological course. Slack is a collaborative tool that can enhance the online classroom experience, improve in-person instruction by facilitating communication, and offer opportunities to disseminate materials and updates between class sessions. Slack serves as a collaborative platform that facilitates intercultural learning and communication among students, particularly in online education (Chadha & Relly, 2024)[111]. Web conferencing platforms like Microsoft

Teams and Slack provide pedagogical advantages and may assist in mitigating poor educational performance.

Furthermore, this research will ascertain the influence of gender on the use of Slack for learning. The term gender refers to a wide range of biological, behavioural, physical, and mental characteristics used to differentiate the female and male population. Gender is one of the important factors affecting the use of technology in the teaching and learning process. Gender is the socially constructed characteristics of women and men, such as norms, roles, and relationships of and between groups of men (male) and women (female) (Abidoye & Abidoye, 2022). Alabi (2023) determined the moderating effects of gender on the dependent variables. The study revealed that gender has no significant effect on the academic performance of students taught with the Microsoft Teams Online Learning Package (MTOLP). The main purpose of this study was to examine the effects of Microsoft Teams and Slack on the academic performance of mathematics students in colleges of education in North-Central Nigeria.

1. examined the difference in the post-test performance of students taught Mathematics using Slack and those taught using the PowerPoint package.
2. investigated the significant difference between the academic performance of male and female students exposed to Slack for learning a Mathematics concept.
3. determined the interaction effect of gender and the use of Slack on students' academic performance in Mathematics.

Research Questions

The following research questions were used to answer the specific purposes raised

1. What is the difference in the post-test performance of the students taught Mathematics using Slack and those taught using the PowerPoint package?

Research Hypotheses

The following research hypotheses were formulated and tested at a 0.05 level of significance:

H_{01}: There is no significant difference between the academic performance of male and female students taught Mathematics with Slack.

H_{02}: There is no significant interaction effect of gender and the use of Slack on students' academic performance in Mathematics.

Methodology

The study adopted a quantitative research approach. A quasi-experimental pretest-posttest (non-equivalent and non-randomised experimental) and descriptive design was adopted. Experimental group was taught using Slack, while the control group was taught using PowerPoint. The design is schematically represented as follows:

EG	O_1	X_1	O_2
CG	O_3	X_2	O_4

Where:
EG: Represents the experimental group
CG: Represents the control group
O_1: Is a pretest for the experimental group
O_3: Is a pretest for the control group
O_2: Is a posttest for the experimental group
O_4: Is a posttest for the control group
X_1: Indicates the treatment for the experimental group (Slack)
X_2: Indicates the treatment for the control group (PowerPoint Package)

The population for the study was all mathematics education students in colleges of education in North-Central Nigeria. The target population was limited to mathematics education students in colleges of education in Kwara State and Niger State. There are 14 public Colleges of Education in the North Central zone of Nigeria, comprising Benue, Kogi, Kwara, Nasarawa, Niger, Plateau and the Federal Capital Territory, Abuja. Kwara State and Niger State were considered due to their geographical accessibility, proximity, and security. The following instruments were used to collect data for the study:

1. Slack Application: The researcher also created another class for Kwara State College of Education, Zuba, students. The class was also created by downloading the Slack Application or visiting https://slack.com and signing up. A Slack chat group was created, and the students were able to access and join the class through the class link, and join the class automatically. The students can also be added manually by the researcher using their respective email addresses. The class or the instrument was titled "Math 211 (integral calculus)".
2. Mathematics Performance Test (MPT): The groups were first pretested with MPT1 before treatment; MPT1 consisted of 10 theory questions drafted by the researcher from the curriculum contents provided. Mathematics Performance Test Two (MPT2) was used to assess the students after treatment. MPT2 will be a rearrangement of MPT1 for the post-test after 6 weeks of teaching.

The total number of (NCE II) mathematics education students (Intact Class) in the Department of Mathematics Education in colleges of education in Kwara State and Niger State were involved. The purposive sampling technique was used to select NCE II mathematics students in

colleges of Education in Kwara State and Niger State. NCE II mathematics students were considered based on the fact that a selected Mathematics concept is in consideration and is within the NCE II curriculum of colleges of education in Nigeria. A pilot study was conducted on NCE II mathematics education students in a non-participating school. Emmanuel Alayande College of Education in Oyo State was sampled.

To avoid any experimental bias, the course lecturers in the participating school were involved as the research assistants for the study. By doing so, the researcher was not directly involved in administering the research instrument. The researcher personally prepared the teaching instruments (lesson plans) and test instruments in order to control invalidity that could be caused by the variable and to ensure a uniform standard in the conduct of the research. The contents of the lesson plan and the mathematics performance test (MPT) were validated for face and content validation by 3 lecturers in the Department of Mathematics Education in colleges of education in Kwara State and Niger State.

The researcher collected an introductory letter from the Head of Department of Science Education, Al-Hikmah University, Ilorin, soliciting permission from all appropriate authorities of the selected school to be sampled. The students to be involved were given a consent form to read and indicate their willingness to participate in the study. Participants were not coerced or induced during the experiment or the administration of the questionnaire. The personal identity of each respondent will be requested while administering the questionnaire to guarantee that their responses remain confidential.

A pre-test of MPT1 was first administered before the treatment. This allowed the researcher to have prior knowledge of the students' academic performance in the selected concept and also find if there is any significant difference in the performance of students before introducing them to Slack, while the post-test of MPT2 was administered after the treatment. Slack applications were used as the main instruments for the actual treatment of the experiment. Permission from the Head of the Mathematics Education Department and lecturers in the participating school was sought before the commencement of the research. The procedure and work schedule are as follows:

1. Training: An orientation program was organised for the participating students with the assistance and guidance of the lecturers in the Mathematics Education Department in the first week. Thus, the groups were trained on the use of Slack applications for learning a selected mathematical concept. During the training session, a general description of the treatment (Slack) for the group, as well as the procedure involved in using Microsoft Teams and Slack, was practically demonstrated.

2. Administration of Pre-test: A pre-test of MPT1 was administered to the experimental group and the control group before the treatment. This is to allow the researcher to

have prior knowledge of the students' academic performance in the subject, and also to determine whether there will be any significant difference in the performance of students before introducing them to Powerpoint and Slack, respectively.

3. Treatment: The control group was taught using the Microsoft PowerPoint Package. The experimental group was taught mathematics using Slack. After the period of treatment, the two groups will be given a post-test (MPT2). The instructional procedure for implementing the instruction for the students was employed to teach the concepts as follows:

4. Administration of Post-test: The instrument, MPT2, was administered to the groups after the treatment with the help of the research assistant. This exercise provided baseline data on which the dependent variables (especially students' performance in terms of cognitive and psychomotor) was compared with the subjects after the treatment.

All the research activities were conducted in accordance with the principles of research ethics in education. Before conducting the study, permission was sought from the appropriate school authorities. The participants were informed sufficiently about the purpose of the study, and participation was voluntary. The researcher ensured the confidentiality and anonymity of participants' responses. All collected information was confidential and for academic research purposes only. Participants were also reminded that they have the right to leave the study at any time without penalty.

The data collected were analysed using descriptive and inferential statistics. Descriptive statistics using frequencies, counts, and mean were used to answer the demographic data and research question 1. Inferential statistics were used to answer all the hypotheses; an independent-samples t-test was used to test hypothesis 1, while Analysis of Covariance (ANCOVA) was used to test hypothesis 2. All hypotheses were tested at the 0.05 level of significance. Statistical Product and Service Solution (SPSS, 27.0) was used to analyse data.

Results

The analysis and results of data obtained from the study on the effects of Slack on the academic performance of mathematics students in North-Central Nigeria. The results are presented in accordance with the research questions and the hypotheses formulated.

Table 1: *Gender Distribution of Students in the Slack group*

Gender	Frequency	%
1. Male	12	57.1%
2. Female	9	42.9%
Total	21	100%

The table shows the number of respondents by gender. 12 (57.1%) were male, while 9 (42.9%) were female. This indicates that male students have the highest number of respondents.

Table 2: *Gender Distribution of Students in the Microsoft PowerPoint group*

Gender	Frequency	%
1. Male	6	46.2%
2. Female	7	53.8%
Total	13	100%

The table shows that 6 (46.2%) were male and 7 (53.8%) were female. This indicates that female students are more than male students.

Analysis of Research Question

Research Question 2: What is the difference in the post-test performance of the students taught Mathematics using Slack and those taught using the PowerPoint package?

Table 3: *Difference in the Post-test Performance of the Students Taught Mathematics Using Slack and those Taught Using the PowerPoint package*

Groups	N	Mean	Std. Deviation	Minimum	Maximum
1. Slack	21	64.7	7.66	45	75
2. PowerPoint Package	13	58.8	8.45	50	80

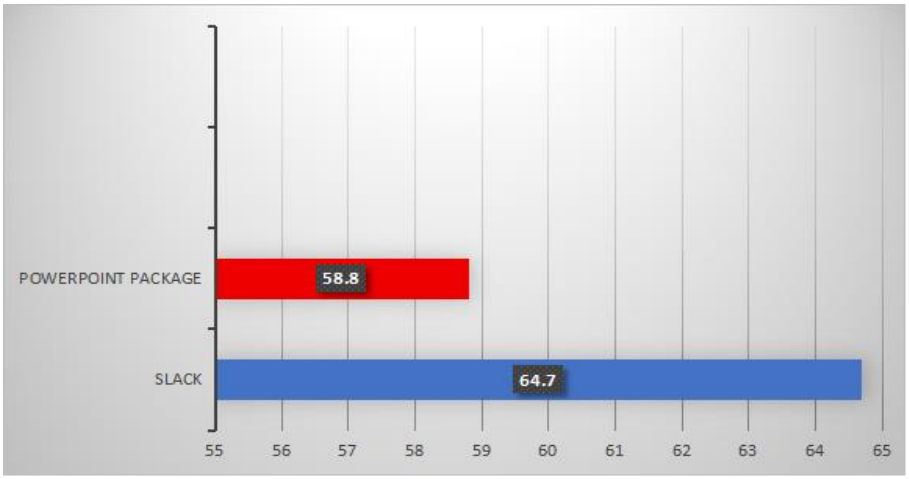


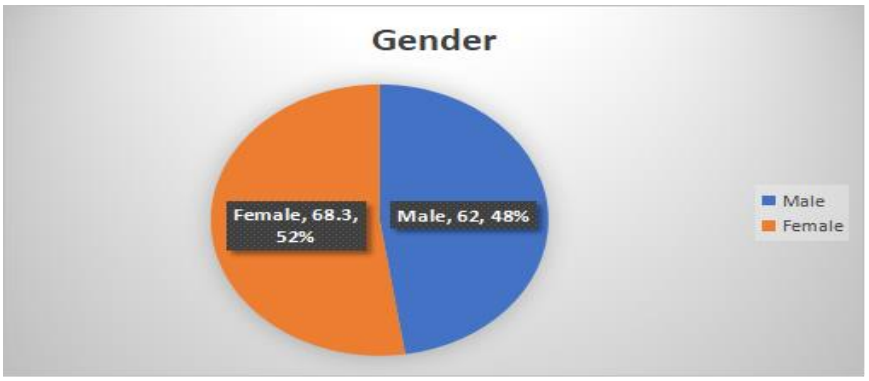
Table 3 presents the post-test performance of students taught Mathematics using Slack and the PowerPoint package. Students in the Slack group obtained a higher mean score (M = 64.7, SD = 7.66) than those in the PowerPoint group (M = 58.8, SD = 8.45). This result shows that

students taught using Slack performed better than those taught using the PowerPoint package.

H_{01}: There is no significant difference between the academic performances of male and female students taught Mathematics using Slack.

Table 4: *Significant difference between the academic performances of male and female students taught Mathematics using Slack*

Gender	N	X	SD	DF	T	Sig. (2-tailed)	Decision
Male	12	62.0	8.38	19	-1.981	.062	Not Rejected
Female	9	68.3	5.00				



An independent-samples t-test was conducted to determine whether academic performance differed significantly between male and female students taught Mathematics using Slack. The results showed that male students (M = 62.0, SD = 8.38) had a lower mean score than female students (M = 68.3, SD = 5.00). However, the difference was not statistically significant, t(19) = -1.981, p = .062. Since the p-value (.062) is greater than the 0.05 level of significance, the null hypothesis was not rejected. Therefore, there is no significant difference between the academic performance of male and female students taught Mathematics using Slack.

H_{02}: There is no significant interaction effect of gender and the use of Slack on students' academic performance in Mathematics.

Table 5: *Significant interaction effect of gender and the use of Slack on students' academic performance in Mathematics.*

Source	df	F	Sig	Decision
Pre-test	1	1.521	.236	Not Rejected
Gender	1	1.962	.182	Not Rejected
Experimental Group (Slack)	1	1.285	.275	Not Rejected

Gender*Slack	1	1.398	.255	Not Rejected

a. R Squared = .258 (Adjusted R Squared = .060)

An analysis of covariance (ANCOVA) was used to determine the interaction effect of gender and the use of Slack on students' academic performance in Mathematics while controlling for pre-test scores. The results showed that the interaction effect between gender and the use of Slack was not statistically significant, F (1, 15) = 1.398, p = .255. Since the p-value exceeded the 0.05 level of significance, the null hypothesis was not rejected. This indicates that, after controlling for students' pre-test performance, the effect of the learning platform on post-test Mathematics achievement did not differ significantly between male and female students. Therefore, there was no significant interaction effect of gender and the use of Slack on students' academic performance in Mathematics.

Discussions

The study revealed that students taught using Slack demonstrated better performance than those taught using the PowerPoint package. This means that Slack's features encourage active participation, peer interaction, and continuous engagement, which positively influence students' understanding of Mathematics concepts. Previous studies have examined the effect of Slack on students' academic achievement; findings are consistent with those of previous studies, highlighting Slack's educational benefits. Job and Ado (2023) found that Slack was effective when used for teaching mathematics, and students gain 3xperience with the strategy, which enhanced high performance levels among them. The study by Job and Ado (2023) investigated the impact of social network applications on interest and performance in the concept of quadratic equations among secondary school students in Yenagoa metropolis. However, the current study focused on the effect of Slack on the performance of NCE II students in the Mathematics Education Department in Colleges of Education, not among secondary school students, and this study also focused on the integral calculus concept, not quadratic equations.

Lopez-Zafra et al. (2020) found that Slack is effective compared to conventional teaching strategies by improving interaction between lecturers and students while enhancing learning experiences. Menzies and Zarb (2020) reported that Slack increased student engagement and supported collaborative learning among computing students. Darvish (2020) also found that Slack facilitated both synchronous and asynchronous communication, thereby improving collaboration and interaction among students. Furthermore, Heryandi et al. (2020) observed that Slack enhanced students' participation during online writing instruction through structured communication and continuous feedback. These findings support the present study by demonstrating that Slack creates a collaborative learning environment capable

of improving students' learning experiences compared with conventional PowerPoint-based instruction.

There was no significant difference between the academic performance of male and female students taught Mathematics using Slack. The finding supports the findings of AbdulRahman (2024) based on the Matific platform, which showed that there was no significant difference between male and female students' academic performance in using Matific. Likewise, Salami and Spangenberg (2024) investigated students from secondary schools in the use of ICT facilities, and the study found that the use of ICT facilities affected the achievement of secondary school students, thereby reducing the gender gap in the achievement of mathematics in secondary schools. Further, Mohammed et al. (2023) studied undergraduate students who were using Telegram and WhatsApp platforms, and it was found that the mean achievement of male and female students on the Telegram platform was not significantly different.

The findings of the study showed that there was no significant interaction effect of gender and the use of Slack on students' academic performance in Mathematics. This implies that the effectiveness of Slack in improving students' academic performance was consistent across both male and female students. Multiple studies found no statistically significant gender differences in mathematics performance when using technology platforms. Tsami et al. (2023) found no difference between genders regarding the use of new technologies or their performance. However, the findings of Salami and Spangenberg (2024) found that there was no significant effect of gender and the use of technology on students' academic performance in Mathematics. The result additionally suggests that collaborative digital learning environments like Microsoft Teams and Slack are gender-inclusive learning environments.

Conclusion

This study examined the effects of Slack on the academic performance of mathematics students in colleges of education in North-Central Nigeria. The results proved that Slack improves the academic performance of mathematics students in colleges of education. The results, however, showed that students using Slack had greater improvements compared to those who used PowerPoint, suggesting that the collaborative and interactive learning environment in Mathematics instruction was more effective in the Slack application. The results further showed that there was no significant difference in students' academic performance between the two genders. Furthermore, there was no significant interaction effect of gender and the use of Slack on students' academic performance in Mathematics. This means that Slack improved both male and female students' academic performance in Mathematics in Colleges of Education. Based on the results of the study, technology-enhanced learning platforms like

Slack improve students' learning outcomes in Mathematics.

Recommendations

The following recommendations are made based on the results of this study:

1. Students should embrace the use of Slack to improve their academic performance in Mathematics.
2. Both male and female Colleges of Education students should adopt Slack for learning mathematical concepts to improve their academic performance.
3. Both male and female students in Colleges of Education should embrace the use of Slack to improve their academic performance in Mathematics.

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