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EFFECT OF MICROSOFT TEAMS 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 Microsoft Teams on academic performance of Mathematics students in college of Education in North-Central Nigeria. Specifically, it determined the difference in the post-test performance of students taught Mathematics using Microsoft Teams and those taught using the PowerPoint package, investigated the difference in academic performance between male and female students taught using Microsoft Teams, and examined the interaction effect of gender and use of Microsoft Teams 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 Niger State and the Federal Capital Territory, Abuja. Purposive sampling was used to select the participants. Data were collected using the Mathematics Performance Test (MPT), while descriptive statistics, an independent - sample t-test, and Analysis of Covariance (ANCOVA) were employed for data analysis at the 0.05 level of significance using SPSS version 27.0. The findings revealed that students taught using Microsoft Teams obtained a higher mean post-test score (M=67.4, SD= 5.60) than those taught using PowerPoint package (M=58.8, SD= 8.45). Female student recorded a slightly higher mean score (M=67.7) than male students (M=67.1), but the difference was not statistically significant, t (17) = -0.256, p= 0.801. Similarly, the interaction effect of gender and use of Microsoft Teams on academic performance was not statistically significant, F (1, 15) = 1.398, p- 0.255. The study concluded that Microsoft Teams-supported instruction was associated with better mathematics performance than PowerPoint-based instruction, with no statistically significant gender difference in achievement. It was recommended that lecturers in Colleges of Education should integrate Microsoft Teams into Mathematics instruction to promote interactive learning and improve students' academic performance.

Introduction

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 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 civilizations 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 helps 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 of 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 uses. 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.

Video conferencing has emerged as a valuable digital tool in electronic learning. Video conferencing, also known as web conferencing, is a collaborative communication system that allows remote participants to meet virtually over the Internet. Video conferencing technologies are communication, collaboration, and learning tools that can be accessed from desktop and mobile devices and are available on various platforms (Al-Samarraie, 2019). Video conferencing supports audio and video calls, messaging, content and screen sharing, and conference and meeting recording. Web conferencing or video conferencing systems, such as Microsoft Teams and Zoom, among others, have gained popularity since the beginning of the 21st century.

Microsoft Teams is one of the subscription application products on Office 365, released by Microsoft, and can be called Teams. Microsoft Teams, which was officially launched by Microsoft in November 2017, brings conversations, meetings, files, and apps together in one Learning Management System (LMS). Microsoft Teams supports both synchronous and asynchronous learning and allows teachers to create an online class (class team) so that students and teachers can communicate and collaborate. Microsoft Teams can be used within formal, non-formal, and informal education, and it supports remote education. Microsoft Teams is a virtual platform appropriate for face-to-face, hybrid, and online learning, which allows real-time social and instructional interaction and collaboration (Poston et al., 2020).

Web conferencing platforms like Microsoft Teams provide pedagogical advantages and may assist in mitigating poor educational performance. Furthermore, this research will ascertain the influence of gender on the use of MS Teams. The term gender refers to a wide range of biological, behavioural, physical, and mental characteristics used to differentiate the female and the 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 Team Online Learning Package (MTOLP).

Purpose of the Study

The main purpose of this study was to examine the effects of Microsoft Teams on the academic performance of mathematics students in colleges of education in North-Central Nigeria. Specifically, this study sought to:

1. determine the difference in the post-test performance of the students taught Mathematics using Microsoft Teams and those taught using the PowerPoint package
2. investigate the significant difference between the academic performance of male and female students exposed to Microsoft Teams for learning a Mathematics concept.
3. determine the interaction effect of gender and the use of Microsoft Teams 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 Microsoft Teams 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 Microsoft Teams.

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

Methodology

The study adopted a quantitative research approach. A mixed-method quasi-experimental pretest-posttest (non-equivalent and non-randomised experimental) and descriptive design was adopted. Experimental group one was taught using Microsoft Teams, while control group two 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 (Microsoft Teams)
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 the Federal Capital, Abuja, 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. Niger State and the FCT were considered due to their geographical accessibility, proximity, and security.

The following instruments were used to collect data for the study:

Microsoft Teams Application: The class was created and scheduled by the researcher for FCT Abuja college students. The researcher created the class using https://teams.microsoft.com or by downloading the Teams application. The class or the instrument was titled "Math 211 (integral calculus)". After creating the class, a link was automatically generated for the class, which was sent to the students to enable them to have access to join the class, or the students can be added manually using their email addresses. The students individually became members of the class and have access to any material that was assigned to the class.

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 Niger State and the Federal Capital, Abuja, was involved. The purposive sampling technique was used to select NCE II mathematics students in colleges of Education in Niger State and the FCT, Abuja. NCE II mathematics students were considered based on the fact that the selected Mathematics concept is under 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 Niger State and the FCT, North-Central Nigeria. Their suggestions, comments, and corrections were used to restructure and validate the instruments both at the content and face level.

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. 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 will allow 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 Microsoft Teams and PowerPoint, while the post-test of MPT2 was administered after the treatment. Microsoft Teams and PowerPoint applications were used as the main instruments for the actual treatment of the experiment. Permission from the Head of the Mathematics Education Department 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 Microsoft Teams and PowerPoint applications for learning a selected mathematical concept. During the training session, a general description of the treatment (Microsoft Teams and PowerPoint) for the group, as well as the procedure involved in using Microsoft Teams and PowerPoint, 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 allowed the researcher to have prior knowledge of the students' academic performance in the subject, and also help determine whether there was any significant difference in the performance of students before introducing them to Microsoft Teams and PowerPoint, respectively.

3. Treatment: The control group was taught using the Microsoft PowerPoint Package. The experimental group was taught mathematics using Microsoft Teams, while the control group was taught using PowerPoint. After the period of treatment, the two groups were 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 to 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 means 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 Microsoft Teams 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 Respondents for Microsoft Teams*

Gender	Frequency	%
1. Male	10	52.6%
2. Female	9	47.4%
Total	19	100%

The table shows the number of respondents by gender. 10 (52.6%) were male, while 9 (47.4%) were female. This indicates that male students have a larger number of participants than female students.

Table 2: *Gender Distribution of Respondents for Microsoft PowerPoint*

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.

Research Question 1: What is the difference in the post-test performance of the students taught Mathematics using Microsoft Teams and those taught using the PowerPoint package?

Analysis of Research Question

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

Groups	N	Mean	Std. Deviation	Minimum	Maximum
1. Microsoft Teams	19	67.4	5.60	55	75
2. PowerPoint Package	13	58.8	8.45	50	80

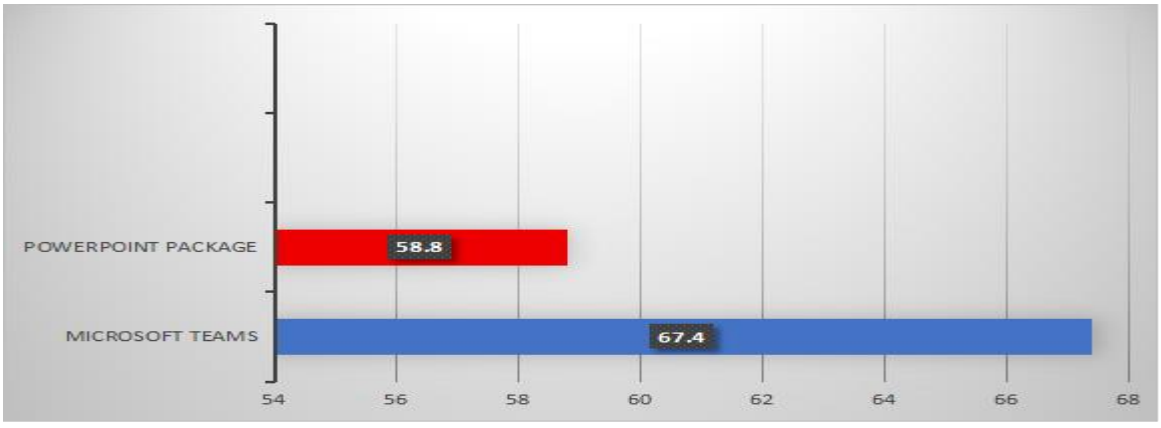


Table 3 presents the post-test performance of students taught Mathematics using Microsoft Teams and the PowerPoint package. Students in the Microsoft Teams group obtained a higher mean score (M =

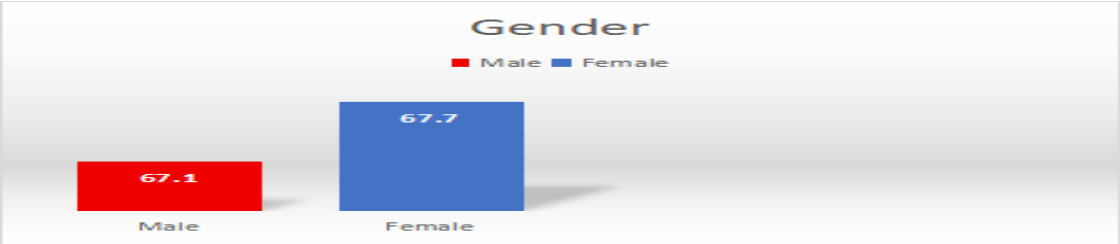
67.4, SD = 5.60) than those in the PowerPoint group (M = 58.8, SD = 8.45). This shows that students taught using Microsoft Teams performed better than those taught using the PowerPoint package.

Hypothesis Testing

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

Table 4: *Significant difference between the academic performance of male and female students taught Mathematics with Microsoft Teams*

Gender	N	X	SD	DF	T	Sig. (2-tailed)	Decision
1. Male	10	67.1	6.29	17	-.256	.801	Not Rejected
2. Female	9	67.7	5.06				



a

An independent samples t-test was used to determine whether there was a significant difference in the academic performance of male and female students taught Mathematics using Microsoft Teams. The results showed that male students (M = 67.1, SD = 6.29) had a lower mean score than female students (M = 67.7, SD = 5.06). However, the difference was not statistically significant, t (17) = -.256, p = .801. Since the p-value (.801) is greater than the 0.05 level of significance, the null hypothesis was not rejected. Therefore, there is no significant difference in the academic performance of male and female students taught Mathematics using Microsoft Teams.

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

Table 5: *Significant interaction effect of gender and the use of Microsoft Teams 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 (Microsoft Teams)	1	1.285	.275	Not Rejected
Gender* Microsoft Teams	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 Microsoft Teams 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 Microsoft Teams 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 Microsoft Teams on students' academic performance in Mathematics.

Discussion

The study revealed that students taught using Microsoft Teams demonstrated better performance than those taught using the PowerPoint package. This is in tandem with the study conducted by Alzubi (2022), who observed that students learning Mathematics with the support of the Microsoft Teams Application recorded significant improvement over students learning Mathematics with the traditional Whiteboard. While Alzubi (2022) investigated the effects of Microsoft Teams-supported mathematics instruction on college students' mathematical skills in Jordan, the present study diverges in scope. First, whereas the prior study examined general mathematics, this research focuses specifically on integral calculus. Second, rather than selecting a specific academic session, this study purposively selected an intact class of Nigerian Certificate in Education (NCE II) students within the Mathematics Education Department in colleges of education; thirdly, the previous study used a whiteboard as the control group, while this study introduced the use of PowerPoint as the control, and this current research was carried out in Nigeria, not Jordan.

Al-Shboul (2024) also found that students at the undergraduate level who were instructed with the use of the Microsoft Teams system had higher academic achievement when compared to the students who were instructed using the traditional approach. While Al-Shboul used Microsoft Teams on Computerised Programming Students, this current research focused mainly on Mathematics students, and both in common choose quasi experimental design as their approach. The study by Mustafa (2021) also revealed that the cognitive achievement of students was significantly better in the hybrid learning model with support from Microsoft Teams. Likewise, Villegas-Ch et al. (2024) reported that integrating Microsoft Teams into classroom instruction increased students' participation and improved their academic performance by about 25%. These studies all indicate that the collaborative elements, accessibility, and

communication incorporated in Microsoft Teams encourage active learning and enhance the learning outcomes of students.

The current study found that there was no significant difference in the academic performance of male and female students taught Mathematics using Microsoft Teams. This means that students have the same opportunities to learn in Microsoft Teams, which can benefit both genders equally. This finding corroborates Alabi (2023), who revealed that gender did not significantly moderate the academic performance of students when instructed with the use of the Microsoft Teams Online Learning Package. The findings indicate that gender does not affect the effectiveness of Microsoft Teams, but rather the students' active engagement with Microsoft Teams.

The findings of the study showed that there was no significant interaction effect of gender and the use of Microsoft Teams on students' academic performance in Mathematics. This implies that the effectiveness of Microsoft Teams 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. Rudhumbu (2022) studied gender interaction practices in mathematics and their influence on academic performance. It was found that there was no interaction effect of gender and technology-enhanced platforms. 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 Microsoft Teams on the academic performance of mathematics students in colleges of education in North-Central Nigeria. The results proved that Microsoft Teams improves the academic performance of mathematics students in colleges of education. The results, however, showed that students using Microsoft Teams 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 Microsoft Teams 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 Microsoft Teams on students' academic performance in Mathematics. This means that Microsoft Teams 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

Microsoft Teams improve students' learning outcomes in Mathematics.

Recommendations

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

1. Colleges of Education students should embrace the use of Microsoft Teams to improve their academic performance in Mathematics.
2. Both male and female Colleges of Education students should adopt Microsoft Teams for learning a mathematical concept to improve their academic performance.
3. Both male and female students in Colleges of Education should embrace the use of Microsoft Teams to improve their academic performance in Mathematics.

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