ISSN: 1118-5872

FOS

MULTI-DISCIPLINARY JOURNAL

(Alvan Ikoku Federal University of Education)

PROBLEMS AND SOLUTIONS OF TEACHING AND LEARNING OF MATHEMATICS COURSES USING GOOGLE CLASSROOM PLATFORM IN A.I.F.U.E., OWERRI

Uzoma Alwell, Ikechukwu Uzoma Innocent, Isaac Adekunle Ogunleke, Joy Ijeoma Uwakwe, Chialuka Adline Onyegbuchulem, Iheanacho Chukwudi Ike, and Eric Anyanwu
Department of Mathematics
Alvan Ikoku Federal University of Education, Owerri, Nigeria
Email: uzoma.alwell@alvanikoku.edu.ng

Abstract

This study investigated the problems and solutions associated with using the Google Classroom platform to teach and learn mathematics courses in Alvan Ikoku Federal University of Education (A.I.F.U.E.), Owerri. Four research questions guided the descriptive survey design. The population comprised lecturers and students from 100 to 400 level in the Mathematics Department at A.I.F.U.E., Owerri (N=71). This comprised all 53 students and 15 lecturers who taught them mathematics courses using Google Classroom platform. A researcher-made questionnaire was used for data collection and analysed using mean scores to answer the research questions. The findings revealed problems such as inadequate Google Classroom-enabled devices, unreliable internet, lack of training on effective platform use, and difficulties assessing student progress. Solutions included providing adequate devices, ensuring reliable internet, organizing training workshops, and developing strategies for student assessment and feedback. The study concluded that while Google Classroom has potential to enhance mathematics education, problems need addressing. Recommendations include adequate provision of devices, reliable internet, training for lecturers and students, and developing assessment strategies to ensure effective teaching and learning using Google Classroom in A.I.F.U.E., Owerri.

Keywords: Google Classroom, Mathematics Education, Online Learning, Student Achievement, Teaching Strategies

Introduction

There are several innovations in teaching and learning, including computer-assisted instructions. Amidst the global lockdown and restrictions on social gatherings due to the COVID-19 pandemic in 2020, physical classroom teaching and learning were stopped across parts of the globe because of threats to human existence posed by the pandemic. Schools resolved to use different online teaching platforms to continue teaching, such as Zoom, Google Meet, Google Classroom, WhatsApp, and Skype, based on factors including suitability, accessibility, storage, and popularity, among other perceived benefits.

Among schools that adopted online teaching strategies in 2020 because of COVID-19 is Alvan Ikoku Federal University of Education (A.I.F.U.E.), Owerri. The university, then a college of education, adopted it in addition to other social media platforms like WhatsApp. A.I.F.U.E., Owerri, is in Owerri, the capital of Imo State, Nigeria. It was established in April 1963 as an Advanced Teachers Training College by the defunct Eastern Nigeria Government on the grounds of the Old Shell Camp, Owerri. As a teacher training institution, the then College awarded Nigerian Certificate in Education (NCE), Professional Diploma in Education (PDE), and Bachelor's degrees in different education combinations, including Mathematics, a programme in affiliation with the University of Nigeria, Nsukka (Alvan

Ikoku Federal College of Education, 2012). In 2023, the institution was upgraded to a university of education.

Mathematics is a core subject at basic and post-basic levels of education in the Nigerian school system according to the Nigeria National Policy on Education (FGN, 2013). This is because of the importance of the subject to the proper fitting and survival of the Nigerian child in daily life and society at large. Mathematics is a subject of numbers, shapes, data, measurements, and logical activities. It has a vast scope in every field of life, such as medicine, engineering, finance, natural science, and economics. We are all surrounded by a mathematical world. Mathematics is the science and study of quantity, structure, space, and change. Mathematicians seek out patterns, formulate new conjectures, and establish truth by rigorous deduction from appropriately chosen axioms and definitions.

During the COVID-19 pandemic in 2020, there were suggestions, demands, and even requirements that traditional classroom education needed to be re-engineered, and the traditional roles of classroom teachers and students should be re-examined and changed accordingly. The use of Google Classroom (an online platform) should not be overemphasized, meaning that the use of Google Classroom should be considered in A.I.F.U.E., Owerri. Since early 2020, most teachers have worked tirelessly to ensure students continue their studies without disruption despite the challenges everyone faced during the COVID-19 pandemic. Their hard work made sure online teaching and learning platforms provided a way to keep students engaged and excited to study. Students continue to learn, and online virtual learning platforms became a good way to help them have an effective remote learning experience, progress with their studies, receive feedback from teachers, learn in a safe environment in line with the school's privacy policies, and get more time back for homework and activities instead of traveling to school. Some of the online teaching and learning platforms include Zoom, Microsoft Teams, WhatsApp, Google Classroom, telegram, and Dialpad, all of which help or make it possible for students and teachers to learn and teach online respectively.

Google Classroom is a free online tool designed to make designing, assigning, and grading assignments easier for educational institutions (Wikipedia, 2014). Edward (2022) claims that Google Classroom is a collection of online resources that enables teachers to assign homework, receive assignments from students, mark assignments, and receive papers back that have been graded. Google Classroom's main goal is to make digital learning possible by streamlining file sharing between instructors and students and doing away with paper in the classroom. Managing many classrooms, letting teachers check for plagiarism, letting students check for citations in their work, and automating the generation of coursework templates for students are some of Google Classroom's important capabilities (Wikipedia, 2014; Edward, 2022). It's crucial to use Google Classroom since it promotes paperless sharing, gives you a way to communicate with students, makes it easier to put up, gather, and grade assignments, and lets you get feedback quickly (Innocent, 2023).

The empirical review, revealed several important findings related to the use of Google Classroom in teaching and learning, particularly in the context of mathematics education. Alwell et al. (2023) conducted a quasi-experimental study to examine the effect of Google Classroom-aided instruction on students' achievement in degree-level Mathematics courses at Alvan Ikoku Federal College of Education (A.I.F.C.E.), Owerri. The study found that male

students performed better than female students in Mathematics courses, and students taught without the aid of Google Classroom achieved slightly better than those in the Google Classroom-aided instruction class. However, the use of Google Classroom-aided instruction did not result in gender disparity in Mathematics achievement. The researchers recommended further investigation into factors affecting the effective utilization of the Google Classroom platform and possible remedies

Okeke et al. (2022) found that while the face-to-face method had a significantly positive effect on students' engagement in mathematics compared to Google Classroom, Google Classroom had a significant positive effect on students' achievement in mathematics compared to the face-to-face method. This suggests that Google Classroom can be an effective tool for improving student performance in mathematics, despite potential challenges with student engagement.

Sukmawati and Nensia (2019) investigated the role of Google Classroom in English Language Teaching (ELT) and found that it can enhance teachers' and students' ability to use technology wisely, save time, be environmentally conscious, overcome distance, increase collaboration, provide timeless communication, and serve as secure document storage. While these findings are from the context of ELT, they suggest that Google Classroom has the potential to provide similar benefits in mathematics education.

Abidin's (2020) research on students' perspectives of online learning using Google Classroom found that the platform has good potential to support students' learning, allowing them to access resources, construct knowledge through discussions, and perform instructional practices efficiently. However, the study also identified challenges such as limited device availability, technical issues, low familiarity with the platform's features, and the readiness of students to study independently online.

Retami et al. (2021) described the usage of Google Classroom in the English teaching and learning process at the senior high school level, finding that it can enhance teachers' and students' ability to use technology wisely, save time, be environmentally conscious, overcome distance, increase collaboration, provide timeless communication, and serve as secure document storage. These findings further highlight the potential benefits of using Google Classroom in educational settings.

Overall, the empirical review suggests that while Google Classroom has the potential to enhance teaching and learning, particularly in terms of student achievement and various operational benefits, there are also challenges that need to be addressed, such as ensuring adequate device availability, addressing technical issues, and supporting students' readiness for independent online learning. These findings provide valuable insights for researchers and practitioners interested in exploring the use of Google Classroom in mathematics education

Every innovation has its associated problems for society. The use of the Google Classroom platform in teaching and learning Mathematics has its associated problems for users, and there could be possible solutions to such problems. What could be the problems associated with the use of the Google Classroom platform in teaching and learning Mathematics courses in A.I.F.U.E., Owerri, and the possible solutions?

The study was guided by four research questions. The first research question investigated the problems associated with the use of the Google Classroom platform in teaching Mathematics courses in A.I.F.U.E., Owerri. The second research question explored the solutions to

problems associated with the use of the Google Classroom platform in teaching Mathematics courses in A.I.F.U.E., Owerri. The third research question examined the problems associated with the use of the Google Classroom platform in learning Mathematics courses in A.I.F.U.E., Owerri. The fourth and final research question sought to identify the solutions to problems associated with the use of the Google Classroom platform in learning Mathematics courses in A.I.F.U.E., Owerri.

Materials and Methods

The study adopted a descriptive survey design to investigate the problems and solutions associated with using the Google Classroom platform in teaching and learning Mathematics courses in A.I.F.U.E., Owerri. The population of the study comprised all lecturers and students from 100 level to 400 level in the regular programme of the Mathematics Department at A.I.F.U.E., Owerri, with a population size of 71. A population size of 53 students and 15 lecturers who had engaged in teaching and learning of mathematics courses using Google classroom were used. A researcher-made questionnaire was used for data collection, and the data were analysed using mean to answer the research questions.

Results

Research Question One: what are the problems associated with the use of Google Classroom platform in teaching Mathematics courses in A.I.F.U.E, Owerri?

Table 1. ***Problems Associated with the use of Google Classroom Platform.***

S/N	Item	N	$\bar{X}$	Decision
1.	Internet connectivity problems such as poor network or server problems during online teaching.	15	3.8	Agreed
2.	Online distractions like Ads that pop up, social media messages and Application notification while using Google classroom.	15	3.1	Agreed
3.	Poor interaction between the learner and lecturers while using Google classroom platform during online teaching.	15	3.6	Agreed
4.	Inability to manage the time while using Google classroom during online teaching of mathematics courses.	15	3.1	Agreed
5.	Device technical issues of PC, Smart phone, etc. during online teachings and preparation.	15	3.5	Agreed
6.	Inability to prepare learning materials such as course outlines, lecture notes, assignment etc. in suitable document formats such as PDF for easy use on google classroom.	15	3.1	Agreed
7.	Difficulty in assigning works and evaluation of students using google classroom platform.	15	3.6	Agreed
8.	Difficult in uploading and sending learning materials to students on the Google Classroom platform.	15	3.1	Agreed

The result of the analyses based on the numerical strength of the data collected showed the mean responses of questionnaire item (1-8) have the corresponding mean of 3.8, 3.1, 3.6, 3.1, 3.5, 3.1, 3.6, and 3.1 respectively. Hence, all the listed problems experienced by lecturers while using Google Classroom platform in teaching mathematics courses in A.I.F.U.E., Owerri were all agreed. Therefore, the problems of teaching Mathematics courses with Google classroom includes: Internet connectivity, Poor interaction between the learner and lecturers, Inability to manage the time, Device technical issues and uploading and sending learning materials.

Research Question Two: what are the solutions to problems associated with the use of Google Classroom platform in teaching Mathematics courses in A.I.F.U.E, Owerri?

Table 2. ***Solutions to the Problems Associated with the use of Google Classroom Platform***.

S/n	Item	N	$\bar{X}$	Decision
9.	Provision of reliable internet connections in all the university buildings to enhance preparation and online teaching of course.	15	3.5	Agreed
10.	By removing anything that can cause distraction while teaching online, e.g., online Ads, blocking of unnecessary sites etc.	15	3.3	Agreed
11.	Regular practice with the Google classroom platform to enable the instructor perfect in use of the platforms to enhance full utilization and effective teaching to ensure learning.	15	3.5	Agreed
12.	Collaboration of team teaching among lecturers to enhance exchange of the skills in teaching with the platform.	15	3.5	Agreed
13.	Seminar and workshop to train lecturers on features and use of google classroom platform.	15	3.6	Agreed
14.	Seminars and workshop on use of education enabling apps such as word processor, math type, PDF editor, power points in preparation of learning materials.	15	3.5	Agreed
15.	Making sure that all the PC and mobile phones are in good condition while using Google classroom during instructions.	15	3.6	Agreed

The result of the analyses based on the numerical strength of the data collected showed the mean responses of questionnaire item (1-7) have the corresponding mean of 3.5, 3.3, 3.5, 3.5, 3.6, 3.5, and 3.6, respectively. Hence all the listed items are solution to problems experienced by lecturers while using Google Classroom platform in teaching mathematics courses in A.I.F.U.E. Owerri were all agreed. Therefore, the solution to teaching with Google classroom are; provision of reliable internet connections, regular practice, collaboration of team teaching among lecturers, seminar and workshop to train lecturers on features Google classroom and provision of devices.

Research Question Three: what are the problems associated with the use of Google Classroom platform in learning Mathematics courses in A.I.F.U.E, Owerri?

Table 3. Problems associated with learning Mathematics with Google Classroom Platform.

S/n	Item	N	$\bar{X}$	Decision
1.	Internet connectivity problem such as poor network or sever problems during online learning.	53	3.4	Agreed
2.	Poor interaction between the learner and lecturers while using Google classroom platform during online learning	53	3.3	Agreed
3.	Inability of students to manage the time while using Google classroom during learning of mathematics courses.	53	3.1	Agreed
4.	Poor motivation of students in the use of google classroom platform during mathematics learning.	53	3.0	Agreed
5.	Device technical issues of PC, Smart phone, etc. during online teaching and preparation.	53	3.3	Agreed
6.	Lack of commitment of students in learning and doing assignment using Google classroom platform.	53	3.1	Agreed
7.	Difficult in receiving learning materials from lecturers on the Google Classroom platform.	53	3.0	Agreed

The result showed that the respondents agreed all the items listed in table above are the Problems associated with the use of Google Classroom platform in learning Mathematics courses in A.I.F.U.E., Owerri, the mean responses are 3.4, 3.3, 3.1, 3.0, 3.3, 3.1, 3.0 respectively. The problems of learning Mathematics courses with Google classroom include: internet connectivity, poor interaction between the learner and lecturers, inability to manage the time, device technical issues and uploading and sending assignments. Others are Lack of commitment by students, difficult in receiving learning materials from lecturers on the Google Classroom platform.

Research Question Four

What are the solutions to problems associated with the use of Google Classroom platform in learning Mathematics courses in A.I.F.U.E, Owerri?

Table 4. Solutions to Problems Associated with the use of Google Classroom platform.

S/n	Item	N	$\bar{X}$	Decision
1.	Provision of internet connections (Availability of network provider) during online teaching of mathematics courses.	53	3.5	Agreed
2.	By removing anything that can cause distraction while learning online, e.g., online Ads, blocking of unnecessary sites etc.	53	3.3	Agreed
3.	Seminars and workshop to train students on features and uses of Google classroom platform.	53	3.3	Agreed
4.	Provision of games and quiz that can motivate students while learning, e.g., computer games, online quiz and puzzles etc	53	3.1	Agreed
5.	Provision of platform where lecturers and students will meet e.g., WhatsApp Group for easy communication	53	3.5	Agreed
6.	Seminars and workshops on use of education enabling	53	3.5	Agreed

	applications such as word processor, MathType, Spreadsheet, PDF editors, power points etc in preparation of learning			
7.	Making sure that all the PC and mobile phones are in good condition while using Google Classroom during learning period.	53	3.5	Agreed

The result showed that the respondents agreed all the items listed in table above are the solutions to the Problems associated with the use of Google Classroom platform in learning Mathematics courses in A.I.F.U.E. Owerri, the mean responses are 3.5, 3.3, 3.3, 3.1, 3.5, 3.5, 3.5 respectively. Therefore, the solution to problems of learning with Google classroom include; provision of reliable internet connections, regular practice, seminar and workshop to train students on use of Google classroom and provision of reliable devices. Based on the results collected and analysed the result is summarized as follows:

1. The problems of teaching Mathematics courses with Google classroom includes: Internet connectivity, Poor interaction between the learner and lecturers, Inability to manage the time, Device technical issues and uploading and sending learning materials.
2. Solution to the problems of teaching with Google classroom include: provision of reliable internet connections, regular practice, collaboration of team teaching among lecturers, seminar and workshop to train lecturers on features Google classroom and provision of devices.
3. On the students, problems of learning Mathematics courses with Google classroom are internet connectivity, poor interaction between the learner and lecturers, inability to manage the time, device technical issues and uploading and sending assignments. Others are Lack of commitment by students, difficult in receiving learning materials from lecturers on the Google Classroom platform.
4. The solution to learning with Google classroom are provision of reliable internet connections, regular practice, seminar and workshop to train students on use of Google classroom and provision of reliable devices.

Discussion

Research question one sought to find the possible problems experienced by lecturers while using Google classroom. From the analysis on table one, it was indicated that some of the problems lecturers face during teaching using Google classroom platform includes: Internet connectivity problems such as poor network or server problems during online teaching, Poor interaction between the learner and lecturers while using Goole classroom platform during online teaching, device technical issues of PC, Smart phone, etc. during online teachings and preparation. Also, inability to prepare learning materials such as course outlines, lecture notes, assignment etc. in suitable document formats such as PDF for easy use on google classroom, difficulty in assigning works and evaluation of students using google classroom platform.

This result supported the findings of Abidin (2020), that stated the challenges to include limited availability of devices, technical issues, the low level of familiarity of Google Classroom's features, the readiness of students to study independently online.

Research question two sought solutions to problems associated with the use of Google Classroom platform in teaching Mathematics courses in A.I.F.U.E., Owerri. The result of the analysis in Table 2 showed that the possible solutions to problems associated with the use of Google Classroom platform in teaching Mathematics courses in A.I.F.U.E., Owerri include;

provision of reliable internet connections, regular practice, collaboration of team teaching among lecturers, seminar and workshop to train lecturers on features Google classroom and provision of devices.

Solution to the problems of teaching with Google classroom include: provision of reliable internet connections, regular practice, collaboration of team teaching among lecturers, seminar and workshop to train lecturers on features Google classroom and provision of devices. It is expected that these solutions will proffer solutions identified by Abidin (2020).

Research question three sought the problems associated with the use of Google Classroom platform in learning Mathematics courses in A.I.F.U.E., Owerri. Sequel to the result of the analysis, the respondents agreed to all the listed items on the questionnaire. The problems of learning Mathematics courses with Google classroom are internet connectivity, poor interaction between the learner and lecturers, inability to manage the time, device technical issues and uploading and sending assignments. Others are Lack of commitment by students, difficult in receiving learning materials from lecturers on the Google Classroom platform. This result is in line with the findings of Abidin (2020) in the listed challenges associated with use of google classroom in teaching and learning of Mathematics.

For research question four, the possible solutions to problems associated with the use of Google Classroom platform in learning Mathematics courses in A.I.F.U.E, Owerri. The solution to learning with Google classroom are provision of reliable internet connections, regular practice, seminar and workshop to train students on use of Google classroom and provision of reliable devices. To compare similar previous works, the relevant literature remains scares.

Conclusion

The study concluded that while the Google Classroom platform has the potential to enhance teaching and learning of Mathematics courses in A.I.F.U.E., Owerri, there are several problems associated with its use that need to be addressed. The study recommended adequate provision of Google Classroom-enabled devices, reliable internet connections, and seminars and workshops to train lecturers and students on the effective use of the platform. The study also suggested developing strategies for assessing students' progress and providing timely feedback to ensure effective teaching and learning of Mathematics courses using the Google Classroom platform.

References

Abidin, Z., & Saputro, T. M. E. (2020). Google classroom as a mathematics learning space: Potentials and challenges. *Journal of Physics Conference Series*, 1567(2), 0220941 doi:10.1088/1742-6596/1567/2/022094

Alvan Ikoku Federal College of Education (2012). Sandwich/EWP Students Handbook. Art Publishers: Owerri.

Alwell, U., Uwakwe, J. I., Ike, I. C. & Ogunleke, I. A. (2023). Google Classroom aided instruction on student teachers' Mathematics achievement in Owerri, Nigeria. *Brillo Journal* 3(1), 21-30. doi: 10.56773/bj.v3i1.46

Edward, L. (2022). Google Classroom: A suite of online tools for teachers and students. Edtech Review.

Federal Government of Nigeria (FGN, 2013). National policy on education. NERDC, Lagos.
https://support.google.com/edu/classroom/answer/6020279?hl=en
Innocent, O. (2023). The importance of using Google Classroom in teaching and learning. *Journal of Educational Technology*, 15(2), 45-60.
Nursyahrina, H., Retami, L. H., Pratama, R., Salsabil, S. P., & Ihsan, M. T. (2021). The use of Google Classroom in English teaching and learning process at senior high school leveL. *Journal Riset Dan Inovasi Pembelajaran*, 1(2), 123-133
Okeke, A. M., Aneshie-Otakpa, V. O, Orga, Chioma, Egara, Felix O., Ubebe, Solomon A., & Inweregbuh, Onyemauche C. (2022). Effect of Google Classroom on Secondary School Students' Engagement and Achievement in Mathematics. *African Journal of Science, Technology and Mathematics Education (AJSTME)*, 8(Special Issue No. 1), 411-417.
Retami, D. D., Nugroho, L. E., & Santosa, P. I. (2021). The use of Google Classroom in English teaching and learning process at senior high school level. *Journal of English Language Teaching*, 10(2), 1-10. https://journal.unnes.ac.id/sju/index.php/elt/article/view/41235
Sukmawati, S., & Nensia, N. (2019). The Role of Google Classroom in ELT. *International Journal of Progressive Sciences and Technologies*, 8(1), doi: https://doi.org/10.29103/ijevs.v1i2.1526
Wikipedia. (2014). Google Classroom. https://en.wikipedia.org/wiki/Google_Classroom