
THE EFFECT OF GOOGLE CLASSROOM AS A TOOL IN CHEMISTRY TEACHING AND LEARNING IN SENIOR SECONDARY SCHOOLS IN ANKPA, ANKPA L.G.A., KOGI STATE, NIGERIA.

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Abstract

The study examines the effect of google classroom on senior secondary school students' achievement in Chemistry. A quasi-experimental design of pre-test and post-test was used in executing the study. A total of 100 students conveniently drawn (that is, 50 students taught with Google classroom (experimental group) and 50 students taught with face-to-face method (control group) were used for the study. Chemistry Achievement Test (CAT) developed was administered for pre- and post-test during the research. The instrument was subjected to content and face validities to three experts in Chemistry Education research questions and hypotheses were answered using statistical tools of mean(x), standard deviation (SD) and t- test at 0.05 significant level. The findings revealed that there is significant difference in the mean performance of students of experimental and control groups for pre-test and post-test. It was recommended among others, that government should provide facilities in schools that enhance the use of google classrooms in teaching.

Keywords: Google classroom, Students; Digital learning, Mean achievement, Chemistry.

INTRODUCTION

The occurrence of the novel corona virus disease (COVID) in Wuhan China in 2019 had an immediate impact on the world. Nearly all aspects of human activities including education were affected. The disease spread so fast that it was immediately declared a pandemic by the world health organization (WHO). Due to the speed with which it was spreading, there was little or no time to produce drugs nor vaccines to tackle it. Hence, the WHO (2019) recommended non-pharmaceutical measures such as social and physical distance among others to curb its spread. This means that activities that requires large gathering of people such as schools and markets were stopped or social and physical distancing maintained. Thus, it became very difficult for schools to operate under such strict conditions. As such governments in many countries closed down schools (United Nation Education, Scientific and Cultural organization (UNESCO) (2020).

Digital learning refers to any sort of learning that makes use of and takes advantage of technology. So, digital learning covers anything that includes learners using digital platforms, resources, systems, and apps. This can involve taking online classes, researching on Google, watching online videos, and using digital tools during face-to-face training sessions. It also allows learners to access expertly designed courses and training materials anytime and anywhere (Stephanie, 2022). Digital learning platforms aim at simplifying, creating, distributing, and grading assignments and engaging students in learning online or remotely. One of such platforms is the Google classroom.

Google Classroom is a new component in Google Apps for Education that was introduced in 2014. This classroom allows teachers to easily create and manage assignments, provide timely feedback, and communicate with their students (Shaharane, Jamil & Rodzi, 2018).

According to Abidin and Saputro (2020), Google classroom is a useful tool for supporting learning activities because of its flexibility and numerous feature. Google classroom has features that can be used in the learning process like class preparation, display student assignments, storing data on Google Drive and developing learning material, namely creating questions, creating assignments, and creating topics will be discussed in virtual classes (Ulum, 2020). Teachers can use Google Classroom to give online assignments, promote collaboration among their colleagues, students, and students, and maintain constant communication with students. Furthermore, teachers can establish virtual courses, offer tasks, send feedback, and view all of this information in one place. Google Classroom acts as a medium that can be used by teachers to create online classes, where teachers can provide learning material and tasks that must be done to students that they will receive directly and can be easily accessed anywhere.

Google Classroom is a mixed learning platform developed by Google for schools which aims to simplify paperless creation, distribution and assignment (Imaduddin, 2018). Learning using Google Classroom can increase student learning participation and provide innovation in learning (Heggart, 2018). The Google Classroom can attract students to get used to learning to use technology and improve learning outcomes (Bondarenko et al. 2019).

STATEMENT OF THE PROBLEM

During the post-covid era, there is a paradigm shift from only the traditional method of teaching to Digital education. Digital education involves the use of information and communication technology in teaching and learning. This is achieved through the use of

online teaching and learning platforms which includes: Zoom, Microsoft Teams, Whatsapp and Google classroom. Despite the advantages associated with the use of the digital learning platforms, some teachers and students do not have digital learning devices while most senior secondary schools are still experiencing difficulties utilizing it. Difficulties such as technological challenges in digital teaching and learning environment, doubts about the ability of the digital method of teaching and learning to realize the objectives of teaching and learning and doubts about the competence of teachers and students in using the digital learning platforms for teaching and learning.

Objective of the Study

The objective of the study is to investigate the effect of google classroom as a tool for teaching Chemistry in secondary schools.

Research Questions

In line with the objectives of the study, the following research questions guided the study

1. What is the pre-test mean achievement scores of Chemistry students taught using google classroom and those taught using traditional method?
2. What is the post-test mean achievement scores of Chemistry students taught using google classroom and those taught using traditional method?

Hypotheses

Ho1: There is no significant difference in the pre-test mean achievement scores of Chemistry students taught using google classroom and those taught without google classroom.

Ho2: There is no significant difference in the post-test mean achievement scores of Chemistry students taught using google classroom and those taught without google classroom.

METHODOLOGY

2.1 Population and Research Sample

The population in this study were 100 students of class SS2 in Unity Comprehensive College Ankpa which were divided into two groups, namely 50 students in the experimental group and 50 students in the control group. The research sample was selected using the purposive random sampling method.

2.2 Research Design

The research employed a quasi-experimental design which used pre-test and post-test for the two groups of students. The design is appropriate because it employs a means to compare groups. With this design, both the control and experimental group are compared.

2.3 Data Collection Method

Chemistry Achievement Test (CAT) developed by the researchers was used for data collection. The CAT was a fifty (50) item, 4-option multiple choice objective test on calculation on gas laws. The test items were drawn from past Senior School Certificate

Examination (SSCE) questions and recommended chemistry textbooks. The CAT was first administered on the subject by the researchers himself and the results carefully recorded before the treatment session, which lasted for four weeks. A week after the treatment, post-test was administered on the subject by the researchers using the CAT as in pre-test to all students in the two groups. The pre-test and post-test were marked, scored and their various scores collected.

3. DATA ANALYSIS AND PRESENTATION

The data collected was estimated using the Statistical Package for Social Science (SPSS) software. The results of the different groups were computed and used in testing the hypotheses. The level of the significance adopted for the analysis was $p= 0.05$ which formed the basis for accepting or rejecting each of the hypotheses. For decision rule, if the t-estimated value is greater than the t-critical value, the null hypothesis is rejected (which means significant) and if the t-estimated value is less than the t-critical value, the null hypothesis is accepted (which means not significant).

4. RESULT AND DISCUSSION

Table 1: Mean achievement scores and standard deviation (SD) of pre-test scores of students in the experimental and control groups.

Group	N	Mean(x)	Standard Deviation (SD)
Experimental (google classroom)	50	42.10	10.98
Control group (face-to-face method)	50	42.02	10.96

The result as shown in table 1 show that the mean(x) achievement scores for the experimental group is 42.10, with a standard deviation (SD) of 10.98, while the mean(x) achievement scores for the control group is 42.02 with a standard deviation(SD) of 10.96. The mean achievement scores of both groups indicates that there is no significant difference in the pre-test scores of students taught with google classroom and those taught with face-to-face method.

Table 2: t-test analysis of pre-test results for students in the experimental and control groups.

Group	N	x	SD	Df	t-estimated	t-critical	Decision
Experimental (google classroom)	50	42.10	10.98				
Control group (face-to-face method)	50	42.02	10.96	98	0.02306	1.99	Not significant

The result as shown in table 2 indicates that t-estimated value of 0.02306 is less than that of the t-critical value of 2.04. Therefore, the null hypothesis 1 is accepted. This implies that there is no significant difference in the pre-test mean achievement scores of students taught

using google classroom and those taught using face-to-face method at 0.05 level of significance.

Table 3: Mean achievement scores and standard deviation (SD) of post-test scores of students in the experimental and control groups.

Group	N	Mean(x)	Standard Deviation (SD)
Experimental (google classroom)	50	87.30	14.17
Control group (face-to-face method)	50	80.20	13.10

Table 3 shows that the mean performance results of experimental group is 87.30 with standard deviation (SD) of 14.17 while the mean(x) performance scores of the control group is 80.20 with standard deviation(SD) of 13.10. The mean of both groups indicates that there is significant difference in the post-test results of students taught with google classroom and those taught using face-to-face method.

Table 4: t-test analysis of post-test results for students in the experimental and control groups.

Group	N	x	SD	Df	t-estimated	t-critical	Decision
Experimental (google classroom)	50	87.30	14.17				
Control group (face-to-face method)	50	80.20	13.10	98	2.16	1.99	significant

The results in table 4 shows that t-estimated value of 2.16 is greater than that of the t-critical value of 1.99. Thus, the null hypothesis 2 is not accepted. This implies that there is significant difference in the post-test scores of the students taught with Google classroom (experimental group) and those taught with face-to-face method (control group) at 0.05 level of significance.

Discussion

Findings of the study revealed that google classroom had a positive effect on students' achievement in Chemistry than the face-to-face method.

The above findings corroborate previous findings by Oyarinde and Komolafe (2020) and Sri Sasmita, Redhana and Suja (2021) who in their separate studies revealed that the Google classroom platform positively affected students' academic achievement, attitudes and their perception during the pandemic in Nigeria's secondary school. The above findings is true because young students enjoy teaching platform that are technologically driven.

This implies that students' achievement in Chemistry would improve if taught using google classroom. Therefore, the use of google classroom may be captivating and interesting to the students who may enjoy the lesson since it involves the use of technology. Hence, students may become more actively engross in the teaching and learning of chemistry which may help

in their retention of chemistry concepts taught and which would culminate to an improvement in their achievement in the subject.

Conclusion/ Recommendations

This study was an attempt to incorporate the use of technology in teaching Chemistry. This will help to ensure that learning continues beyond the four walls of the classroom.

Based on the findings of this research, the following recommendations are made:

1. Stakeholders in Chemistry Education like Ministries of Education, State, and School management boards, Secondary Education Boards, School principals and teachers should organize seminars, workshops and conferences where teachers in the field will be opportune to learn how to use google classroom in the delivery of Chemistry lessons.
2. Chemistry teachers should use Google classroom in teaching Chemistry in schools
3. Government should provide facilities in schools that enhance the use of google classrooms in teaching.
4. Chemistry teachers should be periodically supervised and assessed in relation to their students' performance in the subject.

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