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Impact of Google Classroom as an Online Learning Delivery during COVID-19 Pandemic: The Case of a Secondary School in Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Author OON designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author KOG managed the analyses of the study and managed the literature searches. Both authors read and approved the final manuscript.

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ABSTRACT

The teaching and learning process is rapidly becoming technology driven with the integration of digital learning using of online learning platforms to facilitate instructional delivery. Google classroom learning platform is one of the effective ways of enhancing student active engagement in an online learning environment. The purpose of this study is to examine the impacts of Google classroom as an online learning delivery platform in secondary school during the COVID-19 pandemic in Nigeria. A mixed method approach was used in the study. Online questionnaire on Google Classroom Attitude Scale (GCAS) was used and online Semi-Structure Interview Guide (SSIG) developed by the researcher for data collection on the students' perceptions on Google classroom. The researcher used Statistical Package of Social Science programme to calculate and analyse arithmetic mean, standard deviation and t-test. Content analysis was used for analysis of

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qualitative data. The participants were 140. The results showed that Google classroom platform as an online learning delivery positively affected students' academic achievement, attitudes and their perception during the pandemic in Nigeria's secondary school. Based on the findings of the study, it was recommended that education stakeholders should effectively prepare students for the use of this platform for their learning activities during the pandemic. The platform is capable of assisting both students and teachers to connect, work together, create assignments, grade students and post learning materials. Likewise, students can also ask questions about the areas they do not understand. Hence, the advantages of the platform can be brought into usage for achieving quality in the teaching and learning process at all levels of education during the pandemic.

Keywords: Google classroom; online learning; attitude; secondary school students.

1. INTRODUCTION

Digital technologies are making dynamic changes in society. They are penetrating every aspects of human life. The influences are felt more and more in all tiers of educational system all over the world [1]. Digital technology is an essential tool that provides innovative educational opportunities by reorganizing students' learning content, actively engaging students in classroom activities, and changing instructors' roles in the classroom. In this digital era where technology simplifies virtually everything; contemporary students use this technology in its various formats in their daily activities, both within and outside the classroom environment. This is the reason why educational model has now proven that majority of educational activities is inseparable from technological practices [2].

In recent times, education has undergone a major paradigm shift, from traditional teacher-centered pedagogy to student-centered pedagogy. The student-centered teaching approach, acknowledges student's needs, abilities and learning styles by including the students in decision-making processes, which in turn may motivate and engage students in their learning activities [3]. It is widely believed that the advent of digital technology in education and the emergence of digital literacy have played a great role in facilitating the vast adoption of student-centered techniques in educational settings. The use of digital technology in the classroom changes the way learning occurs, students have opportunities to explore the vast volumes of available information in their various homes rather than the limited time available within the confinement of the physical blocks of classroom [4].

Moreover, [5] explains that the mode of learning among students in the digital age is quite different compared with the past generations of students. The digital age students are active experiential students, proficient in multitasking and dependent on digital technologies to access information and to interact with others. Hence, education should be tailored to the learning needs of the students. This will involve by modification of the paradigms of learning to enable the use of digital technology in consonance with how students learn, interact with the world around and understand the societal expectations from the education of the students. By implication, digital technology serves as a platform that equips students to organise their learning process.

One of the benefits of using digital technology in schools is that audio-visual teaching materials could enhance learning. Studies have shown the influence of digital technology on students' engagement and learning outcomes using various digital modes. These include PowerPoint, radio, television, Internet, video-based, virtual learning environments, zoom video conferencing among others and the results have shown a positive effect of technology usage for educational purposes given their capability to enhance learning in various subject areas [6]; [7]; [8] and [9].

Restriction of movements and social distancing, occasioned by the COVID-19 pandemic have put a stop to classroom activities. Therefore, there is a need for alternative approaches to teach students at their own respective places with the use of digital technological tools. This calls for investigation into other innovative digital technology tools that could be used to bring about improved performance in the teaching and learning process. One of the emerging digital technology tools that could be used to engage today's students in classroom activities during the pandemic is Google classroom. Google classroom is a product of digital industry that provides numerous benefits to facilitate virtual

teaching and learning [10]. Google classroom is a learning strategy that has evolved into a platform for promoting critical thinking, collaboration, and social interactions with peers and teachers on academic activities.

Google classroom is an interface portal, created by Google companies as an online educational platform. It is very easy to set up and allows teachers to create classes, distribute assignments, post announcements, send feedback, upload course materials for students to view and interact in the class stream or by email [11]. It also allows students to work through problems or assignments at their own pace while still receiving support and guidance when necessary. Students could become self-directed, and it produces a learning environment that improves students' knowledge and skills in the subject area [11]. In addition, when students submit their assignments, the teacher can highlight the contents of each assignment, provide the student with instant constructive feedback, and evaluate his/her performance. More so, the platform creates a space for private comment for students to interact with other mates or their teachers on things relating to the topic taught or subject area, which makes the class interesting and enjoyable.

1.1 Statement of the Problem

With the emerging trend in digital technology, there is a dearth of studies on how to ameliorate the problems of teaching and learning among the secondary school students in Nigeria with the use of digital technology. The restriction of movements and social distancing imposed by the COVID-19 pandemic have exposed this weakness in the Nigerian education system. With uncertainty surrounding the return to the pre-COVID-19 normal, it is becoming increasingly difficult to impart knowledge on the students, especially those preparing for their exit examinations. This, therefore calls for an innovative approach with the utilisation of digital technologies to engage the students in teaching and learning. Google classroom learning platform has a way to filling this gap in instructional delivery, as it will directly expose the students to the use of online learning to engage them in the teaching and learning process during the period at their respective places.

Google classroom is an online learning platform for schools that aim at virtual creation, distribution and grading of assignments. It is an e-learning platform, which promotes critical thinking, collaboration, and social interaction with students and teachers on academic activities. Hence, this study therefore, determines the impact of Google classroom as an online learning delivery in secondary schools during COVID-19 pandemic in Nigeria.

1.2 Research Questions

1) What are the attitudes of the students toward Google classroom as an online learning platform?
2) How do the Nigerian secondary school students perceive Google classroom as an online learning platform?

2. LITERATURE REVIEW

Google classroom is an online learning platform that could be used in any educational scope to find solution to the difficulties experienced in making paperless assignments. It was introduced as a feature of Google Applications for Education (GAE), which was released publicly on August 12, 2014. The application was connected to gmail, google drive, hangout, youtube and a deep calendar. It aims is to be a paperless educational system and a tool that allows educators to create, organize and manage online assignments using Google Documents and Google Drive (www.google.com). The Google classroom is available as a tool for developing teaching and learning process all over the world. There are many facilities provided by Google classroom which make it easier for teachers to carry out learning activities. The application offers a paperless teaching and learning opportunity, which has resulted in positive findings. [12] observed that Google classroom technology has proved a valuable platform for distance learners in the National Teachers' Institute Calabar study centre, in term of their experience, perceptions and engagement in the classroom activities. The finding also showed that, the lecturers at the centre possess a high level of competence to use Google classroom for instructional delivery. [13] in their study employed Google Classroom as a tool for managing course materials for flipped mathematics class in an Elementary School, in Istanbul, Turkey and observed improvement in student-instructor interaction, student engagement, and self-paced learning.

One of the most recent studies by [14] made use of a flow theory and use of technology acceptance (UTAUT) model to investigate factors affecting Google classroom assisted blended

learning classroom among the foundation studies in Management, University of Utara, Malaysia. The study was carried out among English language students from year the 2018 to 2019 academic session. The findings revealed that not all the factors are significantly useful in terms of the behavioural intention to the use of Google classroom for blended learning. It was revealed that, the integration of flow theory shows a significant positive relationship on behavioural intention to the use of Google classroom for blended learning. Another study carried out within the domain of self-learning and self-development, by [11] put more emphasis on the role of Google classroom as a self-directed learning platform. It has been found that self-satisfaction on the students' behalf is evident when it comes to the usage of Google classroom due to its usefulness, easy to use, and its practicality in accomplishing the intended tasks. The findings support the fact that Google classroom can enhance the students' self-directed learning (SDL) cognitive skills.

Based on the available literature, the effective way of using Google classroom as an online learning platform would go a long way in engaging the students, increasing the attention rate and improved their academic achievement positively across all the fields of study. Technology has played a great role in improving education globally, but it has not been practically utilized among the 21st century students in Nigerian secondary schools for creating an online learning environment. Google classroom, as it were, remains an emerging pedagogical platform in an online environment and many of the secondary school students are unaware of this new development. Therefore, this study, determine the impact of Google classroom as an online learning delivery in secondary schools during COVID-19 pandemic in Nigeria.

3. RESEARCH METHODOLOGY

This study adopted a mixed method (survey and semi-structure interview) research design to investigate the impacts of Google classroom as an online learning delivery in secondary schools in Nigeria. The qualitative data was collected because the quantitative data alone would not be sufficient to answer the research questions. Quantitative data was generated from online questionnaires while qualitative data were collected through online interview developed by the researchers.

3.1 Population Sample and Sampling Techniques

The population of this study comprised SSII students from Preston International School Akure, Ondo State, Nigeria. The intact classes of 140 students were assigned to Google classroom learning activities.

3.2 Research Instrument

Google Classroom Attitude Scale (GCAS) was developed to elicit information on the disposition or tendency of students to respond positively or negatively to Google classroom learning. The online questionnaire consists of items that were measured on Likert type 4-point scale, where 4 was the most degree of agreement and 1 was the least degree of agreement. The statistical package for social sciences (SPSS) was used for the analyses. The online Semi-Structure Interview Guide (SSIG) was used to gather data on the students' perceptions to Google classroom learning. In addition, Cronbach's alpha value of 0.79 was obtained for the reliability. The test was given to Secondary School Teachers and Educational Technology specialist for face and content validity of the test. Kuder-Richardson (K-R 20) was used to test the level of difficulty and reliability coefficient index of 0.84.

3.3 Procedure

Play Store is the easiest way to access Google classroom. We typed Google classroom, downloaded the application, opened and installed it on each cell phone or android. A green square, with Google classroom, then appeared on the hand phone or android. Upon the prompting to open and install Google classroom, it started by clicking the "+"sign on the top of the toolbar. Two options, making classes and joining classes, then appeared. The teacher can make a class by typing the name of the class, the subject and the subject of learning. Having entered the Google classroom account, three main menus propped up, namely, stream / flow, classwork / activities of students and people. Stream is a Google class facility to make announcements, discuss ideas or see the flow of tasks, materials and quizzes on topics taught by the teacher. In addition, the teacher can use classwork to make test or questions, pre-test, quiz, upload materials and reflections. The teacher can use the menu to invite students, using the access code that is already available on the people bar.

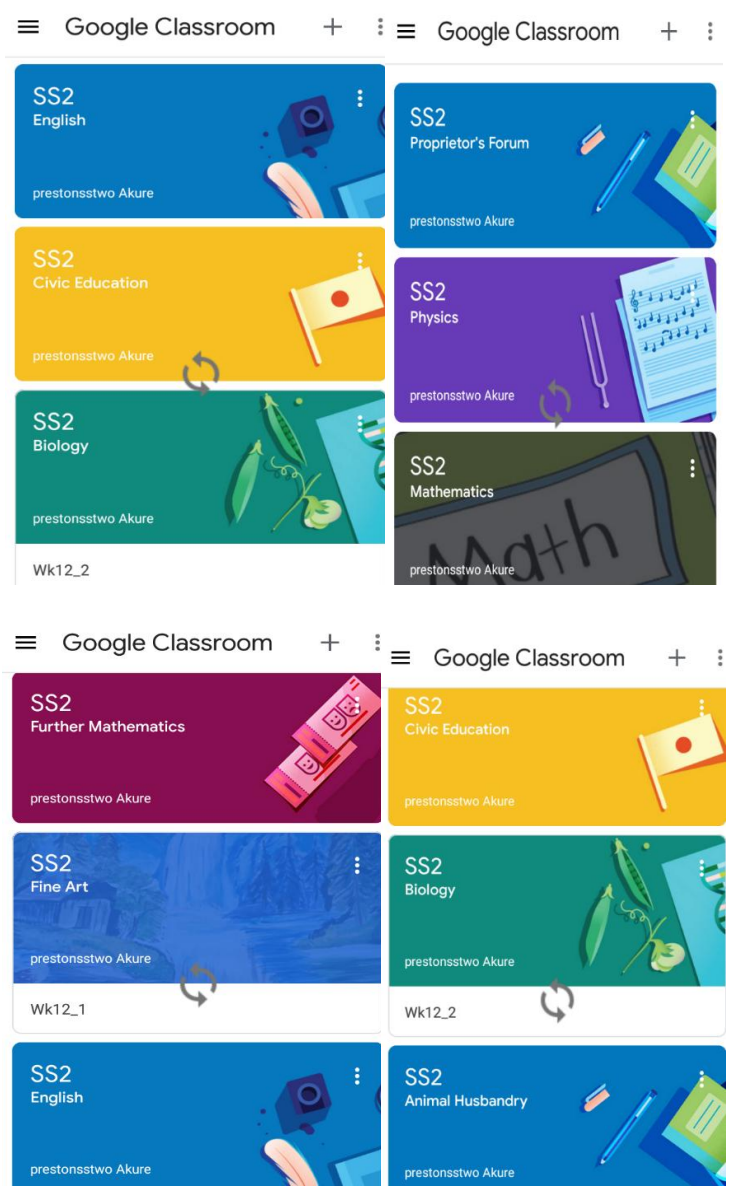

Fig. 1. Screen shot of the Google classroom learning platform

The teacher will upload the materials, in word, excel, power point, pdf or video files, on the classwork bar. The teacher can do this to accommodate any differences in thinking, background of pre-knowledge, and differences in students learning styles.

4. RESULTS

4.1 Research Question 1

What are the attitude of the students toward Google classroom as an online learning platform?

In order to find out the impacts of Google classroom as an online learning delivery in secondary schools, data were collected and analysed to see if there was a significant difference between pre attitude and post attitude of the students to Google classroom as an online learning delivery using paired sample t-test. Table 1 shows the results of the analysis.

In Table 1, the comparative results of the pre- and post-attitude mean scores show that the post-attitude mean score (30.40) is higher than

Table 1. Paired sample t-test results of the pre- and post-attitude scale of the students towards Google classroom as an online learning platform

Tests	N	Mean	SD	t-value	P-value
Pre-Attitude	140	26.35	10.82		
Post-Attitude	140	30.40	12.96	12.39	0.000

Table 2. The perceptions of the students towards Google classroom learning platform

S/N	Items	Strongly agree	Agree	Disagree	Strongly disagree	Mean	SD
1	I find Google classroom useful in my learning activities.	47(33.6%)	57(40.7%)	19 (13.6%)	17(12.1%)	4.61	0.89
2	Using Google classroom enables me to accomplish my tasks more quickly.	46(32.9%)	50(35.7%)	26(18.5%)	18(12.9%)	4.45	0.93
3	The attached course materials are easy to access on Google classroom.	41(29.3%)	59(42.2%)	24(17.1%)	16(11.4%)	4.28	0.82
4	My learning ability is improving as I have more time to watch the prepared videos repeatedly, through Google classroom.	45 (32.1%)	39(27.9%)	20(14.3%)	36(25.7%)	4.55	0.74
5	I prefer using Google classroom Application for all my subjects.	47(36.6%)	61(43.5%)	12(8.6%)	20(14.3%)	4.30	0.81
6	Google classroom helps me to submit assignment on time.	33 (23.6%)	45(32.1%)	28(20%)	34(24.3%)	4.39	0.93
7	I do not want to use Google classroom Application for all my subjects.	38(27.1%)	42(30%)	23(16.5%)	37(26.4%)	4.42	0.77
8	I feel comfortable interacting with other students in the activities using Google classroom.	36(25.7%)	40(28.6%)	30(21.4%)	34(24.3%)	4.35	0.91
9	The feedback I receive is an accurate evaluation of my performance.	51(36.5%)	66(47.1%)	9(6.4%)	14(10%)	4.42	0.78
10	I intend to continue using Google classroom learning in the future	38(27.1%)	45(32.1%)	23(16.5%)	34(24.3%)	4.36	0.72
			Grand Mean			4.41	

the pre-attitude mean score (26.35). Paired sample t-test was computed to find out if 4.05, the difference between the pre- and post-attitude mean scores, was significant and t-value was found 12.39. This value is higher than 2.02 at 0.05 degrees of freedom, which shows that Google classroom has an impact on holding positive attitudes of students towards Google classroom as an online learning platform.

4.2 Research Question 2

How do the Nigerian secondary school students perceive Google classroom as an online learning platform?

The perceptions of the students towards Google classroom learning platform were also qualitatively explored via the semi-structured interview.

From the analysis in Table 2 show that, the perceptions of the students towards Google classroom learning platform was high with grant mean of 4.41. Mean why, 108 (80%) prefer to use Google classroom application for all their subjects because it gives opportunity to answer question online, promotes active participation among others. On the other hand, 80 (57%) participants preferred conventional mode of instruction only to Google classroom due to some challenges associated with the platform caused by internet connection. This is a mixed feeling; notwithstanding, the result implies that students are ready to use Google classroom.

5. DISCUSSION

The finding show that majority of the participants indicated that Google classroom as an online learning platform is very relevance in secondary schools during pandemic. They agreed that Google classroom promotes independent learning, critical thinking, and revision of lesson materials, collaboration among students and continuous assessment with immediate feedback. In support of this, the responses during semi-structure interview was content analysed.

One participant made this statement:

> "It improved my learning ability and increased retention rate because I have enough time to watch the prepared videos over and over."

Another participant said that:

> "It allowed me to accomplish my tasks more quickly because of the time lag; the platform was interesting, it allowed me to interact with my mate during the class activities."

Also, another participant said:

> "It allowed me to do my class anytime anywhere provided there is internet connection." Likewise,

Another participant said:

> "It helps to receive an accurate feedback of my performance and corrections of my tasks."

This finding agrees with [12] who found that Google classroom technology as most valuable platform for distance learners in National Teachers' Institute Calabar study centre. The findings is in line with the study of [15] who observed that Google classroom improved students access and attentiveness towards learning, the knowledge and skills gained through the platform changes students from passive to active learners. This finding corroborates with the work done by [11] who observed that Google classroom is effective in enhancing students' self-directed learning (SDL) cognitive skills in an online learning environment.

In the same vein the findings have shown a positive correlation between students' attitude and the use of Google classroom platform, which engaged the students in online learning activities. The result agreed with the study carried out by [16] who asserted that, students' attitude toward the use of Google classroom was positive, especially in translation subject in English Language. This implies that students' attitude goes a long way in determining the success and acceptance of technology integration into online learning activities. The findings revealed that students' perception toward Google classroom was good and they responses positively to the use of Google classroom platform. This findings support the studies conducted by [17]; [18]; [19] and [20] who reported that Google classroom is very effective and students have positive intention to use the platform as an online learning delivery. This implied that Google classroom platform is an effective online learning delivery because it has contributed to the academic success of the students at secondary school during pandemic.

6. CONCLUSION

Google classroom provides a veritable platform for both teachers and students to utilize digital technological tools for students' engagement in an online environment. The platform promotes active learning which makes the learning materials more accessible to students anywhere anytime. In view of the identified instructional benefits, derivable from using Google classroom platform, it is imperative for education

stakeholders to prepare students for the use of this platform during the pandemic. In addition, because of the current situation of global pandemic (COVID-19), restricted movements and social distancing, Google classroom learning platform offers assistance to both students and teachers to connect, work together, create assignments, grade students and post materials. Likewise, students can also ask questions about the areas they do not understand. Hence, Google classroom, as an online learning platform, offers the advantage of achieving quality in the teaching and learning process at all levels of education during any pandemic period.

7. LIMITATION AND FUTURE RESEARCH

The study was conducted in a private secondary school in Ondo State, Nigeria. Thus, findings cannot be generalised. A similar study could be conducted in a public secondary school to compare if the findings are consistent with the study. Future studies can also incorporate pretest-posttest control group quasi-experimental design in order to get findings that are more comprehensive.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT AND ETHICAL APPROVAL

As per international standard or university standard guideline participant consent and ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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