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**TEACHERS' PERCEPTION OF THE INFLUENCE
OF COVID-19 ON THE PERFORMANCE OF
SENIOR SECONDARY SCHOOL CLASS THREE
STUDENTS: INFERENCES FOR STEM
EDUCATION IN NIGERIA**

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Teachers' Perception of the Influence of COVID-19 on the Performance of Senior Secondary School Class Three Students: Inferences for STEM Education in Nigeria

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Abstract

The latest eruption of COVID-19 pandemic in December 2019 has led to the complete lockdown of key conurbations worldwide which occasioned the premature shutting down of schools in conurbations affected. With the surging cases of the COVID-19 pandemic in Nigeria, it is conjectured that COVID-19 may have an undesirable effect on the performance of senior secondary school class three students in science, technology, and mathematics (STM) subjects in the forthcoming national and regional examinations conducted by the National Examinations Council (NECO) and the West African Examinations Council (WAEC). By drawing on qualitative research method and case study design, the study collected data through electronic interviews conducted with nine STM teachers. Results showed that there are likelihoods of a further drop in the pass rate of senior secondary school class three students in STM subjects in this year's national and regional examinations if COVID-19 contagion is not curtailed. COVID-19 induced school closure and subsequent adoption of virtual modes of learning mediated through social media platforms, television and radio broadcast has resulted in the loss of quality teaching and learning time coupled with the disruption of the school academic calendar. The study recommended that Nigerian government at all levels should make it a point of duty to distribute iPads and electronic tablets preloaded with e-textbooks to all senior secondary school class three students in the country. This will help to mitigate the effect of the COVID-19 pandemic on students' academic performance in STM subjects in the forthcoming national and regional examinations.

Introduction

In December 2019, a mysterious aetiology of a pneumonia eruption emerged in Wuhan, the People Republic of China. The causal micro-organism was isolated on the 7th of January 2020 through series of experimentation as a new coronavirus and named severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) being identical to the virus that formerly triggered SARS pandemic. Since the beginning of this millennium, additional coronavirus outbreaks have been noticed twice. The first occurred in 2003 as SARS-COV in China that affected approximately 8000 people and caused approximately 800 deaths. The second manifested in Saudi Arabia in 2012 affecting approximately 2500 patients and caused approximately 800 deaths with some patchy cases still recounted this day (Cascella, Rajnik, Cuomo, Dulebohn, & Di Napoli, 2020). Globally, coronavirus disease otherwise called COVID-19 which had affected over 19,654,273 patients with 727,111 deaths as at 8th August 2020, was subsequently declared a pandemic by the World Health Organization (WHO) on March 12th, 2020 (Awofala, Lawal, Isiakpere, Arigbabu & Fatade, 2020). While the spread of COVID-19 has remained unabated, human-to-human conduction of the coronavirus occurs through fomites, contacts, droplets, and tears (Ong, Tan, Chia, Lee, Ng, Wong, et al, 2020). Consequently, many nations of the world had adopted numerous measures to curtail the spread of the infection and to reduce the reported active cases of COVID-19. The first index case of COVID-19 in Nigeria was identified on 27th February 2020. The Nigerian COVID-19 pandemic is one of the most prevalent in Africa with over 164,147 reported cases and 2,061 deaths as at 16th April 2021. The actions taken by the government included endorsing and enforcing social distancing and discouraging every form of social gathering/meeting. Other measures included restriction of inflow of flights from other countries, grounding of domestic flights across the country, nation-wide sensitization and advocacy programme on the importance of using face masks at all times and maintaining personal hygiene and daily updates by the Nigeria Centre for Disease Control (NCDC) and closing of schools and tertiary institutions at all levels. Precisely, the Federal Government of Nigeria announced school closure at all levels on 23rd March 2020. Thus, secondary school students in the country abruptly ended Term 2 of the 2019/2020 academic session without sitting for the end-of-term examinations, which normally occur at the end of each term of a session trimester. The effect of the COVID-19

total lockdown on the world of learning is inexorably weighty. Straight costs of the total lockdown strategies are the shutdown of all school activities and the termination/rescheduling of countrywide and foreign examinations.

Teachers have to be innovative in teaching students remotely, keeping on with their students using social media platforms such as WhatsApp and Telegram, coupled with electronic media platforms such as television and radio broadcast of educational contents from core subjects. Nonetheless, it is foreseeable that this experience will revolutionize teaching behaviours, stimulate and advance the expansion and deployment of online tools. Without mincing word, the COVID-19 experience has taught us the significance of implementing codified specific modus operandi to guarantee the protection of students and teachers, while assuring the steadiness of the online learning activities. Literature shows lack of research connecting COVID-19 to educational studies (Sintema, 2020) but there is availability of avalanche of research between COVID-19 and medical studies (Casella et al., 2020; Ong et al., 2020). The paucity of research is attributable to the seemingly little or no correlation between the impact of diseases and efficient delivery of instruction to learners worldwide.

The premature cessation of secondary schools across Nigeria was a progressive response by the Federal Government of Nigeria to safeguard students from likely dangers of being infected with COVID-19 since schools are social gatherings where many students meet thereby making schools precarious places where the diseases can easily spread. There is little or no research on the effect of COVID-19 on the performance of senior secondary school students (Sintema, 2020) who are deemed to write both the regional and national examinations. Students in senior secondary school class three in Nigeria normally write regional examination conducted by the West African Examinations Council while they also sit for the national examination conducted by the National Examinations Council. Nigeria runs a three-term system of education for all schools and each term consisted of 13 weeks. Since school is a place where planned and unplanned undertakings take place, it is sometimes difficult for students to enjoy an itch-free academic session decently devoted to teaching, learning and assessment for examinations, which in the case of senior secondary school class three students occur between April and July of each year. The planned activities like sports are healthy for the schools' smooth running but the unplanned activities such as the outbreak of COVID-19 are unpalatable and could hurt the school. Owing to the fact that the Nigerian government had previously closed down all schools snappishly to curtail the rapid spread of COVID-19 while citizens were persuaded and encouraged to go into self-isolation. With the battle for the production and distribution of COVID-19 vaccine still on, the federal government of Nigeria recently announced the reopening of secondary schools under strict restrictions and observance of the COVID-19 protocol. Notwithstanding, the effect of COVID-19 will sturdily affect the senior secondary school class three students who are due to write their terminal senior secondary school certificate examinations (SSCE). Senior secondary school class three students are finding it difficult to adjust to the new normal that incorporates virtual learning modes as they prepare to sit their final examinations. This anomaly is further compounded with no well-structured e-learning platform for the senior secondary school class three students. The last term of the trimester of 2019/2020 academic session will be hectic for teachers who will be in a hurry to cover the syllabus. As a result, science technology and mathematics (STM) subjects will be at the receiving end as the country struggles to enhance achievement in these very important subjects. In Nigeria, students show poor performance in STM subjects (Oladipo, Awofala & Osokoya, 2020) and the effect of COVID-19 could badly influence the performance of students in these subjects. Table 1 below show the analysis of West African Senior Secondary Certificate Examinations (WASSCE) in STM subjects from 2007 to 2016 in Nigeria.

Table 1: Students' Enrolment and Performance in West Africa Senior Secondary Council Examination (WASSCE) in science and mathematics subjects: 2007-2016

Year	Biology		Physics		Chemistry		Mathematics	
	Number of Student	Percentage (%) pass	Number of Student	Percentage (%) pass	Number of Student	Percentage (%) pass	Number of Student	Percentage (%) pass
2007	1,238,163	33.37	196,063	46.16	409,063	44.16	1,249,028	46.75
2008	1,259,964	33.94	202,762	44.37	408,237	49.08	1,369,142	23.0
2009	1,259,964	33.87	203,762	43.49	444,236	50.14	1,373,009	31.00
2010	1,300,418	32.88	263,059	50.70	463,755	51.27	1,351,557	33.55
2011	1,505,199	38.50	280,250	49.54	563,161	63.94	1,540,250	38.15
2012	1,646,150	35.66	270,570	43.13	624,658	68.74	1,675,224	48.91
2013	1,648,363	51.73	462,517	72.34	637,023	46.77	1,543,683	36.00
2014	1,365,384	56.17	397,649	62.49	635,729	60.76	1,692,435	31.30
2015	1,390,234	57.42	412,323	60.60	684,124	60.01	1,593,442	34.18
2016	1,200,367	61.68	408,122	57.74	705,125	58.95	1,544,234	38.68

Source: Statistics Section of the WAEC Office Yaba, Lagos (2017)

Analysis of the data in Table 1 shows low performance, a condition, which is displeasing and disturbing. If students could record low performances in sciences and mathematics subjects at the regional examinations conducted by the WAEC from 2007 to 2016 when there was no pandemic and schools were not shut, then it would be difficult to expect better performance from students during the period of COVID-19 pandemic in Nigeria. At no time have the senior secondary school class three students recorded higher performance in STM subjects in the country and the prevalence of COVID-19 could further deepen the low performance of students in the STM subjects. COVID-19 has appeared as a serious challenge since it aggravates the anxieties that senior secondary school class three students may record a drop in performance in STM subjects in regional and national examinations this academic year.

The major goal of this study was to investigate empirically the perception of STM teachers on the probable impact of COVID-19 on STEM education in Nigeria and the performance of students in STEM subjects. First, the study is significant in the sense that it could provide the needed data for the Ministry of Education at both the State and the Federal levels to speed up its educational interventions and plan to curb the impact of COVID-19 on education in the country. Second, the study is important to the didactic investigation as it provides useable and vital literature to STEM education that academics might deploy to back up impending investigations connected to COVID-19 and the overall education.

Methods

This study utilized the qualitative method of a case study approach (Creswell, 2017). The case study is an in-depth narrative and exploration of a restricted and definite state, a structure and a single entity (Meriam, 1998; McMillan & Schumacher, 2010). In the present study, in-depth narratives and reflections were made regarding the perceptions of STM teachers on the effect of COVID-19 on senior secondary school class three students' performance in STM based on interviews.

Participants

The participants for this study were nine STM teachers of which three were science teachers; three were mathematics teachers and the remaining three were technology teachers teaching in different senior secondary schools in Education District II of Lagos State, Nigeria during 2019-2020 academic session. Lagos State and specifically Education District II was purposely selected as the study population because Lagos State and educators in Education District II were proactive in the championing of educational responses to COVID-19 through their television and radio broadcast of STM core subjects. The teachers were engaged in the study after obtaining ethical clearance and approval from the Directorate of Education in Education District II. Three criteria were used in the selection of participants for the study. First, the participant must be a senior secondary teacher of mathematics or any of the sciences (biology, chemistry and physics) or any of the technology subjects (auto-mechanics, building and woodwork and electrical electronics). Second, the participant must have 10 years of teaching experience or more in their area of expertise. Third, participant must have basic knowledge of COVID-19 from any source (knowledge from social media like Facebook, radio or television. World Health Organization updates, local updates from Ministry of Health or Nigeria Centre for Disease Control). Following these criteria, nine teachers were purposefully selected to participate in the study and interviews. The anonymity of all STM teachers and confidentiality were guaranteed. All participants were reminded of the guarantees regarding confidentiality and anonymity at every stage of the research process, and permission was sought from them to record interviews and use the interview data for research purpose only.

Instrument

In qualitative studies, interviews are considered a simple data collection strategy (Meriam, 1998). Accordingly, data were collected utilizing the interview schedule, which contained only one semi-structured question. With this interview protocol, the topic is carefully chosen in advance and the researcher decides on the order and expression of the question during the interview (McMillan & Schumacher, 2010). Moreover, in semi-structured interviews, the questions offer suppleness and a large part of the interview gyrates around the questions and sub-questions (probes) that are required to be illuminated (Merriam, 1998). The interview schedule, which contained only one question, was initially given to three STM teachers who were not part of the study's sample in order to determine the face validity and intelligibility of the item. The STM teacher agreed on the only item. This was pilot-tested with three STM teachers and their interpretations concerning the lucidity of the question were sought. Their comments were noted and the only question survived to form the final version of the interview schedule that was used for the study.

Data Collection and Analysis

Interviews were carried out using a smartphone in order to observe the COVID-19 protocol. The interviews with the nine STM teachers were recorded on the smartphone of one of the authors. The telephone interviews lasted five minutes each on the average. The STM teachers' views were transcribed and analyzed using the content analysis technique. The authors circumvented prejudice by carrying out transcription and coding of the data. The authors debated and synchronized all incongruities and contradictions relating to the collected data. Each of the participants was required to read the transcriptions and to approve that the transcript epitomized their opinions. This further ensured the soundness and trustworthiness of the qualitative data.

Results

Findings from the telephone interviews shepherded with STM teachers show that a likely drop in the performance of the senior secondary school class three students in STM subjects at both national and regional examinations abounds in the year 2020 academic session. The reduction in contact hours between the senior secondary school class three students and their STM teachers could account for the drop in the senior secondary school class three students' performance in STM subjects. The STM teachers were asked about the effect of COVID-19 on senior secondary school class three students' performance in STM subjects and they bemoaned the absence of contact hours between the teachers and the students. The STM teachers described how COVID-19 had affected the senior secondary school class three students' performance to school-based practical activities. In the sequel, ST means science teacher, MT means mathematics teacher and TT means technology teacher.

Interviewer: *What are the likely effects of COVID-19 on senior secondary school class three students' performance in STM subjects in the forthcoming national and regional examinations?*

ST1: *The effects of COVID-19 on senior secondary school class three students' performance in STM subjects are negative and displeasing. First, the closure of schools had resulted in a loss of contact hours between the STM teachers and senior secondary school class three STM students, as they no longer have the opportunity for face-to-face interactions in the classroom. With this, it is difficult to conduct practical sessions for the students in the laboratories. Second, online learning in secondary schools in Nigeria is a ruse, as there are no formidable infrastructures in place to support it. Most secondary school teachers are not aware of the online learning platforms that could be deployed during the COVID-19 pandemic in the country. Third, the social distancing in place in the country had prevented private coaching for STM students, as no one knows who has been infected with the COVID-19 disease.*

MT1: *Poor performance in this year national and regional examinations in STM subjects is imminent as COVID-19 had restricted all students to learn at home in the absence of teachers. For instance, this year national and regional examinations for senior secondary school class three students had been shifted from May/June to August/September because of the COVID-19 pandemic and students cannot perform well without being taught. Practical sessions in STM subjects had been put on hold in all schools in the country because of the prevalence of COVID-19 pandemic and this portends danger for students' performance in STM subjects.*

TT1: *During this period of COVID-19, senior secondary school class three students' performance in STM subjects would be worse as students no longer have close contact with their teachers due to the closure of schools. The closure of school has resulted in the loss of contact hours between the teachers and the students and this would affect students' performance in STM subjects. Because of the closure of schools, practical sessions could not be conducted with senior secondary school class three students in STM subjects. Without good footing in practical activities, students will not perform very well in STM subjects. The COVID-19 pandemic has instilled fear in both the students and the teachers. The students are afraid to learn and the teachers are afraid to teach. Teachers and students are maintaining social distancing and are in self-isolation because of the COVID-19 pandemic. The mock examinations that are normally conducted for senior secondary school class three students in preparation for the national and regional examinations could not take place because of the closure of schools nation-wide. The COVID-19 pandemic also prevented schools from administering end-of-term examinations for students due to school closure. Thus, one should expect a poor performance of students in the STM subjects in the forthcoming national and regional examinations in the country.*

ST2: *Before school closure on 23rd of March, 2020 senior secondary school class three students were expecting to start their regional examinations in two-week's time and this never took place. This not only affected senior secondary school class three students' preparation towards the examinations but also made them suffer psychologically. The trauma they experienced due to the postponement of examinations could not be quantified. Students no longer see their teachers face-to-face to ask questions since there is a school closure. Any difficulty*

they experience during self-studying at home will remain with them until schools are re-opened. Even though the present senior secondary school class three students are digital natives, few of them own a smartphone, which could enable online learning and most schools in Nigeria prevent their students from coming to school with smartphones. Schools reject smartphones because it could cause a distraction for the students, as they are fond of using it for non-school activities.

MT2: The COVID-19 pandemic will harm the senior secondary school class three STM students. Right now, schools are closed and so no teaching and learning are taking place throughout the country. Students are at home maintaining both social distancing and self-isolation. This is also due to the teachers. Both the teachers and the students are in palpable fear as the COVID-19 pandemic has ravaged the entire nook and cranny of the country. Teaching and learning are no longer taking place within the four walls of the schools and most teachers are not comfortable with online teaching which could serve as a substitute for face-to-face teaching. Therefore, students are left untaught and this could result in poor performance in the forthcoming national and regional examinations in the country.

TT2: Before the emergence of the COVID-19 pandemic in the country, the performance of students in the STM subjects has been woeful. Now that there is COVID-19 induced school closure, one should not expect students to perform very well in the STM subjects. This is because less teaching has taken place in all schools across the country. COVID-19 pandemic has made both the teachers and the students to self-isolate in order not to contract the disease, which has killed thousands of people in the country. The negative impact of COVID-19 on senior secondary school class three students' performance in STM subjects is better imagined. COVID-19 has led to the loss of four months of quality teaching-learning time in schools and the disease keeps on subsisting in the population. More worrisome is the lack of adequate infrastructure for online learning in secondary schools in the country. The COVID-19 induced school closure is not a problem without a solution if there is adequate infrastructure to support online learning in schools. Most parents could not afford to buy smartphones for their wards to engage in online learning and where parents could afford it, they could not provide the needed data for online learning. This is because data are not only expensive but that data vanish easily when used with 4G supported smartphones.

ST3: COVID-19 will affect different categories of senior secondary school class three STM students. Senior secondary school class three students are of varied learning abilities. While some are fast learners, average learners, others are slow learners and every classroom has these different categories of students. The COVID-19 will have a damaging effect on slow learners than the fast and average learners. This is because slow learners normally rely on teachers' explanations in clearing doubts in learning and the COVID-19 pandemic has prevented teacher-student face-to-face interaction within the four walls of the classroom. The sudden closure of schools with no definite time to re-open them has made some students dump their books while others might be thinking that both national and regional examinations for senior secondary school class three students will be shifted. All students including the senior secondary school class three students have lost four-months of quality face-to-face teaching-learning time which they were used to due to the school closure. Today, students in the non-terminal classes have lost the third term due to COVID-19 induced school closure and the regional examinations for the senior secondary school class three students have been shifted from May/June 2020 to August/September 2020. Students in the non-terminal classes are expected to be promoted to the next class using the results of their first and second terms.

MT3: The effect of COVID-19 on the performance of senior secondary school class three STM students is unquantifiable. However, one thing is sure; COVID-19 will initiate a drop in the performance of senior secondary school class three students in the STM subjects. The effect of COVID-19 on students' performance is already significant with the total closure of schools in which students could not write their end of term and national examinations as and when due. Promotion examinations for students in the non-terminal classes have been cancelled and that of terminal classes postponed indefinitely due to COVID-19 induced school closure. In Nigeria, online teaching and learning are at its infancy stage as there are no formidable infrastructures to support it. The epileptic power supply, high cost of smartphones and high cost of iPads/electronic Tablets and internet data are major obstacles to online learning in the country.

TT3: The closure of schools due to the COVID-19 pandemic in the country portends great danger for students' performance in the STM subjects. This is because students no longer have contact with their teachers for teaching and learning to take place. Instead, they are at home in self-isolation and maintaining social distancing. The COVID-19 pandemic has instilled fear in all and sundry including the students and their teachers to the extent that everybody is on nose mask and maintaining basic health hygiene including intermittent washing of hands with sanitizers to reduce the spread of the disease. What concerns the students and the teachers now is not to

engage in any pedagogical discourse but maintain safety and not contract the disease, which is highly virulent. In this sense, students' performance in STM subjects in the forthcoming national and regional examinations for senior secondary school class three may be adversely affected and a drop in performance in the subjects should be expected. Already, students have lost four months of quality teaching and learning time due to the emergence of COVID-19 pandemic in the country. Most students cannot learn without teachers being involved as only a few can learn independently.

Discussion

The faster an end is put to the COVID-19 pandemic in Nigeria the better it will be for our educational system. Evidence suggests that school activities have been paralyzed to the extent that both the students and their teachers are in palpable fear of Coronavirus infection. Students could not go to school to learn under the tutelage of their teachers due to school closure occasioned by the pandemic. All citizens including the students and their teachers are maintaining social distancing and are in self-isolation to reduce the spread of the disease in the country. Citizens are persuaded to maintain basic health hygiene and use nose masks to curtail the spread of Coronavirus in the population. This study has shown that COVID-19 could have adverse effect on the education sector in Nigeria if appropriate measures are not put in place. This is because four months of quality teaching and learning time had already been lost due to COVID-19 pandemic in the country. Although teaching and learning was mediated with television and radio broadcasts, but only a few numbers of student could access them due to the erratic power failure in the country as reported in a local channel news hour. Students could no longer contact their teachers for explanations on difficult concepts they do not understand. The loss of quality contact hours has made learning at home for many students difficult. Practical sessions in STM subjects could no longer hold due to school closure. More worrisome is the inability of the government in the country to provide the needed infrastructure to support online learning at the secondary school level. Most secondary school students do not have a smartphone that could support online learning. Even the few that could rely on the smartphones of their parents for online learning could not access it due to the high cost of data subscription in the country. Teachers who merely survive on their meager salaries are still striving to purchase mobile data for online learning in order to keep interacting with their students. Presently, the third term examinations for the non-graduating classes have been cancelled while the terminal examinations for the senior secondary school class three students have been shifted from May/June to August/September. All the interviewees alluded to the fact that senior secondary school class three students' performance in STM subjects in the forthcoming national and regional examinations would be adversely affected due to loss of contact hours. To them, a drop in senior secondary school class three students' performance in the STM subjects in the forthcoming national and regional examinations is inevitable. For now, preparations towards the forthcoming national and regional examinations have been put on hold and this portends danger for students' performance in the STM subjects. The loss of quality contact hours cannot be regained this year. Hence, senior secondary school class three students would attempt their national and regional examinations relying mostly on their previous knowledge at school before the emergence of the pandemic.

The Implication for STEM Education in Nigeria

STEM education is yet to be fully incorporated in the senior secondary school curriculum in Nigeria. What we have presently in Nigerian schools is STM education in which the Engineering component of STEM is missing. The lack of STEM education at the pre-tertiary level in Nigeria may be the cause of attrition and underrepresentation of students in STEM disciplines at the undergraduate level. Nigeria needs men and women who are career-oriented in STEM disciplines for technological advancement and economic development. Therefore, to plummet the attrition of STEM-inclined underrepresented students and amass their enrolment into STEM majors should be one of the goals of education in Nigeria. As Nigeria is in dire need of technological development, there is the need to stock the economy with skilled professionals who are STEM inclined for the promotion of economic mobility in which the goal will be to reduce class discrepancies and maximize the effect of various clusters in unravelling predominantly multifarious problems. This study is recommending that solid foundation in STEM education be laid at the pre-tertiary level in Nigeria by introducing STEM education into the senior secondary school curriculum to ease students' transition to STEM careers in the university. The current pandemic will harm STEM education if introduced in the country now that students and teachers are still struggling to adjust to the new normal. COVID-19 has made Nigerians including teachers and students to go through an unpalatable experience. This experience may be difficult to erase in the minds of both the students and the teachers as the Nigerian government at all levels roll out measures to curtail the spread of COVID-19 pandemic. The poor performance in STM subjects, which senior secondary school class three students, may experience in this year national and regional examinations may work against those who will be interested in pursuing a career in STEM disciplines in the university. Therefore, serious work needs to be done as soon possible

to mitigate the impact of the COVID-19 pandemic on the performance of grade 12 students in STM subjects in this year national and regional examinations. Tested learner centred teaching strategies such as differentiated instruction, personalization of instruction and cooperative learning strategy (Awofala & Lawani, 2020; Awofala, Fatade & Olaoluwa, 2013; Olabiyi & Awofala, 2019) that can improve students' attitudes towards and achievement in STEM (Awofala, 2016; Awofala & Ojaleye, 2018) and efficacy in the use of computer (Awofala, Fatade & Udeani, 2015) should be deployed in the teaching of senior secondary school class three students. It is high time teachers adopted digital technologies to teach STM in the classrooms (Awofala et al., 2021).

Conclusion

This study has shown that the COVID-19 induced school closure would harm students' performance in these forthcoming national and regional examinations for senior secondary school class three students in Nigeria. Hence, effort should be made to mitigate the potential impact of COVID-19 on students' performance in STM subjects. Nigerian government at all levels should make it a point duty to distribute iPads and electronic tablets preloaded with e-textbooks in STM to senior secondary school class three students to cushion the effect of the pandemic on their performance in the STM subjects. Nigerian government should provide the needed infrastructures that support online learning and provide free data to students to learn online. The ministry of education should initiate training workshops for STM teachers so that they can be trained on how to use the different online learning platforms such as Zoom, Schoology, Edmodo, Google classroom etc. for academic purposes. To complement this study, future studies can investigate the possible effect of COVID-19 on national educational planning. Since this study relied on a qualitative paradigm, future studies can include quantitative research method in its investigation for possible generalization of the results of this study.

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