

Impact of Covid-19 on the Teaching and Learning of Basic Science in Some Selected Upper Basic School Students in Igabi, Kaduna State

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Abstract

This study investigated the impact of the corona virus (COVID-19) on the teaching and learning of Basic Science in Some Selected Upper Basic School Students in Igabi, Kaduna State. To execute this research, three research questions, and one hypotheses guided the study. In this study, ex-post factor design was used with three hundred and fifty-one (351) respondents chosen as sample size for the study. The instruments for data collection in this study was a students' terminal results and a structured questionnaire and analyzed using mean, standard deviation, and ANOVA. The results revealed that there is significant relationship between impact of Covid-19 pandemic and academic performance of upper basic school students in Basic Science in the study area. There is high impact of covid-19 pandemic on the retention ability of Basic Science students in Igabi LGA, Kaduna State. And online education is not the alternative measure for conversational teaching and learning of Basic Science for future occurrences of any pandemic in Kaduna State. The researcher recommends that due to the difficulties the students had during the COVID-19 pandemic, the platforms and policies for online learning in secondary schools throughout Kaduna State and Nigeria are in need of a thorough assessment and critical examination.

Keywords: Teaching, Basic Science, Igabi, COVID-19, Upper Basic.

Introduction

The coronavirus disease 2019 (COVID-19) pandemic in Nigeria is part of the worldwide pandemic caused by severe acute respiratory syndrome coronavirus 2 (SAR COV-2) (Marra *et al.*, 2013). Coronaviruses are common in certain species of animals, such as cattle camels, and bats which can be transmitted to humans. Some health experts believe that the new strain of coronavirus likely originated in bats or pangolins (Anthony *et al.*, 2017). The first case of COVID-19 was reported in Nigeria by the Federal Ministry of Health on 27th February 2020. This was the case of an Italian citizen who works in Nigeria and returned from Milan, Italy to Lagos, Nigeria on the 25th of February, 2020 (Maclean & Dahir, 2020). Since then, the number of confirmed cases of infection keep rising both in Nigeria and across the globe. Nigeria placed a travel ban on 13 countries with high cases of the virus, the countries are; United States, United Kingdom, South Korea, Switzerland, Germany, France, Italy, China, Spain, Netherland, Norway, Japan, and Iran. On 11th March 2020, World Health Organization (WHO) declares COVID-19 a pandemic. A pandemic is a disease that has

spread across a large region; for instance, multiple continents or worldwide (Cucinotta & Vanelli, 2020).

Over the years, humanity had fought various global health scourges which threatened to wipe human beings off the face of the earth. It is worthy to know that coronavirus is different when compared with the plagues and epidemics that have ravaged humanity throughout its existence, in the sense that none has greatly affected the education of everyone in the world like COVID19 (UNESCO, 2020). A few of these plagues are the Black Death (1346-1353) that travelled from Asia to Europe, living devastation in its wake. Also, the Spanish flu (1918-1920) is among the worst pandemic in history, despite the common name of the pandemic, scientists are not entirely sure where the virus originated, though they do know it was caused by an H1N1 virus (similar to swine flu) that originated in birds. In addition, the Asian flu (1957-1958) was another global pandemic that originated from China, the disease claimed more than 1 million lives worldwide. The Centre for Disease Control and Prevention (CDC) claimed that the disease spread rapidly and was reported in Singapore in February 1957, Hong Kong in April 1957, and the coastal cities of the United States in the summer of 1957 (Chin *et al.*, 2020). Furthermore, the West African Ebola epidemic (2013-2016) ravaged the West African countries with over 28,600 reported cases and 11,325 deaths. However, all these plagues and pandemics mentioned above have ravaged the globe thereby interrupting the educational processes in several ways, sometimes, it leads to the closure of schools which caused serious drawbacks for learners and deprives them of their right to education and postures them to future risk (UNESCO, 2020).

As part of measures to contain the spread of COVID-19 in Nigeria, the Federal Ministry of Education, through the Permanent Secretary in the Ministry, on March 19th ordered the immediate closure of tertiary institutions, secondary and primary schools across the nation over the outbreak of the disease in the country. In addition to this, the restriction was placed on interstates movement, market places were locked, religious gatherings of more than 10 persons were banned, social activities such as parties, ceremonies and club meetings, etc. were placed on hold (Parke, 2020; Burke, 2020). All public and private schools have to shut the doors of their schools following the government directive.

Science is a field of study that involves a dynamic process of seeking knowledge about nature through observation and experimentation (Anaekwe, Olisakwe & Nwankwo, 2009). Science education specifically is the training and acquisition of scientific knowledge through observations and analysis of events that help an individual to integrate effectively into society (Ifeakor & Okoli, 2011). Ukah (2013) sees science education as a social process and medium for the acquisition of relevant knowledge, skills, and attitudes for scientific literacy while Ellah (2014) described science education as the knowledge gained through an understanding of scientific concepts and processes required for personal decision making, participating in civic cultural affairs and economic productivity for survival in a changing world. Science education involves various investigative processes and activities with

regards to developing, acquiring, and controlling knowledge, skills, increasing production capacity, and influencing people's attitudes about the natural factors of the environment. This is why one of the goals of science education is to provide knowledge and understanding of the complexity of the physical world, forms, and conduct of good life (the Federal Republic of Nigeria, 2014).

In Nigeria, Basic Science and Technology as an important subject is taught at the basic (primary and Junior Secondary) education level while the science subjects (Physics, Chemistry, and Biology) are taught at the Senior Secondary education level. Basic Science and Technology provides students at the basic education level with the needed theoretical and practical frameworks which are inevitable prerequisites for future study of Physics, Chemistry, and Biology as school subjects. This statement was buttressed by Okundaye (2005) who maintained that basic science enables students to understand science concepts, principles, theories, and laws which are further elaborated in the core sciences. Jirgba (2008) further maintained that basic science teaching exposes students to scientific activities. It is in this respect that the Federal Republic of Nigeria in her National Policy on Education (FRN, 2014) emphasizes technology education as a foundation for the nation's socio-economic emancipation through technical knowledge and skills necessary for agriculture, industry, commerce, and economic development.

Faced with the circumstances caused by the pandemic as a result of COVID-19, in a context in which schools have closed their doors in 185 countries and government administrations have ordered the transition to the tele-training of students, it has manifested the need to train teaching staff in the use of different technological tools, to adapt the different elements of the basic science curriculum to the new context of a pandemic. We are facing a change in the educational paradigm in which online training through ICT (distance learning) has ceased to be an option in the teaching methodology and has become a necessity in these times of pandemic to continue with the student learning process. Moving to distance learning requires specific professional development for teachers as this way of teaching raises many challenges in designing and facilitating learning. There is also a steep learning curve for teachers to familiarize themselves with the range of learning technologies available (Jeschofnig & Jeschofnig, 2011).

Statement of the Problem

The covid-19 pandemic has unmasked substantial inequities in the education sector. While some private schools in urban areas are engaging their students through online teaching (distance learning), a large number of students who are less privileged or are in rural areas were left out (UNESCO, 2020). Most schools lack facilities which hindered them to partake successfully in online teaching like they do in the developed countries (UNESCO, 2020).

Learning within the homes could be a challenge for learning. Such depends on parents' educational attainment and other commitments, leaving a greater percentage of the learners' population behind. These problems constitute considerable concerns from all

stakeholders in education (Crawford *et al.*, 2020). Hence, even though most states in the country are currently responding through radio and television, a good fraction of the learners are still experiencing some challenges in their education. Further, to the best of researchers' knowledge, no study has investigated the impact of COVID-19 on education with particular reference to primary and secondary schools based on perspectives of education stakeholders (educators, parents, and learners) in Nigeria. Therefore, this study relied on stakeholders' views to deconstruct the educational challenges posed by COVID-19 and how those challenges have impacted education and learning in primary and secondary schools. Thus, the scope of this research is to examine the impacts of corona virus (covid-19) on the teaching and learning of Basic Science in Some Selected Upper Basic School Students in Igabi, Kaduna State.

Research Questions

The following research questions were formulated to direct the study:

- i. What are the impact of Covid-19 pandemic on academic performance of upper basic school students in Basic Science in Igabi LGA, Kaduna State?
- ii. What are the impact of Covid-19 pandemic on the retention ability of Basic Science Students in Igabi LGA, Kaduna State?
- iii. Is online education an alternative measure for conversational teaching and learning of basic science for future occurrences of any pandemic in Kaduna State?

Research Hypotheses

The following null hypotheses will be tested at a 0.05 level of significance:

H₀₁: There is no significant relationship between impact of COVID-19 pandemic and academic performance of upper basic school students in Basic Science in Igabi LGA, Kaduna State.

Literature Review

By January and early February 2020 when countries such as China and other European, American, and Asian countries were battling with the nascent COVID-19 pandemic, Nigeria appeared to be kept aloof from the Chinese disease. The reality of the disease was dawn on the country on February 27 when the first COVID-19 case was confirmed in Nigeria. On March 23, 2020, when the total confirmed case was 40, with one death, two recoveries, and 37 active cases, the Federal Government of Nigeria temporarily closed down all schools in Nigeria in a bid to contain the spread of the coronavirus (BBC News, 2020).

Unlike other countries where governments came up with policies measures to fill in the gap created by school closure, Nigeria had no plan to keep the students engaged in academic activities. The ministry of education casually announced that pupils and students should tune to public media channels such as radio and television for learning programs. There was no clear-cut policy thrust to immediately tackle the disruption of academic activities to cater to over 45 million students affected by the closure of schools. Students were kept at

home without any form of academic engagement. The private universities swiftly switched on to virtual learning platforms and carried on with learning activities while the public schools remained shut totally (Hussain, 2020). The Nigerian education system was indeed hard hit by the COVID-19 outbreak. Second term examinations did not hold in primary and secondary schools, the second term was never started, and upper basic school and senior secondary school certificate examinations, as well as university examinations, were suspended.

Covid-19 pandemic laid bare the wretchedness of the Nigerian education system. The system could not migrate schools to virtual learning platforms. There was no unified data; schools were not linked up to any central information system or portal. Some rich and middle-income households were able to engage their children in remote learning activities via the internet, but so many households do not have the facilities and resources to engage their children in such. Also, many households are located in places with limited internet access and unreliable electric power supply, thus, making them leave their children in the dark when their counterparts in other climes were making progress (BBC News, 2020).

So many countries in the wake of the COVID-19 outbreak and its attendant lockdowns were able to adopt effective measures to curb the effect of disruption of regular schooling. The Chinese government, for instance, provided computers for low-income households and offered mobile data and telecom subsidies as well to enable their children to participate in virtual learning. In France, students who do not have access to computers were lent the devices they need. Portugal, on its part, partnered with postal services to deliver a working sheet to a student who does not have access to the internet at home (Hussain, 2020). COVID-19 pandemic has revealed that there is a digital divide between an average Nigerian child and his counterparts in most developing and developed worlds. The ministry of education was a handicap to play any interventionist role during the lockdown. The efforts of some state governors to adopt the use of local media channels such as were grossly ineffective as such programs did not involve competent teachers and had no feedback mechanism.

Nigerian political leadership has failed to give education its rightful place. Since February 9, 2020, before the outbreak of the COVID-19 pandemic in Nigeria, the Academic Staff Union of Universities (ASUU) has been on nationwide strike action in protest for non-implementation of its agreement with the Federal Government by the same government. ASUU's agreement with the Federal Government of Nigeria broadly borders on revamping and overhaul the public universities, improvement of academic staff welfare, and the imposition of the Integrated Personnel Payroll System (IPPS) by the Federal Government (Anyika, Anikelechi, & Thobejane, 2021). The sorry state of the Nigerian educational institutions which become more pronounced by the COVID-19 pandemic seems to have vindicated ASUU's clamor for better funding and overhaul of the education sector as the government saw the loopholes in the education and health sectors. ASUU seems to be the only voice clamoring for the improvement of the universities in Nigeria. The political

leadership of the country only makes frantic efforts to call ASUU to the negotiation table only when their strategic political interests are at stake. For instance, in 2019 following the long ASUU strike which was extending into the election period, the Federal Ministry of Labour and Employment quickly called ASUU to the negotiation table and promised them a fraction of their accumulated earned academic allowance owed them by the Federal Government (Anyika, Anikelechi, & Thobejane, 2021). The strike was called off. The Nigerian crop of politicians is indeed bereft of nation-building ideals. They are always over-focused on short-term political goals with recourse to long-term gains of the efficient and effective education system.

The Nigerian educational policy framework is another aspect of Nigerian education that needs to be squarely addressed. With the changes in technological advancement, labor market patterns, and the general global environment, there ought to be functional policy responses to ensure that the Nigerian curricular are imbued with the resources and strategies that would align the Nigerian education system with global realities. The policymakers are the only stakeholders empowered to determine the pace and direction of the Nigerian education system. It is therefore pertinent for the policymakers to chart a new course that will move the system away from its current quagmire (Anyika, Anikelechi, & Thobejane, 2021).

Methodology

An ex-post facto design was adopted for the study. The population for the study was made up of all upper basic school Basic Science students of Igabi Local Government Area, Kaduna State. There are seventeen (17) upper basic schools with a total population of six thousand eight hundred and seventy-six (6, 876). Six schools were selected with a sample of three hundred and fifty – one (351) as sample size using purposive sampling. Student's terminal results and a structure questionnaire called "Impact of Coronavirus on Teaching and Learning Questionnaire (ICTLO)", were used for the study. The researchers collected data through the administration of questionnaire with the help of research assistants from the various sampled schools as well as their terminal results. The data collected were analysed using mean, standard deviation and ANOVA.

Results

Table 1: Analysis of Variance of the impact of Covid-19 pandemic on academic performance

Model	Sum of squares	Df	Mean square	F	Sig.
Regression	38420.584	3	12806.861	60.410	.000 ^a
Residual	138648.223	348	212.000		
Total	177068.816	351			

Table 1 shows that the probability associated with the calculated value of F (60.410) is 0.05. Since the probability value of 0.000 is less than 0.05 level of significance, the null hypothesis was rejected. Thus, there is significant relationship between impact of Covid-19 pandemic and academic performance of upper basic school students in Basic Science in the study area.

Table 2: Impact of Covid-19 pandemic on retention ability of students

Statement	SA	A	U	D	SD	Mean	Std. Dev.	Remark
My grades rose during the COVID '19 outbreak.	24	44	0	162	121	2.11	1.07	Low
I've learned more about the COVID-19 outbreak through taking radio and T.V classes	44	51	3	153	100	2.39	1.16	Low
The COVID-19 outbreak helped me develop my creative abilities	21	38	2	189	101	2.11	1.29	Low
By attending online lessons during the COVID-19 pandemic, I have enhanced my communication abilities.	16	40	6	190	99	2.10	1.14	Low
During the COVID-19 controversy, I had some technical difficulties using the online resources.	159	60	6	54	72	3.51	0.81	High
During the COVID-19 pandemic, I've had trouble talking to my teachers.	256	41	7	22	25	4.37	1.86	High
My study strategy was impacted by worry and fear during the coronavirus lockdown.	104	93	4	100	50	3.29	0.70	High
Cumulative Mean						2.84	1.15	High

Benchmark: Mean ≥ 2.5 = High Impact; Mean < 2.5 = Low Impact

Table 2 shows that the cumulative mean of all the items is 2.84 which is higher than the benchmark mean of 2.5 and the standard deviation of 1.15. This is an indication that there is high impact of covid-19 pandemic on the retention ability of Basic Science students in Igabi LGA, Kaduna State. Particularly, majority of the respondents were of the perception that during the Covid-19 controversy, they had some technical difficulties using the online (Radio and TV) resources, they also had trouble talking to their teachers, their study strategy was impacted by worries and fear during the corona virus lockdown. All these have mean mark greater than 2.5.

Table 3: Alternative measure for conversational teaching and learning

Statement	S A	A	U N	D	S D	M ea n	Std. Dev.	Rem ark
I am happy with the online courses that are available.	3 9	3 4	3	1 5 9	1 1 6	2.2 1	1.07	Disa gree
The teachers' diverse online teaching strategies have satisfied me.	4 4	5 1	3	1 5 3	1 0 0	2.3 9	1.36	Disa gree
I am happy with how well the instructors in online courses are doing their jobs.	3 2	3 8	4	1 8 7	9 0	2.2 5	1.29	Disa gree
In online instruction, my contacts with teachers are rewarding.	1 6	4 0	6	1 9 0	9 9	2.1 0	1.14	Disa gree
I am pleased with the teachers' drive in online classes.	5 4	4 0	5	1 5 4	9 8	2.4 2	1.14	Disa gree
I am happy with the state government's policies on online instruction.	1 8	4 1	1 1	2 5 6	2 5	2.3 5	0.81	Disa gree
In our online courses, I get along well with the instructors.	7 0	1 3	2	1 7 4	9 2	2.4 1	0.86	Disa gree
In online instruction, my contacts with teachers are rewarding.	1 0 4	4 4	9	1 2 7	6 7	2.9 7	1.75	Agre e
The online courses' content quality is satisfactory, in my opinion.	4 8	1 0 0	8	1 5 0	4 5	2.8 7	1.10	Agre e
Regarding network accessibility for online instruction, I'm happy.	4 5	5 3	4	1 5 0	9 9	2.4 2	1.06	Disa gree
Cumulative Mean						2.4 4	1.16	Disa gree

Benchmark: Mean ≥ 2.5 = Agree; Mean < 2.5 = Disagree

Table 4.6 shows that the cumulative mean of all the items is 2.44 which is lower than the benchmark mean of 2.5 and the standard deviation of 1.16 which indicate that online

education is not the alternative measure for conversational teaching and learning of Basic Science for future occurrences of any pandemic in Kaduna State.

Discussion of Findings

The COVID-19 pandemic has had an effect on all aspects of human life, and higher education students' academic performance is no exception. In contrast to nations with better resources, the COVID-19 epidemic affects students' learning differently in countries with less resources. This research sought to determine how the corona virus (COVID-19) affected the teaching and learning of basic science in a sample of upper basic school students in Kaduna State's Igabi Local Government Area. The finding of the study revealed that there is significant relationship between impact of Covid-19 pandemic and academic performance of upper basic school students in Basic Science in the study area. This finding is in line with the studies conducted by Dutta and Smita (2020) and Tamrat (2021). They discovered that the COVID-19 had an impact on kids' learning and performances in both positive and negative ways.

Furthermore, the findings indicated that there is high impact of covid-19 pandemic on the retention ability of Basic Science students in Igabi LGA, Kaduna State. The findings of earlier studies by Khalili and Xyrichis (2020) and Owusu-Fordjour et al. (2020), which came to the conclusion that the COVID-19 epidemic had a negative impact on students' capacity to acquire and retain information, are supported by this finding. According to Khalili and Xyrichis (2020), the COVID-19 epidemic caused many students to experience anxiety, which had a negative impact on their academic performance and learning outcomes.

Finally, the study found out that online education is not the alternative measure for conversational teaching and learning of Basic Science for future occurrences of any pandemic in Kaduna State. During the COVID-19 epidemic, students did not feel that online instruction and learning met their needs. The majority reported having technical issues with technology and the internet. Others report that, among others, they do not get along well with the teachers. The result backs up the study of Agormedah et al. (2020), which revealed that online teaching and learning were unsatisfactory due to a lack of facilities. In Igabi LGA, Kaduna State, this study also discovered that the COVID-19 epidemic had a detrimental effect on kids' learning.

Conclusion

The globe needs to work together and coordinate in order to address the critical issue of COVID-19 and lessen its impacts. Anywhere in the world, the virus epidemic has fundamentally altered peoples' ways of life. The global pandemic of a virus that threatened to disrupt education was proclaimed by the World Health Organization (W.H.O.) in March 2020. Since then, teaching and learning have undergone several paradigm shifts and modifications during the Coronavirus era. In schools and universities, these changes have made learning more difficult for students. The lack of resources and the instability of teaching and learning activities in Nigeria had a more detrimental influence on students'

learning than in any other nation in the globe. The main obstacles to teaching and learning during the COVID-19 pandemic included unstable Internet, a lack of technological infrastructure, insufficient resources, expensive Internet, a lack of awareness, a lack of linguistic proficiency, a lack of a reliable source of power, and preparation issues for online instruction. Students, teachers, educational institutions, and other stakeholders all feel the consequences of these issues on teaching and learning in higher education.

The majority of respondents, according to the survey, indicated that there is a strong correlation between how upper basic school students in the study area perform academically in Basic Science and the impact of the Covid-19 epidemic. Finally, it was discovered that online education is not a substitute for conversational teaching and learning of Basic Science for upcoming occurrences of any pandemic in Kaduna State. It also emerged that the covid-19 pandemic has a significant impact on the retention capacity of Basic Science students in Igabi LGA, Kaduna State. Therefore, educational managers and education leaders should take into account all facets of teaching and learning in secondary schools and adapt and adjust policies in emergency situations. Particularly, distinct issues with teaching and learning may have arisen in different parts of the world. For example, during COVID-19 pandemic, students experienced dramatic changes which negatively affected their learning in secondary schools in Kaduna State.

Recommendations

- i. Using new technology in the classroom is not just a good idea, but educational managers and leaders should also take into account changing conditions, flexibility in approaches, and boosting student engagement and creativity in higher education.
- ii. Due to the difficulties the students had during the COVID-19 pandemic, the platforms and policies for online learning in secondary schools throughout Kaduna State and Nigeria are in need of a thorough assessment and critical examination.
- iii. Researchers may contrast the results of the current study with those of other studies and make recommendations for reforms at both the secondary and collegiate levels.

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