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COVID-19 Crisis and Adoption of Virtual Teaching Technology in Nigerian Secondary Schools: Teachers' Perception

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Abstract

Based on the experience of COVID-19, the effectiveness of virtual teaching in Nigerian secondary schools has been questioned. Teachers in the schools are not considered technically competent to masterfully use the online teaching method. Therefore, this study uses Ife-East Local Government Area in the South-West Region of the country as a case study to examine the attitude of teachers towards web-based teaching. A questionnaire was administered to 20 teachers who were randomly selected and their engagement in virtual teaching during the lockdown was considered. The responses obtained were analyzed using statistical tools. It was found that schools used very little virtual teaching technologies and practices during the pandemic, while teachers had a fairly good attitude towards this teaching approach with an overall mean of 2.74 on a 2.50 to 5.0 scale. It is concluded that with the availability of necessary facilities, opportunities for in-service training, continuous capacity building workshops and provision of conducive environment, Nigerian teachers are inherently capable of fitting into the evolving global trend of digitalized education system.

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1. Introduction

The 2019 coronavirus disease (COVID-19) outbreak and the resulting disruption of many important human activities around the world threatened almost every aspect of human endeavour in unprecedented ways. The challenge that the pandemic posed to educational systems all over the world was generally devastating and particularly catastrophic for those nations whose educational systems were previously vulnerable. There are standards that must be met in formal education, and any disruption to the free flow of those standards can lead to negative chain effects. Therefore, the potential consequences of the lockdown caused by the pandemic need to be thoroughly examined. In the education system, the role of teachers is of great importance as they matter for both schools' development and students' achievement. In order to successfully raise the standard of schools and constructively influence learners, the quality of teaching needs to be adequately developed (Stronge, 2013; Hindman, Grant & Stronge, 2013). Teachers are therefore expected to be frequent and proficient users of relevant modern technologies and to keep pace with the modernization of the teaching profession.

During the crisis of COVID, many countries quickly moved to online education as an alternative to sustain the educational processes. It has been shown that online instruction did not provide the academic outcomes of face-to-face instruction due to the hardship caused by the pandemic (Dorn *et al.*, 2020; Hanushek, 2020; Hanushek & Woessmann, 2020; Pinto & Jones, 2020). If the online school alternative is not properly managed by countries with weak education systems, such a failure could allow the systems' existing deficiencies to grow into a protracted disaster. Thus, the education systems of countries that were already facing standard crises before the pandemic were painfully exposed to the negative effects of lockdown.

The fragility of Nigeria's education system was exposed by the incident of the COVID. The country practices a 6-3-3-4 structure, meaning that primary education lasts six years, secondary education also lasts six years (three years each in lower and upper secondary) and at least four years in higher institutions of learning (university, college or polytechnic and equivalents). While primary education is made compulsory by the national government but not seriously enforced, citizens are encouraged to attend secondary school as secondary education offers additional benefits and is central to the country's education system (Ige, 2013). Prior to the emergency of COVID, a number of researchers have described the Nigerian education system as rapidly deteriorating in standard. Inadequate and substandard teachers, decay of infrastructures and poor funding among others have been cited as reasons for the deteriorating quality of the system, while technical and professional reorientation of teachers has been submitted as a major means of improving secondary education in the country (Ige, 2013; Ike, 2017).

At the onset of the COVID lockdown, it was alleged that if the resultant closure of schools and higher institutions of learning in Nigeria were to continue beyond a limit, a significant amount of learning time would be lost and the impact on the secondary school curriculum could be poor and protracted (Aiyedun, 2020; Ngogi and Mahaye, 2020; Anifowoshe et al., 2020). As the lockdown extended, online teaching was adopted wherever possible in Nigeria. In a study that assessed the effectiveness, from the students' perspective, of the virtual instructional method that was triggered by the pandemic, Ajewole et al. (2021) found that 71,493 secondary school students in a studied urban area were locked out of their physical schools by the pandemic, of which only 770 had access to the virtual instruction alternative. While the study reports that online students did quite well with the emergency instructional method, it recommends that physical classes be made up to address the learning deficits created by the use of virtual classes. Aimua and Paul (2021) are of the opinion that the educational gap among school going children in Nigeria is evident in the closure of schools.

Among other issues, there is the question of the technical competence of Nigerian secondary school teachers to masterfully deploy online teaching. Even though the lockdown has now eased and physical teaching has resumed in Nigerian schools amidst the second wave of the pandemic, virtual teaching at the secondary school level may need to continue alongside face-to-face teaching. First, to prevent a resurgence of the pandemic, social distancing must be strictly maintained, so the curriculum may need to be adjusted to accommodate distance education in the post-pandemic period. Secondly, it was submitted that the Nigerian education system needs to keep pace with the trend of digital revolution by embracing the global paradigm shift from face-to-face teaching to e-learning, webinar, distance education and the like. Based on the experience of virtual classes in the COVID lockdown days, this study thus assesses the perception of Nigerian secondary school teachers on the use of virtual teaching methods. The structure of this paper is as follows: Section 2 presents the materials and methodology of the study; Section 3 presents the findings with a discussion of the results; and Section 4 provides the conclusion with some recommendations.

2. Material and method

2.1. Method

The attitude of school teachers in Nigeria towards online teaching was ascertained using a structured questionnaire administered to 20 teachers selected from the teaching staff of secondary school in Ife-East, an urban Local Government Area (LGA) in the South-West region of the country. Participants in the survey were randomly selected from teachers who actually participated in virtual teaching during the COVID-19 lockdown.

There are a considerable number of public and private secondary schools in the study area. Through secondary means of data collection, demographic information about the schools was obtained and the school that actually conducted virtual instruction during the closure was selected for the study. As it was not possible to reach the participants remotely, hard copies of the questionnaire were physically given to each respondent, with concerted efforts made to ensure that the questionnaire was completed independently and without outside influence. The responses were analyzed to draw inductive conclusions. This was achieved through the systematic use of statistical techniques. Five optional text responses were available for each of the 22 questions in the questionnaire and a numerical score was assigned to each of the text responses as shown in Table 1.

Table 1. Assignment of Numerical Values to the Optional Text Answers

Optional Answer	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Ascribed Point	05	04	03	02	01
Acronym	SA	A	U	D	SD

2.2. Participants

The questionnaire was completed by 20 randomly selected teachers who taught online classes during the lockdown. The demographics of the respondents are shown in Figure 1. According to the gender distribution table, 65% of the teachers were male and 35% were female. The age distribution table shows that 50% of the respondents are between 41 and 50 years old, while 25%, 10% and 5% are between 31 and 40 years, 51 and 60 years and 21 and 30 years respectively, with 10% being above 60 years. The teachers have varying years of work experience with 65% having been in the profession for 11 - 20 years and 15% having accumulated 21 - 30 years of experience while 10% fall into each of the categories 5 - 10 years and over 60 years. By subject, 40%, 40%

and 10% are specialists in arts, sciences and commerce respectively, while 5% teach mathematics and 5% teach languages. In terms of overall participation in online teaching during the lockdown days, 95% of the teachers participated well, while 5% just tried the teaching method without making any significant progress.
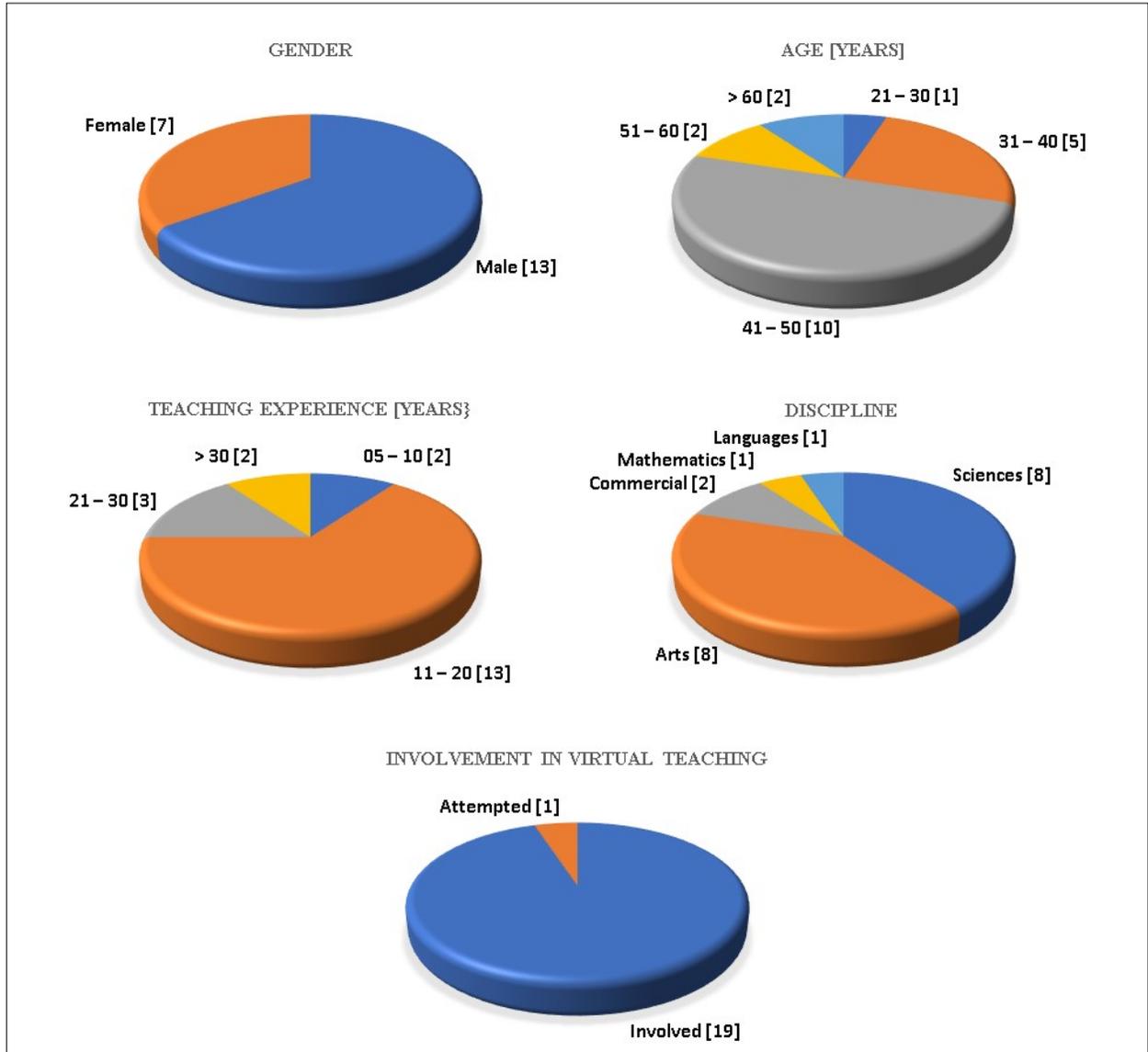

Figure 1. Demography of the sampled teaching personnel

2.3. Data analysis

The information obtained from the responses was processed using percentage, frequency, and mean statistics. To determine the teachers' overall perception of the virtual teaching method, the mean of all participants' responses to each question was calculated from the assigned numerical values. The overall mean was calculated from the 22 mean values and compared to a pre-selected

numerical benchmark. Based on this comparison, the overall disposition of the teachers was classified as either 'High' or 'Low'. A benchmark of 2.50 out of 5.0 is used for decision making. While a low disposition corresponds to a mean score of less than 2.50, a score of 2.50 or more is considered a high disposition.

$$Mean\ Score\ (M) = \frac{\sum f_i x_i}{\sum f}$$ (1)

$$x_i = 01,\ 02,\ 03,\ 04,\ 05;\ \sum f = 20$$

$$Grand\ Mean\ (G) = \frac{\sum M_i}{N}$$ (2)

$$i = 1,\ 2\ ...\ 22;\ N = 22$$

3. Results and discussions

As shown in Table 2, an extremely small percentage [1.27%] of the total number of schools operating in the study area participated in the virtual classes. Similarly, only 2.79% of available teachers participated in online instructional activities during this period. There are 15 public schools in the region, none of which went online during the lockdown.

Table 2. Breakdown of Schools Engagement in the Online Classes

	Private	Public	Aggregate
Number of Available Schools	64	15	79
Number of Schools that Adopted Virtual Classes	01	-	01
Number of Available Teachers	*1,280	190	1,470
Number of Teachers that were Involved in Virtual Education	41	-	41

*1,280:- this is an approximate value since the exact number is unknown because private schools are prone to frequent mobility of workforce. This approximation is based on the regulation that no school has less than 20 teachers at a time.

3.1. Teachers' reactions to the sudden change from physical to virtual teaching methods

Figure 2(a) shows that only 15% of the respondents were familiar with the online teaching method and had used it before the lockdown. However, Figure 2(b) shows that 100% of the teachers used the online teaching method during the lockdown, while 40% said they did not experienced any problems in adopting and using the method during the lockdown, as shown in Figure 2(c). As shown in Figure 2(d), 55% of the teachers received extensive training on the use of the e-learning method before they started using it. Figure 2(e) shows that up to 60% of the teachers were able to adequately inform their students about the available online teaching platforms. From these responses, it can be deduced that despite the sudden and unprepared introduction of the virtual teaching approach, a considerable proportion of the teachers were able to adopt the method seamlessly and also engaged their students properly.
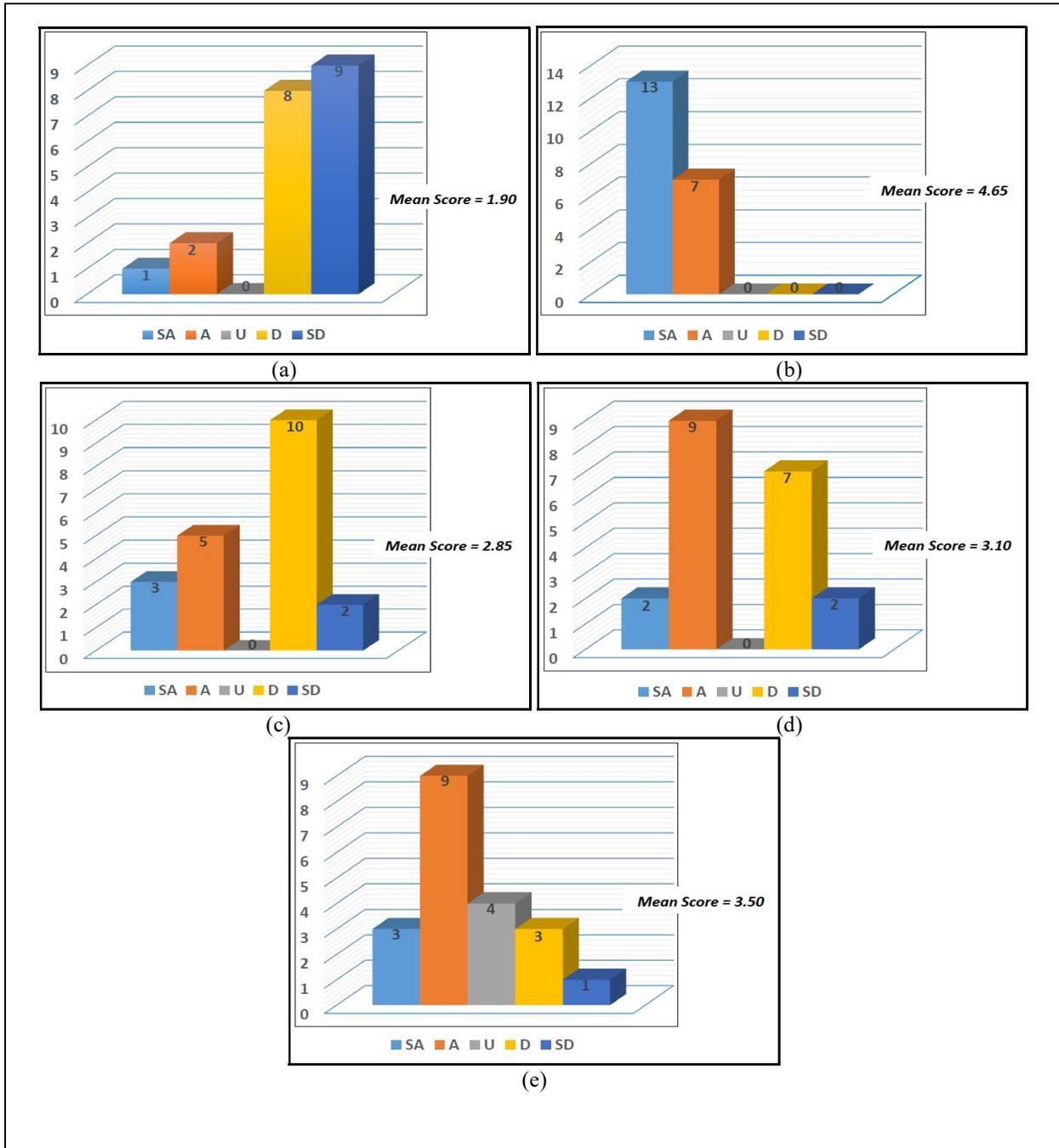
Figure 2. Teachers' reactions to the sudden adoption of virtual education

3.2. Teachers' reactions to the availability of facilities

Electronic whiteboards, application software, laptops, film projectors, Wi-Fi data, etc, are required for effective online teaching and the availability of these facilities is a factor that could influence teachers' perceptions. In this research, it was found that only 5% of the teachers reported having these facilities adequately available as shown in Figure 3(a). However, despite

this challenge, Figure 3(b) shows that 85% of them were able to provide study materials to students in the form of pdf files, PowerPoint slides, Word files, etc, as part of the e-classes. As shown in Figure 3(c), 55% of the respondents indicated that they were able to access technical resources and know-hows during the e-teaching. From Figure 3(d), 75% of the respondents were able to engage in the e-teaching environment without fear or panic and without much difficulty. Thus, Figure 3 shows the teachers have positive attitude towards virtual teaching.
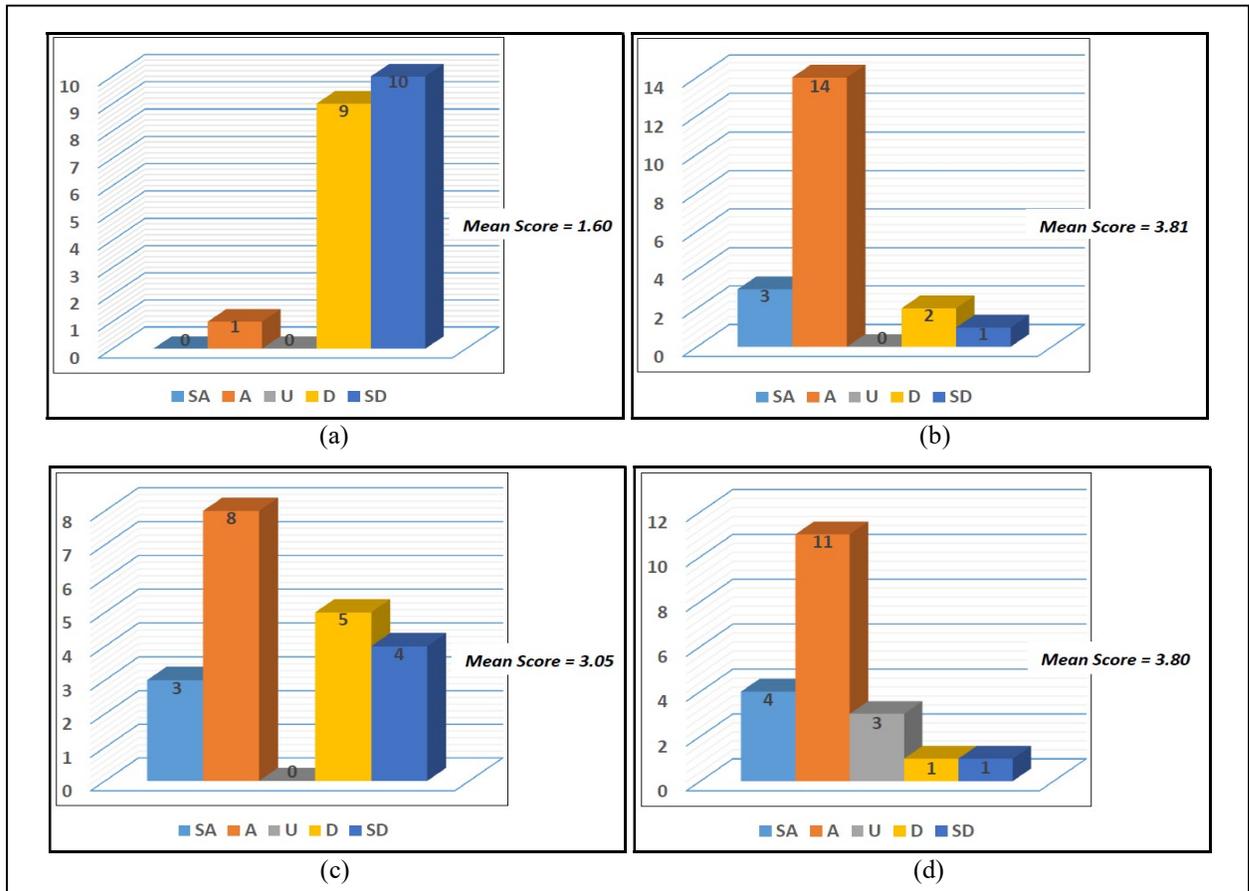

Figure 3. Availability of facilities and teachers' reactions

3.3. Students' engagement and teachers' readiness for virtual instruction

Figure 4(a) shows that none of the teachers recorded full students participation in the online classes held, and thus none of the respondents was able to establish total student engagement in the classes. Similarly, Figure 4(b) shows that only 10% of the respondents found the unexpected change from the traditional face-to-face method to the new online classes to be seamless and without any difficulties for teachers and students. These two statements suggest that students, like their teachers, had some itch with the online instruction of the lockdown days. However, Figure 4(c) shows that only 10% of the teachers lacked confidence in using the online teaching method due to insufficient knowledge and skills in this method. This means that although students might

not be privileged to overcome their own challenges, the teachers were able to ride-through their own difficulties, probably due to the availability of technical support.
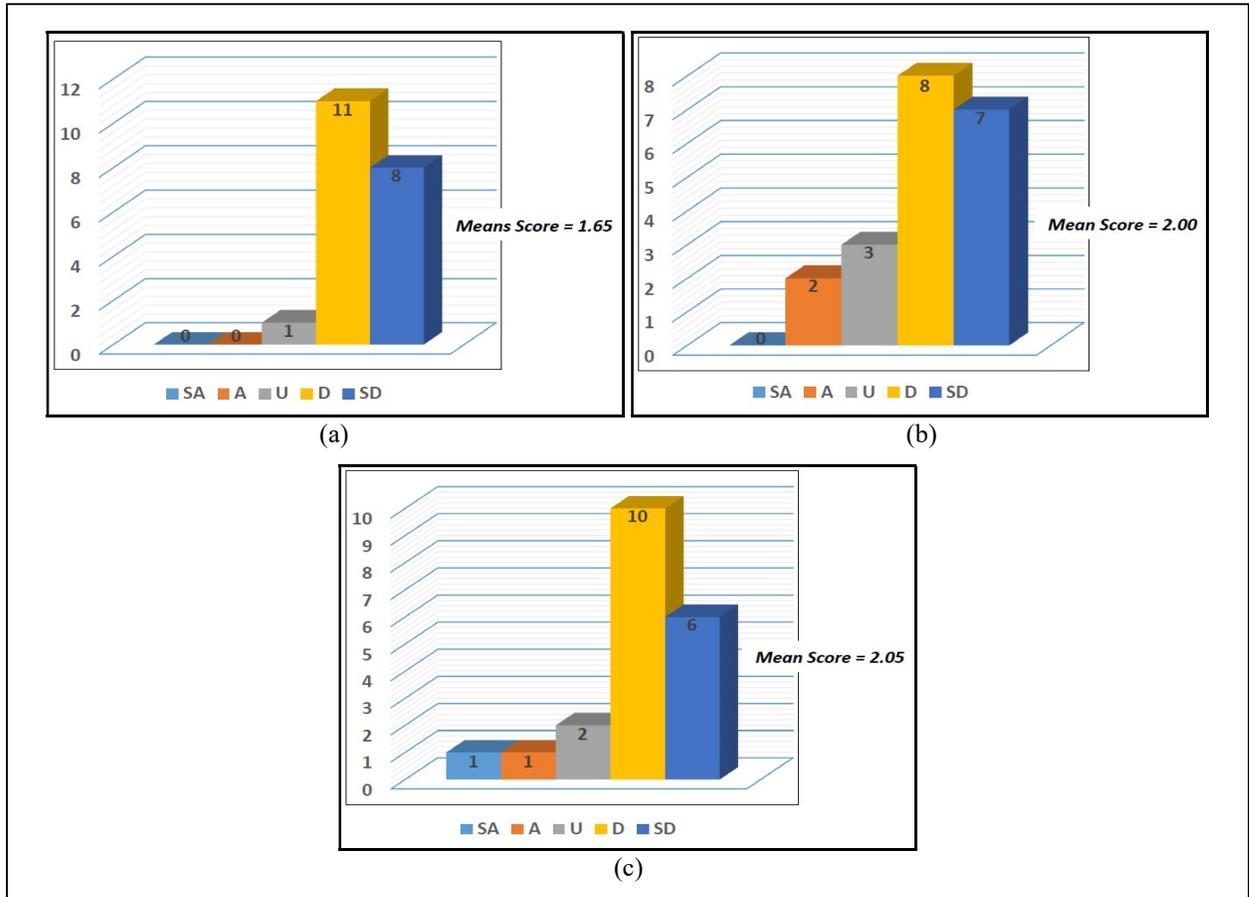

Figure 4. Student engagement according to the teachers

3.4. Teachers' assessment of the effectiveness of the online teaching method

Figure 5(a) shows that none of the respondents felt that the introduction of online teaching in secondary schools during the pandemic was of no use and unnecessary. Figure 5(b) shows that only 5% of the teachers considered the online method inappropriate because they lacked time to prepare e-teaching materials due to their personal workload. None claimed that the content of his/her subject(s) could not be taught using the e-teaching approach as shown in Figure 5(c). Similarly, as shown in Figure 5(d), only 25% of the teachers claimed that the teaching materials included in the available online apps were not in line with the syllabus of their subjects. Difficulty in organizing teaching materials due to their different form (such as texts, images, videos, etc.) was experienced by only 15% of the teachers as shown in Figure 5(e). Thus, the facts presented in Figure 5 show that teachers are positive about the effectiveness of the virtual teaching method.
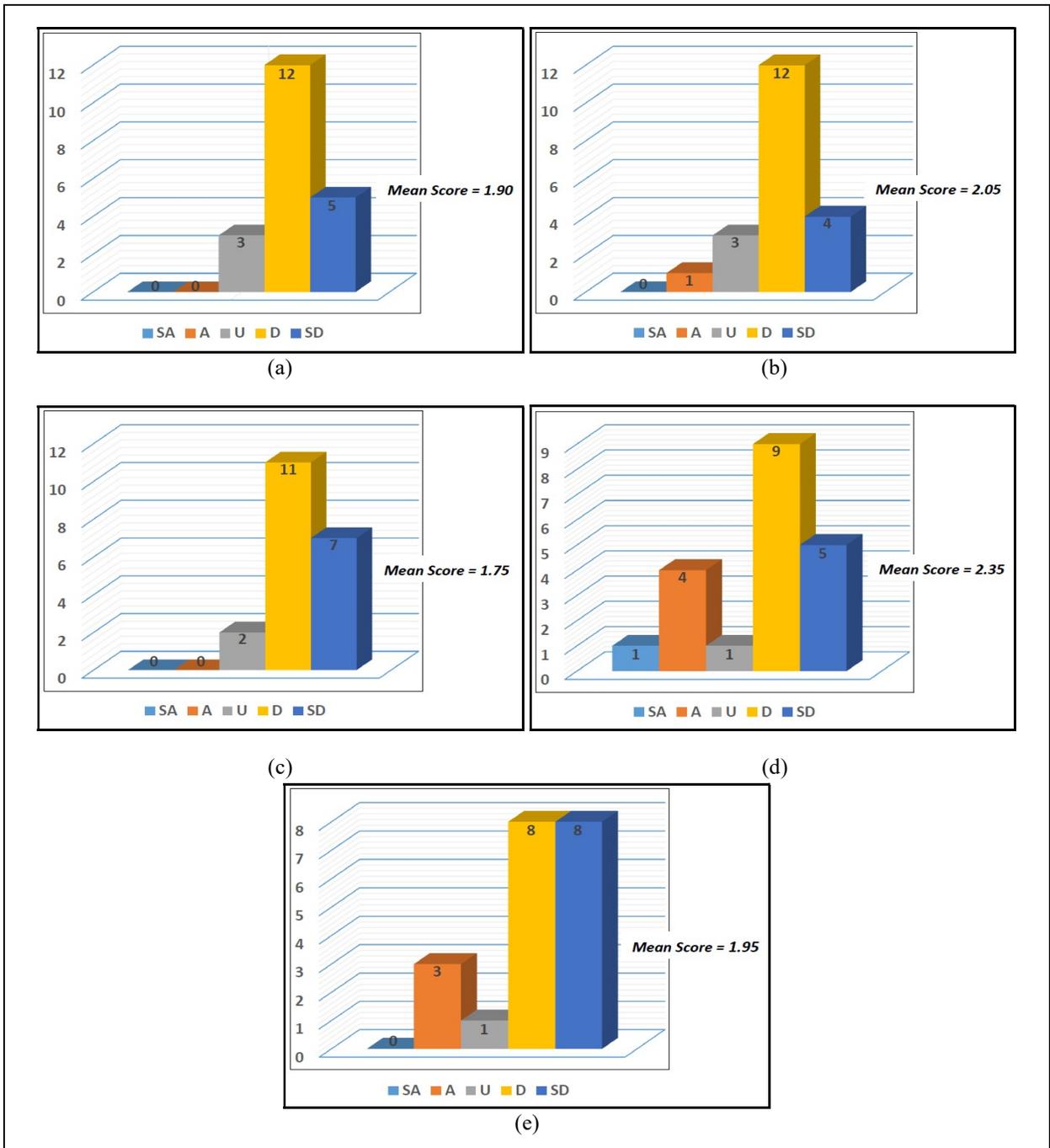
(a)

(b)

(c)

(d)

(e)

Figure 5. Effectiveness of the online teaching method

3.5. Pedagogical practices and the future of Nigerian education system at secondary school level

With regard to the future of secondary education in Nigeria, Figure 6(a) shows that 80% of the teachers believe that the subjects they taught virtually during the lockdown must be repeated when they resume face-to-face teaching in the school, for fulfilling learning experience. In line with this statement, only 20%, as shown in Figure 6(b), expressed the belief that virtual teaching is as effective as physical teaching. Figure 6(c) also shows that only 10% of the respondents would like the virtual method to continue after the closure of the school without returning to the conventional method. These three statements do not seem to be consistent with what subsections 3.2, 3.3, 3.4 and 3.5 reflect. This discrepancy can be attributed to the teachers' experiences as reflected in Figure 6(d), where 85% of them called for a reversal from the virtual teaching method to the conventional method once the pandemic is over due to lack of access to facilities. However, it is found that 65% of the teachers opt for a mixture of e-class and face-to-face teaching after the pandemic, as shown in Figure 6(e).
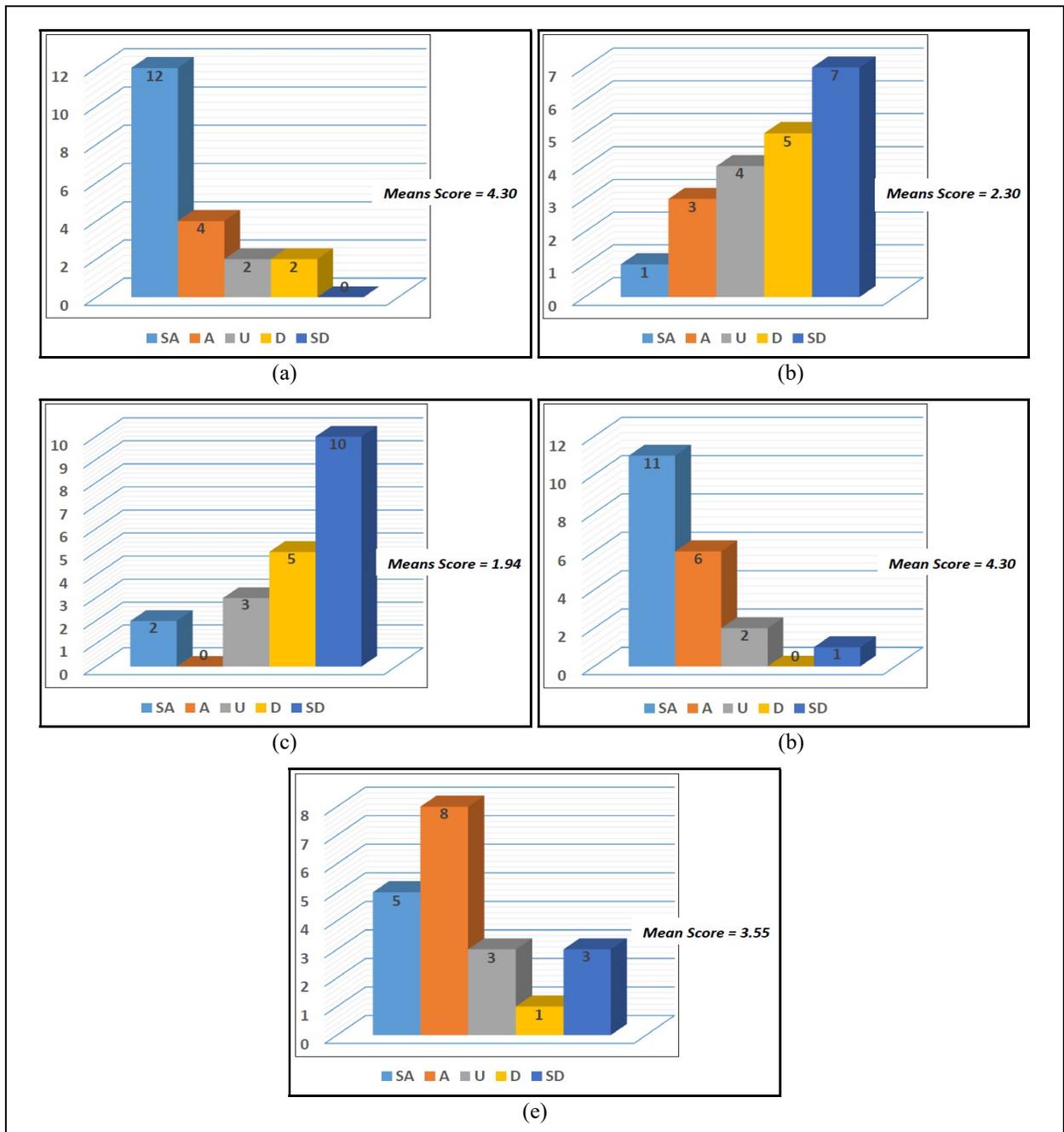

(a)

(b)

(c)

(b)

(e)

Figure 6. Teachers' viewpoint on the future of virtual education in Nigeria

Overall, it appears that teachers perceived the virtual instructional technology used during the COVID lockdown period to be good with a calculated overall mean of 2.74, which falls into the High Disposition category. This is an indication that notwithstanding the shortcomings of the use of the virtual teaching method during the lockdown, the alternative teaching approach was not only well received by the teachers but can be effectively sustained after the pandemic in Nigeria, if a conducive environment could be created for both the teachers and the students.

Conclusions

The educational landscape of Ife-East LGA in southwestern part of Nigeria is examined as a case study to assess the viewpoint of secondary school teachers in the country on the use of virtual instructional technologies. During the COVID-19 pandemic, about 1,470 teachers in 79 secondary schools in the region were prevented from having face-to-face interactions with their students for months. Only one school, where 41 teachers taught, used virtual education during the lockdown. This low statistic has been attributed in part to teachers' misperception of the technology, as well as their lack of competence in using the virtual teaching method. But in reality, teachers in the study area can be divided into three groups based on their experience: (i) the first group, which constitutes more than 97% of the teachers who have never participated in online teaching; (ii) the teachers who have only tried distance education without making any significant progress or impact constitute the second group; and (iii) the third group consists of the teachers who have actually used the online method with some positive results.

Apart from the inadequate skill profile of the teachers in the use of digital teaching methods, the sudden and unprepared change from the traditional to the new mode of teaching, the unavailability of the hardware and software facilities required for online teaching, the total absence (or in most cases, epileptic availability) of internet services and irregular power supply are other factors responsible for the low level of compliance with digital education in the country. However, this study has shown that secondary school teachers in Nigeria are inherently capable of fitting into the evolving trend of digitalized education system. With adequate availability of necessary facilities, opportunity for in-service training and provision of conducive environment, teachers' capacity for effective engagement in online teaching would be greatly enhanced. In view of the fact that COVID-19 is bringing about a paradigm shift in pedagogical practices worldwide, efforts must be made to help teachers in Nigeria to integrate modern technologies into their teaching processes. Nigerian teachers are inherently capable of using computer-based technologies productively.

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