DEMOGRAPHIC DIFFERENCES IN PERCEIVED IMPACT OF VIRTUAL LEARNING DURING COVID-19 PANDEMIC AMONG SECONDARY SCHOOL STUDENTS

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ABSTRACT
Lockdown and social distancing measures employed during COVID-19 pandemic led to the closure of virtually all academic institutions across the globe. This led to adoption of virtual learning as alternative pedagogical delivery by some secondary schools in Nigeria. However, since this mode of learning is unusual among many secondary schools students in Nigeria, the acceptability of its usage may be perceived differently along certain demographic factors. This study therefore examined the demographic differences in perceived impact of virtual learning during COVID-19 pandemic among secondary school students in Oyo metropolis.
A descriptive survey research design was employed for this study. Three hundred and fifty five Senior Secondary School 3 students (Male: 43.7%; Female: 56.3% with the age ranges between 13 and 20 years) participated in the study. The research instrument named "Virtual Learning in COVID-19 Era Questionnaire" during COVID-19 pandemic was used to collect data. Content validity of the instrument was established while the instrument was subjected to split-half method of estimation of reliability technique using the Pearson's Product Moment Correlation Coefficient formula. Later, Spearman-Brusuan Prophecy Formula was computed and a value of .78 was obtained. Simple percentage, t-Test and ANOVA were used for data analysis.
The result shows that there is a significant difference in the perceived impact of virtual learning during COVID-19 pandemic among secondary school students on the basis of age (F = 4.14, P = 3.00). The older students have better perception of virtual learning compared with younger students There is no significant difference in the perceived impact of virtual learning during COVID-19 pandemic among secondary school students on the basis of gender (t = 1.58, P = 1.96). There is a significant difference in the perceived impact of virtual learning during COVID-19 pandemic among secondary school students on the basis of their fathers educational attainment (F = 8.69, P = 3.00). Students whose fathers have higher academic qualifications have positive perception of virtual learning.
Virtual learning is a good opportunity to continue education but in the context of developing country like Nigeria, the acceptability of its usage is perceived differently across ages and father's educational level. It is therefore important that the groups vulnerable to negative perception of virtual learning be taken care off during pedagogical delivery through virtual learning.

Keywords: *Demographic Differences, COVID-19, Virtual Learning, Secondary School Students*

INTRODUCTION

The outbreak of Corona Virus has proved to be one of the deadliest pandemics the world has seen. Covid-19 had the whole world at a standstill with the accompanying global lockdown that was observed to reduce its spread, severity and death tolls. CDC, (2019) describe the Corona Virus as highly contagious and deadly. The virus primarily spreads through saliva droplets or discharge from nose which means that if an infected person coughs, sneezes or talks near other people, there is a good chance of infecting them (WHO, 2020). Majority of the people infected with COVID-19 will experience mild to severe respiratory illness while there are others who will experience no symptoms at all (asymptomatic) (WHO, 2020). The Covid-19 pandemic was caused by the novel severe acute respiratory syndrome: Coronavirus has halted education activities as the spread of the infection proved uncontrollable in the country. In addition, lockdown and reduction of social contact was a needed measure imposed on students and other facets of the socio-economic system.

Consequently, the lockdown measure resulted in closure of many businesses and other public gatherings across the nation. This did not leave out the education sector, as schools and all leaning institutions heeded the global lockdown enforcement in adherence to World Health Organisation's recommendation. Within few months of the outbreak of the pandemic, the deadly disease drastically changed the lifestyles and ways things are done. People being forced to stay

at home, observe self-isolations, and work from home (Ashton, 2020). The pandemic limited the freedom of people to move trade or associate. Not only has COVID-19 caused total lockdowns in many countries across the world, it has also caused the death of many people including women and the elderly.

The effect of COVID-19 pandemic is not limited to the attached ailment and eventual death, it also has some socio-psychological and educational effects both on the individual students and the society at large. For instance, the extensive period of school shutting significantly disrupted academic calendar and the skill acquisition of the learners was halted (Agbele & Oyelade, 2021). In addition, it postponed both teacher made and public assessments period thereby hindering students from completing their academic courses and gaining admission into higher institutions (MuthuLakshmi & Archana, 2020). It raised emotional distress, and maladaptive and antisocial behaviour among the young people (Akanbi, 2022). The lockdown equally raised some socioeconomic concerns among the parents and teachers as some were either not paid or completely relieved of their job during the lockdown (Akanbi, 2022). This of course has the tendency to alter the rate at which students have access to educational resources at home and their physiological needs.

The aforementioned challenges of lockdown of schools then provided a vehicle for academic institutions all over the world to look for ground breaking approaches to engage learners in a moderately short time period (Linney, 2020). Therefore, in an attempt to stop the blockage of learning activities brought about by the enforcement of lockdown as a result of COVID-19 pandemic and to cover the academic curriculum while students were still at home, many secondary schools opted for virtual learning. Therefore, internet and social media which give room for learning while still avoiding social contact became new technologies providing alternative platforms for learning.

Virtual learning, otherwise called computer-mediated learning, online learning, open learning or web-based learning, is described by Schlosser and Simonson (2006) as learning that can functionally and effectually take place in the absence of traditional classroom environments. It is clearly explained by Singh and Thurman (2019) as learning experiences in synchronous or asynchronous environments with different apparatuses such as mobile phones and laptops with internet access. Virtual learning makes it possible for learners to be anywhere where internet facilities could be accessed and learn as well interact with the teachers and their fellow learners. From the definitions, two modes of virtual learning environments can be identified which include synchronous or asynchronous environments. In synchronous environment, teaching and learning occurs live and students and their teachers are able to interact as teaching and learning progresses, questions are asked and there exists immediate feedback. In the case of asynchronous learning environments, teaching and learning are not well structured as the interaction and learning contents are not obtained live, Rather, the lecture might have been recorded in which learners have access to when available. This makes it difficult to have instant feedback and response (Littlefield, 2018). Furthermore, Ihama and Eguasa (2021) classified virtual learning environment into three which include completely web based, blended setup, and traditional courses using web based supplements. In completely web based courses studies are conducted fully on the internet excluding traditional face to face interaction. Blended learning involves both web based and classroom face to face session, with a differing unit of time fixed to the online and in class meetings.

As good as virtual learning seems to be as a measure of improving learning during the pandemic era, it is not without its setback especially in African setting. In a developing country like Nigeria, technological, education/literacy background, socio-economic challenges exist which were cogs in the wheel of virtual learning process. Hitherto the pandemic era, Nigeria's education system has been face-to-face learning. The implication is that most students have no or minimal experience in virtual learning. Most of the population of students in secondary schools in Nigeria

has little or no access to the internet in public and private schools, as well as those who reside in urban and rural areas (Ogunode et al, 2020).

Studies on the impact of virtual learning as a means of facilitating learning, especially during pandemic have been conducted. For example, Khan (2020) confirmed that students reported that virtual learning was a good experience, although the adoption is faced with certain challenges in its implementation for achievement of its objectives. In addition, Allo (2020) found that virtual learning was effective and supportive in teaching-learning process as it was adjudged to be easy, comfortable, fruitful and full of lively interaction. Khan et al (2021) also found usage of virtual learning during COVID-19 Pandemic, positive and acceptable by students as involvement of social media in learning activities may improve the learning outcomes. In their study, Alhumaid, et al (2020) found their participants showing a favourable perception on the acceptance of virtual learning during COVID-19 lockdown. Among the favourable effects of virtual learning as identified by Guatam and Tiwari (2016) include flexibility, cost effectiveness, deeper understanding of concepts through interactive video facility. Muruthy and Yamin (2017) equally found that virtual learning promotes centralized learning, simplified learning process, facilitates easy upgrades, and saves cost among others. On the other hand, other researchers have found some weaknesses of adoption of virtual learning in teaching and learning process which includes poor effectiveness resulting from lack of teacher-students personal interaction, proneness to malpractices, poor communication among students (Gilbert, 2015; Arkorful & Abaidoo, 2015).

Although, the adoption of virtual learning into teaching-learning process has been the suggestion of researchers for decades, the lockdown of schools arising from COVID-19 Pandemic has further awakened its necessity. However, the success of its adoption depends largely on the perception of beneficiaries (learners) on its usage. While there have been different perceptions on the adoption of virtual learning for teaching and learning process, this variation has been traced to various factors. Among such factors are sex, age, learning style and socio-economic background. Even though, studies have focused on the perception of students towards usage of virtual learning, the demographic variables that determine such variation have been largely neglected. Thus, omission may definitely affect the adoption of virtual learning in teaching and learning.

Previous studies which have investigated the perspective and attitude of students towards learning have not been conclusive. For example, Dabaj (2009) found female students to show better perception on the virtual leaning than their male counterparts. Egbo, et al (2011) also found the likelihood of female students accepting virtual learning better than their male equals. On the opposite, Lu and Chiou's (2010) finding revealed superior perspective among male students compare to female students. Also, Tsai and Tsai, (2010) found that males displayed more positive views on using virtual learning than females. In what could have been a possible reason, Siddiq and Scherer (2019) confirmed that males use Information Communication Technology often both on recreation and independent studies as compared to females. In another dimension, other studies submit that no gender differences occurred in the perception of students towards virtual learning (Cuadrado et al., 2010). Snell and Snell-Siddle (2013) found that there were no differences in perceptions of males and females in the usage of Virtual learning. Relating the perception of students to what happened during the COVID-19 pandemic, Korlat, et al (2021) found no significant gender variances in learners' viewpoints about virtual learning.

Concerning age, Dabaj (2009) found that as the age of learner increases they prefer face-to-face class to virtual learning. In the results of the study of Simonds and Brock (2014), it was found that disparity existed in the manner students perceived virtual learning based on the mode of learning. For instance, while older students showed stronger favourable disposition for videos tutors teaching, younger ones showed likeness for interactive learning strategies. Morin, Safaee, and Saadé (2019) also discovered that older students showed more confidence than younger ones in computer proficiency and learning skills; therefore, they are more motivated, exhibited improved attitudes and are less nervous about virtual learning. Snell and Snell-Siddle' (2013)

finding also showed that younger age group had a more positive attitude and perception toward the use of virtual learning.

There are sparse literature on the impact of parents' educational level and the perception of students on impact of virtual learning. However, some relating to socioeconomic status showed variance. For instance, Bhuvaneswar and Padmanaban (2012) found that parents' educational level affect the attitude of secondary school students towards virtual learning, the higher the educational qualification, the positive the perception towards the mode of learning. In another study, Malindog-Uy (2020) found that students who were at socioeconomic disadvantaged background (educational level included) had higher chances of experiencing difficulties accessing online course materials. Hence, they may have negative perception of the impact of virtual learning. In addition, Cuisia-villanueva and Nunez (2020) found that socioeconomic factors such as accessibility to resources and parental support affected students' virtual learning experiences.

Research Hypotheses

The following research hypotheses were formulated and tested at .05 alpha level.

HO_1: There is no significant difference in the perceived impact of virtual learning during COVID-19 pandemic among secondary school students on the basis of age.

HO_2: There is no significant difference in the perceived impact of virtual learning during COVID-19 pandemic among secondary school students on the basis of gender.

HO_3: There is no significant difference in the perceived impact of virtual learning during COVID-19 pandemic among secondary school students on the basis of the fathers educational attainment.

METHODS

Research Design and Participants

This is an exploratory study using the descriptive survey research design. The population of this study consists of all Senior Secondary 3 students in three local government areas comprising Oyo East, Oyo West and Atiba Local Government Areas of Oyo State. A designated sample size of 360 participants was drawn from the schools in the three local governments in Oyo metropolis. The sample was made up as follows Oyo East = 120, Oyo West = 120; and Atiba = 120. The three local governments formed the strata for selection of participants. Four schools were selected from each local government comprising two each from private and public schools through purposive sampling, whereas 30 Senior Secondary 3 (SS3 Grade) students were selected from each school using simple random sampling method. Senior Secondary 3 students were considered for this study because the lockdown measure disrupted their preparation and participation during the 2020 West African Senior School Certificate Examinations and Senior School Certificate Examinations conducted by West African Examinations Council and National Examinations Council respectively. Schools resorted to virtual classes during this period. From the designated sample size of 360 initially selected 5 respondents were dropped for not filling the questionnaire properly. Eventually, the total number of 355 participants formed the final sample size. A demographic breakdown of the participants is as stated in Table 1.

Table 1: Demographic information of Respondents on the Basis of Age Gender and Fathers Educational Attainment

Variable	Frequency	Percent
Age		
13-15	106	29.8
16-18	155	43.7
Above 18	94	26.5
Total	**355**	**100**
Gender		
Male	155	43.7
Female	200	56.3
Total	**355**	**100**
Fathers Educ. Attainment		
Primary Education	112	31.6
Secondary Education	124	34.9
Tertiary	119	33.5
Total	**355**	**100**

Table 1 above depicts the distribution of respondents by age, gender and fathers educational attainment. It can be inferred from the table that respondents within the age range of 16-18 constituted 43.7% followed by respondents within the range of 13-15 who constituted 29.8%, while those in the age of 18 and above constituted 26.5%. On distribution of respondents by gender, it was observed that female constituted 56.3%, while male were 43.7%. On the analysis of father's educational attainment, it was observed that fathers with secondary education constituted 34.9% followed by fathers with tertiary education with 33.5%. It was also observed that fathers with primary education constituted the least with 31.6%.

Measures

The instrument used in gathering data for this study is titled "Virtual Learning in COVID-19 Era Questionnaire (VLCEQ)". It consists two major sections. Section A was used to obtain demographic information like, age, sex, type of school, father's educational attainment and occupation while section B is made up of 20 items used to assess the impact of virtual classes on SS3 students during COVID-19 pandemic. The items were developed by the researcher and drawn from a review of related literature. The four-point response pattern was used to score the responses ranging from Strongly Agree (4) to Strongly Disagree (1) which were assigned.

The content validity of the instrument was established by two experts in test and measurement. The reliability of the instrument was established using the split-half method of estimation of reliability. A single administration of the instrument was made on 40 Senior Secondary 3 students who were not part of the target population in a secondary school in Oyo metropolis. The test was split into two halves which were scored separately and Pearson Product Moment Correlation Coefficient between the two sets of scores was calculated and a correlation coefficient of 0.74 was obtained. Thereafter, the Spearman-Brown Prophecy formula was computed to compensate for the fact that the reliability was estimated from a single test and a value of 0.78 was obtained.

Method of Data Collection

Data were collected by using two research assistants duly oriented on how to administer and collect the questionnaire from the respondents. Per-manuem direct-delivery-system was employed in the administration and collection of completed questionnaires after two weeks.

Data Analysis

The copies of the questionnaire were analysed using t-Test and Analysis of Variance (ANOVA) to find if any significant difference occurred as a result of age, gender, and fathers educational attainment. The ANOVA was employed having met the basic assumption of normality, equal variance and sample independence.

RESULTS AND ANALYSIS

The first hypothesis which predicted that there will be no significant difference in the perceived impact of virtual learning during COVID-19 pandemic among secondary school students on the basis of age was subjected to statistical analysis using Analysis of Variance. The result is as stated in Table 2

Table 2(a): Test of Significant Difference in Perceived Impact of Virtual Learning on the Basis of Age

Sources of Variance	Sum of Squares	df	Mean Square	F-cal	Sig.
Between Groups	46.216	2	23.108	4.454	.026
Within Groups	1826.184	352	5.188		
Total	1872.400	354			

Table 2(a) shows that the calculated F-value ($F_{(2,352)}$ = 4.454; P = 0.03) is significant at alpha level of 0.05. Thus the null hypothesis which stated that there is no significant difference in the perceived impact of virtual learning during COVID-19 pandemic among secondary school students on the basis of age is rejected.

To find out where significant difference lies among the participants in their perception of impact of virtual learning during COVID-19 pandemic based on age differences, a post-hoc test was carried out using Scheffe post hoc analysis. The result is stated in table 2(b)

Table 2(b): Pairwise Appraisal of Age Disparity in Perceived Impact of Virtual Learning

Variable	No	$\bar{x}$	13-15yrs	16-18yrs	18yrs above
13-15 years	106	46.34			
16-18 years	155	49-18	2.84		
Above 18 years	94	53.16	6.82**	3.98	

NB ** Sig. at .001

Table 2(b) revealed that significant difference only existed between participants aged between 13-15years ($\bar{x}$ = 46.34) and above 18 years ($\bar{x}$ = 53.16) with mean difference of 6.82. However, no significant difference is noted between participants' aged between 13-15 years and those between ages 16 and17 years. Also no significant difference occurred between participants of ages 16-18 years and those above 18 years. By implication, the view of the participants becomes better as their ages increases

Table 3: Test of Difference in Perceived Impact of Virtual Learning on the Basis of Gender

Gender	NO	$\bar{x}$	SD	df	t-cal.	Mean Difference	Sig
Male	155	57.16	8.37				
				353	1.58		.079
Female	200	55.58	7.74				

Table 3 shows that the calculated t-value ($t_{(353)}$ = 1.58; P = .08) is not significant at alpha level of 0.05. Thus, the null hypothesis which stated that there is no significant difference in the perceived impact of virtual learning during COVID-19 pandemic among secondary school students on the basis of gender is accepted and retained.

Table 4(a): Test of Difference in Perceived Impact of Virtual Learning on the Basis of their Fathers' Educational Attainment

Sources of Variance	Sum of Squares	df	Mean Square	F-cal	Sig.
Between Groups	62.820	2	31.141	8.698	.001
Within Groups	1260.160	352	3.580		
Total	1322.980	354			

Table 4(a) shows that the calculated f-value ($F_{(2,252)}$ = 8.698; P < .01) is significant at alpha level of 0.05. Thus, the null hypothesis which stated that there is no significant difference in the perceived impact of virtual learning during COVID-19 pandemic among secondary school students on the basis of their father's educational attainment is rejected.

Also, post-hoc test was carried out to find out the point of difference in participants on impact of virtual learning during COVID-19. The result is as shown on table 4(b).

Table 4(b): Scheffe Post-hoc Test on Test of Differences on Impact of Virtual Learning during COVID-19

Variable	No	$\bar{x}$	Pri. Educ.	Sec. Educ.	Ter. Educ.
Primary Education	112	48.69			
Secondary Education	124	50.21	1.52		
Tertiary Education	119	54.76	6.07**	4.55**	

NB ** : Mean Difference Significant at .01 alpha level

Going by Table 4(b), it could be inferred that there is significant difference between participants whose parents have tertiary education ($\bar{x}$ = 54.76) and those with primary education ($\bar{x}$ = 48.69) with mean difference of 6.07. Also, the perception of participants with tertiary education background ($\bar{x}$ = 54.76) and those with secondary education ($\bar{x}$ = 50.21) and also significantly differ ($\bar{x}$ mean difference = 4.55). However, no significant difference is observed between participants with primary and secondary education background. The implication from this is that participants with tertiary education background scored higher in the measure of perception of virtual learning during COVID-19, followed by those with secondary and primary education background in that order.

DISCUSSIONS

The first hypothesis which states that there is no significant difference in the perceived impact of virtual learning during COVID-19 pandemic among secondary school students on the basis of age was rejected. It therefore followed that there is a significant difference in the perceived impact of COVID-19 pandemic on secondary school students on the basis of age. This result does not find support in the works of Snell and Snell-Siddle (2013) who found younger students to have positive attitude towards virtual learning compared with their older colleagues. The study however agrees with the study of Morin, et al (2019) who found that older students showed more interest and confidence in the use of virtual learning. The reason that can be attributed to the variation in the perception of the students on the impact of virtual learning on the basis of age could be in line with that of experience. Older students are believed to have more experience with internet facilities compare with younger ones who might be more restricted from its usage to certain degree. In addition, the attention span of the younger students on online teaching may be small compare to the older ones. Hence, the younger ones may perceive face to face interaction with instructors better compare with virtual learning.

The second hypothesis which states that there is no significant difference in the perceived impact of virtual learning during COVID-19 pandemic among secondary school students on the basis of gender was accepted. This implies that students irrespective of their gender, perceived the impact of virtual learning during COVID-19 pandemic in the same way. The study contradicts the studies of Dabaj (2009) and Egbo et al (2011) who found that females perceived impact of virtual learning better than males. It also did not support the finding of Siddiq and Scherer (2019) whose study found males' view of virtual learning better than females. This result however finds corroboration in the works of Snell and Snell-Siddle (2013) and Korlat, et al (2021) in their perception about the impact of virtual learning. The reason that could be adduced to this is that all categories of students whether male or female seriously felt the impact of virtual learning during COVID-19 and were fed-up of redundancy that could be attributed to the COVID-19 pandemic lockdown. Therefore, regardless of gender differences, students were finding ways of getting back to school and interact with their colleagues and instructors, finding the alternative means of communication and learning could be accepted by all in similar manner.

The third hypothesis states that there is no significant difference in the perceived impact of virtual learning during COVID-19 pandemic among secondary school students on the basis of the fathers educational attainment was rejected. This implies that there is a significant difference in the perceived impact of virtual learning during COVID-19 pandemic among secondary school students on the basis of their father's educational attainment. The outcome shows that the higher the level of fathers' education, the better the perception of students on the impact of virtual learning. This outcome is in tandem with the works of Malindog-Uy (2020) and Cuisia-villanueva and Nunez (2020) who found that socioeconomic class especially educational level of parents have impact on the view of students about the usage of virtual learning. The outcome is not surprising as students whose parents have higher education might have been exposed to related learning during their parents' course of studies. Also, their parents may have more resources for virtual learning compared with those whose parents have low educational qualification. It can be inferred that Africans are patriarchal in nature. Fathers are regarded as heads of their families and they have significant influence on their homes. Most often than none, father's beliefs and values would remain the standard or norm for the household. It is very likely that father's educational attainment would influence the impact of virtual learning during COVID-19 pandemic on their children. This is why the level of education of the father is considered in this study.

Conclusion

The main thrust of this study was to examine the perceived impact of virtual learning during COVID-19 pandemic among secondary school students. The study revealed significant differences in the perceived impact of virtual learning during COVID-19 pandemic among secondary school students on the basis of their age and father's educational attainment. However, no significant difference was found in the perceived impact of virtual learning during COVID-19 pandemic among secondary school students on the basis of gender.

The outcomes of the study, therefore, imply that senior secondary school students perceived the usage of virtual learning differently especially across age differences and father's educational attainment. Since perception of individuals about an issue is very likely to affect their behaviour toward the issue, it is possible that there may be variation in the level at which students may gain in virtual learning if it is eventually adopted as a measure of learning in secondary school even after the pandemic. It is therefore recommended that government should establish online learning portals in secondary schools for students after the COVID-19 pandemic. Government should have a tailored plan to create an adequate online environment to take care of disadvantaged students and that government should drive the change to improve the communities' readiness for such mode of learning.

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