Preference For Virtual and Physical Classrooms Among Undergraduate Agriculture Students at the Federal University of Agriculture, Abeokuta, Nigeria

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ABSTRACT

This study examined the preference for virtual and physical classrooms among undergraduate agriculture students at the Federal University of Agriculture, Abeokuta (FUNAAB). A cross-sectional survey research design was adopted and 334 students from the three Colleges of Agricultural Sciences were randomly selected for this study. Data were collected using questionnaires and analyzed with descriptive and inferential statistics. Results revealed that 52.1% of the students were female, the mean age was 21.12±2.23 years. Platforms utilized by the majority of the students included Google Classroom (97.6%) and Google Meet (86.2%). It was also found that 64.4% of the students preferred virtual classrooms while 35.6% preferred physical classrooms, and that 62.0% had a positive perception of virtual classrooms. The most severe constraints to virtual learning included reduced interaction with lecturer ($\bar{x}$=1.63) and erratic power supply ($\bar{x}$=1.63). Results from Chi-square analyses revealed that students' preference for the virtual classroom was significantly associated with their age (χ^2 = 8.874, p≤0.05) and computer literacy level (χ^2 = 20.006, p≤0.01). It was concluded that more Agriculture students in FUNAAB preferred virtual classrooms than physical classrooms. Among the recommendations the authors noted that University Management should ensure the provision of a constant power supply by making alternative power sources available within the Campus.

Keywords: *Agriculture students; Physical classroom; Virtual classroom*

INTRODUCTION

Agriculture plays an important role in the growth and development of the nation through its contribution to the country's gross domestic product (GDP), employment generation for men and women, provision of food and raw materials for industries, and as foreign exchange earnings. The sector's contribution is crucial for the attainment of the sustainable development goals (SDGs) by ensuring food security, ending hunger and poverty, and promoting gender equality. This can only be achieved through the availability of a viable workforce in the agriculture sector. The sector is currently regarded as informal because it is not as organized as other sectors, and dominated by people with low levels of education and who are mostly among the aged population. Hence, the sector has not been efficient and effective in ensuring food and nutrition security in the country. This is despite the government of Nigeria's establishment of specialized institutions of learning which major in agriculture-related courses with the main objective to offer academic programmes in relation to the training of manpower for agriculture in Nigeria (Law Nigeria, 2018). One such established institution is the Federal University of Agriculture, Abeokuta (FUNAAB). Traditionally, teaching in higher institutions takes the form of lectures in classrooms, and practical demonstrations, amongst others. All these involve the gathering of students in large capacity halls. In fact, most of the lecture theatres or classrooms are overcrowded with many students standing in some cases.

Since the start of the COVID-19 pandemic, all sectors having a direct or indirect impact on the global economy have been negatively affected. The education sector is particularly affected. Educational institutions at all levels were closed globally but the extent of closure varied depending

on the country's scientific and technological level of advancement, and this led to the deployment of virtual classrooms. In Nigeria, the academic session was halted in all educational institutions as schools were closed down for months by the Federal Ministry of Education as part of measures to curtail the spread of COVID-19 in Nigeria (Nlebem, 2020; Eiriemiokhale & Idiedo, 2020). According to David *et al.*, (2021) the pandemic gave stakeholders in the education sector a chance to reconsider how instruction is delivered in schools, which led to the creation of more adaptable learning solutions that better utilize distance learning and digital technologies and better meet the needs of the changing nature of work.

Knowledge is imparted, and wisdom is being taught to the learner through a learning process (Anekwe, 2017). Learning could take place in educational institutions in either formal or informal settings. Formal learning is that which is taught in a classroom setting by a teacher using a face-to-face or online learning platform; informal learning is that which takes place outside of a formal classroom setting. It is also important to state that learning cannot take place in the absence of teaching. The three domains which are imperative to all learners are the cognitive, affective and psycho-motor domains. Theresa (2015) referred to the affective domain as involving the acquisition of attitudes and values, the psycho-motor domain as involving the development of the body and the skills it performs, and the cognitive domain as involving the learning and application of knowledge.

Globally, formal classroom systems can be found in every citadel of learning in all developing and developed countries. The classroom is found in an educational institution including public and private institutions or a religious organization. In Nigerian schools, the physical type of classroom is mainly found as a teaching platform. This classroom involves a standard curriculum delivered by the teacher in person and the time of learning is scheduled. Other platforms used for teaching are the virtual classrooms which came into full existence in recent times. Virtual classrooms have been used to describe different online learning environments. Anekwe (2017) observed that many methods, including online education, web-based training, and technologically delivered instruction known as "Virtual Learning Environments," might be used to make a virtual classroom a reality (VLEs).

Virtual learning environments are described as computer-based settings that allow interactions and encounters with other participants who have access to a variety of resources on an equal basis (Turoff, 2007; Pelet & Lecarte, 2013). According to Idakwo & Anyebe (2021), Webconferencing, videoconferencing, and telepresence technologies are examples of virtual classroom technology. Uzoamaka (2017) noted that neither the tutor nor the learners needed to travel in a virtual classroom. It is a web-based environment that allows participants to be at training events from anywhere they might be. The classrooms are referred to as virtual because learning takes place online and is accessible through a computer or a mobile device. This requires tools such as computer systems or smart phones, mobile data and virtual classroom applications. According to Adeoye *et al.,* (2020), Nigerian tertiary institutions have adopted the use of virtual classroom platforms or applications such as Zoom, Google Classroom, Loom, Google Meet, WhatsApp, YouTube, Skype, Bamboo, Adobe Connect, and many more with varied levels of effectiveness.

METHODS

Context of the Study

This study was conducted at FUNAAB. A cross-sectional survey research design was adopted. FUNAAB introduced the virtual classroom to students enrolled in the 100 to 300 levels of their programme as soon as the Federal Government, through the Federal Ministry of Education, reopened schools. However, both the traditional and virtual classrooms are in use. Virtual classrooms are being used for general courses which are common amongst students in lower

levels while physical classrooms are used for departmental courses where the number of students is relatively small to allow for compliance with protocols on COVID-19. Though it appears that virtual classrooms have come to stay in Nigerian tertiary institutions, especially the Federal University of Agriculture, Abeokuta; it becomes important to investigate Agriculture students' preference for virtual classrooms and physical classrooms. The specific objectives of this study were to ascertain the personal characteristics of FUNAAB Agriculture students, identify virtual classroom platforms used, examine students' preference for virtual and physical classrooms, determine students' perception of virtual classrooms, and identify the constraints faced by students during virtual learning.

Study population and recruitment

The population for this study comprised undergraduate students in the three Colleges of Agricultural Science namely – College of Agricultural Management and Rural Development (COLAMRUD), College of Animal Science and Livestock Production (COLANIM), and College of Plant Science (COLPLANT). Specifically, this study was limited to students enrolled in the 100 – 300 levels of their programmes in the 13 departments making up the three Agriculture Colleges, because they mostly receive lectures through virtual classrooms.   The sampling frame for this study was 4686 students, as shown in Table 1 below.

Table 1: Number of Agriculture Students from 100 – 300 level (2019/2020 academic session)

Colleges/Departments	LEVELS			Total
	100 Level	**200 Level**	**300 Level**	
COLAMRUD	**373**	**407**	**395**	**1175**
Agricultural Economics and Farm Management (AEFM)	126	140	124	390
Agricultural Extension and Rural Development (AERD)	131	131	146	408
Agricultural Administration (AGAD)	116	136	125	377
COLANIM	**657**	**614**	**600**	**1871**
Animal Breeding and Genetics (ABG)	124	99	113	336
Animal Nutrition (ANN)	141	139	135	415
Animal Physiology (ANP)	127	126	109	362
Animal Production and Health (APH)	123	149	127	399
Pasture and Range Management (PRM)	142	101	116	359
COLPLANT	**585**	**536**	**519**	**1640**
Crop Protection (CPT)	116	101	98	315
Horticulture (HRT)	101	101	101	303
Plant Breeding and Seed Technology (PBST)	118	96	115	329
Plant Physiology and Crop Production (PPCP)	116	104	94	314
Soil Science and Land Management (SSLM)	134	134	111	379
Total	**1615**	**1557**	**1514**	**4686**

SOURCE: Academic Planning Unit, Federal University of Agriculture, Abeokuta (2021)

At a 95% confidence level, 5% margin of error and 50% response distribution, Raosoft (2022) recommended a minimum of 356 subjects which represented about 7.6% of the sampling frame of 4686 students. An equal proportion (7.6%) of the students in each Department was then randomly selected across the three levels as detailed in Table 2.

Table 2: *Selected sample size across Departments and Levels (100-300L)*

Departments	LEVELS			Total
	100 level	200 level	300 level	
AEFM	10	11	9	30
AERD	10	10	11	31
AGAD	9	10	10	29
ABG	9	8	9	26
ANN	11	11	10	32
ANP	10	10	8	28
APH	9	11	10	30
PRM	11	8	9	28
CPT	9	8	7	24
HRT	8	8	8	24
PBST	9	7	9	25
PPCP	9	8	7	24
SSLM	10	10	8	28
Grand total	**124**	**120**	**115**	**359**

Data instrument and collection

Data were collected with the aid of questionnaires which were distributed to the selected students after obtaining their consent. Due to inconsistencies in response as well as incomplete responses, only 334 of the completed questionnaires were found useful for data analysis.

Definition and operationalization of variables

Platforms used for accessing virtual classrooms: This was measured at the nominal level with a 10-item scale on responses of Used (1) or Not used (2).

Preference of virtual classroom and physical classroom: Students were required to indicate which of the classroom types they preferred at the nominal level of Preferred (1) and Not preferred (2) for the virtual classroom and the physical classroom.

Perception of Virtual classroom: This was measured with a 10-item scale on 5-Point Likert-type responses of Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. Scores of 5, 4, 3, 2 and 1 were assigned to the response options respectively for all positively worded statements and reversed for all negative statements. With minimum and maximum scores of 10 and 50, respondents with perception score of at least 30 were considered as having positive perception of the virtual classroom while those who had less than 30 were categorized as having a negative perception of the virtual classroom.

Constraint to virtual learning: This was measured at the ordinal level using a 9-item scale on 3-point Likert-type responses of Major constraint, Minor constraint and Not a constraint with assigned scores of 2, 1 and 0 respectively. Mean values were used in ranking the constraints in order of severity. Constraint items with mean values of at least 1.00 were considered as being severe constraints while those with scores less than 1.00 were considered as not severe constraints.

Statistical methods

The data were subjected to analysis using descriptive and inferential statistics. Descriptive statistics such as frequency counts, percentages, mean and standard deviation were used to analyse the data on the objectives while inferential statistics (Chi Square Statistics) was used to analyse the data related to hypothesis testing.

Ethical approvals

The study was approved by the Department of Agricultural Extension and Rural Development, the College of Agricultural Management and Rural Development, Federal University of Agriculture, Abeokuta.

RESULTS

Personal characteristics of students

Results on the personal characteristics of FUNAAB Agriculture students are presented in Table 3 below. It shows that close to half (49.1%) were younger than 21 years old, 46.1 percent were in the age bracket of 21-25 years, and only 4.8 percent were older than 25 years with the mean age being 21.20±2.397 years. On gender distribution, results show that 52.1% and 47.9% of the students were female and male respectively. With respect to parental education, it was found that the fathers and mothers of the highest proportion (42.8%) of the students had tertiary education, with 36.5% and 30.2% of the students indicating that their fathers and mothers respectively had secondary level of education. It was further found that close to two-thirds (63.5%) of the Agriculture students were computer literate at a medium level with an additional 19.2% and 6.9% having high and very high computer literacy levels respectively. The results in Table 3 also reveal that the majority (76.9%) of the Agriculture students made use of smart phones such as Android phones and iPhones to access the virtual classrooms just as 18.9 percent utilized personal computers. However, some of the students (4.2%) had no means of accessing virtual classrooms. This implies that almost all the students could access virtual classrooms directly without having to rely on their colleagues for access.

Table 3: *Personal characteristics of Agriculture students in Federal University of Agriculture, Abeokuta, Ogun State (n=334)*

Variables	Frequency	Percentage	Mean ± Standard deviation
Age			
≤20	164	49.1	21.20±2.397 years
21-25	154	46.1	
>25	16	4.8	
Sex			
Male	160	47.9	
Female	174	52.1	
Father's Education			
No formal	32	9.6	
Primary	37	11.1	
Secondary	122	36.5	
Tertiary	143	42.8	
Mother's Education			
No formal	61	18.3	
Primary	26	7.8	
Secondary	101	30.2	
Tertiary	143	42.8	

Level of computer literacy		
Very low	6	1.8
Low	29	8.7
Medium	212	63.5
High	64	19.2
Very high	23	6.9
Medium of accessing virtual classrooms	63	18.9
Personal computer	257	76.9
Smart phones	14	4.2
None		

Platforms for accessing virtual learning

Results on the platforms utilized by Agriculture Students in accessing virtual learning are presented in Figure 1. The data reveals that almost all (97.6%) of the students were mainly using Google Classroom to access virtual learning. This was followed by those using Google Meet (86.2%), Zoom app (81.1%), YouTube (67.7%), WhatsApp (59.3%), and Telegram (55.4%). Other platforms utilized by the students are Loom (38.3%), Adobe Connect (15.9%), Skype (9.9%), and Bamboo (5.1%).
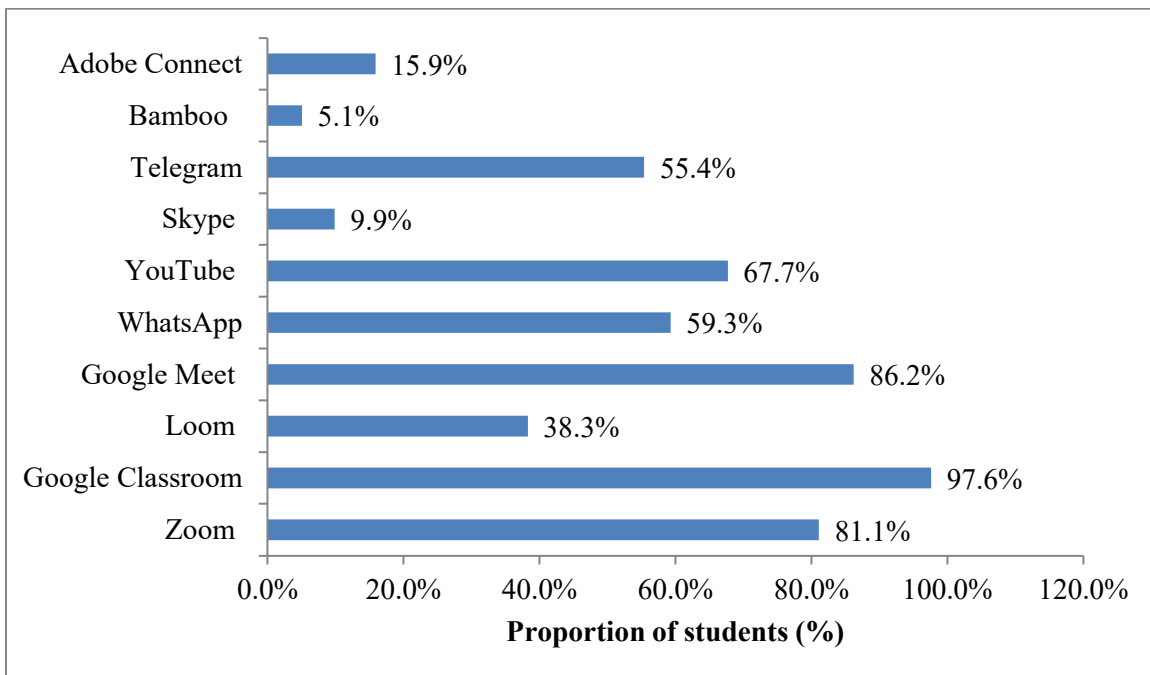

Figure 1: Platforms used by Agricultural Students to access Virtual Classroom (n=334)
Students' preference for virtual and physical classrooms

Further, as shown in Figure 2 below, 64.4 percent of Agriculture Students prefer the virtual classroom while only 35.6 percent preferred the physical classroom.
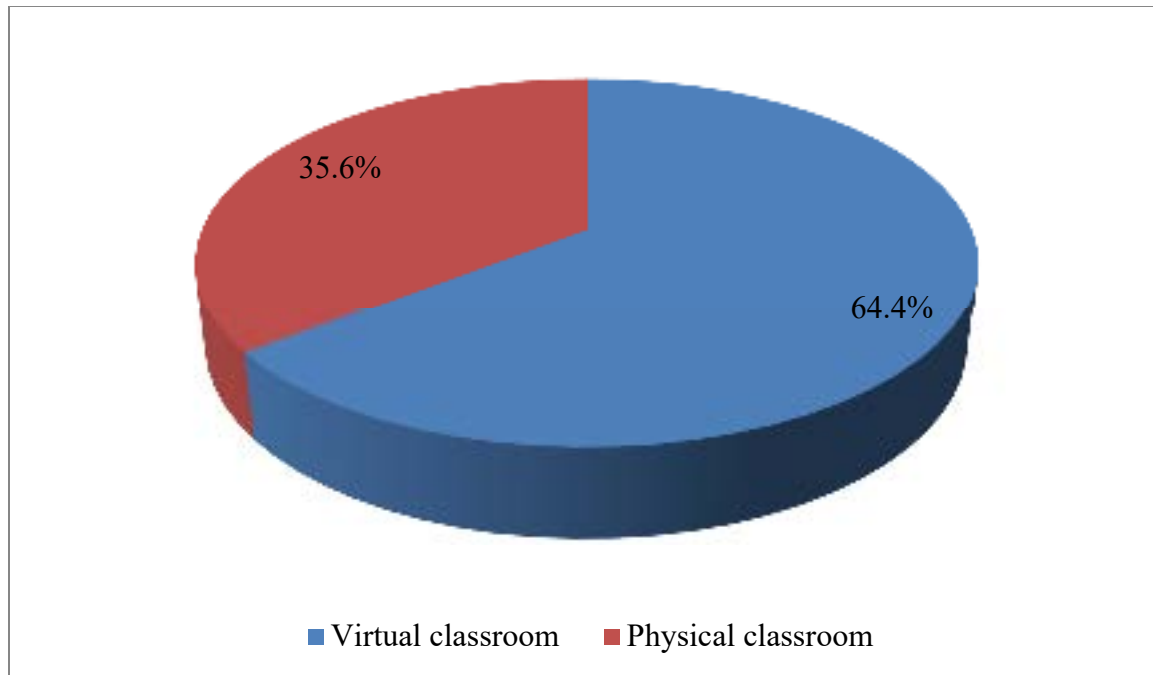
Figure 2: Distribution of students by their preference for virtual and physical classrooms

As shown in Table 4, the majority of the students who preferred the virtual classrooms attributed their reasons including, virtual classroom gives the students opportunity of recording lectures (97.7%), enhances learning at one's pace (94.4%), helps in self-discovery of learning course content (84.7%), provides time management facilities for organized on-going activities (81.4%), timely completion of tasks (94.0%), quick delivery of learning materials (80.5%), virtual learning being cheaper than physical learning (68.4%), and virtual learning helping students to develop a range of communicating skills that could help them to perform well academically (51.2%).

Table 4: *Reasons for the preference of virtual classrooms (n = 215)*

Reasons	Frequency	Percentage
Virtual learning gives the opportunity of recording lectures	210	97.7
It gives the opportunity of learning faster and at one's pace	203	94.4
Virtual classroom helps in self-discovery of learning course content	182	84.7
Virtual classroom provides time management facilities for an organized on-going activities	175	81.4
Virtual classroom provides the student the motivation to work on their own when compared to physical learning	92	42.8
Completing tasks on time during virtual learning	202	94.0
Learning materials are quickly delivered for use	173	80.5
Virtual learning is cheap compared to physical lecture	147	68.4
Virtual learning helps students to develop a range of communicating skills that could help them to perform well academically	110	51.2

On the other hand, results presented in Table 5 provided the reasons for students' preference for physical classrooms, including physical learning being more efficient than virtual learning (69.7%), physical learning enhancing the use of different teaching methods by instructors (94.1%), physical classrooms facilitating students' attendance of classes (61.3%), physical learning being cheaper than virtual learning (85.7%), and better student-lecturer interaction offered by physical classrooms (82.4%).

Table 5: *Reasons for the preference of physical classrooms (n = 119)*

Reasons	Frequency	Percentage
Physical learning is more efficient than virtual learning	83	69.7
Physical learning enhances the use of different teaching methods by instructors	112	94.1
Physical classrooms facilitates students' attendance of classes	73	61.3
Physical learning is cheaper than virtual learning	102	85.7
Physical classrooms offer better lecturer-student interaction which enhances students' understanding	98	82.4

Agriculture students' perception of the online virtual classroom

Agriculture students in FUNAAB were categorized based on their perception of virtual classrooms as a medium of instruction delivery in Nigerian universities, as shown in Figure 3. The data shows that 62.0 percent of the students had a positive perception about the online virtual classroom, while 38.0 percent had a negative perception about online virtual classroom.
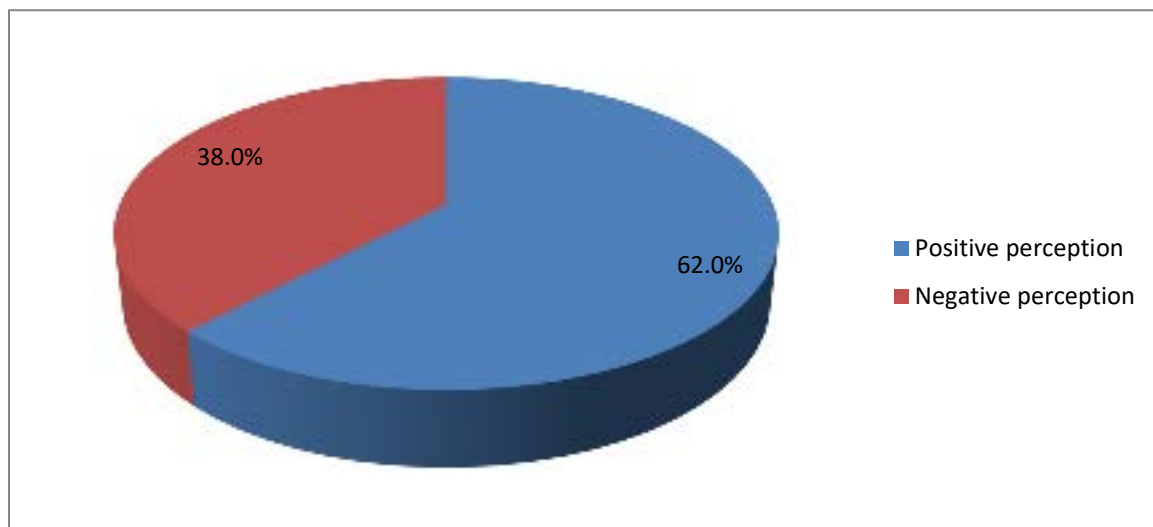

Figure 3: Distribution of students by their perception about online virtual classroom

Constraints to the use of virtual classrooms among Agriculture Students

Despite the preference, the virtual classroom is still faced with some constraints which limited the effectiveness and efficiency of students' learning. The results shown in Table 6 reveal that the highest proportions of the students identified the following as the constraints to learning in the virtual classroom: technical issues connecting to virtual classroom (56.9%), high cost of acquisition of gadgets for accessing online virtual classroom (39.5%), Internet connectivity issues during lectures

(52.7%), distractions caused by students' un-seriousness during lecture (59.0%), reduced interaction with the lecturers (69.5%), erratic power supply (66.5%), delayed participation from colleagues to questions (50.6%), and expensive data services (60.2%). Based on the mean values, reduced interaction with lecturer ($\bar{x}$=1.63) and erratic power supply ($\bar{x}$=1.63) ranked first and were considered as the most severe constraints to learning through the virtual classrooms. These were followed by technical issues connecting to the virtual classroom ($\bar{x}$=1.50).

Table 6: Constraints facing Agricultural Students during virtual class (n= 334)

S/N	Constraints items	Major constraint	Minor constraint	Not a constraint	$\bar{X}$	S. D
1	Technical issues connecting to virtual classroom	190 (56.9)	120 (35.9)	24 (7.2)	1.50	0.653
2	High cost of acquisition of gadgets for accessing online virtual classroom	132 (39.5)	102 (30.5)	100 (29.9)	1.10	0.846
3	Internet connectivity issues during lectures	176 (52.7)	124 (37.1)	34 (10.2)	1.43	0.663
4	Distractions caused by students' un-seriousness during lecture	197 (59.0)	101 (30.2)	36 (10.8)	1.48	0.684
5	Reduced interaction with the lecturers	232 (69.5)	79 (23.7)	23 (6.0)	1.63	0.610
6	Erratic power supply	222 (66.5)	98 (29.3)	14 (4.2)	1.63	0.564
7	Delayed participation from colleagues to questions	169 (50.6)	123 36.8)	42 (12.6)	1.38	0.699
8	Lack of feedback from peers	133 (39.8)	141 (42.2)	60 (18.0)	1.22	0.725
9	Expensive data services	201 (60.2)	97 (29.0)	36 (10.8)	1.49	0.675

Test of association between students' personal characteristics and their perception of online virtual classroom

Results of the test of significant association between Agriculture Students' personal characteristics and their perception of the online virtual classroom using the Chi-square analytical technique are presented in Table 7. It shows that students' level of computer literacy was significantly associated with their perception of the virtual classroom (χ^2 = 27.923, p≤0.01). On the other hand, all other students' personal characteristics showed no significant association with perception of the virtual classroom (p>0.05). This is in consonance with the results from Lung-Yu and Long-Yuan (2016) who found a significant relationship between computer literacy and online learning attitude among students. This implies that while other students' characteristics may not significantly predict students' perception of the virtual classroom, computer literacy level does. This could be linked to the fact that one is not likely to be favorably disposed to what one has little or no knowledge about.

Table 7: Chi-square results on the association between students' personal characteristics and their perception of online virtual classroom

Personal characteristics	χ^2 value	df	p-value
Age	4.776	2	0.092
Gender	2.342	1	0.073
Computer literacy level	27.923	4	0.001**
Fathers' education	5.098	3	0.165
Mothers' education	4.464	3	0.216
Access to smart device	0.063	1	0.801

Test of association between students' personal characteristics and their preference of virtual classroom

The results of the Chi-square analysis on the association between students' personal characteristics and their preference for the virtual classroom are presented in Table 8. Results in Table 8 shows that students' age (χ^2 = 8.874, p≤0.05), computer literacy level (χ^2 = 20.006, p≤0.01) and fathers' educational attainment (χ^2 = 7.899, p≤0.05) were significantly associated with students' preference for the virtual classroom. This could imply that older students, students with low computer literacy levels, and those whose parents had low educational attainment, do not prefer virtual classrooms over physical classrooms. This implication is premised on the view that the adoption of innovations such as virtual learning is mostly affected by age, and level of education.

Table 8: Chi-square results on the association between students' personal characteristics and preference for virtual classroom

Personal characteristics	χ^2 value	df	p-value
Age	8.874	2	0.012*
Gender	0.490	1	0.484
Computer literacy level	20.006	4	0.001**
Fathers' educational attainment	7.899	3	0.048*
Mothers' educational attainment	3.221	3	0.359
Access to smart device	0.108	1	0.742

* and ** signify significant associations at p≤0.05 and p≤0.01 respectively

DISCUSSION

Results confirm more female agriculture students than male students. Ebohon *et al.,* (2021) reported more female than male students in Nigerian public and private universities, while Ojebiyi *et al.,* (2015) reported more female agriculture students. The highest education of the father was secondary school education. Keng (2004) posited that parents who are well educated will support their children's education. The findings of this study suggest that the trend of students' usage of digital tools (Android phones iPhones and personal computers) in accessing virtual classrooms is increasing. Like student usage of electronic media in Western countries (Nikken & Jansz 2006), the growing availability of digital devices and the Internet can increase students' academic activities in Nigeria. This is also consistent with the findings of Boyle *et al.,* (2012) who stated that most students reported their use of digital devices for learning and getting the latest information from the Internet.

Almost all the students were using Google Classroom to access virtual learning. Faieza (2019) reported that the most used virtual classroom platform was Google Classroom. This could be linked to its numerous benefits which according to Hussaini *et al.,* (2020) include posting notes by the teachers to the students, posting assignments and the ability to invite teachers into the class for better discussion of subjects. Aina & Opeyemi (2020) also recommended that Google Classroom should be adopted in the Nigerian educational system. The study findings reveal that most of the Agriculture students prefer the virtual classroom. Studies have found that the virtual classroom environment promotes positive learning outcomes. For instance, Cao *et al.,* (2009) posited that the virtual classroom effectively raises student satisfaction. Lietzau & Mann (2009) found that students can learn more and achieve higher marks if they engage in synchronous virtual classroom activities. Parker & Martin (2010) compared the perceptions of undergraduate students using a virtual classroom in a fully online and a blended education course and found that online students rated their perceptions of the characteristics of the virtual classroom higher than students in the blended course. Idakwo & Anyebe (2021) found that most students preferred virtual classrooms to face-to-face learning.

Most of the students who preferred the virtual classroom attributed some of their reasons to: virtual classrooms enhance learning at one's pace and help in self-discovery of learning course content. According to Arthur-Nyarko *et al.,* (2020), students preferred online learning using digital materials to traditional learning. Likewise, Ienca & Vayena (2020) found that online learning helped, and will continue to help, to overcome the negative effects of the COVID-19 pandemic. Furthermore, the findings show that many of the students had a positive perception about the online virtual classroom. Alhat (2020) noted that students can learn at their own pace. Similarly, Feng *et al.,* (2021) found that the performance of students before the pandemic was better, while in the same vein, Zhao *et al.,* (2021) indicated that students in the virtual reality group performed better than those in the traditional teaching group, concluding that virtual teaching may enhance learning outcomes for students. Students who were negatively disposed to the use of virtual learning could fear a decrease in acquisition of practical skill. Ebohon *et al.,* (2021) observed that some students fear that virtual learning may decrease their practical skills, and hence negatively affect their employability.

The highest proportions of the students identified technical issues connecting to the virtual classroom, and Internet connectivity during lectures as barriers affecting virtual learning. Eze *et al.,* (2018) reported that inadequate Internet facilities and inadequacies in training are amongst the problems associated with virtual classrooms. Idakwo & Anyebe (2021) also linked poor efficacy of virtual classrooms, poor technical know-how of virtual classrooms among some lecturers and students, low Internet availability on campus, lack of free accessibility to the Internet, audio-video support, videoconferencing hall, and power failure. A review by Emeka *et al.,* (2021) also itemized limited accessibility and network connection, lack of technical know-how, and inadequate electric power supply as challenges facing virtual learning in tertiary institutions. Most of these constraints resulted from the non-preparedness of the nation's public higher institutions for the challenges of COVID-19 which could also be linked to poor funding of the education sector, as well as poor ICT infrastructure facilities.

Having reviewed several studies (Victor & Faga, 2015; Adavbiele, 2016; Adewale & Taiye, 2018; Umar & Rosnaini, 2018; Ogunode *et al.*, 2021) on reasons why it was difficult for public universities to switch to Virtual Learning during the COVID-19 lockdown, Olatunde-Aiyedun *et al.,* (2021) summarized the reasons as poor funding of public universities, inadequate ICT infrastructural facilities, poor implementation of ICT policies, high cost of ICT facilities, poor ICT literacy level of academic staff and students, unstable electricity and unstable Internet services. Hunter *et al.*, (2003) revealed that virtual learning slows down interaction between the students and lecturers by limiting students' contribution during lectures. Ebohon *et al.,* (2021) also identified limited interaction between students and teachers as a problem in virtual classrooms.

CONCLUSION AND RECOMMENDATIONS

As evident from the findings of this study, we conclude that more students preferred virtual classrooms than physical classrooms, and that Agriculture students' preference for virtual classrooms was significantly associated with their age, computer literacy level, and fathers' educational attainment. To ensure that more students will exhibit preference for virtual learning in the near future, the following recommendations are suggested based on the findings of this study:

1. Students should be provided with strong Internet connectivity;
2. University Management should ensure the provision of a constant power supply by making alternative power sources available within the Campus;
3. The students, through the Student Union Government with the support of the University Students' Affairs Unit should have good rapport with the Electricity Distribution Company so as to ensure constant electricity supply to the students' residential areas outside the campus;

4. There should be regular training and re-training of both faculty members and students on virtual learning tools and applications, especially when there are upgrades in the applications adopted for use;

5. Students are encouraged to live close to the school campus for easy access to virtual classrooms, and to avoid distractions from domestic work at home;

6. Timely technical supports should be provided to all users making use of virtual classrooms; and

7. Data services should be drastically discounted for all students. The University Management can also provide students with access to quality data services at low costs.

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