Innovations

Undergraduates' Perception of Covid-19 Pandemic and their Academic Achievement in South-South Nigeria Universities: Implications for Technology Education

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Abstract: *The study titled Undergraduates' Perception of COVID-19 Pandemic and their Academic Achievement in South-South Nigerian Universities-Implications for Technology Education was carried out with the major purpose of finding out the perceptions of undergraduate students of technology education on COVID-19 pandemic and how it affected their academic achievement. Four research questions were raised and two null hypotheses were tested at 0.05 level of significance. The population of the study was 186 undergraduate students of technology education in five universities in south-south Nigeria, comprising 130 males and 56 females. The entire population was used for the study because the population size was manageable and as such did not warrant sampling. The instrument for data collection was a structured questionnaire titled" Undergraduates' Perception of COVID-19 Pandemic and their Academic Achievement in South-South Nigerian Universities: Implications for Technology Education" (UPOC-19PATAAISSNUIFTE). The instrument comprising of 52 items was developed by the researcher based on literature reviewed and research questions guiding the study. The survey research design was adopted because the study solicited the opinions of the respondents. Face and content validity of the instrument was done by three lecturers of technology education, in university of Nigeria, Nsukka who confirmed that the instrument had sufficient face and content validity. The reliability of the instrument was undertaken by administering the instrument to ten male and ten female students in Ebonyi State University, Abakaliki. After two weeks interval the same instrument was given to the same set of students. Using Pearson Product Moment Correlation formula to analyse the data, it yielded a co-efficient of 0.81indicating that the instrument was reliable 186 copies of the instrument were administered to the undergraduate students of technology education in the five universities and 100 percent returned rate was achieved. Mean and t-test statistics were applied for data analysis for research questions and hypotheses respectively. It was found that: (1) undergraduate students of technology education are aware that COVID-19 pandemic is real (2) COVID-19 can be contacted by anyone irrespective of status (3) Online teaching and learning during period of lockdown was inadequate (4) Practical skill lectures were not properly delivered to students. Based on these findings, the following recommendation was made among others: (1) Government should build more infrastructural facilities to accommodate more students and staff due to social distancing of three meters from one another.*

Keywords: *1.Covid-19, 2.Pandemic, 3.Academic Achievement, 4.Technology Education, 5.Skill*

1 Introduction

The novel human coronavirus disease COVID-19 has become the fifth documented pandemic since the 1918 flu pandemic. COVID-19 was first reported in Wuhan, China and subsequently spread worldwide. The virus was officially named severe acute respiratory syndrome coronavirus 2 (SARS-Cov2) by the International Committee on Taxonomy of Viruses based on phylogenetic analysis. SARS-Cov-2 is believed to be a spillover of an animal coronavirus and later adapted the ability of human to human transmission. The virus is highly contagious and due to this fact, it rapidly spreads and continuously evolves in the human population (Yen-Chin, 2020).

Currently, people all over the world have been affected by coronavirus disease 2019 (COVID-19). As of now, the virus can be reported as being emanated from a cluster of novel human pneumonia cases in Wuhan City, China since late December, 2019. The earliest date of symptom onset was 1st December, 2019. The World Health Organization (WHO) temporarily termed the new virus 2019 novel coronavirus (2019-nCoV) on 12th January, 2020 and then officially named this infectious disease 2019 (COVID-19) on 12th February, 2020. On 11th March 2020, the WHO finally made the assessment that COVID-19 can be characterized as a pandemic.

The symptomatology of the patients include fever, malaise, dry cough and dyspnea and these were diagnosed as viral pneumonia. As at 18th August 2020, the world population of those of who have contacted the virus was 22,325,157; 784, 748 death and 15.065, 916 have recovered. In Nigeria update of confirmed cases were 49,895; death and 37,051 have been discharged. Due to the issue generated by the pandemic, students of technology education in south-south Nigerian universities have stayed so long at home and it is not out of place to seek their perceptions about the pandemic. It is not an understatement to say that since the pandemic started, many businesses have crumbled and academic activities in all schools including universities have crippled. The lockdown have stopped teaching and learning in academic institutions Students' academic achievement have been affected seriously by this imbroglio. Government and heads of institutions have resorted to teaching and learning on line. According to the opinion of the researcher, there are so many nitty-gritties that are associated with teaching online. Thus, the major purpose of the study, posed in a question form is: what are the undergraduates' Perception of COVID-19 Pandemic and their Academic Achievement in South-South Nigeria Universities: Implications for Technology Education? Specifically, the study sought answers to the following research questions and tested the following hypotheses at 0.05 level of significance. The study will be of relevance to students, lecturers, university authorities parents and government. To students, it will make them to know that learning on line in their homes is the alternative to classroom instructions and this procedure or novelty should be adopted. To the lecturers, they should know that online teaching has come to stay. They should use it, learn it and practice it; to university management, they should realize that for continuity in the administration, online teaching and learning cannot be avoided. This will make the students not to leave any gap in their academic career. To parents, the study will give them hope that their wards are still in touch with their academic activities. This notion will encourage them to fulfil their financial obligations on their children in school. On the aspect of the government, the study will assist it in planning, controlling and administering the universities in order to achieve the objectives of the universities and prevent it from going into extinction. Thus, the research questions and hypotheses are as follows:

1. What is the level of students' awareness of the COVID-19 pandemic in universities in south-south Nigeria?
2. What are students' perceptions about the symptoms of COVID-19 pandemic?
3. What are effects of COVID-19 pandemic on Academic Achievement of Technology Education Students in South-South Nigerian Universities?
4. What are the remedies of the effect of COVID-19 pandemic on Technology Education Students' Academic Achievement in South-South Nigeria.

What is a university and what are its goals?

Opinions are divided about the concepts of a university. Nwadiani (2018) defined university as a center for excellence, Ivory tower and a store house for knowledge and research while Ekoko (2017) defined a university as an institution of higher education offering mainly non-vocational subjects and typically having power to confer degrees.

Globally, the main goals and responsibilities of university education are to seek the truth, teach the truth and preserve the truth (Peretomode, 2018). According to FRN (2013) the following are the goals of university education:

- Contribute to national development through high level relevant training;
- develop and inculcate proper values for the survival of the individual;
- develop the intellectual capacity of individuals to understand and appreciate their local and external environment;
- acquire both physical and intellectual skills which will enable individuals to be self-reliant and useful members of the universities;
- promote and encourage scholarship and community service;
- forge and cement national unity; and
- promote national and international understanding and interaction.

Academic achievement represents the outcome that indicates the extent to which a person has accomplished specific goals that were the focus of activities in instructional environments, specifically in schools. Tella (2010) posited that academic achievement is used to measure student's success in educational institutions or how well students meet standard set out by examining bodies or the institution.

Eze, Ezenwafor and Molokwu (2015) contended that a student's academic achievement is dependent on several factors such as learning environment, instructional methods and teaching strategy, teachers' attitude and enthusiasm, as well as students' attitude and background. Among these factors, the instructional method used by teachers challenge students to work at higher intellectual level that would improve their academic achievement and retention.

Igbo and Ihejiene (2014) refer to academic achievement to the successful result of interaction between a teacher and a student. It is designed to measure an individual's level of skill accomplishment or knowledge in specific area. Success in the area of academics is determined through achievement test. The purpose of testing achievement is to help the teacher and students evaluate and estimate the degree of success attained in learning a given concept. It is appropriate in determining the efficiency of instruction. Obodo in Iji (2010) asserted that achievement is in collaboration with retention.

Technology Education Students in Universities and Effect of COVID-19 Pandemic on their Academic Achievement

Technology Education students are students who are pursuing a course or programme in universities involving the impartation and acquisition of practical skills, knowledge and attitude that will enable them to be self-employed, self-reliant and economically independent on graduation.

One of the aims of technology education as stated in the National Policy on Education (FRN, 2013) is to give training and impart the necessary skills, leading to the production of craftsmen, technicians and other skilled personnel who will be enterprising and self-reliant. It is obvious then, that manipulative skills are only means to justify that meaningful learning has taken place in technology education. Technology education courses like land surveying, building construction, automobile craft practice, metal work, electrical/electronic installation, technical/building, drawing, woodwork, furniture making, carpentry work, motor vehicle mechanic works etc are skill oriented courses. Skills can only be achieved by technology education students when judicious use is made of instructional facilities provided for their training.. The stated objective will be difficult to achieve without adequate provision of tools and equipment for practical training of the students as a result of the COVID-19 pandemic (Odu, 2007). It was observed also by the researcher, through oral interview with the students that most of the tasks and operations in trades like land surveying, woodwork, block laying and concreting, motor vehicle mechanic work have been forgotten by technology education students especially those in the lower level. Relating skill with Charles Prosser's theorem of vocational/technology education, Odu (2012) in Prosser (1949) indicated that effective vocational/technology training can only be given when the training job are done in the same way with the same operation, using the same tools and equipment as it is found in the occupation itself. This signifies that it will be deceitful to train students using hand tools while the actual job required the use of machine tools. In the period of COVID-19 pandemic students were taught by their lecturers on-line which is method outside teaching in real life situation. Indeed, this affected the understanding and acquisition of the psychomotor skills needed by students for practical skill development and also their academic achievement.

In the COVID pandemic period, funding of undergraduate programme in universities was inadequate. The UNESCO 26% bench mark for funding institutions from government was a mirage. Functional undergraduate programmes in technology education according to Odu (2018) demands enormous resources to purchase required equipment, technological devices, tools and infrastructural facilities. Capital projects should, therefore, get a large share of resources since they can make or mar qualitative undergraduate programme.

Training using obsolete tools, machine and equipment will certainly produce graduates who will not be relevant on the job unless given a new training to meet the desire of their employers. Today's technology education students must be familiar with and understand the use of large number of tools and instruments, digital instrument (for detecting faults). Proper tool selections will improve both the quality and speed of any task in technology education programmes in universities. Many jobs would be exceedingly difficult without the right tool for the job. In the period of COVID-19, pandemic, such was the operation of technology education trades in universities as there was no movement of staff to purchase those tools in questions due to the lockdown. This was a lacuna which posed as impediment to teaching and learning affecting academic achievement of technology education students.

Implications of COVID-19 pandemic for Technology Education

According to the researcher, COVID-19 pandemic has the following implications for technology education:

- Due to COVID-19, technology education graduates were half-baked leading to production of graduates who may not be able to teach practical skills in the workshops; who may not be able to perform their jobs in the industries nor create one as a result of haphazard education. The recipients of technology education during the pandemic lack the desired skills needed for sustainable industrial development.
- High incidence of hunger, starvation and disease as a recess economy caused by COVID-19 pandemic.
- Retardation in industrial development
- Dependent on foreign goods and services.

2 Hypotheses

1. There is no significant difference in the opinions of male and female technology education students about their level of awareness of COVID-19 pandemic in universities in South-South Nigeria.

There is no significant difference in the opinions of male and female technology education students about the effects of COVID-19 on their Academic Achievement in South-South Nigeria

Method and Procedures

The study adopted a survey research design. A survey research design is one in which group of people or items are studied by collecting and analyzing data from only a few people or item considered to be representative of the entire group. Ofojebo, Eyiuche and Chukwuma (2015) stated that survey research design is used in observing what is happening to sample proportion or variables in order to generate necessary primary data for the study. The survey design was employed in order to conduct a field study to gather data from technology (130 males and 56 females) education undergraduate students.

The population of the study comprised 186 students offering technology education, from universities in south-south Nigeria including university of Benin, Benin-City, Edo State; Edo State University Ekpoma, Edo State; Delta State University, Abraka, Delta State; Rivers State University of Science and Technology (RUST) Portharcourt, Rivers State and Niger-Delta University, Wilberforce Island, Amasoma, Bayelsa State.

The entire population was used for the study because the population size was manageable and as such did not warrant sampling. The instrument for data collection was a structured questionnaire titled "Undergraduate Perception of COVID-19 Pandemic and their Academic Achievement in South-South Nigerian Universities- Implications for Technology Education" (UPOC-19PATAAISSNUIFTE). The researcher developed the instrument based on literature reviewed and research questions guiding the study. The instrument consists of five sections. Section 1 is level of awareness of Technology education students about the COVID-19 pandemic in universities in South-South Nigeria which contains 11 items; section 2 is titled symptoms of COVID-19 pandemic with 12 items. Section 3 is Ways which COVID-19 affected students Academic Achievement in universities in South-South Nigeria with 12 items. Section 4 is Effect of COVID-19 on Technology Education students in South-South Nigeria with 10 items while Section 5 is Remedies of COVID-19 to students Academic Achievement in Technology Education in South-South Nigeria with 10 items. On the whole, there were 55 items in the instrument.

Face and content validity of the instrument was done by three lecturers of technology education, in university of Nigeria, Nsukka and confirmed that the instrument had sufficient face and content validity. The reliability of the was done by administering the instrument to ten male and ten female students of technology education, in Ebonyi State University, Abakaliki. After two weeks interval, the same instrument was given to the same set of students. Using Pearson Product Moment Correlation formula to analyse the data, it yielded a co-efficient of 0.81 showing that the instrument was reliable.

In the administration of the instrument, 186 copies of the instrument was issued to the undergraduate students of technology education in five universities in south-south Nigeria and 100 percent return rate was achieved. Mean and t-test statistics were used for data analysis for research questions and hypotheses respectively.

Selection of items for research questions was based on the following criterion:
Responses Points boundary Limits
Strongly agree 5 4.50-5.00
Agree 4 3.50-4.49
Unaware 3 2.50-3.49
Disagree 2 1.50-2.49
Strongly disagree 1 0.50-1.49
T-test independent sample test was used to test the hypotheses at 0.05 level of significance adopting the SPSS software, version 22. The output is presented in a table consisting of two sections; Levene's test for equality of variance, and t-test for equality of means.

Results

Data collected from the field for this study were analyzed and the summaries were presented based on the research questions and hypotheses.

Research Question 1

What is the level of students' awareness of the COVID-19 pandemic in universities in South-South Nigeria?
The research question is answered in Table 1

Table 1 Mean and standard deviation of students' awareness of COVID-19 pandemic in universities in south-south Nigeria.

S/N	Level of Awareness	N	Mean	SD	Remark
1.	I am aware that Covid-19 pandemic is real	186	3.79	1.15	Agree
2.	I am aware that Covid-19 exists in Nigeria	186	3.19	0.84	Unaware
3.	Covid-19 can be contacted by anyone irrespectively status	186	3.31	1.06	Unaware
4.	Coming in contact with someone who has the virus helps in spreading the pandemic	186	3.87	1.00	Agree
5.	Coronavirus is very deadly	186	4.24	1.07	Agree
6.	Covid-19 is an air-born disease	186	3.72	0.94	Agree
7.	It can be contacted through sneezing by a person who has the virus to another person not wearing a face mask	186	4.03	1.05	Agree
8	The virus cannot survive in a temperature above 27^0c	186	3.05	0.69	Unaware
9.	It can easily be contacted by a careless person	186	4.42	0.80	Agree
10.	It is connected to viral pneumonia	186	3.28	0.74	Unaware
11.	Drinking enough water can prevent the pandemic	186	4.08	0.92	Agree

Table 1 reveals that level of students' awareness about Covid-19 in items one (M= 3.79, SD = 1.15), item four (M= 3.87, SD = 1.00) item five (M = 4.24, SD= 1.07), item six (M = 3.72, SD = 0.94); item seven (M = 4.03, SD = 1.05) item nine (M= 4.42, SD = 0.80) and item 11 (M= 4.08, SD = 0.92) are all indicating that students are aware of the pandemic while they disagree or unaware of the following items two (M = 3.19, SD = 0.84), item three (M = 3.31, SD = 1.06), item eight (M= 3.05, SD = 0.69), item ten (M=3.28), SD = 0.74).

Research Question 2

What are students perceptions about the symptoms of Covid-19 pandemic?

Table 2 Mean and Standard Deviation of Students Perceptions about the Symptoms of Covid-19 pandemic

S/N	Students' Perceptions About Covid-19 Symptoms	N	Mean	SD	Remark
12.	Cough	186	4.12	0.89	Agree
13.	Fever	186	4.56	0.69	Agree
14.	Shivering and shaking	186	3.58	0.71	Agree
15.	Body pain	186	3.62	0.91	Agree
16.	Headache	186	3.77	0.88	Agree
17.	Sore throat	186	3.53	0.56	Agree
18.	Loss of taste or smell	186	3.72	0.95	Agree
19	Difficulty in breathing/shortness of breath	186	2.66	0.99	Agree
20.	Diarrhea/abdominal pain	186	3.03	1.02	Unaware
21.	Running nose/catarrh	186	2.85	0.81	Unaware
22.	Fatigue (tiredness)	186	3.65	0.74	Agree

S/N	Students' Perceptions About Covid-19 Symptoms	N	Mean	SD	Remark
12.	Cough	186	4.12	0.89	Agree
13.	Fever	186	4.56	0.69	Agree
14.	Shivering and shaking	186	3.58	0.71	Agree
15.	Body pain	186	3.62	0.91	Agree
16.	Headache	186	3.77	0.88	Agree
17.	Sore throat	186	3.53	0.56	Agree
18.	Loss of taste or smell	186	3.72	0.95	Agree
19	Difficulty in breathing/shortness of breath	186	2.66	0.99	Agree
20.	Diarrhea/abdominal pain	186	3.03	1.02	Unaware
21.	Running nose/catarrh	186	2.85	0.81	Unaware
22.	Fatigue (tiredness)	186	3.65	0.74	Agree

Table 2 reveals students' perception about the symptoms of Covid-19 pandemic. Form items 12 to 18, 19 and 22, students agree that items are symptoms of Covid-19 while items 20 and 21 rejected by students.

Research Question 3

What are the effects of Covid-19 pandemic on Academic Achievement of Technology Education Students in South-South Nigerian universities?

Table 3: Technology Education Perceptions about the effect of covid-19 Pandemic on their Academic Achievement.

S/N	Effect of Covid-19 Pandemic on Academic Achievement of Technology Education Students in Universities in South/South Nigeria	N	Mean	SD	Remark
1	Teaching and learning was stopped during the Covid-19 pandemic	186	3.85	1.18	Agree
2	On-line teaching and learning during the lock-down period did not give students enough room to grasp concepts.	186	3.66	1.08	Agree
3	Skill oriented practical programmes in Technology education were not properly delivered to students	186	3.90	0.98	Agree

	through on-line medium				
4	Most students do not have android phone for lectures	186	3.79	0.98	Agree
5.	Most students could not afford for online lectures	186	3.56	0.98	Agree
6	Students understanding of concepts taught by teacher through on-line was inadequate	186	3.76	0.92	Agree
7	Technology Education students could not afford most facilities needed in the on-line teaching	186	3.61	0.98	Agree
8	Teaching of practical lessons were theoretical in nature during the pandemic	186	3.77	1.14	Agree
9	Teachers who conducted the on-line teaching in universities were few, so many courses were not covered	186	4.15	0.99	Agree
10	Students felt that learning was done in abstraction	186	4.48	0.78	Agree
11	Students Academic Achievement was poor due to improper guidance by their teachers as a result of the lock-down	186	4.10	1.03	Agree
12	Assignments and tests administered to students online were not valid as undue assistance were given to students by their brothers, sisters and parents	186	4.07	0.97	Agree
13	Technology education is a practical skill oriented area of specialization and should be taught as such	186	4.09	0.88	Agree
14	Lectures in technology education courses during the COVID-19 were not done based on real life situation	186	4.04	0.99	Agree
15	There were no instruments to be used in practical class other than the ones shown in video conferencing	186	4.32	1.00	Agree
16	Measurements for construction work were not done physically except the ones done on-line which may be misleading	186	4.29	0.82	Agree
17	Real objects for practical work are not felt physically giving room to memorization of tasks instead of acquiring skills	186	3.88	0.75	Agree
18	Space in the workshops where practical work is supposed to be practiced are not provided, rather on-line environment was displayed to students giving room for rote learning	186	3.57	0.95	Agree
19	Students' knowledge transfer of what was learnt in the period of Covid-19 pandemic was poor	186	3.20	0.88	Unaware
20	Skill acquisition was inadequate	186	3.92	0.67	Agree
21	Tools used for teaching on-line was inadequate	186	3.18	0.77	Unaware

In table 3, technology education students' perceptions about the effects of Covid-19 pandemic on their academic achievement indicates that out of the 21 items, 19 items about the covid-19 affected students' academic achievement negatively. Therefore, students' perceptions on the 19 items were rated as agree: item 1 (M = 3.85, SD= 1.18); item 2 (M = 3.66, SD= 1.08); item 3 (M = 3.90, SD= 0.92); item 4 (M = 3.79, S.D. = 1.04); item 5 (M = 3.56, SD= 0.98); item 6 (M = 3.76, SD= 0.92); item 7 (M = 3.61, SD= 0.98); item 8 (M = 3.77, SD= 1.14); item 9 (M = 4.15, SD= 0.99); item 10 (M = 4.48, SD= 0.78); item 11 (M = 4.10, SD= 1.03); item 12 (M = 4.07, SD= 0.97); item 13 (M = 4.09, SD= 0.88); item 14 (M = 4.04, SD= 0.99); item 15 (M = 4.32, SD= 1.00); item 16 (M = 4.04, SD= 0.99); item 17 (M = 4.32, SD= 1.00); item 18 (M = 4.29, SD=

0.82); item 19 (M = 3.88, SD= 0.75); item 20 (M = 3.57, SD= 0.95); and item 21 (M = 3.92, SD= 0.67). On the contrary, item 19 (M = 3.20, SD= 0.88) and item 21 (M = 3.18, SD= 0.77) were rated as disagree.

Research Question 4

What are the remedies of the effect of Covid-19 pandemic on technology education students' Academic Achievement in South-South Nigeria?

Table 4: Technology Education Students' perception about the remedies of the effect Covid-19 Pandemic in their Academic Achievement

S/N	Effect of Covid-19 Pandemic	N	Mean	SD	Remark
22.	Lecturers and students should obey the safety protocols put in place by government during the period of the pandemic	186	3.89	1.20	Agree
23.	Lecturers should repeat their teaching especially for those who participated in on-line teaching for at least one month before examination	186	3.72	1..11	Agree
24.	UNESCO funding benchmark of 26% of Nigerian budget for financing universities should be followed judiciously	186	4.45	0.74	Agree
25.	Tests and assignments should be re-administered by teachers to students, marks awarded and average of the online tests and the ones administered later should be found	186	3.71	0.94	Agree
26.	More machines, hand tools and training materials in the school workshops should be provided by government in order for students to observe and maintain social distancing	186	4.16	0.91	Agree
27.	Students and lecturers should wear their face masks until the pandemic is over	186	3.84	1.11	Agree
28.	Lecturers and students should wash and clean their hands with water and sanitizers	186	4.12	1.17	Agree
29.	Lecturers and students should maintain the approved minimum social distances of 3m from one another	186	4.09	0.97	Agree
30.	Government should fumigate all facilities in the universities to prevent infection of students, lecturers and all stakeholders by the virus	186	3.63	0.51	Agree

In table 4, all the remedies of Covid-19 for students' academic achievement were rated as agree. Item 22 (M = 3.89, SD= 1.20); item 23 (M = 3.72, SD= 1.11); item 24 (M = 4.45, SD= 0.74); item 25 (M = 3.71, SD= 0.94); item 26 (M = 4.16, SD= 0.91); item 27 (M = 3.84, SD= 1.11); item 28 (M = 4.12, SD= 1.17); item 29 (M = 4.09, SD= 0.97); and item 30 (M = 3.62, SD= 0.51).

Hypothesis 1

There is no significant difference in the opinions of male and female technology education students about their level of awareness of Covid-19 pandemic in universities in south-south Nigeria.

Table 5 Summary of t-test analysis for technology education students' level of awareness about Covid-19 pandemic in universities in south-south Nigeria

S/N	Level of Awareness	F	*Sig.	t	Df	**Sig (2-tailed	Remarks
1	I am aware that Covid-19 pandemic is real	0.12	.728	1.00	184	.315	Accepted
2	I am aware that Covid-19 exists in Nigeria	0.96	.328	0.16	184	.874	Accepted
3	Covid-19 can be contacted by anyone irrespectively status	0.79	.376	.108	184	.281	Accepted
4	Coming in contact with someone who has the virus helps in spreading the pandemic	0.21	.651	-0.22	184	.823	Accepted
5	Coronavirus is very deadly	0.25	.618	0.72	184	.474	Accepted
6	Covid-19 is an air-born disease	1.74	.188	1.54	184	.126	Accepted
7	It can be contacted through sneezing by a person who has the virus to another person not wearing a face mask	0.02	.898	-0.15	184	.463	Accepted
8	The virus cannot survive in a temperature above 27^0c	0.45	.504	0.74	184	.463	Accepted
9	It can easily be contacted by a careless person	2.79	.097	2.28	184	.024	Rejected
10	It is connected to viral pneumonia	**0.03**	.854	-0.93	184	.306	Accepted
11	Drinking enough water can prevent the pandemic	**3.37**	.068	0.39	184	.700	Accepted

*Sig and *sig. (2-tailed): test is significant at a = 0.05 level

Table 5 presented the summary of result of independent sample t-test for technology education students' level of awareness about Covid-19 pandemic in universities in south-south Nigeria.

The result shows that all the items in table 5 have the p-values greater than the t-values (p-value >.05) except item 9 at degree of freedom of 184 . Therefore, the null hypothesis for items 1-8, and 10-11 were accepted while item 9 was rejected because the p-values was smaller than the t-value (p-value < .05). Hence, there is no significant difference in the opinions of male and female technology education students in items 1-8 and 10-11 while there is significant difference in the opinions of male and female technology education students in item 9 concerning students level of awareness about covid-19 pandemic.

Hypothesis 2

There is no significant difference in the opinions of male and female technology education students of the effect of covid-19 on their academic achievement in south-south Nigeria. The test statistics for hypothesis is presented on Table 7.

Table 6 Summary of t-test analysis for technology education students about the effect of covid-19 on their academic achievement in universities in south-south Nigeria

S/N	Effect of Covid-19 Pandemic on Academic Achievement of Technology Education Students in Universities in South/South Nigeria	F	*Sig.	t	Df	**Sig (2-tailed	Remarks
1	Teaching and learning was stopped during the Covid-19 pandemic	0.76	.386	0.89	184	.374	Accepted
2	On-line teaching and learning during the lock-down period did not give students enough room to grasp concepts.	0.38	.537	0.75	184	.453	Accepted
3	Skill oriented practical programmes in Technology education were not properly delivered to students through on-line medium	0.66	.417	0.41	184	.684	Accepted
4	Most students do not have android phone for lectures	0.21	.646	0.69	184	.490	Accepted
5	Most students could not afford for online lectures	0.05	.823	1.67	184	..097	Accepted
6	Students understanding of concepts taught by teacher through on-line was inadequate	0.08	.778	1.88	184	.062	Accepted
7	Technology Education students could not afford most facilities needed in the on-line teaching	0.05	.819	-0.69	184	.488	Accepted
8	Teaching of practical lessons were theoretical in nature during the pandemic	0.20	.658	0.76	184	.451	Accepted
9	Teachers who conducted the on-line teaching in universities were few, so many courses were not covered	0.71	.401	1.54	184	.125	Rejected
10	Students felt that learning was done in abstraction	**0.33**	.569	-0.73	184	.466	Accepted
11	Students Academic Achievement was poor due to improper guidance by their teachers as a result of the lock-down	**1.08**	.301	1.73	184	.086	Accepted
12	Assignments and tests administered to students online were not valid as undue assistance were given to students by their brothers, sisters and parents	**3.29**	.071	1.77	184	.079	Accepted
13	Technology education is a practical skill oriented area of specialization and should be taught as such	**1.67**	.198	2.68	184	.008	Rejected
14	Lectures in technology education courses during the COVID-19 were not done based on real life situation	**0.22**	.644	0.06	184	.949	Accepted
15	There were no instruments to be used in practical class other than the ones shown in video conferencing	**0.11**	.736	2.03	184	.044	Rejected
16	Measurements for construction work were	**0.33**	.567	1.02	184	.310	Accepted

	not done physically except the ones done on-line which may be misleading						
17	Real objects for practical work are not felt physically giving room to memorization of tasks instead of acquiring skills	**1.70**	.194	1.87	184	.064	Accepted
18	Space in the workshops where practical work is supposed to be practiced are not provided, rather on-line environment was displayed to students giving room for rote learning	**4.02**	.050	-0.05	184	.959	Accepted
19	Students' knowledge transfer of what was learnt in the period of Covid-19 pandemic was poor	**0.01**	.927	0.10	184	.924	Accepted
20	Skill acquisition was inadequate	**0.87**	.352	0.86	184	.391	Accepted
21	Tools used for teaching on-line was inadequate	**0.17**	.685	-1.55	184	.122	Accepted

The result in table 6, show the summary of t-test analysis for technology education students about the effects of Covid-19 on their academic achievement in universities in south-south Nigeria.
The result shows that all the items in Table 6 have the p-values greater than the t-values (p-values> 0.05) except items 13 and 15 whose p-values were smaller than the t-values (p-values < 0.05).
Therefore, the null hypothesis for items 1-12, 14 and 16-21 were accepted since their p-values were greater than t-values (p-value > 0.05) at 184 degree of freedom indicating that there was no significant difference in the opinions of male and female technology education students about the effect of covid-19 on their academic achievement. On the contrary, items 13 and 15 have the p-value smaller than the t-value (p-value < 0.05), hence the null hypothesis was rejected for these items signifying that there is significant difference in the opinions of male and female technology education students.

Discussion

Technology Education students' Awareness of Covid-19 Pandemic in Universities in South-South Nigeria
The finding from research question one and hypothesis one, indicate that students of technology education in south-south Nigeria universities are aware of covid-19 pandemic. According to Odion (2020), Nigerians' attitude to coivd-19 pandemic has been on of copy-cat-lockdown as others did; offered palliatives and bail-out to sectors of the economy; and calibrated opening as others did. This observation of Odion, clearly shows that Nigerians are aware of the Covid-19 pandemic, technology education students in South-South Nigeria inclusive.

Technology Education Perceptions About the Symptoms of Covid-19 Pandemic
In research question two and hypothesis one technology education students of South-South Nigeria universities perceived that they know the symptoms of Covid-19 pandemic. Chukwuma (2020) states that since Nigerians are aware of the Covid-19 pandemic and know the symptoms of the disease, there is urgent need for them to engage in the new testing protocol discovered and approved by the World Health Organization which costs two thousand, five hundred naira (₦2,500) and gives results in minutes. According to him, " Testing is a critical cornerstone of the Covid-19 response, enabling countries to trace and contain the virus now, and to prepare for the roll-out of vaccines once available".

Effects of Covid-19 Pandemic on Academic Achievement of Technology Education Students in South-South Nigerian Universities
In research question three and hypothesis two it was found that the Covid-19 pandemic affected the technology education students' academic achievement adversely. This is due mainly to the on-line teaching which most students could not participate as a result of one lapses or the other. This dichotomy created by Covid-19 pandemic on academic achievement of technology education students according to Odu (2012) could lead to students not having the necessary competence:

skill, knowledge, attitude, motivation and exposure for self-reliance and has serious implications for technology education growth and development in Nigeria. Ofojebe, Olibie and Chukwuma (2015) agreed with the above observation that the lapses created by Covid-19 have made most students to forget what they were taught in schools in technology education.

Remedies of the Effect of Covid-19 Pandemic on Technology Education Students' Academic Achievement in South-South Nigeria

Research question four and hypothesis two show some of the remedies of the effect of Covid-19 pandemic on the academic achievement of technology education students in south-south Nigeria. Among which are lecturers repeating their teaching for a short while before giving examination; tests and assignments should ne re-administered to students, marks awarded and average of the on-line tests and the ones administered later should be found, more machines, hand tools and training materials in the school workshops should be provided to enable students maintain social distancing and UNESCO funding bench mark of 26% for Nigerian universities should be maintained .

Idris (2011) emphasized the relevance of tools, materials and facilities in teaching technology education courses and stressed that most of the products of technology education are said to lack skills, knowledge, attitude and competence of the subject matter due to inadequate hand tools machines and materials. This assertion was confirmed by (Okoro, 1999 and NABTEB, 2000).

In the same vein, poor funding has resulted in students' poor academic achievement in technology education as UNESCO 26% funding bench mark has not been enforced. According to Odu (2018), poor funding of universities has resulted in slow pace of growth and development in Universities and technology education particularly. Towards this end, the 26% bench mark for funding universities as enunciated by UNESCO should kick-start and be maintained in Nigerian universities.

Conclusion

The damage done by Covid-19 pandemic to the academic achievement of technology education students in south-south Nigeria is innumerable. Students were denied of their academic activities for almost half a year except that teaching and learning was conducted on-line basis. Though students and lecturers were aware of the pandemic, its symptoms and effects, they were helpless and teaching and learning was paralyzed. On-line teaching and learning during the lockdown period did not give students enough room to grasp concepts. Practical skills in technology education were not imparted to students in real life situation among other issues that confronted teaching and learning. This is an lot of implication for technology education. It is suggested that students and lecturers should continue to observe and maintain the Covid-19 protocols, on-line teaching by lecturers should be improved by using the necessary gadgets and adequate funding should be provided by government to universities to get to the level of 26% UNESCO bench mark among others.

Recommendation

The following recommendation are made based on the findings:

- Students should continue to observe and maintain the Covid-19 safety protocols.
- Online teaching by lecturers should be improved by using the necessary gadgets needed for this type of teaching in order to deliver to students the desired skills, knowledge and attitude during lectures.
- There should be adequate exposure of students to theoretical and practical skills through adequate provision of laboratories, workshops and other instructional materials needed for effective teaching.
- Training programme in technology education and other related technology courses should be encouraged by providing conducive teaching learning environment.
- The educational system as a whole needs to be over hauled in order to improve transfer of knowledge and skills. This will enhance sustainable industrial development.
- Adequate funding should be provided by government to the level of 26% of UNESCO bench mark.

2008; Masson, 2001; Posner et al., 1982, for examples). For that, we must favor conceptual conflict as a basis in teaching and learning, considering the students' conceptual reasoning. According to these studies, students' difficulties should be a

point of departure in education. Therefore, teachers must be aware of students' conceptual understanding, as mentioned in the introduction.The two-tier test developed will allow educators to rapidly identify their students' reasoning (Rodriguez, 2016). The next step in this research will be to assess the test developed with students to evaluate its impact on their conceptual reasoning.

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