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STAKEHOLDERS' PERCEPTION ON THE USE OF COMPUTER-BASED TEST TO ASSESS BIOLOGY LESSONS DURING COVID-19 LOCKDOWN IN NIGERIA: IMPLICATIONS FOR LIBRARY PRACTICE

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Abstract

The acceptance of CBT before COVID-19 varied significantly among stakeholders. Considering the closure of schools, governments resorting to radio lessons to keep students educated, and the need to safely assess learning, the study seeks to ascertain the status of stakeholders' perception on CBT for assessing radio Biology lessons. Three research questions and three hypotheses guided the study, which adopted descriptive research design. 321 stakeholders' views were collated using an online survey, with a face/content-validated questionnaire titled "questionnaire on stakeholders' perception of CBT", having Cronbach Alpha reliability estimate of 0.83. Mean/standard deviation were used to answer research questions. T-test was used to test the hypotheses at 0.05 level of significance. Results indicated that stakeholders consider radio Biology lessons a safe way of teaching students Biology during COVID times, but deem it too passive; CBT would make tests available to students anywhere; reduce bias/human mistake from examiners; but perceive it as inefficient for assessing all domains of learning. Although COVID-19 has positively improved its acceptance, there is a significant difference in students'/teachers' perception of CBT. The study discusses the implications of the findings to library practice, and recommended that radio lessons be improved to reduce passivity; CBT should be used as a means of assessing learning outcomes from radio lessons, and awareness be created as to its benefits.

Key Words: COVID-19, Stakeholders, Perception, Assessment, Biology, Computer Based Test

Introduction

The technological dimension of the world is so vast and immeasurable, with ramifications in almost every facet of daily life. So wide is the scope of technology in everyday life, that it has permeated the education system of nations. Twining (2007) reinforces that besides the peculiarities and differences encountered in its application, there is an agreement that ICT should be used in order to prepare people for living in a technology-driven society. Nigeria recognizes the importance of technology in education and so in the 6th edition of the National policy on education, duly recommends its use, in form of computer-based test (CBT), in assessing students' achievement (Federal Republic of Nigeria, FRN, 2013:45).

Assessment is a vital element of the teaching and learning process, as it provides a means via which the teacher determines which stated educational objectives have been achieved. "Assessment is essential not only to guide the development of individual students, but also to monitor and continuously improve the quality of programmes, inform prospective students and their parents. It also provides evidence of accountability to sponsors of education" (Obikeze, Ifeakor, Akujieze, Anujeonye, 2019:234). Assessment is more broadly defined as the processes used to determining students' achievement status, with reference to learning objectives, considered as expected learning outcomes (Anikweze, 2014). A teacher thus states expected learning outcomes as learning objectives for each lesson, and the only way to determine how much learning has taken place is by assessing students.

The advancements in technology has significantly reshaped the assessment/testing landscape. The introduction of technology into the teaching and learning process, has altered the test paradigm, and precipitated a transition from paper-Pencil Test (PPT) to Computer-Based Test (CBT). Olawale and Shafi'l (2010) defined CBT as "the process through which examinations are delivered, taken and scored electronically." The system allows for test questions to be deployed through the intranet and internet, to the students' computer. The students then respond to the questions and submit same through the same platform. Onyibe, Nwadu-Ikpor and Abdulhakim (2015), and Ojerinde (2014) corroborates this by defining CBT as a method of administering tests in which the responses are electronically recorded and assessed. CBT requires the students taking the test to sit in front of a computer, respond to the questions as they pop-up.

Some benefits of CBT as posited by Ojerinde include:

i.   CBT ensures efficient administration of examination and scoring of tests.

ii. CBT facilitates increased delivery of test items that have been calibrated and delineated according to their pertinent item characteristics (instructional levels/objectives, difficulty level, discrimination level and functionality distracters).

iii. CBT makes for improved test security resulting from electronic transmission and encryption for total eradication of breaches of examination security.

iv. Unbiased test administration and scoring is possible with CBT.

v. Test takers' computer awareness and literacy is increased with CBT.

vi. Reduction in the spate of examination security breaches, issues of cancellation of result due to insecurity and missing results due to candidate's carelessness will be eradicated and

vii. CBT improves the overall quality and standard of education in the long run.

Meanwhile, Lukeman and Ogechi (2012: 54) opined that "CBT simplifies the entire testing cycle, including generation, execution, evaluation and presentation of test." The authors noted that CBT advantages include the standardization of test administration condition, offer test developers the opportunity to improve their productivity and lead to innovation in their fields and that no matter the tests' population size, CBT helps developers to set the same test conditions for all participants. Abubakar and Odey (2015) opined that the introduction of CBT examinations in tertiary institutions in Nigeria will afford both teachers and students the opportunity to be information communication and technology (ICT) compliant.

A study was carried out by Sanne and Mohammed (2015) on the views of students on the use of computer-based test for the conduct of UTME. The study found that the introduction of CBT for UTME examination attracted most of students' attention and therefore led to CBT preference over the conventional way of writing the examination. The study revealed further that CBT can reduce examination malpractices and enhanced security as opposed to paper and pencil test. A similar study conducted by Aduwa-Ogiegbaen and Iyamu (2005) on online examination practices in vocational education and training found that students perceived online assessment as a flexible and efficient means of conducting examination with immediate feedback. Another study by Oladimeji and Mwuese (2018) on CBT as a panacea on undergraduate students' performance found that CBT had a positive influence on their performance. They further found out some challenges such as the mixed up of results due to improper data base management which at times could lead to mass failure. Nevertheless, Joshua and Ikiroma (2013) findings were rather contradictory. They carried out a study on CBT in Nigeria's university entrants' matriculation

examination, readiness and acceptability of critical stakeholders. The study among other things found out that the major stakeholders (the students), complained that the examination may be interrupted by electricity while others expressed fear that the computer used for the CBT could malfunction during the test. That notwithstanding, the Register of Jamb, Ojerinde in Adoberin (2012) noted that the CBT mode will improve the Board's service delivery; reduce the incidence of breaches of examination security and help Nigeria operate global best practices. Most Universities all over the world, colleges of education and polytechnics seem to have replaced the customary paper and pen testing (PPT) with CBT for academic assessment and students' evaluation (Oladimeji & Mwuese, 2018).

The temporary halt in activities necessitated by the lockdown of states in Nigeria, an approach adopted by the federal government of Nigeria to manage the COVID19 outbreak, affected the education sector. The impact was felt greatly as school activities came to an abrupt stop, with all students and teachers mandated to stay at home. As the lockdown dragged on, some state governments, notably Enugu and Kaduna states, began radio lessons for students. These are situations where different subject teachers go on air to present planned lessons in their subject areas. These teachers leave their name and phone numbers after every lesson, so that students/parents could contact them for follow-up lessons or to get answers to questions they might have from the lesson. Some private schools also adopted a virtual approach to teaching through such platforms as WhatsApp, Zoom, and Google meet. However, without assessing the level of learning that has taken place, virtual teaching becomes a somewhat futile venture. In the face of the COVID19 outbreak, CBT becomes a healthy alternative to assessing how much learning has taken place among students. One avenue teachers could explore for assessing students is using the virtual mode of assessment that CBT environment provides. CBT also is appropriate for the COVID-19 prevention protocol, as students do not have to sit with each other to take tests. Considering stakeholders' perception to CBT before COVID-19 and the social distancing measure for preventing the spread of the virus, it is important to ascertain whether there has been a change in perception towards CBT, among teachers and students.

Statement of the Problem

The advent of Corona virus has significantly impacted livelihood as it was known. The lockdown as a means of preventing the spread of the virus, has necessitated the closure of schools. Considering the importance education, some states in Nigeria have resorted to radio lessons to

keep students educated. Learning has to be assessed and CBT presents an alternative to the conventional classroom tests. Prior to the COVID19 outbreak, people's perception on the use of computer-based tests was mixed, mostly tilting towards a general rejection of the system. Parents, students and teachers cited several reasons for and against this mode of assessment, first introduced in Nigeria by the Joint Admissions and Matriculations Board (JAMB) in 2015. However, considering the place/importance of assessment to overall learning and effectiveness of teaching, and the suspension of classroom activities to date, CBT remains the sole feasible option for assessing learning outcomes among Biology students. This paper thus seeks to ascertain whether the COVID19 experience has altered stakeholders' perception of CBT as a mode of assessment.

Purpose of the Study

The general purpose of the study is to ascertain stakeholders' perception the use of CBT to assess learning among secondary school biology students in Enugu and Kaduna states. Specifically, the study seeks to ascertain:

i. Stakeholders' perception of radio Biology lessons in Enugu and Kaduna states.
ii. Stakeholders' perception of use of CBT to assess learning among Biology students in Enugu and Kaduna states.
iii. Influence of COVID19 on Stakeholders' perception of use of CBT to assess learning of Biology among students in Enugu and Kaduna states.

Research Questions

The following questions were posed to guide the study.

1. What is the perception of stakeholders on radio Biology lessons in Enugu and Kaduna states?
2. What is the perception of stakeholders on the use of CBT to assess learning among Biology students in Enugu and Kaduna states?
3. How has COVID19 influenced stakeholders' perception of use of CBT to assess radio learning of Biology among students in Enugu and Kaduna states?

Hypotheses

The following hypotheses were formulated and will be tested at 0.05 level of significance.

1. There is no significant difference in the perception of teachers and students on radio Biology lessons in Enugu and Kaduna states.

2. There is no significant difference in the perception of teachers and students on the use of CBT to assess learning among Biology students in Enugu and Kaduna states.

3. The influence of COVID 19 on teachers' and students' perception on use of CBT to assess radio learning among students in Enugu and Kaduna states is not significant.

Method

This study adopted a descriptive survey design. Nworgu and Urama (2015) describes descriptive design as one in which data is collected from a sampled portion of a population, to represent the entire population. Data from such sampled population is generalizable to the entire population from where the sample was chosen. The design is appropriate because data was collected from only a selected portion of a population to represent the entire population. The study was carried out in Nigeria. The study population included all secondary school teachers and students in Enugu and Kaduna states, who for the purpose of this study are collectively referred to as "stakeholders". In adherence to COVID-19 safety guidelines and attempt to minimize contact between researcher and respondents, an online survey questionnaire was used to elicit responses from respondents. Stakeholders who responded to the instrument constituted the sample for the study. This sample was 321 stakeholders, including 69 secondary school teachers and 252 secondary school students from both states. The instrument for data collection was a researcher-developed questionnaire titled *"questionnaire on stakeholders' perception of CBT,"*. The instrument had two sections – A and B. section A was designed to elicit demographic data (status and location) of the respondents. Section B had three clusters, designed with a four-point Likert scale response options, to elicit data on stakeholders' perception of radio Biology lessons, stakeholders' perception of use of CBT to assess learning among Biology students, and the influence of COVID19 on Stakeholders' perception of use of CBT to assess learning among students, in Enugu and Kaduna states. The instrument was validated by three specialists, one in the field of measurement and evaluation, one in Biology education, and a secondary school Biology teacher. The measure of internal consistency for the instrument (0.91), was obtained using Cronbach Alpha reliability index, from 15 responses collected with the online instrument sent to 5 teachers and 10 secondary school students in Ebonyi state. To collect data, the instrument was distributed through google form, allowing teachers and students to provide responses from the comfort of their homes. The data collected were subjected to statistical analysis using mean, standard deviation to answer the research questions, and t-test to test the hypotheses. The results

obtained were presented in tables. The researchers used a criterion mean of 2.50 as the benchmark for decision making. A mean value of 2.50 and above was accepted while mean values below 2.50 were rejected. This was arrived at thus: SA = 4, A = 3, D =2 and SD = 1. Criterion Mean ($\bar{X}$) = $\frac{4+3+2+1}{4}$ $= \frac{10}{4}$ $= 2.50$

RESULTS

The result and analysis of data from the questionnaire are presented in tables I, II and III, according to the research questions; and tables IV, V, and VI in line with the hypotheses that guided the study.

Research Question I: What is the perception of stakeholders on radio Biology lessons in Enugu and Kaduna states?

Table I: Perception of stakeholders on radio Biology lessons in Enugu and Kaduna states

S/N	Item statement	Status	Mean	Std.Dev	Decision
1.	Students learn faster and better on the radio than in the classroom.	**Teacher**	1.75	0.67	Disagree
		Student	1.79	0.76	Disagree
2.	Students residential environment affects their concentration while learning on the radio	**Teacher**	3.20	0.83	Agree
		Student	3.23	0.82	Agree
3.	Power affects radio biology lesson presentation	**Teacher**	3.19	0.67	Agree
		Student	3.14	0.65	Agree
4.	Radio biology lesson is a positive experience	**Teacher**	2.57	0.87	Agree
		Student	2.61	0.67	Agree
5.	Radio biology lesson has a positive effect on students' retention	**Teacher**	2.28	0.68	Disagree
		Student	2.58	0.75	Disagree
6.	It is more convenient to deliver biology lessons on the radio	**Teacher**	1.96	0.86	Disagree
		Student	2.08	0.65	Disagree
7.	Radio biology lesson is very efficient	**Teacher**	1.97	0.66	Disagree
		Student	2.15	0.63	Disagree
8.	Radio biology lessons affords students the opportunity to learn at their own pace	**Teacher**	2.19	0.65	Disagree
		Student	2.44	0.71	Disagree
9.	Radio biology lessons should be made a regular thing.	**Teacher**	2.30	0.90	Disagree
		Student	2.38	0.88	Disagree
	Overall mean	***Teacher***	***2.38***	***0.76***	***Disagree***
		Student	***2.49***	***0.73***	***Disagree***

Number of Teachers = 69; Number of Students = 252; N = 321

Table I shows that students and teachers agree that students' concentration while learning via radio is affected by the environment, power supply would significantly affect radio lessons (items 2, 3

and 4). Respondents however disagreed that students learn faster and retain lessons better through radio lessons, radio lessons are efficient and is a more convenient way of teaching Biology, radio lessons give students the opportunity to learn at their own pace, and that radio lessons should be used regularly to teach biology (items 1, 5, 6, 7, 8 and 9). The overall mean score of 2.38 and 2.49 for teachers and students respectively, indicates that the respondents have a negative perception towards radio Biology lessons.

Research Question II: What is the perception of stakeholders on the use of CBT to assess learning among Biology students in Enugu and Kaduna states?

Table II: Perception of stakeholders on the use of CBT to assess learning among Biology students in Enugu and Kaduna states

S/N	Item statement	Status	Mean	Std.Dev	Decision
10.	CBT is highly efficient in assessing students learning	**Teacher**	2.87	0.71	Agree
		Student	2.93	0.54	Agree
11.	CBT ensures fairness and equity in accessing students' performance	**Teacher**	3.22	0.62	Agree
		Student	3.20	0.59	Agree
12.	I prefer CBT assessment compared to Paper assessment	**Teacher**	2.96	0.83	Agree
		Student	3.02	0.86	Agree
13.	CBT exam allows students concentrate on their work	**Teacher**	3.22	0.74	Agree
		Student	3.07	0.72	Agree
14.	CBT boosts students' confidence during exams	**Teacher**	2.90	0.69	Agree
		Student	2.89	0.77	Agree
15.	CBT assessment is very easy to administer	**Teacher**	3.33	0.74	Agree
		Student	3.27	0.60	Agree
16.	Students proceeds at their own rate while writing CBT exams	**Teacher**	2.94	0.80	Agree
		Student	2.82	0.73	Agree
17.	CBT assessment is always confusing and threatening to students	**Teacher**	2.30	0.67	Agree
		Student	2.51	0.85	Agree
18.	CBT assessment should be encouraged to be used across all academic discipline.	**Teacher**	2.70	1.02	Agree
		Student	2.83	0.53	Agree
19.	CBT guarantees unbiased assessment of learning outcomes	**Teacher**	3.26	0.74	Agree
		Student	3.17	0.83	Agree
20.	CBT can be used to effectively assess all three domains of learning	**Teacher**	2.55	0.98	Agree
		Student	3.65	0.58	Agree
21.	CBT consumes less time than conventional tests	**Teacher**	3.35	0.48	Agree
		Student	3.15	0.51	Agree
22.	CBT provides automatic test results upon completion of test	**Teacher**	3.57	0.53	Agree
		Student	3.36	0.61	Agree
23.	CBT reduces human mistakes in scoring of tests	**Teacher**	3.58	0.53	Agree
		Student	3.33	0.56	Agree

S/N	Item statement	Status	Mean	Std.Dev	Decision
24.	Makes tests available anywhere, anytime	**Teacher**	3.59	0.52	Agree
		Student	3.41	0.75	Agree
25.	CBT discourages examination malpractice among students	**Teacher**	3.04	0.85	Agree
		Student	2.96	0.0.64	Agree
26.	Is convenient for assessing a large number of students all at the same time	**Teacher**	3.49	0.66	Agree
		Student	3.25	0.59	Agree
27.	CBT reduces bias from test examiners	**Teacher**	3.52	0.50	Agree
		Student	3.24	0.59	Agree
	Overall mean	*Teacher*	*3.13*	*0.70*	*Agree*
		Student	*3.06*	*0.66*	*Agree*

Number of Teachers = 69; Number of Students = 252; N = 321

Table II shows that respondents agreed to all 18 items used to elicit their perception on using CBT to assess radio Biology lessons, with mean responses for students and teachers being >2.50. The overall means – 3.13 and 3.06 – for teachers and students respectively, indicates that respondents have a positive disposition towards the use of CBT to assess biology lessons delivered over the radio. The overall standard deviations (0.70 and 0.66) indicate that the responses provide by each respondent was not far away from the mean.

Research Question III: How has COVID19 influenced stakeholders' perception of use of CBT to assess radio learning among students in Enugu and Kaduna states?

Table III: Influence of COVID19 on Stakeholders' perception of use of CBT to assess learning among students in Enugu and Kaduna states.

S/N	Item statement	Status	Mean	Std.Dev	Decision
28.	My acceptance of CBT has been positively influenced by COVID 19 lockdown	**Teacher**	3.00	0.94	Agree
		Student	2.92	0.81	Agree
29.	CBT should be adopted generally as a post COVID-19 assessing method	**Teacher**	2.99	0.78	Agree
		Student	3.01	0.68	Agree
30.	Students would feel safe from COVID-19 while being assessed through CBT.	**Teacher**	3.32	0.56	Agree
		Student	3.29	0.60	Agree
31.	CBT is the safest form of assessment in the COVID19 lockdown	**Teacher**	3.49	0.56	Agree
		Student	3.35	0.66	Agree
32.	COVID-19 has increased your acceptance of CBT as a mode of assessment	**Teacher**	3.43	0.56	Agree
		Student	3.14	0.75	Agree
33.	CBT is the best means of assessing students' achievement during the COVID19 lockdown	**Teacher**	3.49	0.58	Agree
		Student	3.27	0.65	Agree
	Overall mean	*Teacher*	*3.29*	*0.66*	*Agree*
		Student	*3.16*	*0.69*	*Agree*

Number of Teachers = 69; Number of Students = 252; N = 321

Data on table III shows that stakeholders' perception on use of CBT to assess learning has been altered by COVID-19, with respondents agreeing that CBT is the best and safest means of assessing learning outcomes during the COVID-19 lockdown, and should be adopted post-COVID-19 to assess learning.

Hypothesis I: There is no significant difference in the perception of teachers and students on radio Biology lessons in Enugu and Kaduna states.

Table IV: t-test analysis of difference in the perception of teachers and students on radio Biology lessons in Enugu and Kaduna states.

Location	N	Mean	SD	df	t.	Sig. (2-tailed)
Teacher	69	21.41	3.19	319	-2.085	.038
Student	252	22.39	3.54			

As shown on table IV, since the probability value of 0.038 is less than 0.05, the null hypothesis was rejected. Thus, difference in the perception of teachers and students on radio Biology lessons in Enugu and Kaduna states is significant.

Hypothesis II: There is no significant difference in the perception of teachers and students on the use of CBT to assess learning among Biology students in Enugu and Kaduna states.

Table V: t-test analysis of difference in the perception of teachers and students on the use of CBT to assess learning.

Location	N	Mean	SD	df	t.	Sig. (2-tailed)
Teacher	69	56.06	7.98	319	1.133	.258
Student	252	55.01	6.47			

As shown on table V, since the probability value of 0.258 is greater than 0.05, the null hypothesis was not rejected. Thus, there is no significant difference in the perception of teachers and students on the use of CBT to assess learning among Biology students in Enugu and Kaduna states.

Hypothesis III: The influence of COVID 19 on teachers' and students' perception on use of CBT to assess radio learning among students in Enugu and Kaduna states is not significant.

Table VI: t-test analysis of difference in influence of COVID 19 on teachers' and students' perception on use of CBT.

Location	N	Mean	SD	df	t.	Sig. (2-tailed)
Teacher	69	19.72	2.81	319	1.850	.065
Student	252	18.96	3.10			

As shown on table VI, since the probability value of 0.065 is greater than 0.05, the null hypothesis was not rejected. Thus, the influence of COVID 19 on teachers' and students' perception on use of CBT to assess radio learning among students in Enugu and Kaduna states is not significant.

Discussion Of Findings

Result on the perception of secondary school teachers and students towards radio Biology lessons show a negative disposition. The difference in the perception of teachers and students on radio Biology lessons in Enugu and Kaduna states is significant, indicating that students and teachers perceive radio biology lessons differently. Stakeholders are of the view that Biology lessons delivered on radio provide a positive experience for the learner, as it is a somewhat new means of learning among Nigerian students and understandably should be intriguing. However, stakeholders consider teaching students Biology over the radio inefficient and does not facilitate learning more than the conventional classroom lessons. Biology is a practical subject and the fact that radio lessons only appeal to the aural sense of the learner, it is easy to get distracted, reducing retention, and also difficult to develop a full sense of appreciation for what is being taught, as the teacher is not physically present (as is in television lessons) to provide demonstrations, diagrams or engage the students in the lesson. Thusly, respondents indicated that radio Biology lessons are not very efficient. Fleming's VARK learning model posits that students are multi-modal learners, who learn through the combination of either of visual, auditory, read/write or kinaesthetic modes of learning. Radio lessons only appeal to one sense of the learner (Fleming & Baume, 2007). Ali (2015) is of the view that students listening to a teacher they do not see, speaking over the radio for a period could be very boring and students would easily loose interest in the lesson. This passivity characteristic of radio lessons, and the fact it does not appeal to the sense of sight, could explain

why students do not have a positive view towards it. Also, teaching school subjects over the radio is a relatively new approach to teaching in Nigeria. Thus, it has not been widely received by teachers and students. When these stakeholders get used to it, their perception towards it might become more positive.

Findings show that stakeholders have a positive perception of CBT being used to assess radio learning. There also is no significant difference in the perception of teachers and students on the use of CBT to assess learning among Biology students in Enugu and Kaduna states. Some of the reasons CBT is accepted by stakeholders include that they consider it very easy to administer, allows students to take tests from the comfort of their homes, allows for unbiased grading of students' tests, provides results faster than is possible on PPT, makes the tests available to students anywhere, anytime, is ideal for assessing large number of students, reduces assessment malpractices, among others. This agrees with the findings of Aduwa-Ogiegbaen and Iyamu (2005) who report that stakeholders (students) perceive CBT as very flexible for conduct of examinations; Oladimeji and Mwuese (2018), who reported that students consider CBT to have a significant positive influence on their academic achievement; and Olafare, Akinoso and Omotunde and Annenne (2017), who posited that CBT will not only reduce examination malpractices but would ensure prompt and timely release of students' examination results irrespective of the population. It will also prepare students in the aspect of speed and accuracy. With an internet connection, a computer or smartphone, a student can access his/her CBT anywhere, without the need to be physically present in a classroom. Because CBT provides a clock counting down on the test screen, students do not have time to participate in conventional examination malpractices that are prevalent in PPT. CBT is thus easily likely by stakeholders, who consider it to a faster and less tedious means of conducting assessments, as grading of tests is done by the computer, following answers coding into the test by the test developer. The finding however contradicts those of Joshua and Ikiroma (2013), who in their study report that students complain about electricity (power) and technical malfunctioning of computers during tests as being a major challenge to their being assessed through CBT.

When it was first introduced, CBT suffered for acceptance. This was because such challenges as technical glitch and computer malfunction during tests, coupled with erratic power supply which disrupts the testing process were very prominent on inception. As these problems were sorted out,

CBT began to gain more acceptance. However, following the COVID-19 outbreak and the need for everyone to observe safety protocols, stakeholders' perception of CBT has increased even more. Results show that the acceptance of CBT has positively increased, as teachers and students see it as the safest means of assessing learning delivered to radio. The influence of COVID 19 on teachers' and students' perception on use of CBT to assess radio learning among students in Enugu and Kaduna states is not significant. CBT tests can be designed electronically by radio teachers and shared to students' email addresses. The students then click on the link and provide answers to the test, which has a timer to regulate how long students spend on each question. Although there are concerns about CBT promoting malpractices when students take tests without a teacher being present, CBT remains the safest means of assessing outcome of lessons delivered through radio, in COVID-19 times.

Implications For Library Practice

Findings of this study implicate library practices primarily because assessment is based on students' learning, and students need reading materials to supplement virtual lessons they receive from their teachers. The COVID-19 pandemic, spread of the new Delta variant of the virus and recent discovery of lung COVID, have created serious paranoia in parents, who now prefer their children learning virtually, with as little contact with people as possible, than going back to school. Virtual learning platforms like radios, cannot provide exhaustive knowledge to students. As a result, students need access to library resources, to augment what they learn. The conventional practice by libraries to provide books and other library resources in shelves, as well as reading spaces for students to use those books/resources, is not effective for these groups of people. This implies that books and other library resources have to be converted to electronic forms. Libraries also would have to digitalize themselves, and make resources available to students, so they can continue to learn in these 'COVID times.' Standard assessment measures would not be fair to students who are 'academically handicapped' because they cannot get access to resources from libraries. There thus is need for libraries to evolve from their conventional practices, to a digitalised one, so virtual learning and assessment can reflect the true measure of a child's cognitive abilities.

Conclusion

Notwithstanding the COVID-19, learning must continue. Radio lessons still remain a viable alternative to teach students and maintain safety protocols spelt out by the federal government of Nigeria. Lessons, however it is delivered, must be assessed, and CBT provides a route to achieving it. Safety concerns due to the pandemic have contributed to improving stakeholders' perception of CBT. It therefore is imperative that measures be put in place to ensure that this improved perception and acceptance of CBT as a means of assessment, is maintained even post-COVID-19 lockdown. Students should also be allowed access to study materials and books. Library practices have to evolve to provide virtual academic materials to students.

Recommendations

The study recommends that:

1. Awareness should be created on the benefits derivable from radio lessons so as to improve people's perception of radio lessons.
2. Teachers who deliver lessons over the radio should take proper care to prepare their lessons such that it will engage students to some extent, in order generate and sustain students' extent.
3. CBT should be used to assess Biology lessons delivered over the radio.
4. The technical issues associated with CBT should be addresses and reduced to the barest minimum, so as to give CBT users a seamless test experience.
5. Libraries should be digitised, and library resources converted to electronic form to enable students access these resources while learning virtually.

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