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Science Students' Perception of Electronic Assessments: An Indicator of Innovative Approach towards Sustainable National Development

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Abstract

A core principle of sustainable development is to improve an identified condition over time without mortgaging the future. Improving science education today to ensure its future is a core concern. This study investigated students' perception of the use of electronic assessment in science education. The objectives of the study included finding out the level of acceptance, effects on students' skills and major challenges students face during electronic-assessment. The result showed a high level of acceptance of electronic assessments by science students, positive effect on students' examination skills and some challenges they face.
Keywords; Electronic Assessments, Science Education, National Development.
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1.   Introduction

Sustainable national development can be seen as a process of improving the range of opportunities that will enable people to achieve their aspirations and full potential over a period of time while maintaining the resilience of economic, social and environmental systems. Quality education, however leads to acquisition of relevant skills and knowledge required for sustainable developments. The world becoming a global village makes what goes on in any part of the world known and accessible to the rest of the world: Teaching and learning are global phenomena. In this world of Information and Communication Technologies (ICTs), science teaching and learning cannot be effective without the use of ICTs in schools. Modern educational content must be ICT-compliant in all ramifications.

Assessment, being an integral part of instruction, determines whether or not the goals of education are being met. Technology, no doubt, has positively impacted the education enterprise worldwide, especially in the area of design and delivery of content. Yet, a need to explore new approaches when it comes to assessments, still exists (Ma Theresa, Valdez and Lea, 2021) Perception of students about e-assessments is also a major concern. Consequently, this study set out the following objectives as expressed in the following questions:

i.   What is the level of acceptance of electronic assessment by students?
ii.   What is the effect of electronic assessment on students' examination skills?
iii. What are the major challenges students face during electronic-assessment?

2.   Literature Review

It is now generally accepted that any improvements in areas of human endeavor must include computer-based technologies at some point, no matter the level. Quality standards are thereby rested. Quality of teaching and learning must therefore, include such computer-based technologies and their alternatives like virtual labs., science apps,

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multimedia, (Jerik, Aquino and Romiro, 2022). If the learning experiences of students must include ICTs, it is understandable why the call to use e-assessments as vital tool in the education enterprise.

Assessments affect decisions about grades, placements, instructional needs, curricula content and in some cases, funding. Mbajiorgu, Reid and Ezeano (2017) further explain that assessments help to define, select, design, collect, analyze, interpret and use information to increase students' learning and development. Furthermore, assessments aim at providing students with feedback on how they are going to improve their performance and make their next efforts better. Much of literature on E-assessments therefore, focus on their justifications, the benefits, challenges and the strategies for conducting them.

Many educationists and stake holders find a lot of justifications to advocate for E-assessments as the way forward in education as an enterprise. According to Mikki (2019) except for certain types of assessments, for instance those assessments in which students must express themselves in writing; essays, comprehension and so on, online assessments afford students immediate feedback. Immediate feedbacks in turn removes anxiety about the outcome of the tests and reduces the pressure to seek alternative means of assessing their results. Assessments in science help to capture evidence of students' thinking and learning related to important concepts, skills and attitudes. Assessments of science learning also help to gather information about what students do, what they understand, what and how they evaluate. Five issues associated with assessment in the sciences are; how to collect information (data assessment), the purpose of the assessment, how to interpret it and how to communicate it. Assessment in science goes beyond knowledge objectives, it covers skills, applications, interests, attitudes and appreciations.

Closely related to the justifications for E-assessments are their benefits. Nuri, Nermin et al. (2020) articulated the benefits of E-assessments very elaborately. Their contribution to this discourse could be summarized as follows: Ensures that students take active part in their learning and assessment processes; Affords teachers to even learn from the students; Affords the teachers the opportunity for effective and productive communication with students; Presentation of learning outcomes very explicitly; Creation of content in an attractive manner to the students; It affords the opportunity to learners to be unique in their own ways during testing; It affords learners to even acquire new skills and knowledge while testing is on-going; and It can relate content with real life.

There are also other reasons why electronic assessments are preferred, including time spent on assessment, quick feedback, lesser use of paper and safer storage and retrieval mechanisms. Some other benefits of e-assessment include the fact that testing environments are more comfortable and individualized, increased test security, provides access to three dimensional images, elimination of impersonation, increase in learner confidence in technology.

Challenges of electronic assessments also form bulk of discussions on this topic and must also be paid close attention. Nuha (2018) and Nuri, Nermin et al. (2020) have expressed important views on this aspect of this important topic. Their thoughts reflect the realities of students in the not so developed world. The critical challenges of insisting on both e-learning and e-assessments include but not limited to: The need to first train the learners on the use and operations of the relevant devices; difficulty in accessing relevant and useable devices; Poor internet facilities and dependable connectivity; and Poor technical infrastructure as well as personnel to operate them.

Consequently, E-assessments may hamper assessment of large numbers of students, providing immediate feedback that will support effective learning, using a reliable and valid instrument that will be able to give good and accurate results about students. Some major

difficulties in science assessment include describing the skills to assess and how to assess important but very intractable skills like creative thinking skills which cannot be assessed easily even with traditional assessment tools. There is need for an innovative assessment procedure that will adequately assess critical, scientific and creative skills of learners. Science education is looking to E-assessments to bridge this gap very effectively.

Most E-assessments use multiple choice questions. It is very important that the strategies to be employed so that online delivery of multiple-choice questions will be authentic, valid and reliable (Karen and Judith, 2022). To pursue this goal, the authors advocate control measures to minimize cheating during E-assessment sessions. Some of these measures include the following: Enhancing awareness about academic integrity through code of conduct statements; Scheduling single set time to complete the assessment; and establishing a focus on knowledge content, especially higher order cognitive skills.

Despite the huge benefits that justify E-assessments, the envisaged and real challenges as well as the suggested strategies to make online assessments deserve huge investments made to make it operational, the perception of students is a key factor to be considered too. The present researchers are burdened with the desire to find out from the students themselves their level of acceptance of electronic assessments, the effect of electronic assessments on their examination skills and the major challenges they face during electronic-assessments. This is more so in developing country like Nigeria. This desire to empirically provide dependable answers to these questions has no doubt attracted the attention of other researchers. Marioara and Diana (2023) investigated students' perception of online assessment as a result of the interaction among the extrinsic assessment factors on students' psychological characteristics. The researchers came to the conclusion that both technical college and university students appreciated the benefits of online assessment through use of Kahoot and Google forms tools on both psychological and pedagogical levels. In the same vein, Elham Sumya et al. (2020), also conducted their study on students' perception of online assessment in UAE during COVID-19 pandemic as a case study. They came to the conclusion that students are of the opinion that online assessments have challenges and opportunities. One of such challenges was the need to identify the identities of the test and course work participants. The need for adequate feedback was also a challenge.

Imo state of Nigeria is known as one of the states that fields the most candidates for national examinations like school certificate examinations and university entrance qualifying examinations. Imo state is known also as home to various types of federal and state tertiary institutions like conventional universities, universities of technology, poly-techniques, mono-techniques and degree awarding colleges of education. Responses from such varied types and levels of students will no doubt be a reflection of a section of Nigerian students.

3.   Methodology

A descriptive survey design was employed to sample the perception of two hundred and thirty-two (220) science students from three tertiary institutions in Imo State. A researcher made instrument tagged students perception on E-assessment (SPE) was used to elicit information from the respondents. The respondents indicated their interest on a four-point scale of strongly agreed (4points), Agree (3points), disagree (2 points) and strongly disagree (1point) respectively. Data was analyzed using mean, the decision taken is that a mean of 2.5 and above is accepted (high perception) while a mean of below 2.5 is rejected (low perception)

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4.   Data Analysis and Discussion of Findings

4.1   Data Analysis

Table 1:

Level of acceptance of E-assessment by students

S/N	Item	SA	A	D	SD	N	X	DECISION
1	Electronic-assessment is easier compared to the traditional assessment (paper and pencil type)	182 (728)	30 (90)	14 (28)	6 (6)	232	3.8	Accepted
2.	Electronic-assessment gives faster results when compared to other assessment types	98 (392)	100 (300)	14 (28)	20 (20)	100	3.2	Accepted
3.	Electronic assessment gives more accurate and credible results	94 (376)	68 (204)	26 (52)	44 (44)	232	2.9	Accepted
4.	Electronic-assessment reduces problem of missing result	26 (168)	33 (180)	14 (120)	27 (70)	232	2.25	Rejected
5.	Electronic-assessment does not solve the problem of exam malpractice	72 (72)	66 (132)	46 (138)	48 (192)	232	2.44	Rejected
	Total						14.5	
	Gran total						2.9	

Table 1 shows the level of acceptance of electronic assessment by students

Authors' Computation (2023)

Table 2:

Effects of electronic-assessment on students' Examination skills

S/N	Item	SA	A	D	SD	B	N	DECISION
1	Electronic assessment gives more time for students to ponder over questions	34 (536)	28 (84)	44 (88)	26 (26)		232	3.2 Accepted
2.	Electronic-assessment enhances critical thinking skills	70 (280)	110 (330)	24 (48)	28 (28)		232	2.9 Accepted
3.	Electronic-assessment creates tension	74 (296)	72 (216)	36 (72)	50 (50)		232	2.7 Rejected
4.	Electronic-assessment gives a more comfortable testing environment	66 (264)	88 (264)	32 (64)	46 (46)		232	2.7 Accepted
5.	Electronic-assessment creates more confidence on the test taker	52 (208)	64 (195)	46 (92)	70 (70)		232	2.3 Rejected
	Total							13.9
	Gran total							2..8

Table 2 shows a high perception on the effects of e-assessment on timing, thinking skills and comfortable   environment.

Authors' Computation (2023)

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Table 3:
Difficulties students face when using electronic assessment tool

S/N	Item	SA	A	D	SD	N	X	DECISION
1	Fear of operating a computer system	170	38	20	4	232	3.6	Accepted
		(680)	(114)	(40)	(4)			
2.	Low familiarity with computer facilities	62	124	24	22	232	2.9	Accepted
		(248)	(372)	(48)	(22)			
3.	Inability to review past questions on a computer before actual test	50	50	70	62	232	2.4	Rejected
		(200)	(150)	(140)	(62)			
4.	Inability to understand questions on the screen	50	66	58	58	232	2.4	Rejected
		(200)	(198)	(116)	(58)			
5.	Inability to revisit unanswered questions	34	62	58	78	232	2.12	Rejected
		(136)	(186)	(116)	(78)			
	Total						13.69	
	Grand total						2.738	

Table 3 shows the challenges students face while using electronic assessment tool
Authors' Computation (2023)

4.2 Discussion of Findings

The findings show that students agreed that Electronic-assessment is easier when compared with other assessment tools. E-assessment gives faster results. It also solves the problem of examination malpractice, gives more accurate and credible results. On the other hand, students opine that electronic assessment does not reduce problem of missing results. The analysis further revealed that the major challenges students face while using CBT as assessment tool are fear of operating a computer system, low familiarity with computer facilities as well as inability to review past examination questions on a computer before actual test. Inability to understand questions on the screen properly and inability to revisit already provided responses were also identified.

5. Conclusion and Recommendations

Having discovered through investigation some of the perception of science students in the use of electronic assessment in tertiary institutions in Owerri Imo State, Nigeria, the following conclusion is drawn: Electronic assessments are highly accepted by tertiary institution students in Owerri, Imo State, Nigeria. It is therefore the way to go in other to provide sustainable education assessments now and in the future. The challenges experienced by students using e-assessments include fear of operating a computer device and low familiarity with computer operations. This finding also explains the revealed fact that E-assessments create tension that tend to hamper students' examination skills.

Based on the conclusions of this study, the following recombination is proffered**:** That basic E-learning and E-assessment trainings should be inculcated into curriculum offerings of students at all levels of the education ladder. This is seen as a way to create the confidence, requisite skills and combat the techno-phobia and other psychological deterrents to accepting E-education of our time.

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