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NAVIGATING OPPORTUNITIES AND CHALLENGES OF DIGITAL INNOVATION IN EDUCATIONAL ASSESSMENT IN NIGERIAN HIGHER INSTITUTIONS

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Abstract

Assessment is a means to evaluate performances, adjudge assimilation levels and knowledge impartation of students at all levels of education. Thus, innovative approaches to monitor students' learning and progress have been offered by digital technological innovation, which has changed the assessment process in recent years. This positional paper examines navigating opportunities and challenges of digital innovation in educational assessment in Nigerian higher institutions. Related literature is reviewed to examine the variables of the study. Descriptive research methodology is employed to guide the study. The study identified various opportunities of digital innovation in educational assessment, such as improving educational performance assessment, preparing students for life in the digital world, enabling students to build the digital skills and revolutionising students' learning experiences. However, the challenges identified as obstacles to digital innovation in educational assessment include budget constraints, lack of professional training, poor network infrastructure, resistance to change, no clear technology integration strategy, unreliable devices and software, administrators' lack of awareness, data privacy and security concerns, the digital divide and students' engagement issues. The study discussed seven types of educational assessment, such as diagnostic assessment, formative assessment, summative assessment, peer assessment, ipsative assessments, norm-referenced assessments and criterion-referenced assessments. It was recommended that training and retraining should be employed as strategies to aid students and teachers to be digital innovation user-friendly.

Keywords: Navigating, opportunities, challenges, digital innovation, educational assessment

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Introduction

By allowing students to examine their academic achievement, educational assessments encourage self-reflection and the required modifications for better learning outcomes. They can also assist students in changing the way they study. A student who performs below average on a class test, for instance, might readily improve before taking another one because he has seen how he performed on the last one. An integral part of the teaching-learning process is educational assessment. This is gathering data on learners' attitudes, abilities, knowledge, and actions in order to determine the extent to which learning goals have been met. Information from assessments is utilised to make decisions regarding students. Therefore, this paper attempts to unearth the opportunities of digital innovation in educational assessment in Nigerian higher institutions and the accrued challenges.

The objectives of this study were to find out:

1. The types of educational assessment.
2. The opportunities of digital innovation in educational assessment in Nigerian higher institutions of learning.
3. The challenges of digital innovation in educational assessment in Nigerian higher institutions of learning.
4. The way forward to challenges of digital innovation in educational assessment in Nigerian higher institutions of learning.

Concepts of Educational Assessment

The process of collecting and evaluating data from a wide range of sources in order to obtain a deep understanding of students' knowledge and comprehension as well as their capacity to apply that knowledge as a result of their educational experiences is known as 'assessment'. The use of assessment results to enhance subsequent learning marks the end of this process (Huba, 2000). In order to better align previously set educational objectives with the difficulties faced by educational institutions, assessment helps educational policymakers reevaluate them (Djedidi, 2018). Consequently, it is critical that educational establishments at all levels give assessment procedures top priority.

For growth and development in a variety of domains, including management, industrial, commercial, practical, and more, assessment is an essential instrument. Assessment is an essential procedure in the field of education that has several advantages and significant significance. It is used to evaluate students' understanding levels and how much they have learnt from classes or other study-related activities. Teachers use a variety of exams to gauge their

students' understanding and progress. For educators, students, and educational institutions, it is extremely important (Abdul, Mohd, Abdel, Rahman, Omar & Fareed, 2023).

The continuous process of assessment entails determining precise and quantifiable learning objectives and giving students plenty of chances to meet them. In order to evaluate how effectively students' learning matches expectations, it includes the methodical gathering, examination, and interpretation of data. Following collection, the data is used to improve student learning (Suskie, 2009). Diagnostic tests are used to gauge pupils' past knowledge, abilities, strengths, and shortcomings (McTighe, 2005).

Educational assessment, according to Linn and Miller (2019), is the process of gathering, analysing, and synthesising data to support decisions regarding students, programmes, and instruction. This suggests that assessment is used as a foundation for curriculum development and instructional improvement in addition to assessing students' academic performance. In order to improve student learning outcomes and educational programmes, UNESCO (2021) defines 'educational assessment' as the methodical process of recording and using empirical data on knowledge, skills, attitudes, and beliefs. This illustrates a worldwide viewpoint on evaluation as a tool for encouraging responsibility and raising educational standards. According to Ogunleye (2022), educational assessment is the practice of systematically measuring and assessing students' performance in order to ascertain the degree to which learning objectives are met. This is consistent with Nigeria's National Policy on Education's policy of continual assessment.

According to Abdul, Mohd, Abdel, Rahman, Omar, and Fareed (2023), educational assessment is crucial to improving students' learning. It functions as a basic, methodical way to make inferences on the growth and development of kids. Assessment is a useful tool for determining students' academic performance and for preserving the standard of instruction in educational institutions.

Educational assessment "goes beyond testing to include all processes used to determine learners' progress and achievement through formative and summative approaches", according to Ajayi and Alonge (2023). The authors stress that evaluations ought to be comprehensive, learner-centred, and designed to promote holistic growth. In summary, educational assessment is a methodical, ongoing, and intentional process of gathering and analysing data regarding students' performance in order to enhance instruction, learning, and decision-making.

Types of assessments

Basically, there are ten types of assessments identified by McTighe (2005), Jackson

(2023) and University of the Potomac (2025) such as diagnostic assessment, formative assessment, summative assessment, peer assessment, ipsative assessments, norm-referenced assessments, criterion-referenced assessments, oral assessments, gamified assessments and skill assessments.

1. Diagnostic assessment

This entails determining students' needs and capabilities in particular skill areas using a variety of metrics and reports. Teachers can use this information to give advice on how to properly address students' learning requirements. Moreover, it is an essential part of a Multi-Tiered System of Support (MTSS). Comprehensive screening has broadly identified students' academic or socio-emotional behavioural needs, which are then better understood by diagnostic assessment within the MTSS framework. Measuring students' past knowledge, abilities, strengths, and shortcomings is the aim of diagnostic testing. Since the diagnostic test is used to place students—based on prior performance or personal traits—at the most appropriate time in an instructional sequence, with a unique teaching style, or with a suitable teacher, it may also be called a placement assessment.

2. Formative assessment

In order to facilitate learning, it is sometimes referred to as educational assessment. Formative assessment, which can be either teacher-led or peer-led in an educational setting, offers comments on student work without always being utilised for grading. Diagnostic or formative examinations, quizzes, oral questions, and draft work are examples of formative assessments. Formative evaluations can result in a score and are carried out in parallel with instruction. Prior to administering a summative test, formative evaluations are used to ascertain whether students have understood the instructions.

3. Summative assessment

Summative evaluations are typically given to students at the conclusion of a project or course in an educational setting in order to determine their final grade. Summative tests are used to evaluate students' comprehension of the material by summarising what they have learnt. This kind of evaluation is usually classified (e.g., pass/fail, 0-100) and can be in the form of projects or tests. To ascertain if a student has passed or failed a course, summative evaluations are frequently utilised. Summative examinations are criticised for being reductive, exposing the depth of students' knowledge acquisition too late to be of much help. It is also known as final assessment, and as previously said, it is comparable to summative assessment in that it involves cumulative work such as keeping a portfolio throughout the course, standardised examinations, and end-of-unit exams. The assignment that gauges students' progress in the course is referred

to as the final assessment. Students can use this to pinpoint their areas of weakness, and teachers can use it to see where they did well and where they need to improve. Teachers receive information about their instruction and students' learning via the final assessment. (Top Hat: final exam, tophat.com/glossary).

4. Peer assessment

Under the teacher's direction, the students evaluate each other's work and offer comments in this type of assessment. This type of active learning encourages accountability and self-improvement by allowing students to evaluate themselves. Depending on the goal and administration point, peer evaluation can be either formative or summative. The instructor assigns the task and provides an example of how to evaluate papers from peers.

5. Ipsative assessments

Ipsative evaluations compare a student's past and present scores to track their performance. It makes no difference if they perform better or worse than other kids in the same grade level, or if their score satisfies certain predetermined standards. Teachers and students can both judge if the feedback from earlier tests has improved the effectiveness of the learning process. Because they are not comparing themselves to more accomplished pupils, weaker students are not demotivated by the assessment assignment.

6. Norm-referenced assessments

This approach evaluates the student's proficiency in relation to their classmates. Student groups are ranked based on their performance on state assessments or how well they performed under comparable conditions in prior years. It is employed to ascertain the participants' standing in relation to their peers. The degree to which they are above or below the median score dictates the next step.

7. Criterion-referenced assessments

Criterion-referenced evaluations compare a student's performance to preset benchmarks that are available at the assignment setting stage. A predetermined performance level or learning standard is compared to the student's score. This approach does not make reference to the assessment outcomes of other students, in contrast to the norm-referenced evaluation.

8. Oral assessment, Gamified assessment and Skill assessment

Students' knowledge and abilities are assessed orally through assessments that are often triggered by questions or short assignments. Their abilities, mental processes, and conceptual misconceptions are better depicted. The relationship between professors and students is also

strengthened. Oral evaluation can be done through interviews or conversations, presentations on a prepared topic (individual or group, live or recorded) and more.

9. Gamified assessment

Gamified tests are an advanced version of conventional tests that consist of a more advanced version of regular tests; gamified assessments incorporate game-based elements into aptitude and personality tests. The game format makes these quick and interesting. Despite their intended enjoyment, the examinations are grounded in science and statistics. This test increases participation and helps analyse a number of important test-taker behaviours and skills. A series of brief exams to gauge particular skill sets; lengthy games to gauge personalities and responses in intricate situations; job simulation experiences; and quizzes based on trivia are a few examples.

10. Skill assessment

A test designed to evaluate a student's proficiency in a particular skill or group of skills is called a skill assessment. Students are required to demonstrate their understanding of a specific topic, subject, or issue when completing this test. After that, this information is compared to what the relevant standards require of them. The purpose of these tests is to ascertain whether pupils have the abilities required by the curriculum.

In order to help teachers and students measure learning, these evaluations are carried out at various points during the learning process.

Digital innovation in education

Using technology like artificial intelligence (AI), blended learning, and online platforms to offer individualised, accessible, and inclusive learning experiences is known as 'digital innovation in education'. A change to student-centred methods, the development of digital skills, the incorporation of new technologies like virtual reality, and tackling equity issues to guarantee that all students gain from these developments are important ideas (Haddad & Draxler, 2012).

The Key Concepts and Approaches of digital innovation in education

Buyukbaykal (2018) identified the key concepts and approaches of digital innovation in education as follows:

- Student-centred learning: Digital tools provide tailored learning paths, allowing students to learn at their own pace and select content that suits their needs, moving away from one-size-fits-all methods.

- **Blended and Flipped Classrooms:** Innovative approaches, like blended learning, combine face-to-face instruction with online resources, while flipped classrooms relocate traditional lectures online so class time may be used for interactive activities and problem-solving.
- **Personalised and Adaptive Learning:** Artificial Intelligence (AI) and other technologies may adjust to the development of each individual learner, offering content and feedback that is specifically designed to fill in learning gaps and improve performance.
- **Improved Accessibility:** As a result of digital innovation, students can now access a greater range of educational resources at any time and from any location, enabling distant study.
- **Inclusive Education:** By making digital tools available to everyone and offering resources for kids with special needs, innovations seek to close potential learning gaps and establish equal learning settings.
- **Development of Digital Competencies:** Teachers and students must acquire digital literacy and competencies in order to integrate digital resources, equipping them for the knowledge-creation and creative problem-solving that society demands.
- **Collaborative and Active Learning:** Students and teachers can collaborate on projects and hone their *teamwork skills in dynamic, interactive learning environments thanks to digital platforms*.

Driving factors and impact of digital innovation in education

The following are the impacts of digital innovation in education found out by Cavas and Karaoglan (2019):

1. **Technological Advancements:** These innovative teaching strategies are based on the ongoing advancements in information technology, such as artificial intelligence (AI), virtual reality (VR), and online platforms.
2. **Addressing Educational Challenges:** Complex issues can be solved with digital innovation, such as by offering current and pertinent instructional resources and enhancing student engagement.
3. **Building Resilient Systems:** Digital innovations are essential for preserving educational continuity, facilitating distant learning, and minimising disruptions to schooling during emergencies like pandemics.

Forms of digital innovation in educational assessment

There are various forms of digital innovation in educational assessment identified as follows by authors such as Ibrahim and Iliyasu (2021), Ibrahim (2023), Ofem (2024), Okafor (2025) and Omachi (2025):

1. E-Assessment Platforms (Computer-based Testing, CBT; Online Exams)

Many Nigerian universities no longer administer exams on paper as a result of the advent of e-assessment platforms. The online systems are cost-effective in terms of administrative expenses, offer flexibility to both teachers and students, and provide instant feedback on grades. More importantly, infrastructure problems like poor internet and power disruptions continue to be obstacles.

2. Assessment Modules in Learning Management Systems (LMS)

In Nigeria, LMSs like Moodle and Google Classroom are crucial to institutional continuous evaluation. LMSs encourage timely feedback, which simultaneously engages more students in the learning process.

3. Automated Marking and Plagiarism Detection

Reliance on online tools like Turnitin is beneficial for grading effectiveness and academic integrity. With automation, manual grading is eliminated, which reduces bias and grading time while also increasing grading consistency.

4. Artificial Intelligence and Adaptive Testing

AI-based adaptive testing adjusts the questions' level of difficulty based on each student's responses. More individualised and justified assessment experiences are realised in Nigerian universities through the usage of AI-powered technologies.

5. E-Portfolios and Digital Badges

While badges acknowledge minor qualifications, e-portfolios allow students to demonstrate their learning experience through digital artefacts. These tools relate to both the past in terms of formal education and the present in terms of employability abilities.

6. Mobile and SMS-Based Assessment

Due to Nigeria's large mobile user base, mobile applications and SMS-based examinations are making evaluations more accessible to rural residents with limited internet.

7. Online Formative Tools and Real-Time Feedback

The resources that facilitate interactive instruction and real-time feedback are Kahoot and Socrative. Learners become more motivated and involved as a result of such improvements.

8. Remote Proctoring and Integrity Tools

During COVID-19 lockdowns, AI-enabled remote proctoring solutions were regularly used. Privacy and equity issues still exist, though, especially for kids in areas with poor internet.

9. Learning Analytics and Dashboarding

In essence, analytics dashboards give teachers information about trends in students' performance. Institutions in Nigeria are investigating data analytics to pinpoint pupils who are at risk and improve their teaching choices.

10. Peer-Assessment Platforms and Collaborative Assessment

Digital peer-assessment encourages pupils to collaborate and think critically. This approach improves responsibility and peer learning in Nigerian higher education.

Digital Innovation in Educational Assessment

Bello and Ajao (2024) assert that adaptive assessment methods that offer instant feedback and promote customised learning experiences are supported by digital transformation in education. The way learning outcomes are assessed and quantified has changed dramatically as a result of the introduction of digital technology into the classroom. The application of contemporary technology like artificial intelligence (AI), computer-based testing, and data analytics to plan, administer, and assess student performance is known as “digital innovation” in educational assessment (Agbarakwe & Ogbonna, 2024). These developments improve the effectiveness, equity, and accessibility of assessments in the educational system of the twenty-first century. The accuracy and timeliness of student evaluations in Nigeria could be improved by the growing use of e-assessment platforms and AI-driven feedback technologies (Eguagie, 2025).

Opportunities of digital innovation in educational assessment

As supported by Yumei et al. (2025), some of the opportunities of digital innovation in educational assessment are the following:

1. Distance Learning and e-Learning:

One of the most obvious uses of the digital revolution in education is distance learning. With simply an internet connection, students may learn from any location using e-learning platforms like Coursera, Udemy, etc. For people who are unable to attend classes in person, this has increased access to education, particularly in light of the COVID-19 pandemic. For example, learning management systems like Google Classroom and Moodle, as well as online courses, have been used extensively to assist professors and students. Students can take classes from across the globe and have more schedule flexibility rather than being restricted to traditional classroom environments.

2. Learning through Virtual Reality (VR) and Augmented Reality (AR)

Learning experiences are becoming more vivid and captivating thanks to VR and AR technologies. Students can explore historical settings, scientific occurrences, or even human body parts in a virtual world rather than just reading textbooks. For example, Google Expeditions is a virtual reality application that lets students go on virtual field trips to places like space and the deep oceans. Students are better able to comprehend and retain information thanks to this technology, which also improves interaction and makes classes more visual.

3. Personalized Learning with Artificial Intelligence (AI)

New avenues for individualised instruction are being made possible by artificial intelligence. AI enables learning systems to examine each student's behaviours and learning preferences and provide appropriate recommendations. The DreamBox platform, for instance, employs AI to modify maths class difficulty to match each student's aptitude.

4. Blockchain for Managing Degrees and Certificates

Blockchain is a new educational technology that is especially useful for storing and confirming degrees and certificates. Blockchain technology allows for the safe, immutable, and convenient storage of student degree information when needed. This makes it easier for companies to verify information and lessens the issue of degree fraud. Blockchain-based academic certifications are being issued and managed through platforms such as Blockcerts, which guarantee transparency and reliability.

5. Tools for Online Learning Support and Assessment

The way learning is supported and evaluated has altered as a result of the digital transformation in education. In addition to giving students an engaging way to study material, Quizlet, Kahoot, and Socrative give teachers access to rapid and effective evaluation tools. Additionally, teachers save time and gain greater objectivity when assessing student achievement when they employ automated assessment software.

Challenges of digital innovation in educational assessment

In spite of the enormous opportunities of digital innovation in educational assessment, a lot of challenges have posed as obstacles to its appropriation, as identified by Yumei et al. (2025).

1 Technical and infrastructure challenges

The technical and infrastructure constraints that many institutions encounter are among the most urgent obstacles to the adoption and application of digital learning. The difference between those who have access to technology and those who do not, known as the “digital divide”, continues to be a major obstacle, especially in rural and impoverished areas. Students and teachers need consistent access to digital devices, high-speed internet, and other technology resources for digital learning to be successful. Such infrastructure is frequently insufficient or nonexistent in many developing nations, as well as in underprivileged areas of wealthy nations.

2. Pedagogical challenges

Although there are many benefits to digital learning, there are also many pedagogical difficulties, especially with regard to curricular integration and teacher preparation. A fundamental shift in instructional design and delivery is frequently necessary when moving from traditional teaching techniques to digital platforms. There may be a steep learning curve for teachers used to in-person education as they adjust to new methods of interacting with students in blended or virtual learning contexts.

3. Technological Infrastructure Disparities

The difference in technology infrastructure between nations and regions is one of the main obstacles to the digital transformation of education. Digital infrastructure, including computers, internet access, and other learning aids, is sometimes lacking in rural areas and less developed countries. This results in unequal learning chances for pupils in these places since they are unable to access contemporary educational technologies. Broadband internet access, for instance, is still extremely scarce in many developing nations, particularly in isolated rural areas. These schools lack the computers and other equipment needed to implement digital teaching strategies. Because of this, pupils are less able to embrace new instructional tools and hence cannot take advantage of the contemporary learning options available to their metropolitan counterparts.

4. Teacher Training and Adaptability

Teachers play a crucial role in the digital transformation in education. However, not

all teachers are ready or knowledgeable enough to integrate technology into their teaching. The lack of training and enhancement of digital skills for teachers is a significant challenge, especially for experienced educators who are accustomed to traditional teaching methods.

Many teachers may face difficulties using complex technological tools such as artificial intelligence, virtual reality, or online learning management systems. Training teachers to use these technologies proficiently requires time, resources, and support from educational institutions. Without adequate support, the digital transformation process could be delayed or ineffective.

5. Data Security and Privacy

One of the pressing issues in digital transformation in education is data security and privacy. When students and teachers use online learning systems, a large amount of personal data is collected and stored on digital platforms. This increases the risk of personal information being leaked, subjected to cyberattacks, or used for unintended purposes. Furthermore, many schools and educational organisations do not have strong enough cybersecurity systems to protect student and teacher data. Cybersecurity breaches can cause significant damage, not only financially but also to the reputation of educational institutions. Therefore, ensuring information security and privacy is one of the critical challenges that schools face during digital transformation.

6. Resistance to Change

Change always comes with varying reactions from participants, and digital transformation in education is no exception. This transformation requires changes in thinking and teaching methods, which may lead to resistance from both teachers and students. Some teachers may worry about technology replacing their roles or may feel uncomfortable using digital tools.

At the same time, students may also face difficulties adapting to new learning methods, especially those who are used to traditional learning styles. Transitioning from direct lectures to online learning formats can cause confusion and pressure for many students, particularly when they lack technical skills or do not have family support.

7. Costs of Investment and Technology Maintenance

Digital transformation requires significant investment not only in purchasing equipment but also in maintaining and upgrading systems. Schools need to invest in digital infrastructure, including computers, servers, software, and security networks. The costs for maintaining and updating these technologies are also substantial, especially when digital systems need

to be upgraded frequently to keep up with technological advancements. This is particularly challenging for schools or educational organisations with limited budgets. Balancing costs between investing in technology and maintaining traditional educational activities can be a dilemma for education managers.

Digital transformation in education is not only about applying technology but also about changing the mindset and approach to education. These applications are helping improve the quality of education and create new, flexible, and effective learning opportunities for students worldwide.

Conclusion

This paper examines navigating the opportunities and challenges of digital innovation in educational assessment in Nigerian higher institutions of learning. Related literature is reviewed to examine the variables of the study. Descriptive research methodology is employed to guide the study. The study identified various opportunities of digital innovation in educational assessment, such as improving educational performance assessment, preparing students for life in the digital world, enabling students to build the *digital* skills, and revolutionising students' learning experiences. However, the challenges identified as obstacles to digital innovation in educational assessment include budget constraints, lack of professional training, poor network infrastructure, resistance to change, no clear technology integration strategy, unreliable devices and software, administrators' lack of awareness, data privacy and security concerns, the digital divide and students' engagement issues. The study discussed seven types of educational assessment, such as diagnostic assessment, formative assessment, summative assessment, peer assessment, ipsative assessments, norm-referenced assessments and criterion-referenced assessments. It was recommended that training and retraining should be employed as strategies to aid students and teachers to be digital innovation user-friendly.

Suggestions

Based on the findings, the following are suggested as the way forward to address the challenges of digital innovation in educational assessment in Nigerian higher institutions of learning:

1. Invest in infrastructure and accessibility: Governments and institutions must prioritise investments in digital infrastructure, particularly in rural and underserved areas, to bridge the digital divide.
2. Promote student-centred learning approaches: This can be achieved by incorporating interactive elements such as quizzes, simulations, and collaborative projects that

promote critical thinking and problem-solving.

3. Continuous professional development for educators: Training should cover not only the technical aspects of using digital platforms but also pedagogical strategies that leverage technology to enhance student engagement and learning outcomes.
4. Encourage flexibility and adaptability in learning models: This blended approach allows for greater adaptability, enabling students to learn at their own pace while still benefiting from in-person interactions when necessary. Flexibility should also extend to assessment methods, with a range of digital assessment tools used to evaluate student learning in innovative ways.
5. Foster collaboration between educators, students, and technology providers: Educators should work closely with tech developers to ensure that digital tools are user-friendly and aligned with pedagogical objectives. Students should also be involved in the process by providing feedback on digital platforms and tools to ensure that their learning needs are being met.
6. Develop digital content that is inclusive and culturally relevant: Educational platforms should ensure that content is accessible to students with disabilities, including those who require assistive technologies
7. Implement data-driven decision-making: Data-driven insights can also help institutions to refine their digital learning platforms and tools to improve overall effectiveness.

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