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Exploring the Use of Blended Assessment in Evaluating Undergraduates' Learning Performance

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ABSTRACT

Assessment is one of the processes for data gathering from the students in respect their talents, knowledge, skills, and other relevant attributes that can be of use for decisions-making regarding their academic advancement. The study was on the use of blended assessment in managing undergraduate learning outcomes. The study's research design was repeated measure. The population was 45,407 undergraduates in 15 faculties as the intended audience was 10,908 in the educational faculty. The sample size was 2,740 undergraduates in 200 level. The blended assessment focused on face-to-face, Google Classroom, online assignment; PPT, and CBT. Multiple-choice items were used and psychometric properties such as content validity and internal consistency of reliability were affirmed. A one-way ANOVA was employed in hypothesis tested and the finding revealed that Google Classroom has preference over other assessment techniques. It was concluded that blended assessment is an effective assessment tool especially in large class. It was recommended among others that Nigerian universities need to implement blended assessment, which necessitates a reliable, affordable Wi-Fi network for effective internet access and digital interaction.

Keywords: blended assessment, evaluating, exploring, learning performance, undergraduates

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INTRODUCTION

Assessment in education involves systematically gathering of information about students' knowledge, skills, abilities, and other pertinent characteristics that can be used for decisions-making which are pertinent to their educational progress, needs, and accomplishments. This process aids teachers, school administrators, parents and the general public in understanding where students stand in their learning journey. In the 21st century, assessment has undergone notable transformations and advancements (Sharonova & Avdeeva, 2019). These modifications are in line with the changing need for digital integration in education. Assessment techniques have changed to include technologically advanced procedures that combine online examinations with conventional in-person testing. Organization for Economic Cooperation and Development (1999) sees assessment as methods teachers use to gauge and document their students' academic growth, competency, and talents. Janier & Shafie (2009) view assessment as the collective efforts of teachers and students to evaluate themselves, generating valuable feedback to adapt teaching and learning methods. Thus, assessment can be regarded as evaluation methods and tools used to measure student learning performance.

Literature Review

Learning performance refers to the measurement and evaluation of student learning outcomes. Learning outcomes refers to the knowledge, skills and competencies that students are expected to demonstrate upon completing their educational programme. Learning outcomes are quantifiable statements outlining the knowledge and skills students should have acquired after participating in instructional activities (Kennedy et al, 2007). According to Miller–Young (2018), a learning outcome describes what knowledge, understanding, or skills students should have after completing a learning experience. Learning outcome describes observable and specific behaviour the learners should be able to do after being exposed to learning activities. These outcomes must be stated in measurable terms.
The words blended and assessment are combined to form the term blended assessment The definition of blend in Oxford Advanced Learners' Dictionary (nd.) is to mix substances, methods, or strategies. However, the term "blended assessment" has no one definition, therefore definitions might vary based on the goal of the use. A pedagogical approach called blended assessment blends technology-driven assessment methods with in-class evaluations (Kuldas et al., 2013). Blended assessment uses both in-person and online components to provide a comprehensive understanding of a learner's performance. Blended assessment is a hybrid model that combines formative and summative assessment

methodologies, to measure students' understanding, ability and development comprehensively Blended learning and blended assessment are related but distinct concepts in education as illustrated in table 1.

Table 1: Characteristics of Blended Learning and Blended Assessment

N	Blended Learning	Blended Assessment
1	It combines face-to-face and online learning for learning.	It combines different assessment methods, tools and strategies to evaluate student learning outcomes.
2	It integrates technology to enhance instruction.	It integrates multiple assessment tools and platforms.
3	It synchronous and asynchronous learning.	It focuses on performance-based assessment.
4	It focuses on student learning activities.	It focuses on educational evaluation.

To measure student accomplishment in an educational setting, blended assessment combines online and offline assessment technologies (Watson, 2008). A thorough assessment of a person's educational accomplishments is provided by this assessment method, which combines quantitative evaluations like multiple-choice exams, essays, and presentations (Singh & Reed, 2001). It includes assessing the capabilities, knowledge, and skills of learners (Boss, 2011). By combining online and conventional evaluation techniques (Yukselturk & Curaoglu, 2010).

According to Osabutey et al. (2022), blended assessment is a form of progressive evaluation that integrates online quizzes with traditional in-person examinations to create a comprehensive picture of students' academic ability. According to Cleveland-Innes & Wilton (2018), this creative method combines digital evaluations like computer-based tests with offline assignments like pen-and-paper assignments. Blended assessment, according to Ardid et al. (2015), is the capacity to integrate different kinds of assessment questions. Blended assessment, according to Janier & Shafie (2009), is an amalgam of (Bambang et al., 2019). use both classic paper-and-pencil assessments and digital ones. Blended assessment, according to Lin (2020), is an evaluation technique that blends technology-based (virtual) and in-person (physical) evaluations.

The traditional assessment method involves assignments, tests, and exams being completed using paper and pencil, with a hard copy submitted for marking. Blended assessment utilizes ICT tools like computers, Android phones, and email to access internet-based information for students, enabling access to exams, tests, and class assignments. The sum of the two sets of scores derived from them is used to assess how well a student has learned the material. The paper-and-pencil test (PPT) is a

widely recognized and widely accepted assessment method. Blended l earning can utilize this method to assess students' knowledge and abilities after exposure to instructions (Ya-Wen et al., 2017; Pashler et al., 2007; Kirschner et al., 2016). The instructor can use both closed-ended and open-ended items in a PPT, depending on the behavioral objectives established during lesson delivery. In addition, PowerPoint, ICT (information and communication technology) can be used to examine pupils. Computer-based testing (CBT) is one of the techniques being used in assessment to evaluate students' academic performance. The CBT is used enhancing teaching, learning, and assessment (Thurlow et al., 2010). CBT is a tool used in education, supporting various aspects through electronic assessment, marking, and recording of responses in test administration This testing method is crucial as it can measure various skills or knowledge sets, providing valuable insights into individuals' abilities (Alabi et al., 2012).

There are two forms of CBT (Alabi et al., 2012). The first is a linear test in which the computer selects items to individual test-taker without considering their performance levels. The test has a wide variety of questions, varying in difficulty from simple to complex. The test of computer adaptable skills is a linear assessment method that selects questions based on an individual's performance level (Ogunjimi et al., 2021). The questions are chosen from a wide range of potential questions, categorized by content and difficulty level. Test-takers are assigned questions varying in difficulty based on their proficiency level. The study employs a linear test, where the computer uses previous answers and answers to determine the next question to be answered. Google Classroom is a valuable tool for blended assessment, alongside PPT and CBT. The software is a pedagogical tool designed to improve online instruction for teacher-student communication, processing information efficiently (Martínez-Monés et al., 2017). According to Hussaini et al. (2020), Google Classroom is a free web application made to help teachers and students conduct lectures and evaluate their learning experiences.

According to Hussaini et al. (2020), it can be utilized to link students to participate in online classrooms, collaborate with one another, and generate assignments. In the Google Classroom, lecturers can upload resources for their students, post announcements, set homework, and create tests the students can do. Keane (2012) asserts that this application ensures continuity in learning activities for students without face-to-face interactions between the lecturer and students. The tool is designed to assist lecturers in creating and distributing tasks to students in a paperless manner. Liu & Chuang

(2016) suggest that Google Classrooms enhances lecturer-student interaction in virtual environments, making it highly beneficial for online teaching, learning, and assessment. Instructors can use it by uploading a list of students or providing a unique code for access to the online class. Google Classroom is a tech-driven approach that improves the quality of learning by promoting interactions between instructors and students within an educational setting (Ocampo, et al. 2017).

Google Forms is a tool that is closely related to Google Classroom. Sivakumar (2019) explains that Google Forms is an online tool that is specifically designed for creating data collection forms. The form is designed for creating quizzes, surveys, and event registration sheets that can be shared with students or participants through a link or email (Adelia et al., 2021). Respondents use a variety of web browsers, such as those found on tablets and smartphones, to complete quizzes. Sivakumar (2019) continued by listing a few benefits of Google Forms use in the educational sector.

1. This web tool, is available free, makes information gathering easier.
2. It gives facilitators free access to an infinite number of tests, resources, and solutions.
3. Students have access to the lecturer's learning resources, concepts, and experiences.
4. This tool is capable of creating comprehensive lesson plans by incorporating all necessary components.
5. The tool is versatile and can be utilized for conducting tests in both restricted and non-restricted formats.

Research activities have been conducted on blended learning and assessment. For instance, Guangzhi & Lunjin, (2012). The article included a range of assessment methods such as laboratory exercises, demonstrations, written reports, and multiple-choice questions, showing that blended assessments led to higher scores for students. A study by Al-Qatawneh et al (2020) found that blended assessments led to higher academic achievement and improved attitudes among HDE students in the Arabic language class at Ajman University. The study revealed that the experimental group demonstrated superior academic performance compared to the control group. Al-Saidi et al. (2023) used data mining tools to examine how Google Classroom affected students' academic achievement amidst the COVID-19 outbreak. The experimental groups performed more favourable results than the control group. The study found no significant difference in attitudes among students with academic evaluations, computer skills, and teaching experience.

In Oyo State, Nigeria, Ayodeji (2019) conducted research on how a blended learning strategy influenced positively technical college students' woodworking performance, hence, the experimental group had positive evaluations. Khader (2016) examined how well-blended learning can raise kids' performance in science in the third grade. The study revealed a significant advantage in favor of the experimental group. Gambari et al. (2017) examined the academic performance of Nigerian undergraduate students in Kwara State who were taught through blended and e-learning methods. The experimental group with one-ended learning outperformed the other two groups by a large margin, according to the study's findings. Alsalhi et al. (2019) studied how ninth-grade science students' views toward embracing blended learning and their academic performance were affected. The study found notable differences between the control and experimental groups, with the experimental group displaying a positive attitude toward blended learning, particularly among students studying science. Chinwendu & Braham (2020) discovered that students enrolled in the study of Physics performed better when they were exposed to blended learning. It was also discovered that gender has no bearing on a student's performance. Daramola and Umoru's 2021 study examined the influence of Google Classroom on cost accounting students in business education at Federal Colleges of Education. Google Classroom significantly improved students' academic performance in cost accounting business education, with no significant gender difference in course outcomes. In another development, Simon et al. (2022) investigated the use of Google Classroom to improve blended learning at the Federal Polytechnic in Mubi. The results showed that 55% of respondents thought Sending course resources to students is now easy using Google Classroom, the majority of respondents (65%) found grading assignments and quizzes easy, while 61% deemed Google Classroom a crucial tool for timely course delivery and assessment completion.

Statement of the Problem

When normal school activities reopened after a year of COVID-19, there was a large student population. The university, Ilorin, sought the possibility of having teaching and assessment that would reduce teacher-student contact and thus the spread of the pandemic. This has led to the adoption of both face-to-face and online teaching and assessment methods. Students of the Faculty of Education in most Nigerian universities are characterized by a large student population. This thus motivated the researcher to improve the way lectures and assessments were carried out to make school learning activities better. Because of the high population, face-to-face lectures were practically impossible to

reduce the spread of viruses. To avert these challenges in Nigerian institutions, lecturers were instructed to abide by the changing global practices and embrace virtual instructions and evaluation. The aim is to improve students' learning outcomes especially in large classes. To achieve this aim, the study analyzed the academic performance of undergraduates enrolled in a faculty course such as Educational Measurement and Evaluation.

Research Hypothesis

H_{01}: There is no significant difference in the awareness of digital footprint between male and female participants.

MATERIAL AND METHODS

This study deploys a descriptive research method using the survey approach. Descriptive research method involves the systematic collection and analysis of data from a large population to describe the characteristics of the population as they appear based on the phenomenon under consideration (McCombes, 2019). The study was conducted in a higher educational institution in Nigeria, with a population estimated at 45,000. A sample of 381 students was drawn as suggested by the Research Advisors (2006). The research only focused on eight out of the 16 faculties available at the institution. The selected faculties are Arts, Life Sciences, Education, Social Sciences, Management Sciences, Agricultural Sciences, Engineering, and Communication and Information Sciences. The sample consisted of male and female students and were randomly selected from the selected faculties in the University. A researcher-designed questionnaire was developed for this study. The instrument was titled Awareness of digital footprint among undergraduates (ADFAU). It consists of two sections, namely Section A and Section B. Section A sought information about the participants' demographics while the second section presented a Likert-scaled questionnaire items. Section B asked participants about their level of awareness of digital footprint using a simple worded questionnaire items consisting of positive and negatively worded questions, to elicit participants' true response on their awareness to digital footprint. The reliability was determined using Cronbach alpha and found to be 0.92. The questionnaire was distributed using the Google form online tool (https://forms.gle/Akzo29DLtf6N95Cf9), through various students' chats, and class groups. Participation was voluntary, and no person was coerced or forced to be involved in this study. Also, the participants were informed of the intention of the study before sending the link to the questionnaire. Descriptive statistics (mean and standard deviation) and inferential statistics (independent sample t-test) were used in analyzing the results.

RESULTS

Of the total 381 participants that responded to the research instrument, only 331 responses were complete and valid. The gender distribution for the study is presented in Figure 1.

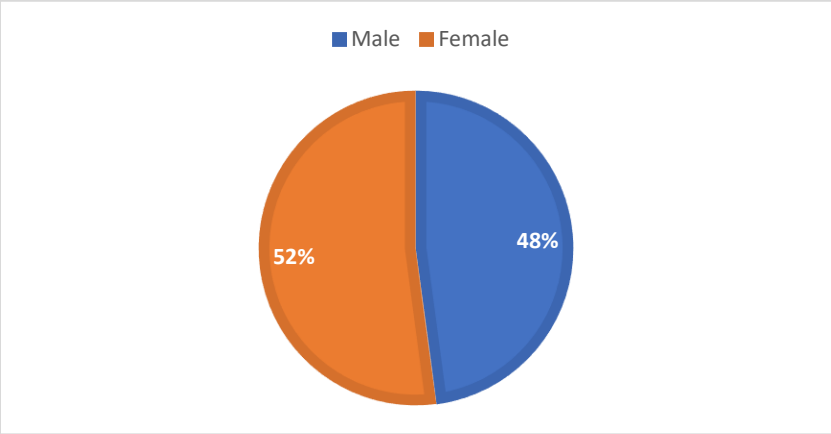


Figure 1: Demographic distribution of the sample for the study.

As shown in the Figure 1, 173 (52%) of the participants were female students, while 159 (48%) male students were involved in the study.

Research Question 1: What is the level of undergraduates' awareness to digital footprint?

To determine the level of awareness of the undergraduate students to digital footprint, a researcher-designed questionnaire was administered to the research participants. The responses of the participants were then retrieved and analyzed using descriptive statistics (frequency and percentage).

Table 1: Descriptive Statistics

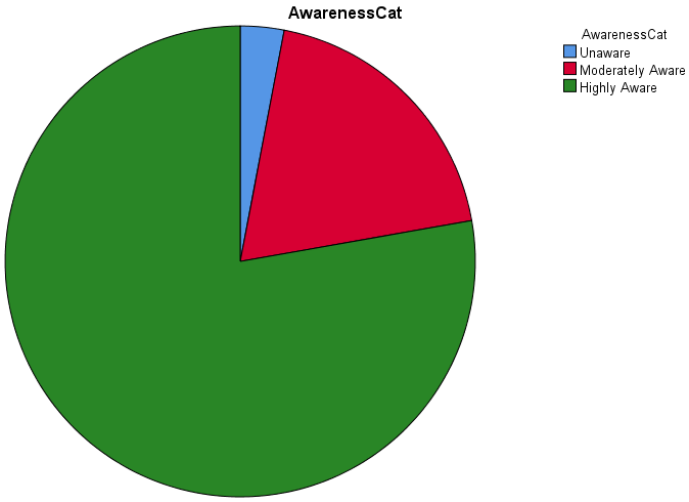
	N	Range	Minimum	Maximum	Mean	Std. Deviation
Awareness Category	333	25	27	52	47.14	4.785
Valid N (listwise)	333					

From the table 1, the minimum score of the respondents is 27 while the maximum score is 52. Three levels of awareness were considered which are Unaware, Moderately Aware and Highly Aware. Each level has a class interval of approximately 8. The frequency count of each level of awareness of the respondent is given in Table x

Table 2: Awareness Levels

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Unaware	10	3.0	3.0	3.0
	Moderately Aware	64	19.2	19.2	22.2
	Highly Aware	259	77.8	77.8	100.0
	Total	333	100.0	100.0	

From Table 2, it can be observed that only 3.0% of the participants are unaware of their digital footprint. About 19.2% of the participants were moderately aware of their digital footprint, while about 77.8% of the participants were highly aware of their digital footprint. It can therefore be concluded that majority of the participants were highly aware of the concept of digital footprint in their usage of internet. This result is graphically explained in the figure x using a pie chart.



Research Question 2: Is there any difference in the awareness of digital footprints among undergraduate students based on gender?

To check if there exist a difference in the awareness of digital footprints among undergraduate students based on their gender, level of awareness of male and female students were compared using both descriptive (frequency and percentage) and inferential statistics (independent sample t-test).

Hypotheses Testing

H_{01}: There is no significant difference in the awareness of digital footprint between male and female participants.

To determine whether there was significant difference among male and female undergraduate awareness of digital footprint among the participant, analysis of independent sample t-test was carried out and the result is as shown in Table 3.

Table 3: Independent sample t-test to determine the difference in awareness of digital footprint among male and female participants.

	Gender	N	Mean	T	Sig (2 tailed)	Std. Deviation	Std. Error Mean
Mean Awareness	Female	173	3.66	1.99	0.17	0.38	0.30
	Male	159	3.59			0.36	0.27

Table 2 displays an F-value of 48.81, surpassing the calculated F-value of 2.70 at a 0.05 P-value. The table reveals a significant variation in undergraduates' CBT test results, online assignments, Google Classroom tests, paper-and-pencil tests, and assessments of learning outcomes in blended learning, with a calculated sig. (0.00) less than 0.05. The significant difference was determined using the Scheffe post hoc test, with the results displayed in Table 2.

Table 3: Scheffe Post-hoc test Demonstrating a Difference in the Assessment of Learning Outcomes in Blended Learning

Groups	N	Subset for alpha = 0.05			
		1	2	3	4
PPT	1579	55.43			
Assignment	1579		58.67		
CBT	2274			69.56	
Google Classroom	1577				82.13
Sig.		1.00	1.00	1.00	1.00

Table 3 shows a Scheffe post hoc test analysis comparing students' learning outcomes using PPT, online assignment, Google Classroom, and CBT test components of blended assessment. Google

Classroom has the highest mean score (82.13), followed by CBT (69.56) and PPT (55.43) being the least.

DISCUSSION

The study found notable differences in blended learning outcomes among undergraduates, linked to their scores from various assessment methods, including PPT presentations, online assignments, Google Classroom tests, and computer-based tests (CBT). The study supports the use of Google Classroom, followed by computer-based tests (CBT), while paper-and-pencil assessments showed the lowest performance. Students preferred using ICT tools like Google Classroom and CBT for tests and exams, as reflected in their performance on these platforms. Qu and Lu (2012) found that students achieved higher marks with blended assessments than with paper-and-pencil tests by the end of the course. The study aligns with Prescott et al.'s (2016) research, indicating a correlation between academic activities and blended learning instruction.

Ilgaz & Adanı. (2020) dowel into how well the online exams are provided for online learners. The study revealed that most learners found online exams to be effective, reliable, and efficient, while some students felt the time allotted to the exam was insufficient. They also believed that there could be possible mechanical issues while implanting online exams. Simon, et al (2022) found that a majority of respondents perceived Google Classroom as facilitating easy material uploading, grading, and timely course delivery, 65% agreed that Google Classroom made it simpler for the teachers to assess students' assignments and quizzes; and 61% of respondents assert that Google significantly contributed to the timely completion of course content and assessment. The study further demonstrated that, among the four methods of assessment used, Google Classroom was the most successful. Google Classroom has been found to positively impact the academic performance of business education students in cost accounting, as per Daramola & Umoru's 2021 study.

This study contradicts Okeke et al.'s (2022) findings, which suggest face-to-face instruction and assessment positively impact students' engagement in mathematics compared to Google Classroom.

CONCLUSION

Google Classroom tests have proven to be an effective method for assessing student learning outcomes, particularly in large classes and during crisis periods. It suggests that the integration of technology-based assessments into traditional teaching approaches can enhance learning outcomes, and thus, a high quality of education could be achieved. Hence, the integration of blended assessment could be encouraged to give room for digital literacy.

RECOMMENDATIONS

1. Nigerian universities need to implement blended assessment, which necessitates a reliable, affordable Wi-Fi network for effective internet access and digital interaction.
2. The education curriculum should incorporate blended assessment in the teaching strategy, as teachers serve as facilitators, managers, instructors, implementers, and wheel during crises.
3. Digital technologies are essential for active student participation in lectures and assessments, enhancing continuity and effectiveness, especially during emergencies, to supplement traditional methods.
4. Field observations indicate that some students lack smartphone ownership, necessitating the establishment of an e-learning center or computer laboratory for those unable to afford smartphones.

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