Integrating Blended Assessment in Blended Learning in a Nigerian University

Mohammed Idris JIMOH1,
Dorcas Sola DARAMOLA2,
Jumokelyabode OLADELE3
Mayowa O. OGUNJIMI4
Henry O. OWOLABI5

University of Ilorin, Faculty of Education, Department of Social Sciences Education
1, 2 & 3

University of Ilorin, Faculty of Education, Department of Adult and Primary Education
4 & 5

jimoh.mi@unilorin.edu.ng
Olatunji.ds@unilorin.edu.ng2
oladele.ji@unilorin.edu.ng3
ogunjimi.mo@unilorin.edu.ng4
henryowo@unilorin.edu.ng5

Abstract

Learning is assumed to have taken place only when a positive change in behaviour item of knowledge, skills and values occurred as a result of learners’ exposure to learning activities. The study, therefore, investigated the integration of blended assessment in blended learning in a Nigerian university. The study focused on the learning outcomes in blended learning using the Paper and Pencil Test, online assignment, Google classroom test and CBT test of undergraduates in EDU 212. The study adopted a repeated measure research design taught by five lecturers using face-to-face and google classroom interactions. One research hypothesis was postulated and tested using one-way ANOVA at a 0.05 level of significance. The population of the study was 45,407 undergraduates of the University of Ilorin, Nigeria in the academic session 2018/2019. The target population comprised 10,908 undergraduates of the faculty of education. At 200 levels, 2,274 undergraduates registered for EDU 212 (Introduction to Educational Measurement and Evaluation). In the process, tests and end of the semester exams were administered to the students. Multiple-choice items were prepared based on the topics taught. Progressively, as the lectures continued, students were examined both offline and online. The finding of the study revealed a significant difference in blended assessment and favoured google classroom. It was concluded that blended assessment is an effective tool in enhancing better learning outcomes. There is, therefore, a need to have an effective, efficient, affordable and reliable Wi-Fi network in the university for blended assessment to be incorporated in teaching and learning.

Keywords:
Blended Assessment, Blended Learning, Learning Outcomes, Nigerian University

© 2021 The Authors. Published by Institute for Research and Community Services Universitas Muhammadiyah Palangkaraya. This is Open Access article under the CC-BY-SA License (http://creativecommons.org/licenses/by-sa/4.0/).
INTRODUCTION

The fact remains that education is the process of developing individuals to acquire knowledge, skills, attitudes and values for the modification of their behaviours for personal and societal benefits. Education could, therefore, be seen as a dynamic process that involves constant reformation of knowledge, skills, values and attitudes that could make an individual become a useful member of his immediate environment and beyond. To achieve these attributes, prospective learners engage themselves in school-based learning activities.

Learning is assumed to have taken place only when a positive change in behaviour in knowledge, skills and values occurred as a result of learners’ exposure to learning activities. Learning is, therefore, a process of gaining new knowledge, skills, attitudes and habits as a result of being exposed to learning experiences (Aleksić and Ivanovic, 2013). Learning takes place when the acquired knowledge and skills are demonstrated or observable. Evidence of retention occurs thereafter when learners can recall for use at any time. This implies what the learners know and have acquired the required skills. These are observable at a particular time as a result of engaging in the learning process. Being able to recall facts represents statements of positive change in behaviour which could be recorded as learning outcomes.

The behaviourist theory offers a very good explanation of students’ learning outcomes which is primarily look into observable and measurable aspects of human behaviour (Zhou and Brown, 2015). The theory explains that teaching is the systematic way of shaping students’ knowledge, skills and attitude following set objectives. The behaviourist sees the responsibility of a teacher, therefore, like that of facilitating learning activities while students are the raw materials that need to be re-shaped into a pattern of behaviour. To them, one of the duties of a teacher is to arrange learning contents that will allow students to behave in a certain manner. In this theory, students are expected to be engaged in classroom activities to shape their behaviours by the knowledge and skills that they have acquired.

Traditionally, to ascertain the quality of learning outcomes in an individual student, a series of assessments such as assignments, quizzes, tests and examinations are carried out both during and at the end of instructions. It must be noted that assessment is an integral and indispensable part of the teaching-learning process. It is an essential ingredient and a vital process in the teaching and learning environment. Hence, every course of study requires assessment of learning activities to obtain valid and reliable information on learners’ progress to make informed decisions about teaching and learning progress and level of compliance with the stated educational objectives to fulfilling societal needs and goals.

The term “blended assessment” has two words “Blended” and “assessment” in the classroom setting, assessment refers to the processes used to describe the nature and extent to which students can understand concepts taught and the degree to which they are mastered by them. Petrisor, Marusteri, Ghiga and Schiopu (2011) noted that the process of assessing students’ knowledge and skills is complex and resource-consuming, especially where a large number of examinees are involved. Assessment is thus defined by the Organization for Economic Cooperation and Development (1999) as a wide range of strategies that teachers use to measure and document the academic knowledge, skills and learning progress of the students. This assessment could either be during the instruction, at the end of a unit/course of instruction or a combination of both (Angelo, 1995).

Blended according to Hornby (2005), the oxford advanced learners’ dictionary, defines “blend” as mixing two or more substances, methods or
strategies. The term “blended assessment” has no universal meaning, hence, can be viewed in many ways depending on the purpose to be achieved. Therefore, blended assessment entails the use of traditional methods (paper and pencil) and Information Communication Technology (Computer and other electronic gadgets) in assessing both offline and online assignments, quizzes and tests to obtain knowledge and skills acquired by the students during learning activities (Janier and Shafie, 2009). The schematic diagram of blended assessment is shown in figure 1.

The same notation applies to “blended learning” as in “blended assessment”. It has two words “Blended” and “Learning”. The word learning is an act in which some concepts are consciously learned, viewed and valued (Kuldas, Ismail, Hashim, and Abu-Bakar, 2013). The term “blended learning” also has no universal definition; hence, it can be defined in many ways. In the field of education, it can be described as the combination of different instructional methods, pedagogical approaches and the use of technologies to enhance teaching and learning.

Singh and Reed, (2001) described blended learning as a learning programme where more than one learning mode is employed to make teaching and learning more efficient and effective to have desirable students’ learning outcomes. It is the integration of traditional teaching strategies and the use of ICT in teaching-learning and assessment processes. Aleksić and Ivanovic, (2013) defined it as the combination of personal interaction and web between the teacher and students, during which the advantages of both instructional approaches are used to enhance learning. Cleveland-Innes and Wilton, (2018) observed that blended learning is the use of traditional classroom teaching methods with the use of online learning for the same students studying the same content in the same course. The schematic diagram of blended learning is represented in figure 2.
the same content in the same course (Cleveland-Innes and Wilton, 2018).

According to Bryan and Volchenkova (2016), there are many ways to implement blended learning and this has been grouped into six distinct models, they include:

1. The Face-To-Face Driven Blended Learning Model: This is when classroom learning activities are supplemented with online learning. The teachers deliver the curriculum content. Teachers lead the class in a lecture following an established protocol. Online resources are given to supplement course material that students can study at home.

2. The Station Rotation Blended Learning Model: In this model of blended learning, in a given course, students are allowed to rotate through stations on a fixed schedule, where at least one of the stations is an online learning station. They are allowed to rotate between classroom-based instructions and online learning activities.

3. The Flex Blended Learning Model: In the flex model of blended learning, students learn mainly in an online platform according to an individually customised schedule, and face-to-face support is provided by the teacher as at when due.

4. The Online Lab Model: In the online lab model of blended learning, students supplement their traditional studies by taking an additional online course on-campus. The entire course contents and teaching are carried out online and enable students to make use of the existing dedicated computer lab. Teachers interact with students through pre-recorded videos, audio and video conferences or discussion forums and email.

5. The Self-Blend Model: In the self-blend model of blended learning, students supplement their traditional studies by taking an additional online course off-campus. The individualized approach is used that allows students to choose, to take one or more courses online to supplement their traditional school courses. The major part of the learning activities is carried out online, but the student will still attend face-to-face classes.

6. The Online Driving Model: It is otherwise called remote blended learning or enriched virtual. In the enriched virtual model of blended learning, learning is mainly online with occasional visits to face-to-face tuition. The students’ focus is the completion of online coursework while only meeting with the teacher intermittently as the need arises. Students work from their various homes most of the time and come to school for optional or required face-to-face classes.

Blended learning can be used at any level of the educational programme i.e. primary, secondary and tertiary. Out of the numerous means of implementing blended learning face-to-face driven blended learning model is more applicable for this study. Hence, blended learning, a face-to-face learning that is supplemented with electronic learning tools.

Assessment in blended learning requires students (test-takers) to respond manually and electronically. Response manually allows the students to use writing materials of any kind and use answer sheets or booklets. An example of such is a paper-and-pencil test which could be regarded as a traditional mode of assessment after the students have been given instructions based on the specified curriculum contents. It is a known fact that the paper-and-pencil test (PPT) is one of the assessment techniques used in blended learning to assess students’ knowledge and skills acquired after they have been exposed to instructions. Paper-and-pencil (PPT) uses both close-ended (multiple-choice) items and open-ended (essay) items as he wishes depending on the stated behavioural objectives stated earlier during lesson delivery.

Aside from this PPT, assessment of students could also be done through the use of Information Communication Technology (ICT). One such could be Computer-Based Testing (CBT) also known as Computer-Based Assessment or Examination. It is a
device being used in education to facilitate teaching, learning and assessment. It focuses mainly on its application which serves as a tool for supporting the various components of education. The applicability of CBT in the area of assessment cannot be overemphasized, it is used in test administration in which the responses are electronically assessed and recorded. This method of testing is important because it can measure different skills or sets of knowledge to provide new and better information about individuals’ abilities (Alabi, Issa and Oyekunle, 2012).

Alabi, et al, (2012) identified two types of CBTs (linear and adaptive test). A linear test is a full-length examination in which the computer selects different questions for individuals without considering their performance level. It consists of a full range of test questions—from easiest to most difficult, but is not always in order of difficulty. In the same vein, a computer adaptive test is one in which the computer selects the range of questions based on individuals’ performance levels. The questions are taken from a very large pool of possible questions which are categorized by content and level of difficulty. Each test-taker receives questions that are at a different level of difficulty based on his or her ability. After each question is answered, the computer uses the answer and all previous answers to determine which question will be answered next (Alabi et al, 2012).

Aside from PPT and CBT, another tool that can be used in blended learning is google classroom. It is software designed as a pedagogical application used to process information and enhance online teaching and learning for the teacher and students’ interaction. It is a tool that can be used in blended learning (Hussaini, Ibrahim, Wali, Libata and Musa, 2020). Martínez-Monés, Reffay, Torio and Cristóbal, (2017) sees google classroom as a free digital application designed to assist students and lecturers to connect, work together, organize, create assignments and enable students to attend classes online. In this application, lecturers can post materials for his/her students, he can make the announcement, create assignments, prepare quizzes for the students to react to. Keane, (2012) states that this application allows the students to have continuity in learning activities without teacher and students meeting face-to-face. It is designed to help lecturers create and distribute tasks to the students in a paperless way.

Furthermore, google classrooms can be used to facilitate the interaction of a lecturer with students in a virtual world (Liu and Chuang, 2016). It is very useful for online teaching and learning. Lecturers can use it by adding a list of students or sharing a unique code that allows students to have access to the online classes. Google classroom is a strategy that uses technology to facilitate students’ learning activities (Ocampo, 2017). It enhances learning quality (Sewang, 2017).

Another tool closely related to google classroom is google forms. According to Sivakumar, (2019) Google form is a web-based app developed by Google which is used to create forms for data collection purposes. It is used to prepare quizzes, surveys, event registration sheets. The form is web-based and can be shared with students or respondents with the use of an appropriate link, emailing a message etc. Google Forms is as free as air. Respondents answer quizzes from almost any web browser including mobile smartphones and Tablet browsers. He went further to identify some of the advantages of using Google Forms in education are:

1. It is a free online tool that allows you to collect information easily and efficiently.
2. With this tool, you can get unlimited quizzes, items and answers at no cost.
3. Lecturers can use Google Forms to share their learning, ideas, reflections or experiences from the classroom.
4. It can be used to create detailed lesson plans, adding all the parts needed to be included in the lesson plans.

5. Google form is a tool that can easily be used to conduct tests using different formats.

For any Nigerian university to succeed as a citadel of learning and to meet international standards, the institution and its lecturers must be able to adapt to changing situations especially in the era of the use of information and communication technologies (ICT) to almost everything we do in life. In case of an epidemic, such as COVID-19, institutions and lecturers are expected as a matter of urgency, to find a way to maintain continuity of their degree and certificate programmes. To do this, “blended learning” and “blended assessment” could be adopted to carry on teaching and learning activities.

There have been a series of research activities on blended learning carried out by scholars and researchers both within and outside Nigeria. For instance, Qu & Lu, (2012) carried out a study on blended learning assessment methods for laboratory intensive courses. In the study, traditional assessment methods, i.e., laboratory exercises, demonstration, written report, and multiple-choice questions were combined innovatively. Findings showed that the students benefited more by getting higher marks in blended assessment compared to paper-and-pencil tests only. Keshta and Harb, (2013) investigated the effectiveness of using a blended learning program on developing Palestinian tenth graders’ English writing skills. It was a quasi-experimental research design. The finding of the study revealed that there was a significant difference in the mean scores of the test in favour of the experimental group and there was a statistically significant difference in the participants' achievement level before and after implementing the blended programme in favour of the post-application. Prescott, Jr., Woodruff, Prescott, Albanese, Bernhardt and Doloresco, (2016) also carried out a study on the introduction and assessment of a blended-learning model to teach patient assessment in a doctor of pharmacy programme. The study integrated a blended-learning model into a two-course patient assessment sequence in a doctor of pharmacy programme and assessed the academic performance and perceptions of enrolled students. The study concluded that the blended-learning mode of instruction was associated with improved academic performance. Khader, (2016) researched the effectiveness of blended learning in improving students’ achievement in the third grade's science. It was a quasi-experimental design. The results indicated the presence of a significant difference in the post-achievement test in favour of the experimental group. There was also a statistically significant difference in the post-achievement based on gender in favour of males.

The study by Gambari, Shittu, Ogunlade and Osunlade, (2017) investigated the effectiveness of blended learning and e-learning modes of instruction on the performance of undergraduates in Kwara State, Nigeria. It was a quasi-experimental research design. This involved three groups, two experimental (blended learning, and e-learning) and a control group (traditional teaching method). The findings of the study showed that there was a significant difference in the performance of the three groups in favour of experimental group 1 (Blended learning). Yayi, Yusuf and Jarimi (2018) studied the Effectiveness of blended learning on the ability level of upper-basic students in social studies in Ogbomoso, Nigeria. It was a quasi-experimental study. The study revealed that there was a significant difference in the performance of high, medium and low ability level students exposed to blended learning. Another finding showed that there was no significant interactive effect of blended learning based on gender and ability level.

Alsalhi, Eltahir, and Al-Qatawneh, (2019) investigated the effects of blended learning on ninth-grade
students’ achievement in science and their attitudes towards using it. It compared the results of various ways of teaching selected science topics, and students’ attitudes towards their use. The findings revealed that there were significant differences between the experimental and the control group, in favour of the experimental group. The experimental group attitudes were also more positive towards the use of blended learning. Their attitude was in favour of students with science subject students. Chinwendu & Braham, (2020) investigated the effect of blended learning on the academic performance of Physics students in Federal Colleges of Education in Southeast, Nigeria. The study found that blended learning increased the performance of Physics students who participated in the study. It was also found that the performances of students were not dependent on their gender.

Looking at previous studies highlighted above, the effectiveness of blended learning was shown via quasi-experimental studies. This study, therefore, investigated the integration of blended assessment in blended learning in a Nigerian University to assess blended learning in the assessment of learning outcomes as one of the Nigerian Universities.

Statement of the Problem

Tertiary education in Nigeria is characterized by a large number of students per lecturer in a small lecture hall especially the faculty courses which makes it practically impossible to have quality students’ mentoring. The practical experience of the researchers revealed that the attendance of students in large classes are usually poor and those that attend are always inactive during lectures. The study, therefore, serves as a case study in the introduction of a blended learning approach in the teaching of faculty courses and beyond believing that the whole students will be more accessible, participate and effectively in the teaching/learning process and perfection in the assessment of individual student learning outcomes will be guaranteed.

Purpose of the Study

1. Examine assessment of learning outcomes in blended learning using Paper and Pencil Test, online assignment, Google classroom test and CBT test scores of undergraduates in EDU 212.

Research Hypotheses

$H_0$: There is no significant difference in the assessment of learning outcomes in blended learning using paper and pencil test, online assignment, google classroom test and CBT test scores of undergraduates in EDU 212.

METHODOLOGY

The study used a repeated measure research design that involved multiple measures of the same variable (performance in EDU 212) taken on the same subjects (200 Level Students) under different conditions in a semester. The design is illustrated as shown in figure 3.

![Figure 3: Repeated Measure Research Design](image)

Figure 3 shows the repeated measure research design used for this study. The students were taught in a face-to-face classroom in their natural environment and received instructions from the lecturers. After the physical lectures, students were given assignments and tested using paper and pencils. Students were also taught using google classroom, assignments and tests were also given. Towards the end of the semester, physical interaction was also carried out. This was informed by the class tutorial to know and ascertain areas of weaknesses and strengths before the end of semester examination.
The population for the study was 45,885 undergraduate students across the 15 faculties in the 2018/2019 academic session while the target population comprised 10,896 undergraduates in the Faculty of Education across 100, 200, 300 and 400 levels in the 2018/2019 academic session (Academic Support Services, 2021). According to the document, 200 level students in the Faculty of Education were 2,532 and they were expected to offer EDU 212 (Educational Measurement and Evaluation). In the long run, 2,274 participated fully in the study.

Four instruments were used for data collection. Each revolved around assignments, Paper and Pencil Test, Google Classroom and Computer Based Test (CBT). At the end of the semester examination was conducted via CBT when other students in the University were writing their end of semester examinations.

All the items for the test were validated by a professor, the superior officer among the five lecturers. This was to ascertain that the questions prepared are free from ambiguities that could influence one group of students performing better than the other. All the scores obtained were used as measures of learning outcomes.

RESULTS AND DISCUSSION

The only research hypothesis was tested using one-way ANOVA at a 0.05 level of significance.

Hypotheses Testing

\( H_{01} \): There is no significant difference in the assessment of learning outcomes in blended learning using PPT, online assignment, Google classroom test and CBT test scores of undergraduates in EDU 212.

<table>
<thead>
<tr>
<th></th>
<th>Sum of Square</th>
<th>Df</th>
<th>Mean Square</th>
<th>Cal F</th>
<th>Tab</th>
<th>Sig</th>
<th>ReMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>23,70</td>
<td>1</td>
<td>7,900</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>1,133,700</td>
<td>6</td>
<td>161.8</td>
<td>48.8</td>
<td>2.7</td>
<td>0.0</td>
<td>S</td>
</tr>
<tr>
<td>Total</td>
<td>1,157,531.1</td>
<td>6</td>
<td>531.1</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Table 1 shows the calculated F-value of 48.81 greater than the table F-value 2.70 computed at 0.05 P-value which shows a significant difference. Further interpretation reveals that the calculated sig. (0.00) is less than the chosen (0.05) p-value. This implies that there is a significant difference in blended learning outcomes using PPT, online assignment, Google classroom test and CBT test scores of undergraduates in EDU 212. This can be symbolically written as Cal-F. (48.81); \( P < 0.05 \). To ascertain where the significant difference lies, the Scheffe Post Hoc test was carried out and the result is shown in table 2.

Table 2: Scheffe Post Hoc Test Analysis Showing the Difference in the Assessment of Learning Outcomes in Blended Learning using PPT, Online Assignment, Google Classroom Test and CBT Test Scores of Undergraduates in EDU 212

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Subset for alpha = 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPT</td>
<td>1579</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>Assignment</td>
<td>1579</td>
<td>55. 43</td>
</tr>
<tr>
<td>CBT</td>
<td>2274</td>
<td>58.6700</td>
</tr>
<tr>
<td>Google Classroom</td>
<td>1577</td>
<td>82.1 306</td>
</tr>
<tr>
<td>Sig.</td>
<td>1.00</td>
<td>1.000 1.000 1.000</td>
</tr>
</tbody>
</table>

Table 2 shows Scheffe’s post hoc test analysis of the source of difference in students’ learning outcomes in
PPT test, online assignment, Google classroom test and CBT test scores components of blended learning assessment in EDU 212. The table reveals that the test given through the Google classroom has the highest mean of 82.13 in subset 4. It is followed by the CBT with a mean score of 69.56 in subset 3 while the least performance is in Paper-and-Pencil (PPT) with the mean performance of 55.43 in subset 1.

Discussion of Findings

The finding revealed that there was a significant difference in blended learning outcomes using PPT, online assignment, Google classroom test and CBT test scores of undergraduates in EDU 212. It is in favour of google classroom followed by the CBT and with the lowest performance in paper and pencil. It seems that students prefer the use of ICT (Google classroom and CBT) in writing tests and examinations seen from their performances in Google classroom and CBT. This finding agrees with the finding of Qu & Lu, (2012). They found that at the end, of the course, students benefited more by getting higher marks in the blended assessment compared to the paper-and-pencil test only. The finding also agrees with Prescott, Jr., Woodruff, Prescott, Albanese, Bernhardi, Doloresco, (2016) that the blended-learning model of instruction is associated with improved academic performance.

Conclusion

The study concluded that integration of blended assessment in blended learning must be encouraged using Google Classroom and other forms of digital literacy. This will eventually lead to effective teaching and learning and better learning outcomes will also be achieved.

Recommendations

1. Teacher education curriculum at all levels needs to be redesigned to include blended assessment in the blended learning teaching strategy since teachers are the facilitator, manager and instructor, implementer and wheel upon which learning activities are carried out.
2. If blended assessment and blended learning are adopted in any Nigerian University, there is the need to have an effective, efficient, affordable and reliable network (Wi-Fi). This will allow both the lecturers and the students to have access to the internet at minimum cost and they will be able to interact via Google Classroom and any other digital means.
3. For the students to participate actively in lectures, especially in large classes, there is the need to effectively use digital technologies to complement the traditional lecturing approach to enhance effective learning.
4. Field observations revealed that not all the students have a smartphone. There is a need for the university to have an e-learning centre or computer laboratory where students will be able to access online assignments and tests.

References


