Correlation between Web-Based Continuous Assessment and Examination Scores in Open and Distance Education: Implications for Academic Counselling

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Abstract

This study investigated the relationship between web-based continuous assessment and pen and paper examination scores of students in open and distance education systems using a correlation research design with a sample of 131 purposefully selected students. Using Pearson's Product Moment Correlation Coefficient (r) for data analysis, the study revealed no significant relationship between web-based continuous assessment and pen and paper examination scores because of irregularities that usually accompany web-based continuous assessment in open and distance education. The study recommended transparency in handling web-based assessment through appropriate training and supervision. The study, having many implications for academic counselling, also suggested pre-examination group counselling for students before any examination is taken to ensure that students approach examinations reasonably and with the appropriate skills and attitude.

Keywords: web-based assessment, distance education, counselling.

Introduction

Education is provided to people with the aim of imparting some knowledge; this knowledge can be quantified based on the setting in which it is obtained. In an informal setting, for instance, learning outcomes are measured by observation of behavioural changes that conform to desired objectives. In a formal setting, learning outcomes are evaluated through organised procedures that determine the extent to which instructional strategies employed to achieve several specific objectives are

successful; these procedures also provide instructors with feedback regarding their actions. These formal procedures can be implemented in the conventional face-to-face learning environment or in technology driven distance education. Distance education has gained some prominence, whether in the form of basic correspondence through postal services or by utilising the wide variety of tools available through the Internet (Moore, Dickson-Deane and Galyen, 2011). Distance education is conceptualised here as a form of education and training delivery in which students (including working adults, children out of school and youths) are remote from the distance education institution (Badmus and Salawu, 2012).

The success of distance education arose after it was accepted that nationally and internationally recognised university degrees, college diplomas and training certifications could be earned from locations other than physical campuses (Keegan, 1996). This wide acceptance is a result of the use of authenticated, computerised means of assessing learning outcomes, which have contributed to an improvement in the quality of assessments in terms of validity, effectiveness and efficiency (Esere and Idowu, 2012). As Kim, Smith and Maeng (2008) stated, assessments are completed through three commonly accepted knowledge domains: affective, cognitive and psychomotor; social/interpersonal or interactive skills are also included in the knowledge domains. Kim, Smith and Maeng (2008) further stated that assessments in new online learning environments focus on students' achievements, in terms of instructional goals and objectives.

Assessment methods in open and distance education, as established by Robbles and Broathen (2002), include self-testing, assignments, electronic portfolios, online discussion, asynchronous threaded discussion in groups, one-minute papers, synchronous chatting and e-mailing questions. Rovai (2000) suggests the use of proctored testing and online discussions to assess students in open and distance education. Many articles suggest that online assessment methodologies be used in distance education (Kim, Smith and Maeng, 2008) because they can be authenticated, are easy to apply and provide an easy means of feedback. Learning outcomes are reviewed regularly to ensure clarity, utility and appropriateness using several methods with specific standards (Yeung, 2001).

Evaluation of learning outcomes in formal settings in Nigeria is completed through continuous assessment and final examinations from primary through tertiary levels of education. The National Open University of Nigeria (NOUN) uses two levels of assessment for both formative and summative evaluation. The continuous assessment, which is worth 30% of the final examination score, is an essential formative evaluation technique used to identify the strengths and weaknesses of the learning process and to provide students with sincere feedback to help them improve. It is referred to as the Tutor Marked Assessment (TMA) or Computer Marked Assessment (CMA) and is prepared and uploaded to the website and available for students to download and complete at established intervals. The students can access and write their tests at home (or almost anywhere) using their personal computer and Internet provider or in the various study centres located throughout the country. Each student is expected to write four TMA tests; his or her best three scores are used to compute his/her final score that is added to the examination score, which comprises 70% of his/her final grade.

The University's first pen and paper examination was conducted in 2005 when the continuous assessment score represented 40% of the final grade, and the examination scores represented 60%. This trend was revised in 2007 to the present day 30% and 70% figures for continuous assessment and examination, respectively. Examination questions are usually moderated by external examiners/lecturers from other universities to ensure quality. In the 2012 examinations, students at the 100 and 200 levels in the Schools of Arts and Social Sciences, Education, Management Sciences and Science and Technology wrote their examinations online. All students in the School of Law and students in 300 level (and above) courses in other schools were given pen and paper examinations during the assessment period. The online papers were marked and recorded electronically, but the pen and paper questions were written at the study centres and marked at the headquarters in Lagos.

Measurement of academic performance of students is usually challenging (Nwokolo, Oraegbunam and Anyamene, 2009). For instance, Adekeye (2006) opines that many educationists and researchers doubt the validity and reliability of continuous assessment because of favouritism and teachers' biases in setting questions or experience. Kim, Smith and Maeng (2008) opine that assessment activities of online distance education do not

strictly follow the principles suggested in the literature; despite the fact that web-based assessment systems have more potential for access, flexibility and effective and efficient managements for both students and teachers than paper-based assessment systems.

The controversies that surround continuous assessment scores (Adekeye, 2006) often prompt experts to investigate the relationship (or predictability) of pre-examination test scores with students' performance on final examinations. Omebe and Ukwueze (2010) studied the predictability of Senior School Certificate Examinations (SSCE) results using students' performance (at Command Secondary School, located in Abakaliki in southeastern Nigeria) on mock examinations taken in their penultimate year; their efforts revealed a significant positive relationship or correlation between the two examinations. At various times, Enunwa (1995) and Adekeye (2006) have studied the correlation between continuous assessment scores and performance of students on Junior School Certificate Examinations (JSCE) in Ilorin, located in north-central Nigeria, and have revealed a positive relationship between the continuous assessment scores and JSCE results. Those who achieved high scores on their continuous assessment also had good results on the JSCE. Iyewarum in Adekeye (2006) noted that a meaningful assessment constantly supplies students with a realistic view of their self-image and academic and psychological abilities. Thus, the true ability of an individual cannot be correctly ascertained through a single examination, but only through tests as complimentary approaches. Tests are an obvious significant systematic method of obtaining information and comprise one set of tools for assessing behaviours.

The Problem

As observed over the years, even at the secondary school level, students often have inflated scores on their continuous assessments but record incongruous scores on their examinations. In open and distance education, as found by NOUN, students usually perform significantly well in their continuous online assessment. Because students can complete their assessment anywhere and in an unsupervised environment, there is a tendency to infer that there might be unethical consultation of course materials or other sources in the process of writing the tests; this accusation places the predictability of continuous assessment in serious

doubt. The expectation is always that high scores on the web-based continuous assessment should be reflected in pen and paper examinations. However, they are not. Simply put, the research problem focuses on the degree to which students' continuous assessment scores reflect actual cognitive competence, which is often reflected in performance on pen and paper examinations that are usually completed under strict supervision and examination conditions. It must be stated unequivocally that no attempt was made in the literature to analyse the predictability of students' academic performance from web-based continuous assessment in open and distance education institutions using pen and paper examinations as a measuring reference. Consequently, this study is necessary to fill this gap and seeks to establish the actual relationship between web-based continuous assessment and pen and paper examinations and to determine the efficacy of learning in open and distance education.

Scope of the Study

This research studied the correlation between continuous assessment and examination scores of students in the School of Education of NOUN at both the undergraduate and postgraduate levels. The School of Education offers students fully accredited course work that is delivered in a single mode, as in other schools at the university. The school currently offers programmes such as the Bachelor's degree in Science, Technology and Business Education as well as Early Childhood and Primary Education. Postgraduate Diploma in Education (PGDE), Postgraduate Diploma in Distance Education (PGDDE) and Postgraduate Studies (M. Ed. and Ph.D.) programmes are also available. Course grades were used from the following classes: GST 107: The Good Study Guide, a course offered to every learner before graduation and EDU 612: Professionalism in Teaching, which is also a compulsory course for all students enrolled in the post-graduate diploma in education programme, which allows students to qualify as professional teachers.

Research Hypotheses

1. There is no significant correlation between web-based continuous assessment and examination scores of undergraduates in GST 107.

2. There is no significant correlation between web-based continuous assessment and examination scores of graduate students in GST 107.
3. There is no significant correlation between web-based continuous assessment and examination scores of Postgraduate Diploma in Education (PGDE) students in EDU 612.

Research Methodology

In conducting this study, the researcher employed a correlation research design to predict students' academic performance in pen and paper examinations from web-based continuous assessment scores. This prediction was necessary because a study of this nature makes use of existing relevant data that cannot be manipulated to predict future behaviours of one variable from the behaviour of another variable (Mertler and Charles, 2008).

The sample used in this study is composed of all the students enrolled in the School of Education of NOUN, in all 47 study centres across the country, who completed their continuous assessment and participated in the 2005 and 2008 examination exercises. A total of 131 individuals (45 undergraduates, 49 postgraduate diploma students and 37 graduate students) were selected for the study using a purposeful random sampling technique. While the scores from GST 107 were used for the undergraduate and graduate students, the scores from EDU 612 were used for the PGDE students.

Data Collection

The data for this study were obtained from the examination unit of the School of Education at NOUN Headquarters in Lagos. The continuous assessment and examination scores of GST 107 in 2005 and the continuous assessment and examination scores of EDU 612 in 2008 were chosen for the study through a stratified random sampling technique.

Data Analysis and Results

The data obtained were analysed using a descriptive research method that used Pearson's Product Moment Correlation Coefficient (r) to establish

the relationship between web-based continuous assessment and pen and paper examination scores by testing the null hypotheses at the 0.05 level. The results of the analysis are presented below in Tables 1–3.

Table 1   Correlation between web-based continuous assessment and examination scores of undergraduate students in GST 107

Assessment Mode	Number	Mean	SD	r-cal	r-value	df	sig lev.
Continuous Assessment	45	26.80	3.50				
				0.02	0.254	43	NS
Examination	45	32.84	6.57				

NS: Not Significant

The data in Table 1 indicate a very weak correlation between the continuous assessment and examination scores of undergraduate students in GST 107. This observation falls short of the criterion of acceptability for test reliability or validity of the result. As a result, the null hypothesis of no significant correlation between web-based continuous assessment and examination scores of undergraduates in GST 107 (hypothesis 1) is accepted. The students obtained an average score of 26.80 out of 40 on their web-based continuous assessments and obtained an average score of 32.84 out of 60 on the 2005 pen and paper examinations. Therefore, the web-based continuous assessment scores are not good predictors of students' academic performance.

Table 2   Correlation between continuous assessment and examination scores of graduate students in GST 107

Assessment Mode	Number	Mean	SD	r-cal	r-val.	df	Sig. Lev.
Continuous Assessment	37	28.80	4.18				
				–0.98	0.361	35	NS
Examination	37	36.80	7.36				

NS: Not Significant

The data in Table 2 show that there is a very high negative relationship or correlation ($r = -0.98$) between the web-based continuous assessment and examination scores of graduate students in GST 107. The analysis shows that the students, on average, obtained a score of 28.80 out of 40 on their web-based continuous assessments as opposed to a mean score of 36.80

out of 60 on the 2005 pen and paper examinations. Therefore, the null hypothesis of no significant correlation between the web-based continuous assessment and examination scores of graduate students in GST 107 (hypothesis 2) is accepted. This implies that web-based continuous assessment scores of graduate students are not statistically adequate to test or predict competence in academic performance in open and distance education.

Table 3   Correlation between continuous assessment and examination scores of postgraduate diploma students in EDU 612

Assessment Mode	Number	Mean	SD	r-cal	r-val.	df	Sig. Lev.
Continuous Assessment	49	19.45	4.16				
				0.39	0.254	47	Significant
Examination	49	40.60	8.83				

The information in Table 3 indicates that there is a positive correlation (r = 0.39) between the web-based continuous assessment and examination scores of Postgraduate Diploma in Education (PGDE) students in EDU 612. The subjects scored an average of 19.45 out of 30 on their web-based continuous assessment and a 40.60 out of 70 on their 2008 pen and paper examinations. Here, the web-based continuous assessment scores are a predictor of academic performance. Therefore, the null hypothesis of no significant correlation between the web-based continuous assessment and examination scores of PGDE students in EDU 612 (hypothesis 3) is rejected.

Discussion

In a study of this nature, the expectations is always that the variables under study are strongly correlated, which will prompt the study's application as a proven rule or government policy. There is no doubt that the predictability value of such a study is held in high regard. This particular study established that web-based continuous assessment scores correlate poorly with pen and paper examination scores of undergraduate students (Table 1). The study also revealed a high negative correlation between web-based continuous assessment and pen and paper examination scores among graduate students (Table 2). These findings conform to the assertion of Kim, Smith and Maeng (2008) that assessment in online distance education, which is carried out at NOUN, does not strictly follow

the principles suggested in the literature. The fact that web-based assessment systems have more potential for efficacy than paper-based assessments (Kim, et al., 2008) is an admission that there is a weak correlation between the two assessment modes in open and distance education. This assumption is the position of this paper. It might be accurate to state that this lack of a genuine correlation between web-based continuous assessment and pen and paper examination scores cannot be attributed to the superiority of web-based continuous assessment in open and distance education in Nigeria.

Perhaps, the students in this study performed better on their web-based assessments than their pen and paper examinations because they were not adequately prepared for the examinations or lacked counselling regarding strategic approaches to studying independently and writing examinations on their own. In addition, the fact that GST courses are not used in the computation of students' final results could be responsible for their nonchalance toward and poor performance on pen and paper examinations. The students were fully aware that they needed only a few marks from the examinations to augment their web-based continuous assessment scores, which were already high, to receive the required minimum score to pass the course. Those who are currently clamouring for all-inclusive web-based assessment in open and distance programmes are doing so out of an unpatriotic zeal for convenience, driven by laziness and a lack of commitment.

Furthermore, there is always thorough supervision, non-manipulation of questions and a lack of copying from course materials on pen and paper examinations; in the web-based assessment, however, a student can suspend the assessment and refer to his course materials to retrieve an answer that he does not know. The students have up to two weeks to complete their online assessment, which gives adequate room for collusion and cheating from course materials and other sources: students are able to log in and out at will within the stipulated period. Because the probability of cheating is high on web-based continuous assessments, the true picture of students' cognitive potential can only be sufficiently assessed through organised and supervised pen and paper examinations, which produce far better assessments than those obtained from the flexible and fraud-laden web-based assessments that lack control and supervision.

This study also revealed a positive correlation (r = 0.39) between web-based assessment and pen and paper examination scores among Postgraduate Diploma in Education (PGDE) students (Table 3). This finding conforms to the findings of Enunwa (1995), Adekeye (2006) and Omebe and Ukwueze (2010), which affirmed a positive relationship between continuous assessment scores and mock examination results, Junior Secondary School Certificate Examination results and Senior School Certificate Examination results. This might stem from the fact that earlier studies were undertaken in conventional secondary schools, where operations are quite different from the open and distance education systems. Furthermore, the PGDE students, who are teaching without teaching experience, must be more committed to their studies than the undergraduate and graduate students, or they risk flunking out of the programme. Some of them might be graduates of other disciplines who are interested in teaching but cannot become employed because of a lack of teaching qualifications. Such individuals would find it in their interest to pass the programme and obtain the qualification to secure professional teaching jobs. In addition, EDU 612, which was used with regard to the PGDE students, is used to compute students' final results and grades or level of performance in certification, unlike GST 107. This might be responsible for the PGDE students being more committed and therefore their impressive performance on their pen and paper examinations. Many of the students are most likely adequately prepared for both the web-based continuous assessments and pen and paper examinations to earn good grades.

Implications for Academic Counselling

Counselling is defined by Jones, Stefflre and Stewart (1970) as a professional relationship between a trained counsellor and a client that seeks to help the client understand and clarify his view of his life so that he may make meaningful and informed choices consonant with his potentials. According to Jones, Stefflre and Stewart (1970), this relationship is usually provided through academic, vocational and personal-social counselling. Anagbogu (1988) views academic counselling as an educational guidance that is concerned with educational, school and academic programmes and is aimed at helping individuals to make adequate plans, choices and decisions pertaining to their educational goals. Assistance includes the provision of information regarding educational

opportunities, the benefits of a timetable, the course requirements, using the school libraries, improving reading skills, coping with examination stress and anxiety, passing examinations with high grades and paying attention to and concentrating on educational materials. Akinade, Sokan and Osareren (2005) summarise academic counselling as a means of generally assisting people with learning, teaching and educational problems.

In open and distance education, academic counselling is incorporated into Learner Support Services (LSS), where students are assisted with general academic matters, study skills, and administration of teaching. Ojo (2010) argues that counselling in open and distance learning should include suggestions regarding improving one's reading skills, planning and designing assignments and projects, relating the salient points of a lesson, revising lessons and generally improving general study skills. Students in open and distance education can avail themselves of various counselling services provided by their host institutions to perform well on both web-based continuous assessment exercises and pen and paper examinations to realise their goals without frustration.

Each study centre at NOUN has at least one trained student counsellor who attends to students' academic, social, personal and psychological problems. Opportunities are therefore available for students to improve their reading skills and solve other personal problems that might hinder their performance on pen and paper examinations, despite the fact they always do well on web-based continuous assessments. Adult students in open and distance education are burdened with financial, marital and job-related problems; these are intervening variables in the pursuit of their goals. Such problems, when carried into examination periods, can cause poor performance relative to good grades obtained earlier on the web-based continuous assessments during the course of their programme. Students therefore need counselling before, during and after each period of assessment to obtain balanced assistance that can contribute to a well-adjusted life in society.

Conclusion and Recommendations

Full understanding of our present problems in education will enable us see the challenges that lie ahead and actions we must take to guarantee future

success (Adekeye, 2006). One of the positive features of evaluation in education is predictability, which this study attempted to establish for open and distance education using web-based continuous assessments to predict performance on pen and paper examinations. Unfortunately, the study revealed no significant correlation between the web-based continuous assessment and pen and paper examination scores of undergraduate and graduate students, and only a weak positive correlation between the two variables was found among the Postgraduate Diploma in Education students. This lends credence to the positions of some critics, who often blame our educational woes on faulty assessments occasioned by a lack of enabling environments and widespread fraudulent activities among stakeholders.

In light of these facts, this study recommends the following:

1. There should be unconditional transparency in web-based continuous assessment through definite timing of administration and supervision of tests at study centres only.
2. Counsellors should always engage students in pre-examination group counselling to sensitise them (students) to reading and writing examinations and introduce them to appropriate study skills.
3. Providers of open and distance education may choose to abandon web-based continuous assessment for now and rely on assignments and projects to assess performance prior to pen and paper examinations.
4. More qualified counsellors should be recruited and placed in study centres in the ratio of one counsellor to 2,500 students to adequately cater to the needs of an ever increasing population of students in open and distance education who seek to improve both academically and vocationally to live happy lives.

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