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Assessment methods as effective tools for learning outcomes of students in senior secondary schools in Ila-Orangun, south western Nigeria

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Abstract

Different methods of assessment on the students learning outcomes in Agricultural Science at five different secondary schools in Ila-Orangun, Osun State were studied. An arm of a class was used for each test; Continuous Assessment (CA) and Conventional Method (CM) were used for each arm. Students were taught during their normal school times for the maximum time of forty minutes thrice a week. There were ten objective questions weekly for each assessment of the students in the CA method for six weeks. The same questions were used throughout for all the schools, done simultaneously for CA. Also, sixty questions at once at the end of the sixth week for CM. Standard deviation and regression equations for the mean values were used in the analysis. The results show that CA could be adjudged to be better off than the CM because of its higher mean values in all the schools than the CM. The higher R^2 values of 0.99 and 0.88 revealed stronger correlation between different methods of assessment and the targeted learners. The CA test should be used instead of CM; the CM does not make learners to gain much cognitive knowledge when compare with what CA does to students.

Keywords: Learning outcomes, Agricultural science, Continuous assessment, Conventional method

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1. Introduction

The purpose of conducting assessment cannot be ruled out of learning process if one wants to be sure that the learning objectives have been achieved in the learners. This was after relevant materials and methods of teaching, that is, inputs have been used appropriately for the learners, and then assessment can be made. If the learners possess desirable learning outcomes or not, this assessment will show, otherwise the whole process will need to be repeated again, if the learning outcomes have been achieved, new objectives are set up and pursued in the same manner for the students in any educational system.

Educational system consists of educational planning which is concerned with activities leading to the achievement of goals and objectives such as the establishment of ends and means relationship, ranking of alternative strategies, allocating personnel, material space and other resources, analyzing performance constructing time, cost schedules and the regular revision of objectives (Adeyemi and Arogundade, 2005). Therefore, it is the responsibility of the teacher or instructor to know and study the environment properly to know the best educational system appropriate for the type of assessment that is suitable to the learners. There are two types of assessment that are used in schools, namely the Continuous Assessment (CA) and the Conventional Method of assessment (CM), these two were used in this research. The Federal Ministry of Education (1985) lists three areas that assessment in schools must embrace. These are the cognitive, the affective and the psychomotor domains.

Depending on the level of education of the learner and what desired goals are on ground, the learners are not expected to have all the domains under each area. For instance, the cognitive domain is of six levels, in ascending order, they are knowledge, comprehension, application, analysis, synthesis and evaluation. Pupils in primary school levels are not supposed to cover more than the first two levels of cognitive domain (Okwilagwe, 2000). The affective domain has five levels namely receiving, responding, valuing, organization and characterization. They have to do with values, beliefs, attitudes and appreciation, interest, social relations, emotional adjustments, habits and life styles while the psychomotor domain deals with the way pupils manipulate objects and move their hands and bodies, these are observed in such activities as writing, drawing and setting-up of laboratory equipment. All these are to make a child useful for himself and others in the society (Aladekomo, 2004).

1.1. Conventional Method (CM), Continuous Assessment (CA) and their Purposes

CA tests are periodical, systematic and well-planned form of assessment; they are not in haphazard manner. They may be in any form, oral, written, practical, impromptu or announced, it may be multiple choices, objective and subjective and are usually 30-40% of the final examination (Falayajo, 1992). Assessed tasks capture sufficient students' time and effort (Graham, 2004). CA are used as motivation for students, though they cater less for individual differences, but when the number of the conducted CA are many, selection at random will take care of this anomaly, thus individual differences in students can be care for unlike CM (Chan, 2004). CM is a method where learning takes place for a specific period and then the final and only one

examination at 100% for the learners. It is also called one-time test, unlike CA where assessments are made several times to determine the progress made in the teaching-learning activities.

Both the CM and CA face some challenges; these are aligning of the objectives, learning and assessment, problem of engaging the students, how to source for fragments and the useful feedback and how to provide these fragments to the learners. Also, the challenges of the school administration management of the assessment workload and how do assessment usage result to evaluation and improvement in the teaching-learning process (Graham, 2004).

Educational institutions deliver what they should deliver and what they deliver produces desired outcomes (Maduewesi, 2005). Learning outcomes are always the products of the quality of teaching, learning itself is influenced by the environment and the level of learning achieved is greatly influenced by what goes on in the learning environment.

For any good assessment, it must be systematic in its procedures for such to be able to have any tangible impact on learning objectives and the learners. The teacher must be systematic in his or her procedures, implying that the teacher is exposed to many of such procedures, leading to good and effective assessment (Emeke, 1995).

The objectives of this paper were to examine the effect of Continuous Assessment (CA) and Conventional Method (CM) on the students' learning outcomes in Agricultural Science at five different secondary schools and which of the methods is most effective towards achieving the set goals in the societies.

2. Methodology

The learning was based on the Agricultural Science Book 1-module for Senior Secondary Schools. There was a topic for a week according to the scheme of work; the research was started in the fourth week of the second term in 2011/2012 session in all the schools used. The schools were College High School, Igbonnibi High School, Ila Grammar School, Ajagunla Grammar School and Hope High School, all in Ila-Orangun.

The independent variables in the research were the two methods of assessment used, these were the Conventional Method (CM) of assessment and the Continuous Assessment (CA). In each of these schools, with the help of the class teachers, the students were regrouped into different arms of classes depending on their intelligent and earlier performances in the class. This was to see to it that all arms were with equal number of brilliant students as far as possible. An arm of a class was used for each test in the design; the class arm that CA was used for shall not have CM used for it and vice-versa. The number of students in each class was not equal, 30 in College High School, 26 in Igbonnibi, 32 in Ila Grammar School, 28 in Ajagunla and 30 in Hope High School, and all the students in the used classes were used as respondents; this was to allow all the regular students in each class to participate. They were taught during their normal school times for the maximum time of forty minutes thrice a week in Agricultural science. Mean ages of the students for the boys and for the girls were found together inseparably as they were treated equally in the research; 2-man panel made up of an agriculturalist and an educationist examined the questions for assessment (Falayajo, 1992).

There were weekly ten objective questions for each assessment of the students in the Continuous Assessment CA method, which were sixty questions for the six weeks. The same questions were used throughout for all the schools, making sure they were done on the same day and at the same time, this was to be double sure of the no leakage of the questions from one school to another. Again, these questions were at each time taken away from them for keep, each test lasted ten minutes. There were four options each for a question, options a-d. In the Conventional Method CM, students were evaluated at the end of the six weeks of intense teaching using the same format of the CA, that is, the same questions were given to the second arm of the class, this time for sixty minutes. There was no show of any reflection of poor performances of any sex, as sex was not use in the variables; the students were picked at random by the Agricultural teacher for all tests carried out with good representation of both sexes.

Statistical analysis based on standard deviations, mean values was used for the discussion of the results obtained from the research. Using grouped data for the marks from 1-10 for six tests in a Table. For the CM analysis, the same method was used, only that the grouped data were grouped not 1-10 but 1-5, 6 -10, 11-15 and so on for the mark distribution. This was still the same thing in that there were ten divisions in the entire grouping whether for the CM or the CA methods. Also, line curve with the regression value was used for the comparism between the mean values of the CA and the CM to know their stance on the subject considered.

3. Results and discussion

In Tables 1 and 2, the results from the mean values, standard deviations among the CA and among the CM and between them, show that both methods worked well. The mean and standard deviations values revealed that the CA tests prove more effective than the one-time test also known as CM because students' marks did not deviate too much in CA like in CM (lower Standard deviations in CA shows closeness of marks, whereas in CM, higher standard deviation signifies higher discrepancies in marks scored). The mean values and standard deviations for the CA tests show that the students performed better in all the schools in the weekly tests. Their standard deviation values were also proof of their good performances as they were low.

Table 1. Mean Scores for CA Tests in the Five High Schools

Schools	Mean values of CA (weekly)						Total	Standard deviations
	1st	2nd	3rd	4th	5th	6th		
College High Schl	6.14a	6.33a	6.73a	6.47a	6.33a	6.33a	38.33	1.18
Igbonnibi Gram Schl	6.65b	6.43a	6.81a	6.46a	6.54a	6.57a	39.46	2.12
Ila Gram Schl	5.50c	5.48b	5.53b	5.13b	5.68b	5.66b	32.98	5.5
Ajagunla Gram Schl	5.57c	4.97c	5.82b	6.48a	4.52c	5.54b	32.9	1.62
Hope High Schl	5.90a	5.44b	5.93b	5.58b	5.25b	5.58b	29.68	1.19

Mean values with same superscripts along the same column are significantly different ($p < 0.05$)

Table 2. Mean Scores and Standard Deviations for CM Tests in the Five High Schools

Schools	Mean values of CM	Standard deviations	Weekly mean
College High Schl	23.14b	10.45	3.66
Igbonnibi Gram Schl	22.81a	10.59	3.6
Ila Gram Schl	23.09b	10.66	3.63
Ajagunla Gram Schl	25.02ab	9.55	4.17
Hope High Schl	30.61c	9.82	5.1

Mean values with same superscripts along the column are significantly different ($p < 0.05$)

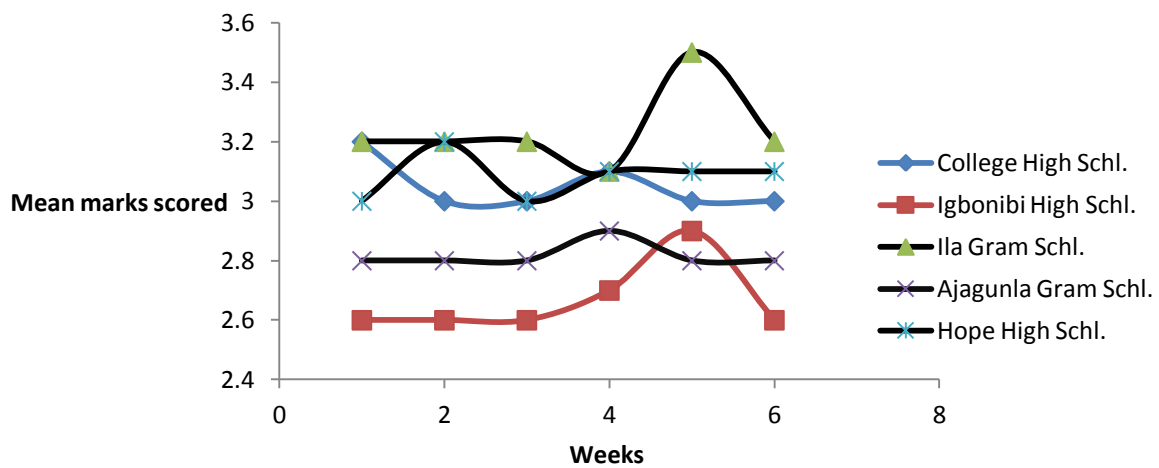


Figure 1. Averages of frequency scores for six weeks of CA tests in all schools

For College High Schl,

$$Y = -0.013 X^3 + 0.146 X^2 - 0.511 X + 8.566 \quad R^2 = 0.76 \quad (1)$$

For Igbonnibi High Schl,

$$Y = -0.023 X^3 + 0.023 X^2 - 0.617 X + 3.033 \quad R^2 = 0.75 \quad (2)$$

For Ila Grammar Schl,

$$Y = -0.015 X^3 + 0.167 X^2 - 0.488 X + 3.566 \quad R^2 = 0.27 \quad (3)$$

For Ajagunla Grammar Schl,

$$Y = -0.003 X^3 + 0.31 X^2 - 0.064 X + 2.833 \quad R^2 = 0.35 \quad (4)$$

For Hope High Schl,

$$Y = 0.007 X^3 - 0.081 X^2 + 0.268 X + 2.833 \quad R^2 = 0.35 \quad (5)$$

Figure 1 show the mean marks scored with students of Ila Grammar School having more mean values than others. In the raw scores, the marks scored by vast majority of the students (60%) were between 5 and 7 marks as the curves have shown, while mark 8 was few, and especially 9 and 10 marks where, though the tests were bit by bit, yet no student was able to score. However, in College and Igbonnibi High Schools, the marks scored by the students were highly correlated ($R^2 = 0.76, 0.75$) implying that majority of them scored high marks and were closer than in other schools. This couldn't have been so especially as they were regrouped before the research commenced, the reason for their performances may be due to the competency of the teacher who taught them or their conducive environment or the students' intelligence.

The higher value of the R^2 value (Figure 2) shows that there were strong correlation between each of CA and CM and the marks scored by the students in the different schools. Also, these total mean values of each of the CM and CA were statistically significant to each of its kinds. Though there was stronger correlation for CM than for CA, both methods of assessments were effective on the students in their assessments. The results in Figure 2 show that CA could be adjudged to be better off than the CM because of its higher mean values in all the schools than the CM. All these added with high standard deviations of marks in CM than CA, (Tables 1, 2) revealed that the CM does not make more students/learners to gain much cognitive knowledge when compared to what CA have contributed to students' education and that cognitive knowledge may not be uniformly guaranteed among the learners/students. The independent variable - method of assessment Y as shown in their regression equations, with their stronger correlation ($R^2 = 0.99, 0.88$) also testifying to the findings. At $p \leq 0.05$, the mean values and the mean of the scores were significant for the CM and CA; this could lead to the conclusion that both methods were effective on the learning outcomes of the students, however, CA proved to be more effective than the CM, this was in agreement with what had earlier been observed by (Falayajo, 1992).

For CM,

$$Y_{CM} = 0.254 X^3 - 1.323 X^2 + 1.931 X + 22.26 \quad R^2 = 0.99 \quad (6)$$

For CA,

$$Y_{CA} = 0.372 X^3 - 3.516 X^2 + 7.390 X + 34.42 \quad R^2 = 0.88 \quad (7)$$

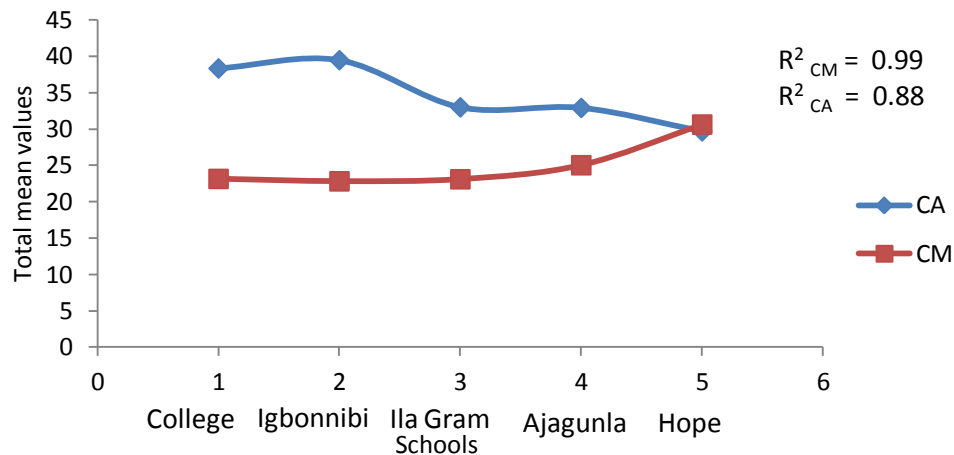


Figure 2. Total mean values of CA and CM in five schools

4. Conclusion and recommendation

The CA test proves better and reliable for the secondary school students to know more facts, acquire knowledge and reasoning abilities and to be able to understand what is learnt. Most of them scored 5, 6 and 7 marks on the average, that is, average performance in the tests. Since teaching-learning process is all about learners to understand some facts and to pass examination and not that the teacher will aim at failing students, the CM does not make learners to gain much cognitive knowledge when compared to what CA have contributed to students' education. The mean values and the mean of the scores were statistically different for the CM and CA; it can be concluded that both methods were effective on the learning outcomes of the students, however, CA proved to be more effective than the CM.

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