SELF-ASSESSMENT IN MATHEMATICS AS CORRELATE OF PERFORMANCE OF STUDENTS IN JUNIOR SECONDARY SCHOOL BASIC SCIENCE IN ONDO STATE, NIGERIA

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Abstract:

This study investigated the relationship between student's self-assessment in Mathematics and academic performance in junior secondary school Basic Science. The research adopted the descriptive research design of the survey type as there was no treatment and manipulation of subjects to treatment. However, it involves the use of questionnaire titled Self-Assessment in Mathematics (SAM) adapted from Oloda (2006) and revalidated by the researchers and students records of performance in Basic Science. The instrument has face and content validity and the reliability coefficient of 0.82. A total of 300 students were selected by stratified and simple random sampling techniques from ten schools in five Local Government Area of Ondo State. Pearson Product Moment Correlation coefficient was used to test the two hypotheses generated. The results showed that self-assessment in Mathematics is significantly related to Basic Science.

Keywords: self-assessment, performance relationship, correlation analysis

1. Introduction

Assessment has been described as a process for obtaining information that is used for making decisions about students, curricula, programmes and educational policy. Assessment applications in schools presents a very different face as the means by which schools and teachers wittingly or unwittingly sort out children for occupation of different status and remuneration in a hierarchically ordered society (Scitterly, 1989). According to Oloda and Awogbemi (2012) education assessment is an omnibus term

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which includes the processes and products, which describe the nature and extent of children's learning, its degree of correspondence with aims and objectives of teaching and learning and its relationship with the environments which are designed to facilitate learning. Nitko (1996) and Adebule (2005), see assessment as a process of obtaining information that is use for making decision about students, curriculum, programmes and educational Policy. The overall goal is not to stop at the description (whether quantitative or qualitative) but to provide information to be used in decision making.

The system of education in Nigeria was inherited from the British Colonial Master when the mode of assessment consisted of two broad groups of examinations ie internal and external examinations. However, Ojerinde and Falayojo (1984) opined that one of the weaknesses of the internal mode of assessment was summative evaluation. It only takes into consideration all assessment information about a given child at the end of each programme of activity and decision are based on a single examination. Thus, the expected feedback to the teachers, students, curriculum workers and the stakeholders in education was lacking. Oloda and Awogbemi (2012) reported that the issue of examination malpractice which gain considerable dimension was a direct offshoot of emphasis on selection and certification characteristics of the inherited system. Thus, the National Policy on Education in 1977 which was revised in 2004 recommended a new approach to assessment on learning outcomes after strong consideration of the effects of the one single examination for determining the success or failure of an individual student. The new approach is called continuous assessment which is considered to be a better replacement of the inherited mode of assessment. Yoloye (1984) and Oloda & Awogbemi (2012), see continuous assessment as a mechanism whereby the final grading of a student in the cognitive, affective and psychomotor domain of behaviour takes into account in a systematic way of all his performance during a given period of schooling

The problems associated with continue assessment or militating against its adoption among others include the requirement of absolutely dedicated and committed teachers to make it a success, since it is more demanding on the teachers, especially with the present large environments in our schools and poor condition of service of teachers is a problem.

Furthermore, the present mode of assessment is teacher centered, the teacher does the teaching, assessing and grading of the students, however, the students do not have an input in the mode of assessment. Thus, there is in recent times, a shift to self-assessment in the teaching-learning process of supplying information from the perspective of the learner to be used in its own right or to be placed alongside that of an outside observer, Also Bamidele (2004) defined individual Self-Assessment as the process where an individual learner judges his or her progress or achievement in a course of study. In agreement with the forgoing Oloda and Awogbemi (2012) opined

that self- assessment is a process where learners input on personal achievement or progress is taken into account during decision making. According to Adebule & Adebule (2014), self-assessment is to encourage the learners to assess their own progress or to comment on their own achievement in school. Students Self-Assessment is a cognitive strategy, which provides an avenue for a very clear shift in assessment, where the focus is on learning rather than simple measurement of that learning

Boud and Mc Donal (2003) opined that, teachers are taking more interest in assessment for learning in which they target their own and their students actions precisely upon the next steps in learning for individuals. According to Oloda (2006), some of the theoretical advantages of self-assessment could be summarized in two perspectives.

- encouraging more active interest on the part of students as more informative during learning than summative statements as less destructive of morale – especially for students in the middle and low ability range than their traditional test and examination.
- helping the teachers to develop greater respect for pupils' feelings and point of view about schooling and has provided insights into the effect of teaching programmes hidden from other methods. The introduction of self-assessment to be used in its own right or to be placed alongside that of the present mode of assessment could serve as an antidote eradicating the evil phenomenon among our students.

2. Statement of the Problem

The worth of students' self-assessment in the learning process is best understood when learners learn to evaluate and monitor their own performance in relation to a set criteria or standards. There is this problem that external assessments excludes the input of students, compare and categorize students' performance and present information about students in a package and labeled form that limit, rather than facilitate students learning. It is possible for a student to perform brilliantly or poorly if the information supplied from the perspective of the student is used alongside that of a teacher or an outside observer. Thus, the use of students input in the overall assessment will go a long way in facilitating students learning experience. In this study therefore, the following questions were raised.

1. Is there any relationship between the self-assessment of students' cognitive domain in Mathematics and their performance in JSS 2 Basic Science?
2. What is the relationship between Self-Assessment in Mathematics and students performance in JSS 2 Basic Science?

3. Research Hypotheses

The following hypotheses were generated and tested at 0.05 level of significant.

1. There is no significant relationship between self-assessment of students' cognitive domain in Mathematics and their performance in JSS 2 Basic Science?
2. There is no significant relationship between Self-Assessment in Mathematics and students performance in JSS 2 Basic Science?

4. Methodology

The study adopted the descriptive research design and of the survey type to investigate the self-assessment in Mathematics as correlates of performance of students in the Junior Secondary School Basic Science. It involves the use of questionnaire and students records of performance in Basic Science. The population consisted of all students of the Junior Secondary Schools in Ondo State. A sample of 300 JSS 2 Students was selected using stratified random sampling techniques from ten secondary schools in Ondo State. In each secondary school, 30 participants made up of 15 male and 15 female students were selected for the study.

The instruments used in the study were:

1. A questionnaire titled "Self-Assessment in Mathematics (SAM) was adapted from Oloda (2006) and re-validated by the researchers. The questionnaire was designed to deal with the three domains of the subject (i.e cognitive domain, affective domain and psychomotor domain).
2. The achievement results of the subjects in Basic Science

The reliability of the instrument was established through split-half method. The correlation coefficient of these half tests was calculated using the Pearson Product Moment Correlation Analysis formula to compute the reliability coefficient usually denoted by $r_{\frac{1}{2}}$. In order to obtain the reliability of the fully length of the original items, Spearman Brown prophecy formula was used. A correlation Coefficient of r=0.82 was obtained. The instrument was certified to have face and content validity by experts in tests, assessment, measurement and evaluation.

4.1 Data analysis and results

The data collected were analyzed using inferential statistics. Pearson Product Moment Correlation analysis was used to test the hypotheses 1 and 2. All the hypotheses were subjected to the test of significance at a probability level of 0.05.

Hypothesis 1

There is no significant relationship between the self-assessment of students' cognitive domain in Mathematics and their performance in JSS 2 Basic Science.

Table 1: Pearson Product Moment Correlation Analysis Summary of Self-assessment of students' cognitive domain in Mathematics and their performance in JSS Basic Science

Variables	N	r-cal	r-table
Self-assessment in Mathematics (Cognitive domain)	300		
Performance in Basic Science	300	0.304	0.195

It could be seen on Table 1 that r-calculated value of (0.304) is greater than r-table value of (0.195) at 0.05 level of significance, the null hypothesis is rejected. Thus, there is a significant relationship between the self-assessment of students' cognitive domain in Mathematics and their performance in JSS 2 Basic Science.

Hypothesis 2

There is no significant relationship between the self-assessment in Mathematics and the performance of students in JSS 2 Basic Science.

Table 2: Pearson Product Moment Correlation Analysis Summary of Self-assessment in Mathematics and their performance in JSS Basic Science

Variable	N	r-cal	r-table
Self-assessment in Mathematics (SAM)	300		
Performance in Basic Science	300	0.32	0.195

A cursory look at Table 2 shows that r-calculated value of (0.32) is greater than r-table value of (0.195) at 0.05 level of significance, the null hypothesis is rejected. Therefore, there is a significant relationship between the self-assessment in mathematics and the performance of students in JSS2 Basic Science.

5. Discussion

The findings of this study showed that there was a significant relationship between self-assessment in mathematics and the performance of students in Basic Science. Also, the study established a relationship between the self-assessment of students' cognitive domain in mathematics and their performance in JSS2 Basic Science which agree with the findings of Oloda and Awogbemi (2012) that established a relationship between the self-assessment of students' cognitive domain in mathematics and their performance in SS2 physics. Therefore, self-assessment of students in any subject could be used along-side the performance of students in the same subject during any of the assessment in

the secondary schools. This will go a long way to improving general mode of assessment in schools.

6. Recommendations

The mode of assessment in the schools needs to be re-structured to include students' self-assessment in the process of obtaining information that would be used for making decisions about students, curricula, programmes and educational policy.

Effective techniques for the evaluation of the overall students' self-assessment in each of the school subjects should be developed and validated. A project such as Self-Assessment Technique Project (SATP) should be initiated by government whereby experts would be recruited to organize workshop and seminars on a regular basis for the training and re-training of students, teachers, counselors and school administrators on the new mode of assessment.

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