SELF – ASSESSMENT IN MATHEMATICS AS CORRELATE OF PERFORMANCE OF STUDENTS IN PHYSICS

F. S. Oloda and C. A. Awogbemi
National Mathematical Centre, Abuja, Nigeria
E-mail: awogbemiadeyeye@yahoo.com

Abstract
This study was conducted to investigate the relationship between students self assessment in Mathematics and academic performance in Senior Secondary School Physics. The research is descriptive and of the survey type as there was no treatment and manipulation of subjects. Instead it involves the use of questionnaire and students records of performance in Physics. A total of 600 students were selected by stratified random sampling from 10 schools in five Local Government Areas of Ondo State. Pearson Product moment Correlation coefficient was used to test the hypotheses 1 and 2. Findings of the Study showed that self–assessment in Mathematics is significantly related to SS 2 Physics.

Keyword: Self assessment, performance, relationship, correlation analysis

Introduction
Education assessment is an omnibus term 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. 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 (and the assessment mode) was inherited from the British Colonial Masters. The assessment system here consisted of two broad groups of examinations – internal and external examinations. The internal examinations also known as teacher made tests were conducted by each institution for its own use in assessing the progress of its students and were administered at the end of each term. External examinations on the other hand are those conducted by external bodies such as West African Examination Council, National Examination Council, National Teachers Institute and Ministry of Education, etc. These examination bodies are termed external because they are not involved in the teaching of the students. These external examinations are taken at the end of each level of education and were meant for certification, selection and prediction.

However, a number of weaknesses plaguing the internal mode of assessment have been identified by Ojerinde and Falayajo (1984) among others as:
1. The mode of assessment was incomprehensive and unreliable; usually achievement test is used as exclusive evaluation. This does not give insight into development in other domain such as affective and psychomotor. The issue of examination malpractice which gain considerable dimension was a direct offshoot of emphasis on selection and certification characteristics of the inherited system. Consequent upon the preceding paragraph was the need for a new assessment mode void of these numerous weaknesses. In 1969, a curriculum conference was organized by the Nigerian Educational Research Development Council (NERDC). The outcome of the conference led to the emergence of the National Policy on Education NPE in 1977 and revised 2004. The NPE 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 child.

Continuous Assessment is a component of the National Policy on Education and considered to be
a better replacement of the inherited mode of assessment. Yoloye (1984) defined continuous assessment as a mechanism whereby the final grading of a student in the cognitive, affective and psychomotor domain of behavior takes into account a systematic way of all his performance during a given period of schooling. There is in recent times a shift to self-assessment in the teaching and learning process.

David (1989) defined self-assessment as a 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. 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. Thus self-assessment is a process where learners input on personal achievement or progress is taken into account during decision making.

The advocates of the present mode of assessment were of the view that the problem of examination malpractice will be reduced drastically, noting that examination malpractices have become the most dangerous virus in the country’s educational system today. With increasing tactics of examination malpractice and education frauds couple with people with wrong doings being offered positions of authority in the country. Mediocrity has reigned for a very long time, which may in turn lead to the collapse of our very existence as a people. 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 be an antidote eradicating the evil phenomenon called examination malpractice.

**Statement of the problem**
The value of students’ self-assessment in the learning process is best understood when students learn to evaluate and monitor their own performance in relation to a set criteria or standards. Students self-assessment requires judgment of the “worth” of one’s performance and the identification of one’s strengths and weaknesses with a view to improving one’s learning outcomes which the present assessment practices fail to achieve. Taking part in the overall assessment will go a long way in building confidence in the students. Thus answers were sought to the following questions

1. Is there any relationship between the self-assessment of student’s cognitive domain in Mathematics and their performance in SS 2 Physics
2. What is the relationship between self-assessment in Mathematics and students performance in SS 2 Physics

**Research hypothesis**
The following hypotheses were tested at 0.05 level of significance:

1. There is no significant relationship between self-assessment of students’ cognitive domain in Mathematics and their performance in SS 2 Physics.
2. There is no significant relationship between self-assessment in Mathematics and performance of Students in SS 2 Physics.

**Methodology**
The research is descriptive and of the survey type which sought to examine the self-assessment in Mathematics as correlates of performance of students in the Senior Secondary School Physics. Within this context, there was no treatment and manipulation of subjects. Instead, it involved the use of questionnaire and students records of performance in Physics.

**Sampling technique**
The population consists of all the science students of the Senior Secondary Schools in Ondo State. The sample consisted of 300 SS 2 science students in the ten schools randomly selected from the State. Thirty Students were further selected at random from each School.

**The instrument**
The instruments used in the study were:

1. A questionnaire titled “Self-Assessment in Mathematics (SAM) was constructed 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 Physics.
The reliability of the instrument was established through split –half method. The correlation coefficient of these half tests were 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 full length of the original items, Spearman’s Brown formula was used. A correlation coefficient of \( r = 0.82 \) was obtained.

Data analysis and results
The data collected was 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 SS 2 Physics.

Table 1: Pearson Product Moment Correlation Analysis summary of Self assessment of Students’ Cognitive domain in Mathematics and their performance in SS 2 Physics

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>r - cal</th>
<th>r - table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self assessment in Mathematics (Cognitive domain)</td>
<td>300</td>
<td>0.260</td>
<td>0.195</td>
</tr>
<tr>
<td>Performance in Physics</td>
<td>300</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Since the calculated \( r \) – value of 0.260 is greater than table value of 0.195 at 0.05 level of significance, the null hypothesis is rejected. Therefore, there is significant relationship between the self-assessment of students’ cognitive domain in Mathematics and their performance in SS 2 Physics.

Hypothesis 2
There is no significant relationship between the self – assessment in Mathematics and the performance of students in SS2 Physics.

Table 2: Pearson Product Moment Correlation Analysis summary of self assessment in Mathematics and the performance of students in SS 2 Physics.

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>r - cal</th>
<th>r - table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self assessment in Mathematics (SAM)</td>
<td>300</td>
<td>0.243</td>
<td>0.195</td>
</tr>
<tr>
<td>Performance in Physics</td>
<td>300</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Since the calculated \( r \) – value of 0.243 is greater than table value of 0.195 at 0.05 level of significance, the null hypothesis is rejected. Hence, there is significant relationship between the self-assessment in Mathematics and the performance of students in SS 2 Physics.

Discussion
The result of this study showed a significant relationship between self assessment in Mathematics and the performance of students in Physics.

Since the study has established a relationship between the self assessment of students’ Cognitive domain in Mathematics and their performance in SS 2 Physics, self - assessment of students in any subject could be used along-side the performance of students in the same subject during general assessment in our Secondary Schools. This will reduce if not eradicate the menace of examination malpractices in the Country.
Recommendations:
1. There is the urgent need to restructure the mode of assessment in our schools to ensure the use of self-assessment in schools.
2. Effective techniques have to evolve for evaluating the overall students’ self-assessment in each of the School subject.
3. The Government could initiate a project such as self-assessment technique project which should recruit experts who would organize workshop and seminars on a regular basis for the training and re-training of teachers, students, counsellors and school administrators on the new mode of assessment. Such seminars should be held at national, zonal and state level.

References

