



## ASSESSMENT OF STUDENTS' PERFORMANCE IN TEACHER-MADE MATHEMATICS ACHIEVEMENT TESTS IN EKITI STATE SECONDARY SCHOOLS

Kolawole E. B. and Olanrewaju B. O.

Institute of Education, Faculty of Education, Ekiti State University,  
Ado - Ekiti, Nigeria

### Abstract

*This study assessed the performance of Students in Teacher-made Mathematics Achievement Tests. Specifically, the study aims at comparing the performance of students in essay and objective Mathematics achievement test as well as the performance of male and female students in mathematics achievement test in Ekiti State Secondary Schools. The study employed a descriptive designed of the survey type. A total number of 100 Senior Secondary School Two (SS2) students were used as sample for the study by using multistage sampling technique. The instruments used were two types: MC-MAT that contained 50 items each and Essay test which contained 12 items based on the current SSCE mathematics syllabus. Data collected were subjected to statistical analysis of mean, standard deviation and t-test. Result of the study showed that there was a significant difference in the performance of students in Objective and Essay test. It also showed that there was no significant difference between the performance of male and female students in the Mathematics Achievement Test. Therefore, it was recommended that; the various examination bodies like JAMB, NABTEB, WAEC, NTI and Ministry of Education could use objective test. Essay test can be used more frequently in the classroom to measure the reasoning ability of the students and their ability to handle numeric data. Mathematics teachers should prepare their students well for any examination regardless of their sex.*

**Keywords:** Assessment, Achievement Test, Academic Performance and Gender.

### Introduction

The main objectives of sending children/wards to school is to assist them learn some basic skills, beliefs and knowledge, necessary for their development. Omirin (2001). The role of the teachers is mainly to assist and guide the students to achieve their objectives. The teacher continuously assesses his method of teaching and the students' performance. Nwana in Omirin (2001) added that listening to a lecture given by a teacher without assessment is similar to listening to a sermon on sundays in the church. Therefore, the importance of Assessment cannot be overemphasized. Bloom (1956) classified the aspects of testable educational objectives in the cognitive domain as; recall of knowledge, comprehension, application, analysis, synthesis and evaluation. Those in the affective domain have been classified as; receiving, responding, valuing, organization and characterization. The importance of

these cannot be overemphasized under the progressive assessment of students' performance and keeping records of their achievement. However, the extent to which achievement test contribute to improved instruction and learning, depends largely on the application of principles underlying their development. Test can direct students' attention towards the objective of instruction, it can encourage students to focus on a limited aspect of the course content or direct their attention to all important aspects. Educational objectives make clear what learning outcomes we expect from our teaching. These are teaching goals expressed in terms of the desired results of instruction. Thus, in order to effectively evaluate pupils' progress towards these goals, educational objectives are defined in terms of specific changes in pupils' behavioural objectives and are thus referred to as taxonomy of educational objectives (Bloom, 1956)



The National Policy on Education emphasizes Continuous Assessment as the progress of students on a continual basis. This has to be systematic, comprehensive, cumulative and guidance oriented (Adebule, 2011).

Oladunni (1996) cited in Olanrewaju (2014) asserted that a fundamental process in the writing of test items is the formation of test blue print. The table provides assurance that each objective will be presented in the test according to its relative importance. The table indicates the number of test items to be devoted to each instructional objective. The test items are written to meet the requirements of each cell of the table. That is, it prescribes the appropriate number of items in the appropriate categories, giving attention to the level of intellectual functioning. Kolawole (2010) added that blue print is a two-way chart which maps instructional objectives with course content. It also specifies the relative emphasis to be given to each type of learning outcome. According to Alonge (2004), in constructing blue print that would assist classroom teacher in test construction, the following steps are to be taken

- i. Give an outline of the content and the objective of each test item
- ii. Suggest what might be covered under each item
- iii. Allocate percentage of the total test by content and objectives
- iv. Make decision on what types of test item to be used
- v. Specify the difficulty level of each item
- vi. Specify the discrimination index of each item of the test
- vii. Arrangement of the test items

One of the responsibilities of the subject teachers is to prepare and write questions in Nigerian Secondary Schools but it appears as if adequate consideration is not given to the quality of questions been set. Most of the questions are either too difficult

or too simple, Over the years, students performance in Mathematics seems not encouraging despite all efforts been put in place by the subject teacher during the teaching-learning process. Hence, the major problem of this study is to find out the level of students' academic performance in Mathematics Achievement test.

#### **Purpose of the Study**

This study assessed the performance of students in teacher-made Mathematics achievement tests in Ekiti state secondary schools. Specifically the study aimed at comparing the performance of students in essay and objective mathematics achievement test as well as comparing the performance of male and female students in mathematics achievement test

#### **Research Hypotheses**

The following hypotheses were formulated for the study

1. There is no significant difference in students' performances in objective and essay mathematics achievement test
2. There is no significant difference in the performances of male and female students' in essay mathematics achievement test
3. There is no significant difference in the performances of male and female students' in objective mathematics achievement test

#### **Methodology**

This study employed descriptive research design of the survey type. The study compared the performance of students in Essay and Objective Mathematics Achievement Test. The population for the study consisted of 11,180 Senior Secondary School two Students of 2014/2016 Session as obtained from Planning, Research and Statistics Department, Ekiti State Ministry of Education, Science and Technology, Ado Ekiti. A total of 100 students were selected through



multistage random sampling techniques as sample for the study. The instruments used in collecting data for this study were Multiple Choice Mathematics Achievement Test (MC-MAT) that contained 50 items and Essay Mathematics Achievement Test (E-MAT) that contains 12 items based on the current SSCE mathematics syllabus. A test-retest method of reliability was used; the instruments were administered on 20 students who were not among the sample for the study on two occasions with an interval of two weeks. The Pearson Product Moment Correlation yielded a coefficient (r) 0.65 for Multiple Choice Mathematics Achievement Tests and (r) 0.75 for Essay Mathematics Achievement Test respectively.

**Results**

**Hypothesis 1**

There is no significant difference in the performance of students in essay and objective test items in mathematics achievement test

**Table 1:** t-test showing students' performances in essay and objective mathematics achievement test

Academic Performance	N	Mean	S.D	d	t <sub>cal</sub>	t <sub>table</sub>
Objective Test	10	28.6	8.6	9	2.84	1.98
Essay Test	10	25.2	8.4	9	2.84	1.98

\*P>0.05 (Significant result)

Table 1 shows that t<sub>cal</sub> (2.841) is greater than t<sub>table</sub> (1.984) at 0.05 level of significance. The null hypothesis is rejected. It implies that there is a significant difference in the performance of students in objective essay mathematics achievement test.

**Hypothesis 2**

There is no significant difference in the performances of male and female students' in objective mathematics achievement test

**Table 2:** t-test showing difference between male and female students' performances in objective mathematics achievement test

Academic Performance by Gender	N	Mean	S.D	df	t <sub>cal</sub>	t <sub>table</sub>
Male	38	29.58	8.27	98	0.830	1.984
Female	62	28.10	8.86	98	0.830	1.984

P<0.05

Table 2 shows that t<sub>cal</sub> (0.83) is less than t<sub>table</sub> (1.984) at 0.05 level of significance. This implies that there is no significant difference in the performance of male and female students in objective mathematics achievement test.

**Hypothesis 3**

There is no significant difference in the performances of male and female students' in essay mathematics achievement test

**Table 3:** t-test showing difference between male and female students' performances in essay mathematics achievement test

Academic Performance by Gender	N	Mean	S.D	d	t <sub>cal</sub>	t <sub>table</sub>
Male	3	22.5	8.8	8	0.24	1.98
Female	6	25.0	8.2	5	0.24	1.98

P<0.05

Table 3 shows that t<sub>cal</sub> (0.249) is less than t<sub>table</sub> (1.984) at 0.05 level of significance. This implies that there is no significant difference in the performance of male and female students in essay mathematics achievement test.

**Discussion**

The findings of this study revealed that there is a significant difference between the performance of students in Objective and Essay tests respectively. The students performed well in Objective than Essay Test. This implied that objective test items are easier to pass than essay items. This finding was in agreement with earlier findings of Excell (2000), who opined that multiple choice questions have the potential to cover the whole of the syllabus and they force the student, in principle, to learn all the taught material, though it is also suggested that multiple-choice questions are not suitable for assessing numerical design exercises, a feature of many traditional



engineering examination questions (Excell, 2000; Zhao, 2005). However, it is in contrast with the finding of (Brown, 2001) who suggested that students find multiple-choice questions 'confronting' and would prefer to express themselves more fully.

Hypotheses two and three were not rejected. This shows that there is no significant difference between the performance of male and female students in Mathematics Achievement test. This finding is in agreement with the findings of Becker (1999) who stressed that boys do better in algebra problems, girls do just as well in arithmetic and geometry and better in computation. He also argued that gender differences in cognition are changeable and then suggested that training in Mathematics can significantly improve performance by both males and females. R.L Atkinson et al (1990) pointed out that the sex difference in cognitive abilities which have been observed almost since the beginning of systematic testing appears to be vanishing and that female ability on tests of mathematical reasoning has been increasing to match that of males. Bandele (1988) similarly suggested that there was no significant difference between the performance of boys and girls in mathematics achievement test. It may therefore be concluded that earlier difference in scores in mathematics test between the sexes result from differences in training and social expectation.

### Conclusion

This study specifically showed that students performed very well in objective test than essay test. Since the two tests have their differences and similarities but students performed better in objective, hence it is here by concluded that 'objective test has higher measuring ability in mathematics achievement test than essay test.

### Recommendations

Based on the findings in this study, it was therefore recommended that; the various examination bodies like JAMB, NABTEB, WAEC, NTI and Ministry of Education could use objective test. Essay test can be used more frequently in the classroom to measure the reasoning ability of the students and their ability to handle numeric data.

Mathematics teachers should prepare their students well for any examination regardless of their sex.

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