JOURNAL OF RESEARCH IN SCIENCE AND VOCATIONAL EDUCATION (JRSVE)
Volume 5; Issue 1, 2025
Official Publication of Science and Vocational Department
Godfrey Okoye University, Ugwuomu- Nike, Enugu-Nigeria
Published by K-Injo | Kobia Data Limited

INFLUENCE OF TESTING PROCESS ON STUDENT MATHEMATICS ACADEMIC PERFORMANCE IN PRIVATE SECONDARY SCHOOLS IN ENUGU EAST LOCAL GOVERNMENT AREA OF ENUGU STATE

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DOI: https://doi.org/10.5281/zenodo.15583880

Abstract: The purpose of this study is to investigate the influence of testing process on student mathematics academic performance in private schools in Enugu East L.G.A of Enugu State. Two research questions guided the study; to what extent does test type and test taking skill influence student mathematics academic performance. Is the use of test taking a sine qua non for student success in mathematics academic performance? The study adopted a descriptive survey design which allowed the researcher to gather information from a sampled population. The study sampled 50 teachers among whom were randomly selected ten Teachers from each five (5) private schools in Enugu East LGA. Method of data collection was through a structured online questionnaire which was distributed to schools via their WhatsApp platform and email address. After completion from respondent the response from the question were analyzed using simple mean. The study finding indicate a statistical significant in student knowledge and their performance in mathematic subject. There was no significant different between teachers. The study therefore recommend that mathematics teachers may introduce the use of mathematics games which can have a positive influence on student academic performance regardless of gender or scoring ability. Game based learning can encourage student to develop their skills.
Keywords: Assessment, Testing process, test taking skill and feedback.

Introduction

Mathematics is an important subject in school curriculum in every country of the world Betts, et al (2015). Mathematics has been discussed so much that youths/ students can understand the numerical data presentation to them, as well as manifest those information both simple and complex in a day to day encounter as cited in the same article. Learning mathematics is cumulative in nature where it is structured step by step starting with the simplest tasks until getting into more complex ones Adetula, (2016). The essence of the knowledge of mathematics is paramount to individual's academic needs across diverse human discipline. Mathematics is an important subject that is associated with academic and career opportunities. It is a science of number. Mathematic is one of the core subjects in Nigerian School System at all level. Mathematics is full of technical terms which make it difficult for student to understand it, if not

properly explain in the manner to which it will be understood. There are several reasons which have been advanced for student poor performance in mathematics. Some of these reasons are attributed to the following qualities.

1. Teachers' poor quality.
2. The nature of the subject.
3. Student phobia and fear of the subject.
4. Poor communication and style of testing process etc.

Teachers and learners of mathematics must work hard together to improve student academic performance in mathematic which is persistently poor and low especially in external examination. Therefore it is important to know that if it is possible to eliminate an obstacle in mathematics success, one of the most significant obstacle in mathematics is anxiety. Ezeamaenyi (2017).

However, Aiken, L.P (2019) said that the very abstracters of mathematical symbols surely adds to the difficulties that student encounter when learning mathematics, including difficulties in storing and using information in working memory of the students. Students who do poorly in mathematics but believe in its importance may not be anxious about mathematic while student doing poorly in mathematics but want to do well may report higher level of its anxiety. Therefore poor mathematics performance might be perpetual by its anxiety Bulus, (2020).

Mathematics success level has been one of the crucial keys to school success and profession selection.

Evaluation, an important step in educational settings, it is usually understood as a process to measure what students know or what they have learned. A variety of methods can be used for assessment. Tests are one of the most important and widely used. They are generally used because they require a shorter time for assessment. Ozan, Kincal (2018). Although preparation of tests requires spending a lot of time, since they can be administered to large groups easily and scored objectively as they are frequently used.

Testing is a part of assessment. Assessment is defined as any procedure or activity that is designed to collect information about the knowledge, attitude, or skills of the learner or group of learners (Ofem, Idika, & Ovat (2017). Testing is the process of evaluating a system or its components to determine whether they meet specified requirements and are fit for use. It can involve various types, including unit testing, integration testing, system testing, and acceptance testing, depending on the stage of development and the level of detail required. The process of measurement as it implies involves carrying out actual measurement in order to assign a quantitative meaning to a quality. Measurement is therefore a process of assigning numerals to objects, quantities or events in other to give quantitative meaning to such qualities. Items with unsound qualities would lead to poor achievement whenever a test consisting of such unsound items are administered to a group of examines Nworga (2015) each test item must be valid to function effectively in a test.

The testing process in an educational environment involving several key steps: defining objectives, designing assessments, administering tests, scoring tests, evaluating results, and providing feedback. This process helps to measure students' understanding and skills, guiding instruction and curriculum development. Chakrabatta (2020). Effective testing should align with learning goals, fairness, reliable, and valid to ensure accurate measurement of student learning. Eleje & Esomonu, (2018). There are two main levels of evaluation viz: programme level and student level. Each of the two levels can involve either of the two main types of evaluation – formative and summative at various stages. Programme evaluation

has to do with the determination of whether a programme has been successfully implemented or not. Student evaluation determines how well a student is performing in a programme of study.

In formative testing, students' learning are being tested multiple times during the unit of instruction or educational program with the aim of providing teachers feedback of students' mastery of what is taught. The feedback provided can aid the teachers to modify their teaching methods, materials, and educational sustenance. The purpose of formative evaluation is to find out whether after a learning experience, students are able to do what they were previously unable to do. Its ultimate goal is usually to help students perform well at the end of a programme. Summative testing, on the other hand, tests student's learning in order to produce feedback regarding students' educational advancement and achievement. That is for the benefits of students, teachers, parents, and the society. Therefore, such feedback comes typically at the conclusion of teaching and learning, term, educational program, or session (Schaffer, 2013). Summative evaluation is judgmental in nature and often carries threat with it in that the student may have no knowledge of the evaluator and failure has a far reaching effect on the students.

A performance test is an assessment designed to measure an individual's knowledge, skills, or proficiency in a specific subject or area, typically after a certain period of instruction or learning. These tests aim to evaluate how much a learner had understood and retained from their educational experiences. A performance test measures how an individual has learned over time and what the individual has learned by analyzing his present performance. It also measures how a person understands and masters a particular knowledge area at the present time. With this test, you can analyze just how quick and precise an individual is performing the tasks that they consider an accomplishment.

Item response theory as described by Ojerinde, et al (2014) is a set of mathematic models that describe the relationship between an individual's "ability" or "trait" and how they respond to items on a scale.

Testing process can have a significant impact on students' academic performance in mathematics including the type of test, the order of test item, the test taking skill used, the test preparation and the test administration.

Students perform better on multiple choice and essay tests than an alternative response. Students perform better when test items are arranged from easy to difficult rather than difficult to easy or randomly. Betts, el al (2015). Students who use test taking skill effectively are more likely to do well or perform better in mathematic tests. Good test taking skill can improve student attitudes and motivation towards learning mathematics and practically lower their anxiety also students who are anxious about a test may perform poorly because anxiety can be caused by student feeling that the test is beyond their intellectual and social capabilities Fatoke, et al (2013). Exams they say is a necessary evil due to these anxiety.

Other factors that can effect student test performance in Mathematics is Panic, Carelessness, Lack of focus, excessive anxiety, cramming, lack of exercise, low motivation etc. a teaching style that emphasis on active student learning centre can improve academic performance. Good use of test taking skills or process could improve on student level of anxiety, attitude and motivation toward learning mathematics which improve on student performance in both internal and external mathematics exams.

Tests help teachers and students; to evaluate student learning process. Testing help students to identifying areas where they need to focus their studies more.

The used testing process is the indices for students' achievement testing. The student's educational involvement is verified through achievement testing. Test combines subjects, encourages self-assurance, intellectual skills and motivates academic progress. Dixon (2019) noted that testing releases the parent unnecessary and impractical burden by not necessitating them to play the role of expert in evaluation. The testing process can significantly influence academic performance by assessing student knowledge, skills, and abilities. Effective testing can provide feedback to students and educators, helping identify areas for improvement and tailoring remade instruction accordingly. Ajogbeje, & Alonge, (2012). However excessive focus on testing can lead to stress and may not fully capture a student's capabilities.

In secondary schools in Nigeria, the testing process typically involves continuous assessments, mock examinations, and the final achievement tests, which often include both internal school exams and standardized national exams. The Performance tests aim to evaluate students' knowledge and skills in various subjects, ensuring they meet the educational standards required for graduation and further studies.

Statement of the Problem

The persistent poor performance of student of Enugu State in Junior, senior secondary and tertiary institution in mathematics is highly over whelming and a source of serious concern despite the fact that the subject has a clear use to student's immediate environment and across various human endeavors. It can be deduced students' academic performance which determines their readiness and suitability for the next level educational studies and employment. In view of these, the importance of the testing process cannot be over emphasis, particularly when testing is not carried out to reflect the academic performance as capture in the programme of the study. However, in order to answer the question of whether tests are helpful to learning outcomes in a real classroom environment or not, it is required to study the testing process on student mathematic academic performance. Little attention is paid to the critical issues of the quality of the test items used in measuring the level of performance of student mathematics academic endeavors.

Testing process, particularly on academic performance, is used in various ways to achieve specific objectives. While in the classroom, the role of the teacher is to conduct learning process to the understanding of the learners. Testing is one tool that could be efficacious in assisting the students form an effective study habits that would improve their performance in mathematics. This study therefore investigate the influence and impact of testing process on student academic performance in mathematics especially in private secondary schools in Enugu East of Enugu State.

Purpose of the Study

The main purpose of this study is to investigate the influence of testing process on student mathematics academic performance in private Schools in Enugu East Local Government Area of Enugu State.

Specifically the study sought to ;

1. Define objectives in student mathematic academic performance among selected private schools in Enugu East Local Government Area.
2. Designing assessment learning / Testing process. It is pertinent to design the text items from easy to difficult so that student can attempt it.
3. Administering tests to identify areas of important.

Test help students to identify areas where they need to focus their student to enhance their performance towards positivity.

Research Questions

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1. To what extent does test type and test taking skill affect student academic performance in mathematics among selected private secondary schools in Enugu East L.G.A?
2. Is the use of tests/test taking skills a sine qua non to student success in mathematics among selected private secondary schools in Enugu East L.G.A?

Hypothesis

The study was guided by the following null hypothesis;

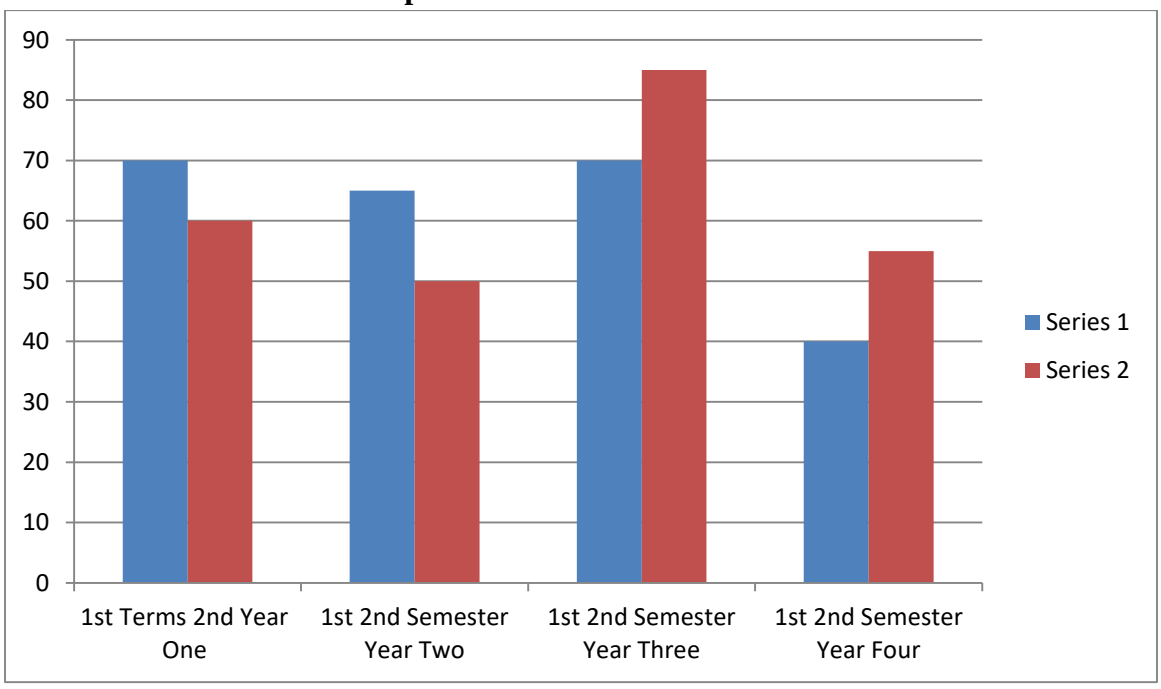
1. There is no significant difference in the mean of test type and test taking skill of student mathematics academic performance in selected schools.
2. There is no significant difference in the mean of the use of a test taking skill as a sine qua non for student success in student academic performance in selected private schools.

Methodology

The study adopted descriptive survey research design. Specifically the study is to find out the influences of testing process on student mathematics academic performance. The mean scores were used to answer the research questions, while the Analysis of Variance (ANOVA) was employed to test the hypotheses of the study. The hypotheses were tested at 0.05 level of significance. The decision rule was as follows:

- The null hypothesis was rejected if the p-value obtained from the ANOVA test was less than 0.05
- If the p-value was greater than or equal to 0.05, the null hypothesis was not rejected.

Student Performance for the past four Academic Session



The population for this study consists of all the teachers in private secondary school in Enugu East Local Government Area of Enugu State. The sample of the study is 50 teachers which was randomly selected, ten teachers each from the five (5) selected in private secondary schools in Enugu East Local Government Area of Enugu State.

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The method of data collection is through a structured questionnaire. The soft copy of the questionnaire (instrument) was distributed to the same number of teachers that made the sample of this study. The teachers were instructed to provide their responses to the items outlined in the questionnaire. The questionnaire was returned via their whatsapp platform and email address, after completion, from the respondent.

The responses from the questionnaire were analyzed using simple mean for answering of the research questions. The study will use four Likert-scale and the frequency was used to determine the extent of the agreement and disagreement in each of the questionnaire.

Result

This section shows the data presentation and analysis. The returned rate of the 50 distributed questionnaires was 47 which is 95% of the sample size and the analysis of the Hypothesis. After careful observation and analysis of the hypotheses, the p-value obtained was greater than 0.10. Since the p-value (0.29) is greater than the significant level (0.05), we fail to reject the null hypotheses.

Source of Variation	**Sum of Squares**	**Degrees o Freedom**	**Mean Squares**	**α-level**	**F_{tab}**	**F-ratio**
Between Groups	959.375	3	319.7917	0.05	6.59	3.3
Within Groups	387.5	4	96.875			
Total	1346.875	7	416.6667			

Decision: Since 3.3 < 6.59, we fail to reject H_0.

Q1: To what extent does test type and test taking skill influence student academic performance in mathematic among selected private secondary schools in Enugu East L.G.A?

Table 1.1 Mean rating influence of test type and test taking skill on the student's academic performance mathematics among selected private secondary schools in Enugu East L.G.A

S/N	**ITEM STATEMENT**	**SA 4**	**A 3**	**D 2**	**SD 1**	**FX Total**	**X Rule U=2.5**	**Decision**
1	**Things** – Students are asked to quickly list 3 things they want to know more about in regards to their topics, in mathematics or 3 things they don't Currently understand.	37	10	0	0	47	3.8	Accepted

2	**3-2-1 Reflection**-Have students to write down 3 big ideas from what they learned, 2 insights (reflective comments), and 1 question they still have.	30	17	0	0	47	3.6	Accepted
3	**3x Summarization** – Have Students to summarize the topic in three ways: in 10-15 words, 30-50 words, and 75-100 words. As they up in word count, they will need to add some more depth and detail to demonstrate deeper knowledge and understanding.	37	10	0	0	47	3.8	Accepted
Grand mean							3.7	

Field Source: 2024

In table 1, in investigating the influence of test type and test taking skill on the student's academic performance in mathematics among selected private secondary schools in Enugu East L.G.A of Enugu State, item 1 with mean score of 3.8 accepted that **Things** – Students are asked to quickly list 3 things they want to know more about in regards to their topic in mathematics, or 3 things they don't currently understand. Item 2 with mean response of 3.6 also accepted that **3-2-1 Reflection** – Have students to write down 3 big ideas from what they learned, 2 insights (reflective comments), and 1 question they still have. Item 3 with mean score of 3.8 accepted that **3x Summarization** – have students summarize the topic in three ways: in 10-15 words, 30-50 words, and 75-100 words. As they step up in word count, they will need to add some more depth and detail to demonstrate deeper knowledge.

The grand mean of the items of the above research question showed 3.7 which is above 2.5 cutoffs for the decision rule. This shows that the items that were used to indicate the teaching with the software package (classnote.ng) on the learning outcome of selected private secondary schools in Enugu East L.G.A of Enugu State were accepted.

Q2: Is use of test taking skill a sine qua non for student success in mathematics among selected private secondary Schools in Enugu East L.G.A?

Table 1.2 Mean rating on testing skill a sine qua non for student's academic performance in mathematics among selected private secondary schools in Enugu East L.G.A

S/N	ITEM STATEMENT	SA 4	A 3	D 2	SD 1	FX Total	X	Decision Rule U=2.5

1. Mid-term has Influence on the Performance in mathematics	37	3	0	7	47	3.4	Accepted
2. Term Examination has Influence on the students performance in mathematics.	30	17	0	0	47	3.6	Accepted
3. Standardize test improve students performance in mathematics	37	8	1	1	47	3.8	Accepted

Field Source: 2024

In table 2, in investigating the use of test taking skill a sine qua non for success on the student's academic performance in mathematics among selected private secondary schools in Enugu East L.G.A of Enugu State, item 1 with mean score of 3.4 accepted that Mid-term test has a very strong Influence on the student's academic performance in mathematics. Item 2 with mean response of 3.6 also accepted that Term Examination has influence on the student's performance in mathematics. Item 3 with mean score of 3.8 accepted that Standardize test improve students performance in mathematics.

The grand mean of the items of the above research question showed 3.6 which is above 2.5 cutoffs for the decision rule. This shows that the items that were used to indicate the influence of testing skill on the student's academic performance in mathematics among selected private secondary schools in Enugu East L.G.A of Enugu State were accepted.

Conclusion

In view of the findings, developing mathematics skills at an early stage can positively impact a child cognitive development. Early mathematics learning provide student with the background knowledge they need for future performance.

Recommendation

1. Mathematics teachers need to help their students have a positive view towards mathematics by exposing their leaners with consistent testing process, feedback and an adequate corrective measure/remediation.
2. Studies have shown that mathematical games can have a positive effect on student academic performance regardless of gender or scoring ability, game based learning can encourage students to develop their skills.
3. School heads/school administrators ought to permit and offer inductions for their teachers so as to attend conferences, workshops, seminars and trainings that will improve their performances.
4. Teachers should help students to understand how to solve problems and think critically. Teachers should also expose their learners to real world applications on mathematics.
5. Teachers should help to build students confidence and motivation to excel academically.
6. The researcher finally recommend a further study on the use of testing processes with feedback and remediation by future researchers.

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