

Enhancing Student Academic Performance through Educational Testing and Measurement

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Abstract

Student academic performance depends upon several factors that can improve or impair their performance. Educational testing and measurement have been attested to help improve students' academic performance. Educational testing and measurement are used in education to explain the learning progress and assess the outcome of any learning situation. Hence, educational testing and measurement are crucial to the educational system of any given country as it avails itself numerous benefits, such as feedback for both the learners and instructors, evaluation of knowledge gained, and identification of gaps to be filled, among others. The need for educational testing and measurement at all levels of education cannot be over-emphasized; however, the paper focuses on tertiary education students in Nigeria. It seeks to explore the various ways educational testing and measurement enhance students' academic performance. Several articles have been written regarding student academic performance; however, there is a need to write more, given the current situation in the country and the world. The study is descriptive as it explores the practice of enhancing students' academic performance through educational testing and measurement. It engaged in library research to gather data and is limited in scope to tertiary institution students in Nigeria. It thus provides a means to enhance students' academic performance through educational testing and measurement. The paper argues that student academic performance can be enhanced through educational testing and measurement because of its benefits. Hence, it is recommended that tertiary institutions in Nigeria take educational testing and measurement procedure more seriously.

Key Words – *Student Academic performance and Educational Testing and Measurement.*

Introduction

Efforts have been put into enhancing students' academic performance, some of which are the use of reinforcement principles to motivate learners. However, there is a need to put in more

effort. Hence, the need to find other means of enhancing students' academic performance. Thus, this paper discusses enhancing student academic performance through educational testing and measurement. It considers the overview of academic performance, the concept of educational testing and measurement and means of enhancing student academic performance through the benefits of tests and measurement. Throughout the paper, academic performance is viewed as the outcome of students' activities after a period. And students are viewed as learners who can be motivated to study more through testing and measurement. Lastly, the paper argues that given the benefits of testing and measurement, students' academic performance can be enhanced.

Overview of Academic Performance

Academic performance can be viewed as the outcome or result of a learner's effort at a given time. According to [Kumar, Agarwal and Agarwal \(2021: 3094\)](#), “the term academic performance has a multitude of perspectives, which are responsible for the varied constitutions of its very definition.” However, for the sake of this study, a few definitions are explored. For [Okorie \(2014: 33\)](#), academic performance is viewed as “excellence in all academic disciplines, in all classes as well as extracurricular activities. It includes excellence in sporting behaviour, confidence, communication skills, and others.” This definition suggests that academic performance has to do with the all-inclusive development of the learner(s). While quoting Steinberger's position on academic performance, [Okorie \(2014:33\)](#) notes that academic performance includes students' capacity and performance. It is multidimensional and complicatedly related to human development and cognitive, enthusiastic and social-physical advancement. It reflects the total child, not associated with a single occasion but happens over time and through a student's life in school. Hence, academic performance alludes to how well a student finishes his errands and ponders.

Hence, as posited by Steinberger reveals, academic performance exceeds the student's life in the classroom but reflects in the students' all-encompassing attitude and behaviour within and outside the classroom. Thus, it suffices to define academic performance as the outcome of a learner's ability in all his learning domains – cognitive, affective and psychomotor. From the preceding, it can be deduced that academic performance results from learners' input to their studies. Consequently, [Lamas \(2015: 353\)](#) submits that “several authors agree that academic performance is the result of learning prompted by the teaching activity by the teacher and produced by the student.” This definition makes academic performance a

“primary business of education ([Ampofo and Osie-Owusu, 2015: 20](#)).” Therefore, the school greatly influences the learner's academic success.

However, a student's academic performance can be influenced by several factors, such as gender, age, environment, and emotional influences, among other things. This is substantiated by [Lamas \(2015: 354\)](#), who noted that “academic performance involves factors such as intellectual level, personality, motivation, skills, interests, study habits, self-esteem or the teacher-student relationship.” These factors are essential in measuring a student's academic performance. A student in a conducive learning environment is likely to perform better than a learner in a not-too-conducive environment.

The human environment includes all things around man, both living and non-living. The influence of the learning environment on learners cannot be overemphasized, knowing that man's environment greatly influences his growth and development in all aspects. In a typical teaching-learning environment, other humans are the learners and the teachers in a learning environment. The teacher is “primarily a person with transparent objectives and motivation ([Hendricks, 1998: 243](#)).” In essence, the teacher is expected to make the environment conducive to learning. This is in congruence with the Pavlovian classical conditioning theory, where learning is associated with an object of learning.

[The World Book Encyclopaedia \(1986\)](#) describes classical conditioning as a learning process “based on stimulus relationships.” Hence, a learner exhibits certain traits at the sight of the stimulus, just as the dog salivates at the sight of the plate or hears the bell; a learner naturally associates a subject of learning with the teacher. The learner's physical environment has been observed to influence their learning in multiple ways. Some factors in the environment that can affect learners include distractions, the classroom, the emotional atmosphere and the teacher's personality. Since these are not the focus of the discourse, adequate attention is not given to them but mentioned in passing.

Concept of Educational Testing and Measurement

Measurement and evaluation of progress are essential factors in all educational processes. It is needed to continually gauge the progress of all academic activities at all levels of education. [Adom, Mensah and Dake \(2020: 109\)](#) opine that “test, measurement and evaluation are concepts used in education to explain how the progress of learning and the final learning outcomes of students are assessed” this description suggests that testing and measurement in all educational system are germane to the measurement of progress in the academic procedures.

In paying attention to each of the terms, [Wright \(2008: 3\)](#) asserts that “educational testing is normally conducted to measure the status of the child on one dimension such as arithmetic and other subjects.” A reflection on this assertion suggests that there should be a focus while carrying out tests. In this case, the essence of carrying out a test is to enhance students’ academic performance.

Measurement, on the other hand, is often used interchangeably with evaluation. Hence, it poses some challenges in an attempt to define its concept. [Rani, Priyadarsaini and Rao \(2004: 11\)](#) submit that “some scientists believe that the procedure known as a measurement in psychology is not truly measurement.” It is true to some extent because the term is sometimes so defined that several dimensions are not included. However, even then, it is called measurement in psychology. By implication, measurement means different things to different experts in their field of learning. For instance, in mathematics, [Ferris \(2015: 1\)](#) defines measurement as “an empirical process, using an instrument, effecting a rigorous and objective mapping of an observable into a category in a model of the observable that meaningfully distinguishes the manifestation from other possible and distinguishable manifestations.”

In education, measurement, according to [Maheshwari \(2016\)](#), is viewed as “a collection of quantitative data. A measurement is made by comparing a quantity with a standard unit.” By implication, a standard is usually set before a measurement can be made in education. For instance, the requirement to measure a student's success for a particular course may be set to 60%. And anything below that, the student would be said to have failed a test. Thus, more succinctly, [Adom, Mensah and Dake \(2020: 109\)](#) submit that “when contextualised within education, a measurement can be referred to as a process used to glean the degree of an individual’s competence in numerical terms. In other words, measurement is undertaken to quantify the level of knowledge or skills acquired by a learner.” Hence, measurement quantifies the learner’s achievement in numerical terms.

Types of Educational Tests and Measurements

Educational tests and measurements come in different types. Some of these are identified by [Kubiszyn and Borich \(2013: 10-13\)](#) as objective, essay, performance, portfolio, teacher-made, standardised, non-referenced tests (NRTs), criterion-referenced tests (CRTs) and curriculum-based measurements (CBMs). On the other hand, measurements are grouped into formative and summative assessments (Fedia, nd.). For want of space, three are highlighted.

Objective Tests and Measurement

According to [Kubiszyn and Borich \(2013: 10\)](#), objective tests include item response formats that can be scored consistently and objectively.” This description indicates that objective tests are given to learners to test their cognition or the level at which they understand a concept. However, it should fulfil the criterion of consistency and objectivity. Examples are multiple-choice, matching formats and true or false tests.

Performance Tests

According to [Khattri and Sweet \(2009: 1\)](#), performance tests, otherwise known as performance assessment, refers to “a type of assessment that requires students to perform, demonstrate, construct, develop a product or a solution under defined conditions and standards” which implies that performance tests are usually designed to measure the level of skill acquisition of learners in the chosen or selected area(s) during the course of study. For instance, to judge the level of accuracy of a student in cookery, there is a need for a performance test where the student will be practically considered during a cooking exercise.

Teacher-made Tests

As the name suggests, teacher-made tests are designed and administered by teachers. [Kubiszyn and Borich \(2013: 11\)](#) described teacher-made tests as “developed, administered and scored by teachers, and often consist of completion, true-false, matching, multiple-choice, and essay items. They are usually flexible or variable in terms of their administration and scoring procedure and the amount of attention given to their construction. Hence, it can be concluded that there are no straight rules to designing teacher-made tests other than it is designed and constructed as the teacher deem fit.

Educational Testing and Measurement and Student Academic performance

The benefits of tests and measurement on student academic performance at all educational levels cannot be overemphasized. However, the study is limited to higher education students. [Roediger, Putnam and Sumeracki \(2011: 4\)](#) discussed retrieval and retention, identification of gaps in knowledge, learning more of subsequent learning episodes, improved organisation of knowledge, transfer of knowledge, retrieval of new materials, metacognitive monitoring, prevention of interference, feedbacks to instructors, and encouraging students to learn as ten benefits of testing and applications to educational practice. Five of these benefits are discussed subsequently to show how they enhance student academic performance.

Test and Measurement Aids Retrieval and Retention of Knowledge

Retrieval and retention of knowledge in the academic process are key to measuring its success. Learning without retrieving or retaining the knowledge gained cannot be considered transformative since the learner may fail to apply the knowledge gained to daily life. [Putnam, Nestojko and Roediger \(2017: 95\)](#) assert that “one of the most effective learning tools available to teachers and students is retrieval practice. Also called the testing effect refers to the idea that retrieving something from memory not only measures what someone has learned but also changes the retrieved memory, making it easier to recall in the future.” This assertion indicates that a practice that leads to recalling what has been learnt is viable for effective learning. Hence, regular testing would aid the retention of the students and improve their academic performance. This is traceable to the fact that test-taking helps test takers deeply think about what they have learnt, and in the process, they recall what they have learnt.

Identification of Gaps in Knowledge

[Roediger, Putnam and Sumeracki \(2011: 8\)](#) reminiscently state that “taking tests permits students to assess what they know and what they do not know so that they can concentrate effort on areas in which their knowledge is deficient.” A reflection on this reveals that students would take time to study their areas of deficiency when they fail or miss a test score. Over the years, as a student, this writer attests to the view that students are made to see reasons to study when they are regularly tested. Failing a test or missing the mark on tests is known to puncture the ‘ego’ of students, and as a result, they give more time to study. Moreover, “frequent testing in classrooms encourages students to study continuously throughout a course, rather than to bunch massive study efforts before a few isolated tests (Fitch, Drucker and Norton, 1951 in [Roediger and Karpicke, 2006: 182](#)).” Hence, a regular test and measurement in higher institutions would encourage constant study among the students. Because, “students may take a practice quiz, realise which questions or items they got wrong, and then spend more time studying the items they missed ([Roediger, Putnam and Sumeracki, 2011: 8](#)).”

Learning more from subsequent learning episodes

Taking tests and measuring the performance of students of higher institutions prepares their minds to learn in subsequent learning episodes, probably because students, after a retrieval test, are made to revisit their study materials and, in the process, learn more than when they study without taking a test. From their study, questions concerning subsequent learning may arise, and their mind is prepared for the next learning episode(s). [Roediger and Karpicke \(2006: 182\)](#) evocatively state that “it is not the act of taking the test itself that influences learning, but rather

the fact that testing promotes learning via some process or processes.” Going further to explain this, they gave an instance that when a test provides feedback about whether or not students know particular items and the students guide their future study efforts accordingly, testing promotes learning by making later studying or encoding more effective; thus, testing enhances understanding through this meditating process.

Feedbacks to Instructors

Tests and measurements enhance students' academic performance by providing a platform for feedback to their instructor(s). When instructors are provided with adequate feedback on their student's performance on a course of study, they are encouraged to do more to assist the students in learning more. As a result of testing, teachers can encourage students they need improvement while improving their teaching method and application of lessons. Also, through feedback, teachers can compare the differences among their learners and seek ways to strengthen the weak ones. The [Directorate of Distance Education, Tripura University \(2016: 5\)](#) bolsters this by stating that “in the educational system, measurement is the quantitative assessment of the student performance in a given test. It can be used to compare performance between students and indicate their strengths and weakness.” The knowledge would help the teacher, and the student know their areas of strength and weaknesses and means of improving or understanding their areas of strengths. Moreover, [Putnam, Nestojko and Roediger \(2017: 98\)](#) aver that “providing feedback or providing students with the opportunity to restudy almost always magnifies the size of a testing effect.” Hence, with tests and measurements, the learner and the instructor are provided with the necessary feedback(s).

Encouraging Students to Learn

Students' performance can be improved through test taking as they are encouraged to spend more time studying. [Karpicke \(2017: 489\)](#) noted that “tests can also influence student motivation because knowing about an upcoming test often leads students to increase their study efforts.” This notion is true as, in noticeable numbers of cases, students tend to pay closer attention to their studies when they understand that they will be tested. Moreover, from experience, students are observed to study more during their test or examination week compared with other days.

Conclusion

Student academic performance in every educational system depends upon several factors that can improve or impair their performance. Educational testing and measurement are viable

means of enhancing students' academic performance. Educational testing and measurement are concepts associated with the learning progress and assess the outcome of any learning situation. Hence, educational testing and measurement are crucial to the educational system of any given country as it avails itself numerous benefits, such as feedback for both the learners and instructors, evaluation of knowledge gained, and identification of gaps to be filled, among others. This paper has discussed how tests and measurements can enhance students' academic performance, bearing in mind the context (Nigeria tertiary institution). Hence, it suffices to conclude that tests and measurements can be used in all educational institutions to enhance students' academic performance.

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