Science Q

Research Article

Association between Students Performance In Diagnostic And Readiness Tests in Secondary School Biology

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ABSTRACT

The purpose of the study was to find out the association between the students performance in readiness and diagnostic test scores in secondary school Biology. The design of the study was correlation and the population was all the 2256 students' secondary school II students in biology in the 2014/2015 academic session. Simple random sampling (battling without replacement) was used to sample 420 students from 14 secondary schools in Udi Local Government area of Enugu State. The instruments for data collection were diagnostic biology achievement tests (DBAT) and readiness biology achievement tests (RBAT). Pearson 'r' and t-test were used to correlate and test the research question and hypothesis at 0.05 level of confidence respectively. Based on the analyzed data, it was found out that out of the 10 schools studied, the relationship between readiness and diagnostic scores was significant in six schools, the relationship was significant in the co-educational and girls' schools but that was not significant in the boys' schools. Based on the findings of the study, the researcher recommended among other things that scores from readiness test could be used to make decision on students who might be unavoidably absent during the diagnostic test in Biology and vice versa.

Keyword: Fingerprints, attendance, enrolment, authentication, identification

INTRODUCTION

Evaluation is a process of assessing the desired behavioural change in the learners. These processes take into account all the skills, attitudes, abilities, behavioural changes and knowledge, in subject acquired by the students in a particular programme. The reasons for evaluation could be to judge the level of performance. Teachers need to know the successes of their students and in doing so, weakness in learning is revealed. Okoye (1997) stated that if evaluation is to be effective, the teacher must ensure the success of his students' learning and to receive feedback from them in order to enable the teachers to be sensitive to their needs. Evaluation techniques include readiness, diagnostic, practical, projects, questioning, marks and corrections. These different methods of evaluation are useful in the science in general and Biology in particular. It has been observed that the type of evaluation taking places in our schools strongly influence the type of study procedure used by students preparing for them, Maduabum (1984).It appears that teachers do not use readiness and diagnostic tests in the evaluation of students' performance in Biology. What makes a Biologist is not only how much information he/she has stored in his memory but the actual practice he receives in biological rigorous process, how he wonders, sets up a controlled experiment, his willingness to withhold judgments and how he realized the limitations of Biology. These are affected by not using readiness and diagnostic tests in evaluating Biology in the schools. Some of the benefits of using readiness and diagnostic tests in the evaluation of Biology are to provide opportunity to promote the scientific method of thought. Readiness tests extend and re-reinforce theoretical learning. Diagnostic tests promote problem solving and self-reliance in real life situation. Getting involved in readiness and diagnostic tests can also enable students to know much about their strength and weakness in science

subjects. Tests are at times administered before instruction is going on so as to find out their entry behavior. These tests aimed at providing feed back to the teachers and students. When a test is used to monitor leaning preparedness, readiness test is said to have been given. For the students, the test provides information as regards the willingness to learning while the teacher uses it to know the students previous knowledge on the topic/subject to be taught. When the teacher discovers, from the results of the test, that students have not learned as much as is expected, he may modify his instructional strategies. Usually scores obtained from readiness tests are not supposed to be included in the final grading of the student (Okoye in Ezeudu, 1997).

When a student continues to experience learning difficulties despite all efforts to improve him, there arises a need to engage in a detailed diagnosis of his learning problem. This exercise is carried out with diagnostic tests. Using a medical analogy, Okoye in Ezeudu (1997) saw diagnostic test as providing first aid treatment for simple learning problems and to identify underlying causes of those problems that do not respond to first aid treatment. In developing a diagnostic test in a subject, several component abilities necessary for successful performance in the area must be covered. Thus a diagnostic test usually contains many sub-tests, each aimed at measuring a particular component parts. Items of the test should also be constructed in such a way that students are given the opportunity of committing errors that will indicate their deficiencies. Thus the primary concern of diagnostic evaluation is not to find out how much the student scores but his area of difficulty. Diagnostic tests are most relevant in subjects where acquisition or some skills or knowledge is a condition for the learning of higher concepts. Readiness Tests are constructed for the purposes of determining the ability of a student to undertake a prescribed type of learning. The person's score will make it

possible for decision to be taken on whether he can benefit from appropriate training. Readiness tests have to do with highly specific kind of achievements such as reading, mathematics or language. Readiness tests in given school subject matter area are something also called *prognostic* tests. They are administered before formal instruction begins.

Readiness and diagnostic tests are employed in the evaluation of Biology are designed ultimately to produce educated individuals. Some of whom may or may not take to biological studies in their professional pursuits. However, in whatever professional they finally find themselves, it is hoped that the Biology education they have acquired in school will be of value to the totality of their education. Correlation study is highly useful in studying problems in education or in other behavioural sciences. This permits one to measure a great number of variables and their interrelationships simultaneously.

Pure or quasi-experimental method which manipulates one variable and attempts to hold others constants often introduces a high level of artificiality into research process in the behavioural science. Correlation or association however, is often preferable to experimental design in situations where control is necessary as it permits the statistical control of variable that we wish to hold constant and does so without changing the field situation.

Having justified readiness, diagnostic tests and rationale for the use of co relational study, it is pertinent to carry out a study on the association between students' performance in readiness, and diagnostic tests in secondary school Biology in Udi LGA.

Low performance of students in biology as a result of inadequate use of the claimed method of evaluation biology such as readiness, and diagnostic tests has been identified. Okeke (1985) found out that the method of evaluating biology in particular and sciences in general affect students' performance. Consequent upon this, the researcher wishes to study the relationship of using readiness test scores as a correlate of students' performance in diagnostic test scores in senior secondary biology.

The purpose of the study was to correlate students' performance in readiness and diagnostic tests in secondary biology.

This study was carried out in secondary schools two in Udi local government Area of Enugu state. It focused on readiness and diagnostic tests in Biology in the 2014/2015 academic session.

Research questions

What is the correlate of students' performance in readiness and diagnostic test in senior secondary school Biology?

Hypothesis: The hypothesis was tested at five percent (5%) level of significance

There is no significant relationship between students' performance in readiness and diagnostic tests in secondary school Biology.

METHOD

This study is a correlation study. It was aimed at finding out the relationship between students' performance in readiness and diagnostic tests in secondary school Biology.

The study was carried out in all the secondary schools in Udi local government area of Enugu state. Udi local Government Area has both urban and rural areas.

The population for the study comprised all the secondary school Biology students in 18 senior secondary schools in the Udi L.G.A in 2014/2015 session. The students were made up of 2256 secondary school (SS2) Biology students.

The study did not use all the 2256 Biology students in the 18 secondary schools in the Local Government Area. Ten (about 50%) schools were randomly sampled. Simple balloting without replacement was used to sample four co-educational, three boys and three girls' schools and at least 60% of each type was composed of secondary school two students.

A proportionate random sampling based on about 40% was used to sample the representatives of the four co-educational, three boys' and three girls' schools. These were drawn by simple balloting without replacement and the sample size was 420 secondary school (SS2) Biology students.

The scores from the 420 secondary school three (SS2) Biology students of the 10 sampled schools were extracted from biology scores. These data were collected by the researcher with the permission of the principals of the various schools.

In order to analyze the data, various tools were employed. Firstly, the Pearson's product moment correlation co-efficient was used to analyze the interval data and to find out the relationship between the two variables. The calculated Pearson's 'r' was tested for significance with t-test statistics at five percent confidence level The correlation coefficient were given qualitative interpretation based on the table 1 below

Table 1: Quantitative interpretation of correlation co-efficient

Correlation coefficient value	Interpretation
O.OOv-0.20	Very low/virtually no relationship
0.20-0.40	Low/ definite positive relationship
0.40 - 0.60	Medium relationship
0.60-0.80	High relationship
0.80-1.00	Very high/ near perfect relationship

Source: Nworgu (1992)

RESULTS

Research questions

What is the correlate of students' performance in readiness and diagnostic test in senior secondary school Biology?

Table 2: Pearson's 'r' and t-test of students' performance in readiness and diagnostic scores.

Schools	Pearson's	Calculated -t	Table -t
Co-educational (Overall)	0.75*	6.25	3.06
Girls (Overall)	0.71*	4.80	2.92
Boys (Overall	-0.16	-11.29	2.10

* Significant correlation co-efficient

Table 2 above showed that the relationship between readiness and diagnostic scores in SSII biology examinations was positive in the various school types. There was very low/virtually no relationship in the three overall boys' schools. In schools where the relationship was positive, the magnitude was between 0.16 and 0.75 which showed a range of very low/virtually no relationship to high relationship in the two school types (co-educational ad boys) the relationship was high with correlation coefficient of 0.70 and 0.75 respectively.

Hypothesis

There is no significant relationship between students' performance in readiness and diagnostic tests in secondary school Biology.

Out of the 10 schools studied, the relationship between readiness and diagnostic test scores was significant at five percent confidence level in six schools. While in the four schools, the

relationship was not significant. The relationship was significant in the co-educational, girls' but not significant in the boys' schools

DISCUSSIONS

From the analysis of the results, it was observed that the students' performance in readiness in relation to their scores in diagnostic was positive and significant in most of the schools types except in boys' schools (see table 2).

The variation in the magnitude of the correlation coefficients among the various schools is comparable to Daniel (1984) in which essay scores were correlated with practical scores in mock-WASC with WASC O'Level results. The findings were quite significant for they have revealed some degrees of reliability and validity that existed especially in the practical and essay tests. The variation in relationship between essay and practical scores which ranged from high to very low/virtually no relationship could be attributed to certain factors.

The high relationship could be as a result of adequate staffing, both qualitatively and quantitatively in the different schools and in Biology. Qualitative staffing involves the handling of the subjects by teachers who were adequately informed in the course of measurement and evaluation and in the subject matter. Quantitative aspect implies appropriate teacher-student ratio. Similarly, Ali (1986) observed that the quality of staff affects students' performance in Biology subjects. The existence of qualitative and quantitative staff attributes lead to high quality instructions and evaluation. The very low/virtually no relationship might be that the schools lack qualitative and quantitative teachers in Biology. Thus the available teachers would be engulfed in heavy workloads which reduce adequate teaching and evaluation processes. Inappropriate teacher-student ratio results to excessive workload. It could as well be attributed to lack of regular seminar and workshops to acquaint the teachers-with necessary skills needed for construction, administration and scoring of readiness and diagnostic tests; and the use of other evaluation techniques. These were highlighted in the work of Azikiwe (1989), Ebuoh, Nnaemeka and Nwosu (1989) and Okure (1989).

In the schools in which the relationship between readiness and diagnostic scores was not significant could be attributed to lack of qualified teachers. This affects among other things the quality of instructions, evaluation instrument and the neglect of other evaluation techniques. This might be why Maduabum (1984) noted that for testing to be effective, the professional teachers must use various techniques to evaluate the success of his pupils' learning and receive feedback from them to enable him to be sensitive to their needs. Negative relationship might be militated by the factors highlighted above and in addition, inappropriate scoring.

Significant relationship was observed in four co-educational schools. However, the relationship between students' readiness and diagnostic test scores varied from school to school and sex to sex. The factors which accounted for variations in the magnitude of relationship as emphasized earlier were accountable for the variations in various school types.

CONCLUSION

❖ The relationship in the students' performance in readiness and diagnostic biology test were positive and high in all the school types except boys' secondary schools.

❖ There was significant relationship between students' performance in readiness and diagnostic biology test in all the schools except in boys' schools.

RECOMMENDATIONS

The following recommendations were made Based on the findings of the study.

❖ Readiness could be used to make decision on students who might unavoidably be absent during the diagnostic test in Biology and vice versa

❖ It could be used on such students that due to error of omission, their scripts lost in either readiness or diagnostic tests in transit.

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