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CONSISTENCY OF STUDENT'S PERFORMANCE IN MATHEMATICS AND FINANCIAL ACCOUNTING

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Abstract

This paper was designed to find out the consistency of students' performance in Mathematics and Financial Accounting in Secondary School Certificate Examination in Akwa Ibom State, Nigeria. One research question and five (5) null hypotheses were formulated to aid the research. The variables used were consistency in performance in Mathematics and Financial Accounting in Secondary Schools over the last five years in Akwa Ibom State. The population of the study comprised 3529 final year students from six (6) secondary schools selected at random from the state who took the senior secondary school certificate examination (SSCE/WAEC). The data collected were analysed using the Pearson's Product Moment correlation co-efficient (r) to determine the consistency between students' performance in Mathematics and Financial Accounting. Five null hypotheses were formulated and tested in accordance with the objectives of the study. All the null hypotheses were accepted and the alternative hypotheses rejected. The study revealed that, there is no significant relationship between a good knowledge in Mathematics and Financial Accounting among students in Akwa Ibom State. Good students' performance in one subject may not necessarily influence the performance in the other subject. Based on the results obtained, the study suggested as remedies, students positive perception of their teachers instructional behaviour, teachers' improvement strategies, more effective motivational strategies and innovative approaches among others.

Key words: Predictive, Validity, Mathematics, Financial Accounting, Students' Performance.

Introduction

An important factor in the development of behaviour which is positive to the society of any nation, is education. The United Nations Development Program (UNDP) uses education as one of the components of its Human Development Indices (HDI). Most countries in the world apportion greater share of their budget to the educational sub-sector. For education to integrate a person into a society, it may be formal, informal or non-formal. Formal education is an organized or established form of knowledge in an established and an organized institution. The form of education which provides the basis for research work is gotten from the primary, secondary and tertiary institutions. In some countries such as ours (Nigeria), free and Universal Basic Education

is the policy that gives opportunity to every child to enroll in school. This programme has been accompanied by rapid growth of institutions of all levels. Akwa Ibom State of Nigeria is one of the beneficiaries of this programme. The research work is an appraisal of the consistency of the performance in Mathematics and Accounting in Senior Secondary Schools - a case study of Ikot Abasi Local Education Committee in Akwa Ibom State.

Mathematics has been defined in many ways by different authors, The Lexicon Webster's Dictionary defines Mathematics as a science of dealing with quantity, forms, measurement and arrangement. It is also define as a science that deals with methods of discovery using concepts and symbols,

properties and inter relationships of quantities and magnitudes. According to Elaine, (2013), Mathematics is the science that deals with the logic of shape quantity and arrangement. Mathematics is all round use in everything in our daily life including mobile services, art, money, architecture, engineering and even sports. Oredugba 2000 asserted that universality and versatility of mathematics at explaining as well as enhancing the understanding of physical phenomenon have made it an indispensable "tool subject" in the hands of scientist, all over the world. Hence, it is the bed rock and the life pointer to all pupils and students. No wonder, it is called the mother of all knowledge and it is made a compulsory subject in our school system. Since all modern scientific and business developments have been based on mathematics and there is no likelihood that this position will change. In this regard, Ekpe (2009) has argued that any nation that wants to develop must give emphasis to the study of mathematics and financial accounting which he sees as the chief determinant of economic development in the present day world. Financial account is that field of accounting that treats money as a means of measuring economic performance instead of as a factor of production. Financial accounts encompasses the entire system of monitoring and control of money as it flows in and out of an organization as assets and liabilities and revenue expenses.

Financial Accounting gathers and summarizes financial data to prepare financial reports such as balance sheets and income statements for the organizations management, investors, suppliers, tax authorities and other stakeholders. Thus, a business man who lacks or has a little knowledge of Financial Accounting could give room to fraud by unscrupulous accountants employed. In other words, a good knowledge of financial accounting could help prevent the collapse of business of any kind. In a nutshell, Mathematics and Financial accounting are very important to every Individual in various areas:

- i) The subjects are necessary in the formation of a liberally educated person. For better

understanding of these subjects general and powerful concepts must be developed to meet up with our needs in technological development and in the production of self-reliant individuals.

- ii) This is to meet up courses which constitute sound preparations in subsequent study of these subjects in higher level.
- iii) The usefulness of these subjects in practical matters have always been the factors that determine their validity as school subjects.
- iv) Finally, the subjects enable students to solve new problems and become liberated from the shackles of authority.

Generally speaking, there is hardly any field where Mathematics and Accounting are not useful. The farmer, carpenter, mason, bricklayer, the housewife, tailor and every other field of human endeavor makes use of Mathematics and Financial Accounting even though they might not be aware of this. Despite the importance of Mathematics and Financial Accounting, there are some factors that have significant impacts on the achievement of students. These are:

- i. School location: The relationship between the geographical location of the school and students' academic performance is still a matter of controversy. Some educational authorities argue that school location does influence performance of learners while others maintain the contrary. Edem (2002) maintains that the topographical area which provides adequate space for the building of classrooms, laboratories, dormitories and for the development of playground constitute a conducive environment for learning to take place. On the contrary, Okeke (2010) opines that school buildings alone do not enhance

good

performance in Mathematics and Accounting but to an extent where the student live and study.

- ii Sex and academic performance of students in Mathematics and Accounting. Generally it appears that boys tend to develop through the help of the society more positive attitude toward the study of Science, Mathematics and Accounts than girls. This therefore influences their varying achievements. In support of this Nwana (2007) asserted that boys usually received more encouragement and support from the parents and teachers to do Science and Mathematics than their female counterparts.
- iii The National Educational Research Council (2004) in one of the studies, observed that the poor teaching and poor learning result from unavailability of learning materials in most schools. Concerning students' performance Dalton's (2010) using various approaches in to the production of Education finds out that the student study time has a positive and significant effect on test scores. He argued that a student who devotes more time to his studies would have better achievement than others. Enivomelin (2010) also stated that academic performance is measured by recommendation and commendation of the public especially when looking for their children's admission. Furthermore in line with students' performance, psychometricians are of the view that a child's academic performance in a particular examination could be a good mirror to the forthcoming examination. To testify to this, Nwana (2007) maintained that "in most cases it is expected that those who perform in Post Unified Tertiary Matriculation Examination (PUTME) would also do well in their respective programmes". He further attested that the generated data from this test can be used in

predicting the performance of the students in their future programmes. Kpolovie (2002) also affirmed the usefulness of test in predicting students' future academic performance. In addition to this, he added that a good measuring instrument should therefore have some essential psychometric properties which include validity, reliability and usability. According to Onunkwo (2002), the coefficient of validity is from - 1 to +1. Thus, the nearer the coefficient of validity to +1, the higher the predictive strength of the test and vice versa. To this end, he also viewed that a high validity is an indication of high reliability of a test, that a test is highly valid and reliable if it serves as a good predictor of the future academic performance of the students.

Research Questions

The research question below was posed to guide the research work:

- To what extent is students' performance in Mathematics and Financial Accounting consistency over the period of the last five (5) years?

Statement of hypotheses

The following hypotheses were tested for the purpose of this study

1. There is no significant relationship between the students' performance in Mathematics and their performance in Financial Accounting at SSCE in 2010/2011 school year.
2. There is no significant relationship between the students' performance in Mathematics and their performance in Financial Accounting in SSCE in 2011/2012 school year.
3. There is no significant relationship between the students' performance in Mathematics and their performance in Financial Accounting in SSCE in 2012/2013 school year.
4. There is no significant relationship between the students' performance in

Mathematics and their performance in Financial Accounting in SSCE in 2013/2014 school year.

5. There is no significant relationship between the students' performance in Mathematics and their performance in Financial Accounting in SSCE in 2014/2015 school year.

Methodology

The study adopted descriptive survey design, aims at collecting and analyzing data to find out the consistency of students' performance in Mathematics and Accounting. The total population of the study comprised all final year students from the ten (10) Secondary Schools in Ikot Abasi Local Education Committee (L.E.C) who sat for West African Examination Council (WAEC) Examinations. The total of five thousand, five hundred and forty students offered both Mathematics and Financial Accounting from 2010 to 2015 Academic Years in all the schools. Six of these schools were considered for this study with a total sample size of 3,529 students who sat for SSCE Mathematics and Accounting throughout the five years. (2010-2015). This

study did not require a questionnaire but rather a computer print-out of West African Examination Council (WAEC) results as collected from the year 2010 /2011, 2011/2012, 2012/2013, 2013/2014, 2014/2015 in Mathematics and Accounting from each of the sampled schools principals.

The researchers considered the instruments used valid enough for this study since it is an already developed standardized (W.A.E.C) candidates' computer print results (CPR). More so, the questions were validated before the questions were administered and the results of properly administered examinations were released. The instrument is also known to have a very high reliability index being original copy of W.A.E.C results which is known to possess integrity and reliability. The data collected from the instrument were analyzed using Pearson Moment Correlation Coefficient (r) as seen below. The result was further converted to Critical Correlation Coefficient (z) to determine trend of the students' performance in Mathematics and Financial Accounting in the subsequent table;

Table 1.1: The relationship between students' performance in Mathematics and Financial Accounts

VARIABLES	$\sum X$	$\sum Y$	$\sum X^2$	$\sum Y^2$	$\sum XY$	r
Performance in Mathematics (x)	660		17582			
					15261	0.78
Performance in Financial Accounting (y)		581		14551		

The above table indicates a co-relational coefficient of 0.78. The result therefore implies that , there is a high positive relationship between students' performance in Mathematics and their performance in Financial Accounting.

Result

Research Questions 1:

To what extent does students' performance in Mathematics and Financial Accounting is predicted over the period of the last five (5) years?

Hypothesis one (1): There is no significant relationship between students' performance in Mathematics and Financial Accounting at senior school certificate examinations (SSCE) in 2010/2011 school year.

Table 2: Significance of the relationship between Students performance in mathematics and accounting in 2010/2011 school year.

VARIABLES	$\sum X$	$\sum Y$	$\sum X^2$	$\sum Y^2$	$\sum XY$	r	Zcal	Zcrit
Performance in Mathematics (x)	143		3955					
					3151	0.74	1.66	1.96
Performance in Financial Accounting (y)		120		2686				

From the above table it was indicated that the calculated Z (z cal) of 1.66 at 0.05 level of significance is < the table Z (z crit) of 1.96 and r at 0.74 shows that the null hypothesis (Ho) is accepted. This means that, there is no significant relationship between the two variables at 0.05 alpha level. The calculated value 1.66 < the critical value (Zcrit) 1.96. Hence, we accept the null hypothesis. This implies that there is no significant between students' performance in Mathematics and Financial Accounting at SSCE in 2010/2011 school year.

Hypothesis two (2): There is no significant relationship between the students' performance in Mathematics and Financial Accounting at SSCE in the year 2011/2012 school year .

Table 3: Significance of the relationship between students' performance in Mathematics and Accounting in SSCE 2011/2012.

VARIABLES	$\sum X$	$\sum Y$	$\sum X^2$	$\sum Y^2$	$\sum XY$	r	Zcal	Zcrit
Performance in Mathematics (x)	162		5466					
					4961	0.84	1.86	1.96
Performance in Financial Accounting (y)		151		14727				

The above table indicates Zcal = 1.86, the Z crit of 1.96. The null hypothesis is accepted.

- This implies that the relationship between students' performance in Mathematics and Financial Accounting in the above year is not significant at 0.05 alpha level. Moreover , since the correlation coefficient (r) is positive , it follows that students good performance in Mathematics also influences their performance in Financial Accounting positively.

Hypothesis 3: There is no significant relationship between students' performance in Mathematics and Financial Accounting in 2012/2013 school year.

Table 4: Significance of relationship between students' performance in Mathematics and Financial Accounting at SSCE 2012/2013.

VARIABLES	$\sum X$	$\sum Y$	$\sum X^2$	$\sum Y^2$	$\sum XY$	r	Zcal	Zcrit
Performance in Mathematics (x)	122		2808					
					2775	0.83	1.86	1.96
Performance in Financial Accounting (y)		113		3131				

The table above shows that the Zcal of 1.86 < the Zcrit of 1.96, the H0 is accepted. This implies that the relationship between the two variables is not significant at 0.05 alpha levels

Hypothesis 4: There is no significant relationship between students' performance in Mathematics and Accounting at SSCE in the 2013/2014.

Table 5: Significance of relationship between student's performance in Mathematics and Financial Accounts at SSCE 2013/2014

VARIABLES	$\sum X$	$\sum Y$	$\sum X^2$	$\sum Y^2$	$\sum XY$	r	Zcal	Zcrit
Performance in Mathematics (x)	130		3406					
					2622	0.72	1.61	1.96
Performance in Financial Accounting (y)		160		2336				

The result of the analysis as shown in the table 1.4 indicates a r value of 0.72. The Zcal as 1.61 and Zcrit as 1.96. The r value expressed a high relationship between the students' performance in Mathematics and their performance in Financial Accounting although the relationship

is not significant at 0.05 alpha level since Zcal < Zcrit. Thus, the Ho is accepted.

Hypothesis five (5): There is no significant relationship between students' performance in Mathematics and Financial Accounting in SSCE in the year 2014/2015.

Table 5: Significant relationship between students' performance in Mathematics and Financial Accounting in 2014/2015 school year

VARIABLES	$\sum X$	$\sum Y$	$\sum X^2$	$\sum Y^2$	$\sum XY$	r	Zcal	Zcrit
Performance in Mathematics (x)	130		3406					
					2622	0.72	1.61	1.96
Performance in Financial Accounting (y)		100		2336				

The above result from the table 1.5 above shows an r-value at 0.64 and the calculated z value at 1.43 and the table z at 1.96. The r-value expressed a strong relationship between the students' performance in Mathematics and Accounting even when the relationship is not significant at 0.05 alpha level since Zcal <

Zcritical. Thus, Ho is accepted. This implies that there is no significant relationship between students' performance in Mathematics and Accounting in 2014/2015.

Discussion of findings

The findings of the study as revealed by the analysis of data are in line with a lot of other writers and researchers in similar and related areas. The positive relationship that exists between the performance of students in Mathematics and Financial Accounting in SSCE examinations in Akwa-Ibom State between 2010/2011- 2014/2015 as seen in hypotheses 1-5 implies that, there are significant relationships between Students' performance in Mathematics and Financial Accounting at SSCE examinations in these school years in Akwa Ibom state. The results show that although there are high positive values for co relational co-efficient (r) but, the null hypotheses (Ho) hold that, there is no significant relationship between students' performance in Mathematics and Financial Accounting in those years. When z statistics was applied, r- values of 0.74, 0.83, 0.72 and 0.64 were found to be significantly significant as seen in tables 1-6. The unrelated relationship between Mathematics and the performance in Financial Accounting implies that students who are vested with the knowledge of Mathematics may not perform well in Financial Accounting and vice-versa. The degrees of association on relationship between students' performance in Mathematics and Accounting were 0.74, 0.83, 0.83, 0.72 and 0.64 respectively (Table 1.6). The percentage of association ($r^2 \times 100$) was found to be 54.76%, 68.8%, 68.89%, 51.84% and 40.96% respectively. These values represent the moderacy in the magnitude of relationship between students' performance in Mathematics and accounting, although, their relationships may not be significant. The coefficient of alienation $\sqrt{1 - r^2}$ were discovered as follows: 0.673, 0.558, 0.558, 0.694 and 0.768 respectively. These represent the degrees of lack of association between students' performance in Mathematics and Accounting. Thus, while the degrees of relationship were 0.74, 0.83, 0.83, 0.72 and 0.64 the degree of lack of relationship were 0.673, 0.558, 0.558, 0.694 and 0.768 respectively, and were found to be moderately high. When the percentage reduction in error of prediction (r^2) for students' performance in Financial Accounting was determined, the

values were 0.5476, 0.6889, 0.6889, 0.5184 and 0.4096. This implies that, we cannot exactly predict performance in accounting from the knowledge of performance in Mathematics by 54.76%, 68.89%, 68.89%, moderate relationship between Students performance in Mathematics and their performance in Accounting even when the relationship may not be significant.

Furthermore, the percentage of error of prediction ($1-r^2$) of the two variables were, 0.45%, 0.31%, 0.31%, 0.48% and 0.59%. Therefore, for predicting one variable, it confirms that, 54.76%, 68.89%, 68.89%, 51.84% and 40.96% of variations in students' performance in Mathematics cannot be explained be reference to performance in Accounting. Thus, the relationship between the students' performance in SSCE Account was not statistically significant. The magnitude of the relationship was mere moderate, and the percentage of predicting one variable from another was also moderately low.

The finding of this study is supported by the work of Anchor, Aligbe and Emmanuel(2010) who, using multiple regression for analysis, discovered that prelim and UME mathematics did not significantly predict SSCE Mathematics. They studied the predictive power of two selection examination scores on senior school certificate examination result of pre-degree science students of Benue State University using scores of 270 candidates that had record for Mathematics and Physics as their sample for the study.

This finding is also in support of the study carried out by Asuru and Ibiene (2008) who using Pearson moment correlation formular found out that JAMB scores can predict performance in the post selection test scores when they studied how far candidates' JAMB scores can predict performance in the post JAMB selection test. This lack of support may be attributed to the variance in the variables used.

Conclusion

This study was designed to find out the consistency of students' performance in Mathematics and Financial Accounting in Senior Secondary Certificate Examination

(SSCE). The study was carried out using six (6) Secondary Schools in Ikot Abasi Local Education Committee in Akwa Ibom State and it covered the last five academic sessions for each school. The instruments that was considered necessary for the work was SSCE candidates computer print results (CPR). This instrument was highly favoured with validity and reliability index. To aid the study, one research question and five (5) hypotheses were formulated to test the significance relationship between students' performance in Mathematics and Financial Accounting for a period of five years. The findings of the research reveal that in hypotheses 1-5 there is no significance relationship between students' performance in Mathematics and Financial Accounting in some case and also, there is significant relationship in their performances. This in general implies that, the performance in one subject may or may not influence the performance of the other.

Recommendations

The following recommendations were considered germane:

1. Teachers should improve upon their pedagogical skills in the teaching of these subjects.
2. Teachers should employ a good teaching/learning relationship with their students since a good or poor knowledge in one subject can influence the other.
3. Government should provide a good learning environment for students.
4. Proper counselling should be provided to the students as needs arises by either parents, guidance counsellors.

5. Parents should provide their children with adequate learning materials.

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