Research Journal of Finance and Accounting
ISSN 2222-1697 (Paper) ISSN 2222-2847 (Online)
Vol.6, No.1, 2015

Influence of Entry Grades in Mathematics and Principles of Accounting on Students Performance in Financial Accounting in Nasarawa State Colleges of Education Akwanga, Nigeria

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Abstract
This study examines the influence of entry grades in mathematics and principles of accounting on students' performance in financial accounting in Nasarawa state Colleges of Education Akwanga. The study had eight objectives and eight null hypotheses. Developmental research design was adopted for the study. In the test of null hypotheses, documentary records (students' performance in financial accounting and O'L grades in accounting and mathematics) of all the 115 NCE II Business Education students in the 2011/2012 academic session were used. Logistic regression was employed to test null hypotheses one to three, while t-test was used to test null hypotheses four to eight. All the hypotheses were tested at significance level of 0.05. The results of the test revealed among others that entry grades in mathematics and principles of accounting have significant impact on students' performance in financial accounting. Hence the researcher recommended that credit grades in mathematics and accounting should be emphasized as one of the entry requirements for students opting for business education in tertiary institutions in Nigeria. This will assist to enhance students' performance in financial accounting at tertiary institutions.
Keywords: Entry grades, Mathematics, Principles of Accounting, Financial Accounting, Performance

Introduction

Grades acquired in prerequisite subjects at secondary schools are one of the basic requirements for obtaining admission into tertiary institutions in Nigeria. It is expected that the grades obtained in prerequisite subjects at secondary school level can promote academic progress with regards to a more in-depth understanding and performance of students into their area of specialization. This assumption made all the programmes of studies in tertiary institutions in Nigeria to emphasize on at least credits grades in some relevant subjects. Based on this, most business educators maintained that any student opting for business education in tertiary institutions should have at least credit in mathematics and principles of accounting. It is believed the knowledge and skills acquired at secondary school in these subjects will help to develop in students' critical thinking, problem solving, team-work, time-management and writing skills. A search into importance of prerequisite subjects on students shows that it is very crucial for student's success at tertiary institutions. Scholars such as Alan and Stephen (2010) reported that prerequisite knowledge in the areas of math, economics, and accounting are of great importance to finance students. This opinion was also shared by Adamu and Musa (2012) who reported that basic skills and knowledge gained at secondary school helps to develop in students the understanding, critical thinking and technical skills to meet the educational challenges at higher education. Hence student's prior performance in prerequisite subjects at secondary school tended to carry over to success of students in tertiary institution.

Interestingly, several research works have considered a variety of potential predictors of academic success for college students and different techniques such as entry grades. It is assumed among scholars that entry grades and skills have impact on students' academic achievement. This position was earlier held by Willingham (1985),Young and Barrett (1992), Cabrera,Nora and Castaneda (1993), Mouw and Kkanna (1993), Eimers and Pike (1997) and Noble et al. (1999) who provide evidence that intellectual variables such as entry grades have influence on overall academic success for college students (not necessarily accounting students). A similar study conducted by Johnson and Kuennen (2006) shows that pre- and post-test scores are positively and significantly related to course grade, more so than variables designating which mathematics courses have been taken by students.

The skills required in mathematics and accounting are strong parallels subjects. These skills are very importance to accounting, business administration, business education, insurance and finance students in higher institutions. The skills in the subjects enhance student's reasoning and problem-solving skills. Bearing in mind the importance of these subjects, courses such as business administration, accounting, finance and a host of

others require a solid understanding of basic in skills and knowledge of accounting and mathematics for students opting for the programmes (Adamu and Musa 2012). Studies on prerequisite entry grades include that of Jubril (2011), Sani (2011) and Adamu and Musa (2012) singled out the impact of entry grades in either accounting or mathematics on students' performance in accounting. Considering the importance of accounting and mathematics skills on academic success of students in business related subjects, the researcher investigates the influence of entry grades in mathematics and principles of accounting on students' performance in financial accounting.

Statement of the Problem

Accounting is a very important term to our modern society. The tremendous growth of the business world which increased the complexities of accounting and financial reporting required skillful personal to teach the subject or handle the financial records. As a result, students' performance at tertiary institutions is considered as the basis to determine competent personal to teach or manage the financial records. The discipline of accounting and mathematics are concerned with accurate numerical measurement of precisely defined operational skills. Jubril (2011) discovered that the accounting and mathematics are resemblance within the educational settings. Sani (2011), Musa and Adamu (2012) earlier reported that approach in mathematics and accounting will serves as the foundation for student's success in accounting.

Despite the importance attached to accounting and mathematics on students opting for accounting, the general complain of students with myopic knowledge of the importance of prerequisite entry skills, is that emphasizing on it is a strategy for admission denial and have no impact on student's academic attainment. Earlier the study of Majasan and Bakare (1997) reported that entry grades was a poor predictor of academic performance and furthermore, that the degree performance cannot be linked to validity of grades obtained in the entry qualification. Ihiegbulem (1998) revealed that there is very low and insignificant degree of relationship between scores of students in the requisite theoretical education. A study by IhiegMomoh-Olle (1998) established that entry grades has poor predictive validity on performance party because non-equivalence of entry qualifications. The contradicting statement instigated the researcher to determine the influence of entry grades in mathematics and principles of accounting on students' performance in financial accounting.

Objectives of the Study

The study had the following objectives

1. Determine the influence of O'L entry grades in mathematics on students' performance in financial accounting in Nasarawa state Colleges of Education Akwanga, Nigeria.
2. Determine the influence of O'L entry grades in principles of accounting on students' performance in financial accounting in Nasarawa state Colleges of Education Akwanga, Nigeria
3. Determine the influence of O'L entry grades in mathematics and principles of accounting on students' performance in financial accounting in Nasarawa state Colleges of Education Akwanga, Nigeria.
4. Determine the difference in the mean performance of students in financial accounting who had credit and above in their O'L mathematics and those who have not.
5. Determine the difference in the mean performance of students in financial accounting who had credit and above in principles of accounting at O.L and those who have not.
6. Determine the difference in the mean performance of students financial accounting who have credit and above in mathematics and principles accounting at O'L and those that credit in mathematics only.
7. Determine the difference in the mean score of students in financial accounting who have credit and above in mathematics and principles of accounting at O'L and those that credit in principles of accounting only.
8. Determine the difference in the mean performance of students in financial accounting who have entry credit and above in mathematics and principles of accounting at O'L and those who have pass and below.

Null hypotheses

The following null hypotheses are tested at 0.05 level of significance

1. O'L entry grades in mathematics have no significance influence on students' performance in financial accounting in Nasarawa state Colleges of Education Akwanga, Nigeria.
2. O'L entry grades in principles of accounting have no significance influence on students' performance in financial accounting in Nasarawa state Colleges of Education Akwanga, Nigeria
3. O'L entry grades in mathematics and principles of accounting have no significance influence on students' performance in financial accounting in Nasarawa state Colleges of Education Akwanga, Nigeria.
4. There is no significant difference in the mean performance of students in financial accounting who had

credit and above in their O'L mathematics and those who have not.

5. There is no significant difference in the mean performance of students in financial accounting who had credit and above in principles of accounting at O.L and those who have not.
6. There is no significant difference in the mean performance of students financial accounting who have credit and above in mathematics and principles accounting at O'L and those that credit in mathematics only.
7. There is no significance difference in the mean score of students in financial accounting who have credit and above in mathematics and principles of accounting at O'L and those that credit in principles of accounting only.
8. There is no significant difference in the mean performance of students in financial accounting who have entry credit and above in mathematics and principles of accounting at O'L and those who have pass and below.

Methodology

Developmental research design was adopted for the study. This design enable the researcher to capture attitudes or patterns of past behavior and help researchers to plan and carry out descriptive studies by measuring the degree of relationship between two or more variables for purposes of describing and comparing such variables (Jong, 1999 and Shane, 2010). The Population of the study consist all the 115 NCE II Business Education students in Nasarawa state Colleges of Education Akwanga, Nigeria in 2011/2012 session.

The instrument used for this study was documented records. Documentary records used for this study are two. The first document was O'L results which were used to determine student's entry grades in financial accounting and mathematics and the second document was first year first and second semester student's results which were used to determine students performance in financial accounting. The documents were obtained in from records and examination office of the department. The researcher collected the data personally, this was done so as to ensure genuine and integrity of the data as opined by Hongxing (2006) and Monageng (2006).

Simple Logistics Regression statistics was employed to test null hypotheses one, two and three while t-test was used to test null hypotheses four, five, six, seven and eight. All null hypotheses are tested at significance level of 0.05. In the test of the hypotheses, when the calculated value of any tested hypothesis is found to be less than or equal to the critical value, the Null hypothesis was retained. On the other hand if the calculated value is greater than the critical value, the Null hypothesis was not retained.

Results of the Study

Analysis of data used to test the hypotheses is presented in Table 1 to Table 7

Null Hypothesis One: O'L entry grades in mathematics have no significance influence on students' performance in financial accounting in Nasarawa state Colleges of Education Akwanga, Nigeria

Result of test of null hypothesis one is as presented in Table 1.

Table 1: Regression analysis of influence of EGM on students' performance in FA

Model		B	Std. Error	T	Sig.	R-Cal	R-Crit	R^2	Adjusted R^2	Std of Estimate
1	Entry Grades in Mathematics	4.188	4.337	0.966	.217	.711	0.088	.506	0.041	4.361
	Performance in Financial Accounting	.903	.118	7.6532	.000					

Source: Field work 2013

Analysis of data used to test null hypothesis one revealed R-cal value of .711 against 0.088 for R-critical at $\alpha = 0.05$. The calculated (R = 0.827) was significant. The constant (Beta) was 4.188 with R^2 value of .506 which indicates 50.6% of the variability in PFA of business education students was determined by EGM. The analysis therefore shows that EGM has significant influence on student's performance in Financial Accounting. Hence the null hypothesis is not retained

Null Hypothesis Two: O'L entry grades in principles of accounting (EGPA) have no significance influence on students' performance in financial (FA) accounting in Nasarawa state Colleges of Education Akwanga, Nigeria

Table 2: Regression analysis of influence of entry grades in principles of accounting on students' performance in financial Accounting

Model			Std. Error	T	Sig.	R-Cal	R-Crit	R^2	Adjusted R^2	Std of Estimate
1	Entry Grades in Principles of Accounting	6.629	2.107	3.146	.000	.811	0.088	.658	0221	4.480
	Performance in Financial Accounting	.500	.061	8.197	.000					

Source: Field work 2013

Result of Regression analysis used to test null hypothesis two revealed score of .841 for R-cal which was found to be greater than 0.088 for R-crit. The constant (Beta) value of 6.629 with R^2 value of .658, the analysis therefore shows that EGPA has 65.8% contribution on student's performance in FA. Thus null hypothesis two is therefore not retained.

Null Hypothesis Three: O'L entry grades in mathematics and principles of accounting (EGMA) have no significance influence on students' performance in financial accounting (FA) in Nasarawa state Colleges of Education Akwanga, Nigeria.

Table 3: Regression analysis of influence of entry grades in mathematics and principles of accounting on students' performance in financial Accounting

Model		B	Std. Error	T	Sig.	R-Cal	R-Crit	R^2	Adjusted R^2	Std of Estimate
1	Entry Grades in Mathematics and Principles of Accounting	16.629	2.100	13.486	.000	.955	0.088	.912	0.3221	4.678
	Performance in Financial Accounting	.619	.080	7.738	.000					

Source: Field work 2013

Analysis of data used to test null hypothesis three shows that R-calculated was greater than the R-critical value (.955>0.088) at $\alpha = 0.05$. The observed value of (R = 0.955) was found to be significant. The constant (Beta) value was 16.629 with .912 for R^2. The result indicates that entry grades in mathematics and principles of accounting have 91.2% influence on students performance in financial accounting, the null hypothesis is not retained.

Null Hypothesis Four: There is no significant difference in the mean performance of students in Financial accounting who had credit and above in their O'L mathematics and those who have not.

Analysis of data used to test null hypothesis seven is as presented in Table 4.

Table 4: Test of difference in the mean performance students in financial accounting with credit and above in their O'L mathematics and those who have not

Respondents	N	Mean	SD	Mean Error	T-cal	T-Cri	Df	Sig. (2-tailed)
Credits above in O'L mathematics	73	67.01	1. .807	.108	2.45	1.96	106	0.000
Passes and below in O'L mathematics	35	42.35	.647	.258				

Source: Field work 2013

Result of the analysis in Table 4 revealed mean score of 67.01 for students with credits and above in O'L mathematics against 42.35 for those with passes, with standard deviations of 1.807 and .647 respectively. The observed values t-cal>t-cri (2.45>1.96) at significance level of 0.05 level, hence the analysis indicated that the there is significance difference in the mean performance of the two groups of students in financial accounting. Thus the null hypothesis is therefore not retained.

Null Hypothesis Five: There is no significant difference in the mean performance of students in financial accounting who had credit and above in principles of accounting at O.L and those who have not.

Analysis of data used to test null hypothesis seven is as presented in Table 5

Table 5: Test of difference in the mean performance students in financial accounting with credit and above in their O'L principles of accounting and those who have not

Respondents	N	Mean	SD	Std. Error Mean	T-cal	T-Cri	Df	Sig. (2-tailed)
Credits and above in O'L Principles of accounting	42	58.23	1. .985	.108	2.44	1.96	65	.001
Passes and below in O'L Principles of Accounting	25	41.05	1.011	.283				

Source: Field work 2013

Result of the analysis in Table 4.5 shows a mean score of 58.23 for students with credits and above in O'L Principles of accounting against 41.05 for those with passes and below their standard deviations stood at 1.985 and 1.011 respectively. The t-cal value was 2.44, greater than critical value of 1.96. The analysis indicated that there is significance difference in the mean performance of the two groups of students. Hence, the null hypothesis was not retained.

Null Hypothesis Six: There is no significant difference in the mean performance of students financial accounting who have credit and above in mathematics and principles accounting at O'L and those that credit in mathematics only.

Analysis of data used to test null hypothesis seven is as presented in Table 6.

Table 6: Test of difference in the mean performance students in financial accounting with credit and above in two of the subjects and those that had credit in mathematics only

Respondents	N	Mean	SD	Mean Errorn	T-cal	T-Cri	df	Sig. (2-tailed)
Credits and above in O'L mathematics and Principles of accounting	62	71.03	1. .972	.108	2.77	1.96	95	0.000
Credits and above in O'L mathematics only	35	65.01	1. .802	.108				

Source: Field work 2013

Analysis of data in Table 6 shows that students with credits and above in O'L mathematics and principles of accounting had mean score of 71.03 with standard deviation of 1.972, on the other hand those that had credits and above in O'L mathematics only had mean score of 65.01 with standard deviation of 1.802. The t-cal value was 2.77 found to be greater than critical value of 1.96. The analysis indicated that students with credits and above in the two subjects significantly performed better than those with credit in and above in mathematics only. Hence, the null hypothesis was not retained.

Null Hypothesis Seven: There is no significance difference in the mean score of students in financial accounting who have credit and above in mathematics and principles of accounting at O'L and those that credit in principles of accounting only.

Analysis of data used to test null hypothesis seven is as presented in Table 7.

Table 7: Test of difference in the mean performance students with entry credit and above in mathematics and principles of accounting and those who with credit in principles of accounting only

Category of Respondents	N	Mean	SD	Mean Error	T-cal	T-Cri	df	Sig. (2-tailed)
Credits and above in O'L mathematics and Principles of accounting	62	71.03	1. .972	.108	2.48	1.96	82	.0.002
Credits and above in O'L principles of accounting only	22	59.23	1. .986	1.115				

Source: Field work 2013

Result of the analysis in Table 7 showed a mean score of 71.03 with standard deviation of 1.972 3.for students with credits and above in O'L mathematics and Principles of accounting. Those that had credits and above in principles of accounting only scored 59.23 with standard deviation value of 1.986. The t-cal value was 2.48 greater than critical value of 1.96. The analysis indicated that students with credits and above in O'L mathematics and Principles of accounting performed better than those with credits and above in O'L principles of accounting only. Hence, the null hypothesis was rejected.

Null Hypothesis Eight: There is no significant difference in the mean performance of students in financial

accounting who has credit and above in mathematics and principles of accounting at O'L and those who have passes and below.

Analysis of data used to test null hypothesis seven is as presented in Table 8.

Table 8: Test of difference in the mean performance students with entry credit and above in mathematics and principles of accounting and those who with credit in principles of accounting only

Category of Respondents	N	Mean	SD	Mean Error	T-cal	T-Cri	df	Sig. (2-tailed)
Credits and above in O'L mathematics and Principles of accounting	62	71.03	1. .972	.108	1.99	1.96	91	0.000
Pass and below in O'L mathematics and principles of accounting	31	42.22	1.607	.258				

Source: Field work 2013

Analysis of data used to test null hypothesis 8 revealed a mean score of 71.03 and standard deviation of 1.972 for students with credits and above in their O'L mathematics and Principles of accounting. Those with passes and below in the two subjects had mean score of 42.22 with standard deviation of 1.607. The t-cal value was 1.99 greater than critical value of 1.96. The analysis indicated that students with credits and above in O'L mathematics and Principles of accounting performed better than their counterparts with pass and below. Hence, the null hypothesis was not retained.

Discussion of the Results

Result of the study shows that O'L entry grades in mathematics has significant contribution on students' performance in financial accounting. The finding agrees with that of Guest (2003) who reported that the relational level of cognitive complexity of mathematics that is achieved could facilitate student's performance in accounting courses thereafter. The finding was similar with that of Jubril (2011) who observed that mathematical knowledge and skills is very importance for students' success in accounting. Adamu and Musa (2012) emphasized that students with skills and knowledge in mathematics may have the potentials of coping up with accounting problems. He stressed that mathematics skill facilitate students knowledge and skills in accounting.

Analysis of data collected shows that O'L entry grades in principles of accounting have significant influence on students' performance in financial. Van Rensburg, Penn and Haiden (1998) observed that high school accounting had a more permanent or persistent effect on grades that are obtained on courses beyond first year accounting courses. Sani (2011) opined that initial accounting skills are important for students to understand accounting systems and financial statement analysis in future life. He stressed that academic and professional success in accounting will be facilitated by initial level of exposure in the course.

The study further revealed that student's grades in mathematics and principles of accounting have influence in their performance in financial accounting. The outcome of this study conceded with the findings of Eskew and Faley (1988) who maintained that previous exposure to accounting by way of college preparatory has influence on future performance of students in accounting. Kealey et al. (2005) also reported that critical thinking skills, overall GPA, aptitude mathematics and accounting prior to entering university, and majoring in accounting were significant predictors of examination performance in accounting course. Tan and Laswad (2006) earlier affirmed that the learning style and background of students without accounting background could be very different from that of students with accounting background.

Data collected further indicated that performance of students with credit and above in principles of accounting at O.L is better than those who have not. The finding further confirmed that of Michell (1988) reported that high school accounting had a positive effect on grades obtained at university level beginner's accounting course. The finding also confirmed the statement of Rowlands (1988) who opined that students who had previous exposure to accounting performed better than their counters parts in first year accounting course. Van Rensburg, Penn and Haiden (1998) observed that high school accounting had a more permanent or persistent effect on grades that are obtained on courses beyond first year accounting courses.

Result of the study again shows the performance of students in financial accounting who have credit and above in mathematics and principles accounting at O'L is higher than their mates that had credit in any one of the subject. The result of this finding is similar with that of Collier and McGowan (1989) reported minimum competency in arithmetic and accounting are necessary conditions for success in accounting programmes at tertiary institutions, Collier and McGowan emphasized that there is association between mathematics grades and scores in Intermediate Accounting. Lee and Less (2009) discovered that the accounting and mathematics the resemblance within the educational settings, hence initial grades in them is a predictor of future performance in accounting.

Conclusion

Based of the findings of the study, the researcher concluded that:-

i. students with good entry grades in mathematics and principles of accounting have the potentials of performing better. The skills will obviously facilitates their understanding and professional success in accounting at tertiary institutions.
ii. students with good grades in mathematics and principles of accounting secondary school level are more comfortable with numbers and have the chances of copping up with financial accounting challenges in the future academic endeavour at tertiary institutions.
iii. initial skills in mathematics and accounting at secondary school level plays significant role on students skills in accounting. Hence students with good entry grades in mathematics and accounting will have the potentials of performing better than their counterparts that have in only one.

Recommendations

Based on the findings of the study, the following recommendations were forwarded

1. Mathematical and accounting teachers in secondary schools should endeavour to cover their course outline, this will help to equip students with pedagogical content knowledge and skills require for success in accounting.
2. Mathematics and accounting teachers at secondary schools should explore strategies that will increased students' interests and their learning habits towards the subjects, this will help to motivate them and enhance their performance in the course.
3. At secondary school, mathematics and accounting teacher should use of take-home exams and assignments more often with students in the traditional classroom setting to offset disadvantage students in mathematics and principles of accounting might have.
4. Credit grades in mathematics and accounting should be emphasized as one of the entry requirements for students opting for business education in tertiary institutions in Nigeria. This will assist in students' performance and quality assurance of in business education.

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