Relationship between Students' Performance in Ordinary Level Mathematics and NCE Biology in Osun State College of Education, Ila Orangun, Nigeria

Farounbi, A. I.
School of Science, Osun State College of Education, Ila Orangun
Email: kunlefaroline@hotmail.com

ABSTRACT

The effect of ordinary level mathematics grade on students' performance in NCE Biology examinations was surveyed in this work with the aim of establishing whether mathematics as a prerequisite for biology will enhance students' performance in biology. The study looks for the relationship that exists between ordinary level mathematics and grade point average (GPA) of the students under study using secondary data. The data used include the result of senior secondary school examination of the students admitted to study Biology in the year 2005 and their results in NCE biology from part one to three. It is observed from the results that there is no significant difference in the GPA of the students that made high scores in SSCE mathematics and those with low scores but those that failed SSCE mathematics have GPA that is significantly lower to others. It is, therefore, recommended that passes in ordinary level mathematics should be made a prerequisite for admission to NCE biology.
Keywords: *Biology, Mathematics, Performance, Prerequisite, Score*

INTRODUCTION

There have been some studies that sought to pin out factors that influence students' performance and their findings point out to hard work and discipline as factors that can explain differences in students' grades. Some other factors such as previous schooling, parents' education, family income and self motivation have a significant effect on the students GPA as well. For example, Siegfried and Fels (1979) conclude that the student's aptitude is the most important determinant of his learning. Romer (1993) finds that class attendance is reflected significantly on the students' GPA. Devadoss and Foltz (1996) studied the effects of previous GPA, class attendance and financial status on the performance of students of some agriculture economics related courses. They concluded that previous GPA and motivation affect positively the current GPA. They also found that students who support themselves financially are likely to have better performance. Ellis, Durden and Gaynor (1998), in their study on the factors affecting student performance in principles of economics, found that the likelihood of a student making an A or B significantly decreases as the number of absences increase; when the student is a member of fraternity or sorority; and as the number of credit hours carried by the student during the semester increases. On the other hand, the chance of a student making an A or B in the course significantly increases with having taken a calculus course; a higher GPA; and higher SAT scores. Karemera

ISSN: 2141-6753

(2003) finds that students' performance is significantly correlated with satisfaction with academic environment and service received. He also finds that the existence of professional development programs and internship opportunities are associated with better academic performance. With regard to background variables, he discovers positive effect of high school performance and school achievement while there was no statistical evidence of significant association between family income level and academic performance at the same time, educational and cultural background matter. The classroom practitioners, notably the professional teachers of science and even non-science teachers believe that no student can make a head way in science and technology without a basic knowledge of mathematics and according to Taylor (1970), fewer people seem to be aware that mathematics carries the main burden in all of scientific reasoning and is the core of the major theories of physical science. In recent years, all fields of science have become more and more quantitative. The distinguishing feature of mathematics is its quantitative character. All sciences depend on investigations and all investigations depend on measurements and measurement is a branch of mathematics (Barnes, 1978).

Most investigators in the sciences are of the opinion that competence in mathematics is an essential part in the study of most courses in chemistry and physics. Barnes (1978) studied mathematics skills tests (MAST) for chemistry as a predictor of success in beginning college chemistry for science majors. Research findings indicated that mathematics skills test (MAST) had the highest Pearson r with the chemistry final grade. Students in science, engineering and technical education programmes in Nigeria are always required to study mathematics in addition to their respective major choices. Experience has shown that some students run away from the sciences and allied courses because of mathematics.

However, despite the students' attitude in the above regard, admission requirements into science (engineering and technical education) programmes still hold fast to their demands. The aim of this study is to know whether students' high level passes at ordinary level mathematics will lead to a corresponding performance in NCE biology. The results obtained will help to make recommendation on whether or not good grades in mathematics should be a prerequisite for admission into NCE biology. The following hypotheses were used to direct the study.

$H_0$1: There is no significant relationship between student's scores in ordinary level mathematics and NCE biology

$H_0$2: There is no significant difference between the Grade Point Average (GPA) of students that pass mathematics at ordinary level and those that failed.

METHOD

The design of the study is a survey. It made use of secondary data which were analysed using correlation analysis. The analysis compares recorded scores of students in Mathematics at Senior Secondary School Certificate Examination (SSCE) with their performance in Nigeria Certificate in Education (NCE) Biology. All the biology students admitted into the College in the year 2005 form the sample for this study. In all there are 60

ISSN: 2141-6753

students in four biology combinations:

- Biology/Chemistry,
- Biology/Computer Science,
- Biology/Geography and
- Biology/Integrated Science.

The students' scores were recorded from their individual personal academic files kept at the Departmental office. The students' scores in all courses set out for certification in NCE Biology were used in this study. Mean Grade Point Average (GPA) were analyzed according to students' performance at SSCE. Mathematical entry behaviour is grouped according to SSCE result. None of the students under study score A_1; students with B_2 and B_3 are rated as B; those with C_4, C_5, C_6 are rated as C; those with D_7 and E_8 are rated DE; and F for those admitted without pass in mathematics. The data were analyzed using ANOVA to test whether there is significant difference between the mean GPA of the students according to their mathematical entry behaviour.

RESULTS AND DISCUSSION

The mean GPA of the students from part one to three is presented on Table 1. There is no student with distinction in ordinary level mathematics. The corresponding one-sample statistics test of the result is presented on table 2, the level of probability is set at 0.05. There is no significant difference among the GPA values of students in categories B, C and DE hence the hypothesis that there is no significant relationship between student's scores in ordinary level mathematics and NCE biology is accepted.

The GPA of students in category F shows significant deviation from the other categories. The GPA of students in category F is significantly lower than those in the other categories, as a result of this the hypothesis that there is no significant different between GPA of students that pass mathematics at ordinary level and those that failed is rejected. The observation of this study shows that the performance of students at NCE biology does not directly correlate with their performance in SSCE mathematics; mathematics high achievers at SSCE did not show a corresponding high performance in NCE biology. Those that were admitted to study biology without SSCE mathematics among the students under study actually carry over their weaknesses to the NCE by performing least among the students studied.

Table 1: Mean GPA of students according to their ordinary level result.

SSCE Result	Mean GPA Part I	Mean GPA Part II	Mean GPA Part III
A	-	-	-
B	2.223	2.13	2.04
C	2.23	2.20	2.21
DE	2.28	2.25	2.37
F	2.30	1.51	1.98

Source: Correlation research results, 2013

ISSN: 2141-6753

Table 2: One-Sample Test of the students' GPA in biology at NCE level

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference		95% Confidence Interval of the Difference
				Lower	Upper	
B	40.992	2	.001	2.13000	1.9064	2.3536
C	250.968	2	.000	2.21333	2.1754	2.2513
DE	63.791	2	.000	2.30000	2.1449	2.4551
F	8.413	2	.014	1.93000	.9429	2.9171

Source: Correlation research results, 2013

CONCLUSION

This study aimed at investigating whether students' high level passes at ordinary level mathematics will lead to a corresponding performance in NCE biology. The findings of this study show that the performance of students at NCE biology does not directly correlate with their performance in SSCE mathematics; mathematics high achievers at SSCE did not show a corresponding high performance in NCE biology. Therefore with the observations made on this study, it is recommended that credit at SSCE mathematics should be made one of the criteria for admission to NCE biology.

REFERENCES

Barnes, L. M. (1978). *Mathematics Skill Test*. Georgia: Georgia State University Press.

Devadoss, S. and **Foltz, J.** (1996). Evaluation of Factors Influencing Students Attendance and Performance. *American Journal of Agricultural Economics*, 6: 499-507.

Ellis L., Durden G. and **Gaynor P.** (1998). Evidence on the Factors That Influence the Probability of A Good Performance in the Principles of Economics Course. University of West Georgia, *http://www.westga.edu/~bquest/1998/perform.html*

Harb, N. and **El-Shaarawi, A.** (2006). Factors Affecting UAEU Students Performance *The Sixth Annual U.A.E. University Research Conference*, 20-27

Karemera, D. (2003). The Effects of Academic Environment and Background Characteristics on Students' Satisfaction and Performance: The Case of South Carolina State University's School of Business. *College Student Journal*, 9, 115 -123.

Romer, D. (1993). Do Students Go to Class? Should they? *Journal of Economic Perspectives*,35, 57-61.

Siegfried, J. J. and **Fels, R.** (1979). Research on Teaching College Economics: A Survey. *Journal of Economic Literature, 55*: 923-969.

Taylor, S. J. (1970). *Exploring Mathematics Thought*. London: Gum and Co. Ltd.

ISSN: 2141-6753