Comprehension of Mathematical Language Ability, Gender and Socio-Economic Status as Correlates of Students' Performance in Computer Science

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ABSTRACT: *The study investigated the influence of comprehension of mathematical language ability, gender and socio-economic status in Computer science at Nigeria Certificate of Education (NCE) level. This is an expo-facto research design because of data used for this study are existed. This study sample comprised of 143 Students in the department of Computer science of Adeyemi College of Education, Ondo, Ondo State, Nigeria. The data collected through the use of a preformed, were coded and subjected to statistical analysis of correlations, t-test and multiple regression to test the hypothesis generated at p > 0.05 level of significant. Results showed that comprehension of mathematical language ability, gender and socio-economic status have significant correlation with the performance in Computer science. It was recommended that Mathematics vocabularies should always be explained to the students*

Key Words: *Mathematics language ability, gender, socio-economic status, correlates, students' performance.*

Introduction

Mathematics is a dynamic and elegant field of human creation which involves a process and a way of being that can be learned. It is conceived as an intelligent communication among entities and a useful tool in science (Olukanni, 2003). The knowledge of Mathematics is basic to science and technology. It is a pillar upon which scientific and technological advancement rest Popoola, 2008) .It serves the unique premise of being the foundation upon which all forms of the scientist discoveries are built. Akinsola (1994) opined that most of the scientific and technological discoveries are found to be mathematically oriented.

Well equipped Mathematics laboratory presently has enormous impact on science and the society. The information technology (IT) of today has transformed the world into a global village. Almost every facet of our daily living is affected by the computer as a result of our accelerated drift into the technological age. Ranging from economic, political, and religious to educational sector, the computer has almost taken over and it continues to take over many manual labors. Since, the computer can read, sort, store and rapidly retrieve huge amount of information or data, it is often used to stimulate well-known activities of human brain such as reading, comparing, memorizing and recalling (Akanbi, 2005).

The technology of using computer and all its resources to process data and the information from one place to another is referred to as computer technology. Computer technology can be valuable for the teaching and learning of sciences in our schools since it open up opportunities for developing innovative assessment tools in science education.

The basic instruments for communication remain wields , signs gestures and numbers for most of the time in science and technology classrooms , words are used to communicate. Numerous researches have been done on the kind of verbal transactions in such classrooms findings vary considerably in their details but remain the same (Abmbolam, 2005) unlike other discipline. Scientists have their unique language however, the acceptable language of communication among scientist varies from one discipline to another .According to Jimoh (2005) in the field of Mathematics, the use of numbers, symbols, diagrams lines .formulae and identities is an acceptable language of communication among Mathematics symbols such as U and represent union and intersection respectively of mathematicians diagrams and lines such as "Δ . < and // connote triangle, angle and parallel line respectively while identities and formula such as cos 2Θ + sinΘ2 = 1, sin 2A =2 sin A cos A v =Π rh are best understanding by Mathematics (Aduroja, 2005).

Performance of students can also be influenced by other characteristic such as gender and socio-economic status. Gender has been one of the prominent factors that influence performance in computer science (Makinde 2006).It was documented that disparity existed between male and female students

performance in Mathematics . Makinde (2006) and Balogun (2000) affirmed that girls were been discouraged from taking advance courses in certain subjects areas such as Physics, Computer science and Mathematics because they were considered infemines. In the same opinion Adetuwo (2002) indicated that boys are more disposed to Sciences and Mathematics than girls.

Occupation is an –instrument which can be used to measure the level of socio-economic status of parents which reflects in the academic achievement of their children Alonge (2005) showed that students whose parents were scientist tend to choose science course. In contrary, Balogun (2000) indicated that parents occupation have no significant influence on choice of physical science

Hypotheses

The following hypotheses were tested at 0.05 level of significance:

$H0_1$: There is no significant difference between students Mathematics languages and their performance in Computer science.

$H0_2$: There is no significant difference between the performance of the male and female students in Computer Science.

$H0_3$: There is no significant difference between the performance of the students' Socio-economic background and Computer Science.

Methodology

This study is purely expo- facto because the data used were in existence . This study population is made up of 143 NCE I, NCE II and NCE III Computer science students in Adeyemi College of Education, Ondo, Ondo State, Nigeria. The data used for the study were collected through the preformed called socio-economic status and achievement format (SEBAT).

The data for the study were collected from the students and the selection based on their socio-economic and cross- checked from their file. The grades in term of cumulative grade point average CGPA were collected from detailed mark sheet (DMS) from the Head of department of computer sciences.

The data collected from the study were subjected to appropriate descriptive and inferential statistics techniques .The descriptive statistics which involved correctional matrix while inferential statistics such as t-test used.

Results and discussions

Hypothesis One

$H0_1$. There is no significant difference between the students' mathematical ability and the performance in computer science.

Table 1 Comparison between students' mathematical ability and the performances in computer science using correctional matrix.

Variables	C1	C2	C3
M1	0.65*		
M2	0.40	0.62*	
M3	0.63	0.42	0.68

Table 1 shows positive relationship between comprehension of mathematical language ability and computer science between 0.40 and 68. This relationship is further confirmed with the computed fishers z transformation, which is significant at 0.05. This means that students' mathematical ability have significant relationship with their performances i n Computer science. In classroom situations students who have difficulties in comprehension of mathematical language ability may not be able to perform well in exercise involving computation.

Significant results at 0.05 level table /above shows that C1 , C2 and C3 represent the performance of students in Computer science at the end of academic session in part 1,2 and 3 respectively and m1,m2, and m3 represents the performance of students in Mathematics in part 1,2, and 3 respectively. Going through all the correlation coefficients ,one observed that they are all significant at 0.05 level since the correlation coefficient are significant according to Kalehaiye (1992) who found that ability to calculate, comprehend mathematical problem has a significant relationship with students performance in computer science.

Hypothesis Two

$H0_2$: There is no significant difference between the performance of the male and female students in Computer science.

Table 2: t-test showing the performance of male and female students in Mathematics

Variable	N	X	S.D		dF	t.cal	t-table	P
Male	123	1.75	2.03		194	2.52	1.96	Ns
Female	73	1.83	1.65					

Result significant at p <0.05 level

Table 2 showed the result is significant at 0.05 level. The table revealed that gender difference influence the mathematical comprehension of students ability and Computer science since the value of t-calculated value which is 2.52 is greater than t-table 1.96 at 0.05 level of significance. That is, there exist a significant difference between male and female students ability in mathematics and computer science

Hypothesis Three

H03:- There is no significant difference among socio-economic status, comprehension of mathematical performance of students in computer science.

Table 3: Multiple regression analysis on the effect of parental socio-economic status comprehension of mathematical language and gender on student performance in Computer science

Multiple R	0.8402
R^2	
Adjusted R^2	
Standard Error	

Table 3 showed the value of R to be 0.8402, this value indicate the proportion of the strength of associating between the students performance in computer science and the independent variables (comprehension of mathematical language ability gender and socio- economic status)

Resultantly, there was a positive relationship of 0.8706 between students socio- economic status, comprehension of mathematical language ability and gender

Discussion

The study showed that comprehension of mathematical language ability enhance positive effects on the performance of student in Mathematics . This work is in line with Makinde (2006) who confirmed that in a situation where a students does not know and comprehend mathematical terminologies and what they represent, it becomes difficult if not totally impossible for such student to comprehend all mathematical subjects like Computer science. Table ii also indicated a significant difference in gender performance in comprehension of mathematical language and Computer science. This was supported by Popoola (2000) and Adetuwo (2002) in an experimental study showed that boys performed better than girls in Science and Mathematics . The result from table 3 showed that there was a significant relationship between parents occupation and the academic performance of students . The findings supports that of Makinde (2006) who asserted that parental occupation is one of the indices of socio-economic background and it has significant relationship with academic performance of their children

Conclusion

The findings from this study confirmed the existence of significant relationship between comprehension of mathematical language ability and academic performance of students in Computer science. It could be concluded that ability to comprehend mathematical language are very necessary and essential in Computer science .Lack of this mathematical terminologies symbols, diagrams notation and signs are barrier to students in learning most of concepts in Computer science.

It could also be concluded from the results of findings that gender and socio-economic background of students play vital roles in the performance of students in Computer science and Mathematics

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Mathematics teachers should introduce new topics to the students with explanation on all the new vocabularies , terms ,notations and symbols in the topic.
2. English language teachers should wake up to their responsibility of teaching effectively to uplift the general reading ability of English language among the students.
3. Parent should lay emphasis on their children education by devoting their resources to buy all the necessary instructional materials especially Computer machine and other peripheral to enhance the

good performance of their children in Computer science.

4. Guidance and counseling unit in the schools should take good care of gender issue in child development.
5. The teacher should be awarded of the fact that the students come from different socio-economic background as in effect, they should use it as a device to encourage students that are weak academically that they should endeavour to handle each student according to their level of understanding at a given situation.

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