

**Understanding Mathematics Terms; A Panacea for Basic General  
Mathematics Improvement in Colleges**

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**Abstract**

*This research on understanding mathematics terms; a panacea for basic general mathematics improvement in colleges, investigated the relationship between students understanding of mathematics terms and their performance in basic general mathematics. To achieve the purpose of this study, one null hypothesis was formulated from one research question. A survey design was employed for the study. Two hundred (200) college students were selected by a simple random sampling technique. The instruments for data collection were the Test of Mathematical Terms Reading Ability (TMTRA) and the Mathematics Performance Test (MPT). Data obtained were analysed using Pearson's Product Moment Correlation ( $r$ ). Tested at  $P > 0.05$  level of significance. The result showed that the calculated  $r$ -value (0.322) was higher than the critical  $r$ -value (0.139) which implies that there is a significant relationship between students understanding of mathematical terms and their academic performance. From the findings it was concluded that emphasis should be laid on explanation of terms found in mathematics to improve understanding of the subject.*

**Introduction**

Mathematics is the science of numbers, quantities and shapes and the relationship that exists between them. It is also seen as the science of numbers and their operations, interrelations, combinations, generalization and abstraction of numbers, and of space configuration and their structure, measurement, transformations and generalizations.

Mathematics is one of the major subjects introduced into the teaching and learning process throughout the world due to its relevance to human existence as well as the growth of the society and the world at large. The importance of mathematics as a subject in schools and in everyday life cannot be overemphasized. That is why it is considered to be an indispensable tool in the study of science, humanity and technology (Ofonime 2016).

Mathematics is a core subject in the secondary school curriculum in Nigeria because it is the rudiment of all scientific careers such as medicine, engineering and pharmacy. Proficiency in mathematics is of basic importance to the study of subjects such as physics, chemistry and biology, not only at the advanced level, it also aids in the understanding of the elementary principles of science subjects (Edoho & Uwase, 2017).

However, Mathematics as a school subject and discipline has its own peculiarity. This peculiarity lies in the language of mathematics and the simple philosophy behind the growth of the subject and its teaching and learning (Ekwueme 2003).

The language of mathematics is the system used by mathematics and especially mathematics teachers to communicate mathematical ideas among themselves and among students in the classroom. This language consists of substrate of some natural language (e.g English) using technical terms and grammatical conventions that are peculiar to mathematical discourse, supplemented by a highly specialized symbolic notation for mathematics formulae (Asuka, 2001).

The learning and teaching of mathematics is tied to the understanding of mathematical terms by both teachers and learners in the classroom. According to Edoho, Inyang & Uwase (2018) there have been changing expectations concerning what mathematics teachers should know. Arithmetic skills and a little algebra were once all that were required for the teaching professions in mathematics. Now, with the explosion of computer sciences and mathematics fields, there are increased mathematics skills needed for communication and understanding in the classroom. This means that teachers must be able to instruct their students in the correct mathematical terminology and problem-solving skills needed to be successful later in life and improve in their basic mathematics in schools.

### **Research Review**

Proficiency with mathematical terms is critical to the foundation of basic general mathematics understanding in colleges. The basic general mathematics curriculum provides that upon completion of college programme, particularly the colleges of education three year programme for the acquisition of the Nigeria Certificate in Education (NCE), the students should have proficiency with rational number concepts and numeration, algebraic processes, geometry and statistics. This was part of the inclusive effort of the National Council of Teachers Mathematics (NCTM) reform of 1970 which was also adopted by the Nigeria Commission for College of Education (NCCE) in 1989.

However, for the basic mathematics policy to be actualized, efforts must be targeted towards improvement of the teaching and learning of the subject in classrooms as they have always been complaints about how poorly students perform especially when tested using understanding of the mathematics vocabulary. The vocabulary of mathematics must be looked upon as a unique language that must be meaningful and consistent if the students are expected to communicate and apply mathematics with proficiency (Monroe 1996).

According to the National Council of Teachers of Mathematics (NCTM) the goal of Mathematics terms proficiency is to become fluid and natural with the language so that students may either speak or write to enhance their Mathematics work (NCTM, 1989).

### **Mathematics Terms**

Like any other profession, mathematics also has its own brand of technical terminology. In some cases, a word in general usage has a difficult and specific meaning within mathematics. Examples are group, ring, field, category, term and factor. In other cases, specialist terms have been created which do not exist outside mathematics; for instance factor, divisor, addend, and remainder. Mathematical statements have their own moderate complex taxonomy being divided into axioms, conjecture, theorems, lemmas and corollaries (Ofonime, 2016).

Most notably, mathematical notation used formulas as its own grammar, most dependent on a specific natural language but shared internationally by mathematicians regardless of their mother tongues. This includes the conventions that the formulas are written predominantly from left-to-right. Also, when writing systems of the substrate is right-to-left and that the Latin alphabet is commonly used for simple variables and parameters, formulas such as  $1/u + 1/v \geq 1/F$  is understood by Chinese and Syrian mathematicians alike. The formula above can be considered a sentence or sentential phrase in which the “greater than or equal to” symbol has the role of a verb. If students could hear terms used in mathematics context and use them properly during discussions and in their writing to describe the mathematics they are doing or learned about, then the goal of basic general mathematics in colleges is attained.

### **Statement of problem**

The language of mathematics is essentially the grammar of natural language used as substrate, but with several mathematics specific peculiarities. This language often confuses students and is sometimes difficult for the teacher to explain the meaning of mathematical terms simply and accurately. This paper offers an up-to-date analysis of teachers’ and students’ understanding of mathematics terms and how this simple, clear and precise understanding of the terms will improve the students’ performance of general mathematics in colleges of education.

### **Purpose of the study**

The purpose of this study is to find out the relationship between students’ understanding of mathematical terms and their performance in basic general mathematics in college of Education.

Specifically, the study seeks to:

Determine the extent of relationship between mathematics terms and students basic general mathematics performance.

### **Significance of the study**

This study is important because the findings will be useful in the following way:

Firstly, the research will expose teachers to rudiments of mathematics teaching and the demystification of mathematics vocabularies to enhance understanding.

Secondly, the high rate of failure experience by students in recent time resulting from lack of understanding of mathematical terms will be drastically reduced.

Finally, the society, educational planners and administrators shall benefit greatly from this finding because it will help in restructuring and reforming the school curriculum for effective teaching and learning processes.

### **Research Question**

In order to guide the research, the question was stated thus: How does the understanding of mathematics terms influence students' performance in Basic General Mathematics in Colleges.

### **Research hypothesis**

The null hypothesis for the study is as follows:

H<sub>0</sub>: There is no significant relationship between students understanding of mathematical language and their academic performance in Basic general mathematics in colleges.

### **Research design**

The survey research design was employed in this study:

### **Research instrument**

The researcher administered two self-structured instrument developed for data collection. The instruments were Test of Mathematical Terms Reading Ability (TMTRA) and the Mathematics Performance Test (MPT).

The Test of mathematical terms reading ability (TMTRA) consisted of twenty (20) items designed to measure the following;

- a. Ability to translate in English to a corresponding mathematical statement.
- b. Ability to express mathematical terms in simple sentence or statements.
- c. Ability to relate meaning to different terms used in mathematics.

The Mathematics Performance Test (MPT) consist of twenty multiple choice question drawn from the basic General Mathematic Curriculum for Colleges. The instruments were validated by experts in mathematics and test and measurement for content and construct validity, the reliability of the instrument using the spilt-half method was obtained. A reliability coefficient of 0.73 was obtained and 2.50 mean for the research question on four point likert scale.

### **Sample**

Two hundred students were selected across various programmes in the Cross River State College of Education Akamkpa, using a simple random sampling technique.

**Data analysis technique**

The data obtained from the students were analyzed using pearson’s product moment correlation for hypothesis and computed at 0.05 level of significance.

H<sub>0</sub>: There is no significant relationship between students understanding of mathematical language and their academic performance in basic general mathematics in collages.

Table: Pearson product moment correlation (r) between students mathematical terms understanding and their performance in mathematics

Variable	N	Σx	Σy	Σx <sup>2</sup>	Σy <sup>2</sup>	Σxy	r-cal	r-cri	Remarks
Mathematics terms	200	2282		28094					
						28828	0.322	0.139	Sig
Mathematics performance test (mpt) (y)	200		2465		32690				

**Result interpretation**

Table 1.0 show that the calculated r-value is 0.322 is greater than the r-critical of 0.139 when tested at 0.05 level of significance; this indicates a positive correlation between students understanding of mathematics terms and their performance in mathematics. It implies that as the understanding of mathematical terms increase the performance increases. Since the calculated r-value is greater than the critical r-value. Therefore the null hypothesis is rejected which implies that there is a significant relationship between mathematical terms understanding and performance in mathematics.

**Conclusion and Recommendation**

The research work examined the understanding of mathematics language terms as a panacea for basic general mathematics improvement in college. From the research analysis it shows clearly that the calculated r-value of 0.322 is higher than the critical r-value of 0.139, this implies that the understanding of basic mathematics terms directly influences the performances of the students in mathematics positively.

However, the mistakes teachers make in trying to teach basic concepts of mathematics in classrooms is that they dwell more on solving problem without recourse to the fact that students do not understand the wordings, composition as well as the terms used in expressing most mathematical problems and solution. These trends cause confusion among the students and limit their understanding.

However, this study recommend that mathematics teachers dwells more on the meaning of terms found in mathematics with in-depth explanation of their application to solving problems.

Furthermore, the government at all level has a role to play in improving students mastery of content by providing and making available to all students a simplified mathematics dictionary where students can peruse at all point in time.

Finally, curriculum and educational experts should incorporate mathematics glossary in examination papers to give students easy glance to words and terms that may be difficult in understanding.

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