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INFLUENCE OF LANGUAGE BARRIERS ON TEACHING AND LEARNING OF MATHEMATICS IN JUNIOR SECONDARY SCHOOLS IN GWAGWALADA AREA COUNCIL OF FCT ABUJA, NIGERIA

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Abstract
This study examined the influence of language barriers on teaching and learning of Mathematics in Junior Secondary Schools in Gwagwalada Area council of FCT Abuja, Nigeria. Specific objectives of the study were to determine the influence of mother tongue in the process of teaching and learning of Mathematics; ascertain the influence of wrong usage of words on teaching and learning of Mathematics in Junior Secondary Schools; and find how the wrong description of concepts affect teaching and learning of Mathematics in Junior Secondary Schools. The study adopted a descriptive survey design. The population for this study comprised all the 188 Mathematics Teachers from Universal Basic Education (UBE) Junior Secondary Schools in Gwagwalada Area Council of FCT Abuja. The entire population of 188 Mathematics Teachers were used for the study as sample. The instrument used for data collection was a questionnaire constructed by the researchers titled "Influence of Language Barriers on Teaching and Learning of Mathematics (ILBTLM)." Both face and content validity of the instrument was ascertained by the researchers being experts in Mathematics Education, Tests and Measurement while the reliability of the instrument was carried out using Cronbach's Alpha. A coefficient 0.81 was obtained. Data analysis was done using Mean and Multiple Regression. Finding revealed that revealed that the students cannot operate meaningfully when the concept is too difficult for them to conceive, the mother tongue of the teacher hinder or prevent the students from pronouncing Mathematical words correctly. The study found that most of the Mathematics teachers use words wrongly in the process of teaching and learning. It was found that concepts wrongly described by teachers, hinder/prevents the students from distinguishing one concept from the other. The study concluded that language barriers influence teaching and learning of Mathematics in Junior Secondary Schools in Gwagwalada Area Council of FCT Abuja. It was recommended that use of mother tongue to teach students should not be encouraged as it affects teaching and learning of Mathematics.

Keywords: Language Barriers, Teaching, Learning, Mathematics and Junior Secondary Schools

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Introduction

The language used to convey mathematical ideas to students has become topic of concern. When the language of instruction is English, the learning of Mathematics by students for whom English is a second language raises some important issues. Since English language is not our Mother tongue, many teachers/students who are not proficient in the language find it difficult to teach or learn and write expressing their ideas using the medium of English language. The students are then placed in a double jeopardy (harm or failure). This situation is known as language barrier.

A language barrier is a figurative phrase used primarily to refer to linguistic barriers to communication. That is the difficulties in communication experienced by people or groups speaking different languages, or even dialects in some cases (Spencer-Rodgers, 2002). Language barrier is a term used to imply all the problems faced by an individual as he tries to communicate with a group of people who speak a tongue other than his own. It is prevalent in settings which involve the conglomeration of people from different cultures, speaking different languages. It is also used as a blanket term for all the difficulties associated with the learning of a foreign language (Shohamy, 2005). In a similar vein, Pia (2015) noted that factors that inhibit or prevent people from participating in activities are referred to as barriers, constraints, deterrents, impediments, or obstacles.According toPia (2015), there are many causes of language barriers. These include difference in accent; phrases and Idiom; structure of English; culture; slang and language style.

According to Ledibane, Kaiser and Van der Walt (2018), teachers of mathematics are advised to focus more on language acquisition because, first, it is frequently a predicted result of mathematics instruction, and second, there is proof that language.Mathematics educators working with students whose native language is not English need to be more cognizance of what is known about the complex process of learning a second language. To a large extent, the process is similar to that of learning ones first language; the process begins with a period of listening to the sounds and words of the language followed by attempts at speaking.The interest in the relationship between language and learning in general is not new. Language determines and defines thought. The acquisition of mathematical ability is a subtle process (not easily understood or hard to grasp) but between the learner and the teacher is imperative, and this depends on effective communication. This is always affected by incorrect usage of words.

Incorrect usage of words is the unintentional misuse of a word by confusion with one of similar sound, especially when creating a ridiculous effect. It is an incorrect or unsuitable name or term for a person or thing. This is also an attitude of speaking incorrectly, improperly, or misleadingly. An example is the word median; median can mean the line that is drawn from the vertex to the midpoint of the opposite side. However, median can also mean when data is put in numerical order and the middle data point is found. Both of these words do relate to the middle, and teachers need to help their students make this connection (Rubenstein & Thompson in Flanagan, 2009).

Mathematics can be seen like a strange foreign language when the teacher uses wrong description of concepts; the students fail to distinguish between one object and idea to another. Patkin (2011) opined that students consequently "drag" the meaning of terms from common speech into the language of mathematics, which frequently leads to errors and misunderstandings. Wrong description of conceptsin mathematics means that the teacher uses words that students do not understand which ideas are key by not being able to draw inferences about those ideas and students do not grasp the heuristic value of those ideas. They

are thus not able to use them strategically to solve problems especially non-routine problems. This leads to common misunderstandings as well as inflexible knowledge and skill in Mathematics. For instance, students do not understand connections between counting and addition and subtraction (e.g., adding two is the same as counting on two). They use properties of addition to add whole numbers and to create and use increasingly sophisticated strategies based on these properties (e.g., "making tens") to solve addition and subtraction problems within 20. Another common conceptual problem is understanding that an equal sign (=) refers to equality that is, mathematical equivalence.

Abiri in Oginni and Owolabi (2013) stated that Mathematics taught in a child's mother tongue has a lot advantages such as overcoming limited knowledge of foreign mathematical vocabulary. Teaching in mother tongue also bring closer to children mathematics example and concepts, it helps the children to develop a mathematical vocabulary in the mother tongue. It equally helps adults who are not literate in English to understand and appreciate mathematics. Obodo in Oginni and Owolabi (2013) affirmed that failure of the learners to master the mathematical language lead to poor performance in the subject. Hoffman in Oginni and Owolabi (2013) remarked that mathematics has often been described as "arithmetic with letter, however notations used in mathematics such as +, –, or ÷— are symbols while other mathematicians believed that mathematics language are special emblem that guided the learners on steps to take.

The uniqueness of mathematics language has distinguished mathematics from other subjects. Anyone that cannot cope with imperial and native language which is based on verbal reasoning may likely get lost easily in quantitative reasoning where the use of mathematics language is necessary. Spatial and mathematical reasoning will help students to generate, retain, retrieve and transform well-structured visual images into mathematics appreciation with the aid of mathematics language (Lohmanin Oginni and Owolabi, 2013).

Basic arithmetic operations (addition, subtraction, multiplication and division) are commonly use in occupational and educational settings where it is essential. Yet, the knowledge of arithmetic is not enough for the learners to think reflectively and creatively. There is need for the mastery of mathematical language and verbal ability which might be helpful for spatially gifted learners in multiple domains (Lohmanin Oginni and Owolabi, 2013).

Furner, Yahya, and Duffy in Flanagan (2009), said that knowledge of mathematics is an important skill necessary to succeed in today's world. To further support Furner and all it is clear that students need to understand vocabulary and complex concepts or they are not going to be able to complete complex tasks (Shields, Findlan, & Portman, 2005). Mathematics vocabulary is one of the hardest vocabularies to teach students. By the time students are in sixth grade they should know and understand forty-three terms and concepts from their previous years (Shields, Findlan, & Portman, 2005). Mathematics words are abstract and thus difficult to understand since many vocabulary words used in mathematics are used for more than one concept. Yani (2011) noted that many teachers do not know how to teach learners how to add fractions. They do not know how to add (x/y)+(u/v), and some of them do not even know how to add (2/3)+(7/9). It is hard to classify the different kinds of mistakes they make, but in many cases their mistakes are commonly made.
Language is a central factor to all teaching and learning processes.

Language is for explanation of relevant terms and concepts in Mathematics. Effective communication between teachers and students has the potential to improve the learning experience and create a positive environment in the classroom. However, in Gwagwalada

Area Council of FCT Abuja, the situations indicate that there are multifaceted challenges and barriers in the teaching and learning of Mathematics in Secondary schoollevel of education. The researchers' observations have revealed also that there are language problems among teachers and students of secondary schools in the study area. Students have unaddressed language or speech difficulties which lead to poor communication. This scenario constrains teaching and instructional methods in Mathematics. The resultant effect of this problem is poor performance of students in their external examinations even at senior secondary school level. The barrier in the classroom certainly make it difficult for students to get advanced in their educational pursuit. It is against this background the study is designed toinvestigate the Influence of Language Barriers on Teaching and Learning of Mathematics in Junior Secondary Schools in Gwagwalada Area Council of FCT Abuja.

Objectives

1. Examine the influence of mother tongue in the process of teaching and learning of Mathematics.
2. Ascertainthe influence of wrong usage of words on teaching and learning of Mathematics in Junior Secondary Schools.
3. Findhow the wrong description of concepts affect teaching and learning of Mathematics in Junior Secondary Schools.

Research Questions

1. How does mother tongue influence students from expressing their ideas in Mathematics?
2. How does incorrect usage of words influence the students understanding in Mathematics?
3. How does wrong description of concepts influence students from differentiating one object from another in Mathematics?

Hypotheses

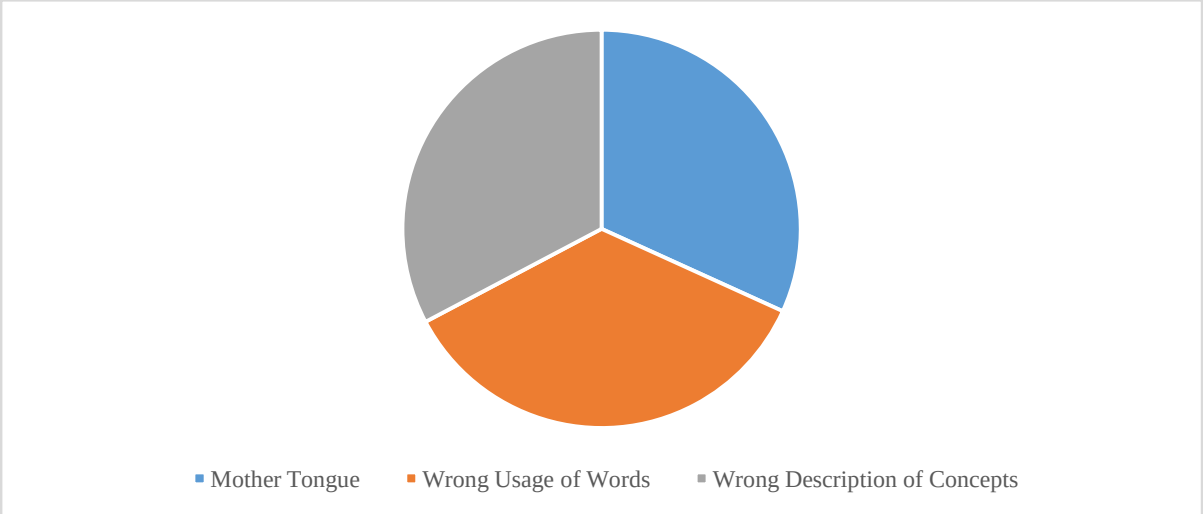
H_O: There is no significant relationship between mother tongue, incorrect usage of words andwrong description of concepts, and teaching and learning of Mathematics in Junior Secondary Schools.

Methodology

This study useda survey research design. The area of study was Gwagwalada Area Council of FCT Abuja. The population for this study is 188 teachers comprised all Mathematics Teachers from Government owned, Government grant-aided andUniversal Basic Education (UBE) Junior Secondary Schoolsin Gwagwalada Area Council of FCT Abuja. The entire population of 188 Mathematics Teachers were used for the study as sample because the population size could be handled effectively by the researchers. The instrument used for data collection was a questionnaire constructed by the researchers titled "Influence of Language Barriers on Teaching and Learning of Mathematics (ILBTLM)." The face and content validity of the instrument was ascertained by the researchers being experts in Mathematics Education, Tests and Measurement while the reliability of the instrument was carried out using a test-retest method of reliability and the two scores obtained from the tests were analysed using Pearson Product Moment Correlation (PPMC) statistical analysis and a correlation coefficient $r = 0.81$ was obtained which was good enough to consider the instrument reliable. The data collected was analysed using descriptive statistics such as mean and inferential statistics Multiple Regression.

Results and Discussion

Figure 1: Mean of the Relationship between Language Barriers and Teaching/Learning of Mathematics



Source: Field Survey, 2025

Result in Figure 1 shows that mother tongue had a mean value of 3.35, wrong usage of words had a mean value of 3.73 and wrong description of concepts had 3.44 respectively. This indicates that language barriers influence the teaching and learning of Mathematics.

Table 1: Model Summary of Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.968[a]	.938	.937	.18158

a. Predictors: (Constant), Wrong Description of Concepts, Wrong Usage of Words, Mother Tongue
Source: Field survey, 2025

Result in Table 1 shows the R value of 0.968a which represents a high degree of correlation and the R Square value of 0.938 which indicates how much of the total variation between a mother tongue and the teaching and learning of Mathematics.

Table 2: ANOVA Result of Regression Analysis

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	91.468	3	30.489	924.672	.000[b]
Residual	6.067	184	.033		
Total	**97.535**	**187**			

a. Dependent Variable: Teaching and Learning
b. Predictors: (Constant), Wrong Description of Concepts, Wrong Usage of Words, Mother Tongue
Source: Field survey, 2025

Result in Table 2 shows regression ANOVA with a significant value of 0.000 which is less than the *P*-value of 0.05. This indicates that overall, the regression model statistically significantly predicts the outcome of variable and it is a good fit for the data collected

Table 3: Coefficient of Regression Analysis

	Unstandardized Coefficients		Standardized Coefficients		
Model	**B**	**Std. Error**	**Beta**	**T**	**Sig.**
(Constant)	-1.859	.109		-17.111	.000
Mother Tongue	.208	.024	.208	8.793	.000
Wrong Usage of Words	.433	.025	.344	17.044	.000
Wrong Description of Concepts	.840	.026	.704	32.157	.000

a. Dependent Variable: Teaching and Learning
Source: Field survey, 2025

Result in Table 3 shows an interaction effect of language barriers and teaching and learning of Mathematics. Mother Tongue had a coefficient of 0.000 while wrong usage of words had 0.000 and wrong description of conceptshad 0.000 respectively. The coefficients were less than the p-value of 0.05 which indicates that all the variables were statistically significant in influencing the teaching and learning of Mathematics in the junior secondary schools.

Discussion of Findings

Findings revealed that the students cannot operate meaningfully when the concept is too difficult for them to conceive, the mother tongue of the teacher hinder or preventthe students from pronouncing Mathematical words correctly.For instance, the teacher may pronounce lectangle instead of rectangle, quaterateral instead of quadrilateral. These difficult words cause problems because often students do not remember the meanings as taught in mother tongue, thus causing learning difficulty. Students might not be able to learn the meaning without confusion with others in everyday usage of Mathematics concepts. Findings also revealed that Some Mathematical concepts cannot be easily translated from the foreign language to the mother tongue of the teacher/learner. This results to the learner not getting the exact meaning of such concept like Quadratic. This finding affirms a study by Shields, Findlan and Portman (2005) which found out that mathematics vocabulary is one of the hardest vocabularies to teach students. By the time students are in sixth grade they should know and understand forty-three terms and concepts from their previous years Mathematics words are abstract and thus difficult to understand since many vocabulary words used in mathematics are used for more than one concept.

Results of finding on the influence of wrong usage of words on teaching and learning of Mathematics in Junior Secondary Schools. Findings revealed that most of the Mathematics teachers use words wrongly in the process of teaching and learning. This makes learning difficult. The words, evaluate and solve are wrongly used interchangeably in the process of teaching and learning. This leads to learning difficulty. Students find it difficult to grasp (understand) the meaning of quotient and division as teachers uses them wrongly. This will also cause learning difficulty. The word “set” as wrongly used by teachers, makes students to grasp the meaning as: to rest or adjust, instead of the correct meaning: as used in set theory (the collection of similar things). This leads to learning difficulty. The words, product, sum, difference and division should be used correctly to avoid students’ miss application of operation(s). These words are wrongly used by Mathematics teachers causing learning difficulty. The finding is similar to that of Yani (2011) who found out thata teacher is the model of person. Most learners also believe that what their teachers do is the correct thing. The same perception may happen to most parents. Parents believe that teachers will teach a

correct and right thing to their children. When a teacher uses wrong description of concepts, it affects teaching and learning of Mathematics.

The finding on how wrong description of concepts affects teaching and learning of Mathematics. Findings revealed that concepts wrongly described by teachers, hinder/prevents the students from distinguishing one concept from the other e.g. cube and cuboid. This causes learning difficulty. Students find it difficult to manipulate with a concept that is wrongly described and wrong application of knowledge and skills on a given problem is as a result of wrong description of concepts. Finding agrees with a study conducted by Abiri in Oginni and Owolabi (2013)who found out that Mathematics taught in a child's mother tongue has a lot advantages such as overcoming limited knowledge of foreign mathematical vocabulary. Teaching in mother tongue also bring closer to children mathematics example and concepts, it helps the children to develop a mathematical vocabulary in the mother tongue. It equally helps adults who are not literate in English to understand and appreciate Mathematics.The findings also confirms a report by Omoniyi and Olabode (2013) which found out that use of mother tongue and mathematical language on assessment of Nigerian's Primary School pupils in mathematics in Ado-Ekiti.

Conclusion

This study has found out that Mathematics is an important subject to students. It inspired students' ability performance in other subjects and it is applied to solve further problems in different areas. Mathematics inspired by one area proves useful in many areas. The study concludes that language barriers influence teaching and learning of Mathematics in Junior Secondary Schools in Gwagwalada Area Council of FCT Abuja.

Recommendations

Based on the findings of the study, the following recommendations are made:

1. Use of mother tongue to teach students should not be encouraged as it affects teaching and learning of Mathematics
2. Workshops and seminars should be organized for Mathematics teachers where training will be given to them on appropriate usage of correct concepts in Mathematics
3. Sound knowledge of Mathematical symbols should be given to children right from Primary schools for effective learning of Mathematics.

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