

EFFECT OF CODE SWITCHING ON PRE-NCE STUDENTS ACHIEVEMENT IN MATHEMATICS: A STUDY OF FCE, KATSINA

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Abstract

This study investigated the effect of code switching on Pre-NCE students' achievement in Mathematics, the study was carried out in Federal College of Education Katsina, the Pre-NCE students admitted in 2019/2020 session into mathematics related courses were used for the study. All the students that were given admission were used, they are 30 in number but two of them were exempted because they are non- Hausa speakers. Two of their second semester courses Mechanics (MAT 023) and Statistics (MAT 024) were used for the research. The students were taught a topic from the two courses at a different time with English language only, they were examined by the course lecturer, they were taught the same topic after one week using code switching, they were also tested by the course lecturer. Hypotheses were tested using student t statistic at 0.05 level of significance, the calculated t for Statistics is 5.326 and that of Mechanics is 3.674, the p values are 0.000 and 0.002 respectively, the null hypotheses were rejected. The findings indicated that the Pre-NCE students perform better when their course lecturer alternate between the official language of instruction and their first language. It was recommended that lecturers should be encouraged to alternate between the learners' first language and the official language of instruction when teaching mathematics and also code switching should not be seen as an abomination in a mathematics classroom in our schools.

Keywords: Code Switching, Bilingual, Mother Tongue, Mathematics, Language of Instruction.

Introduction

The medium of instruction for Mathematics and science in Nigeria Colleges of Education is English; this is the official language of teaching in a mathematics class. Research have shown that teachers comply with this official language when teaching, but in some cases the students first language are still being used by teachers, this leads to the phenomenon of code switching. Code switching has been discussed widely by many researchers. Fundamentally the term code switching is the use of more than one language in a sentence. It is the practice of alternating between two or more languages or varieties of languages in a conversation. Carlos (2010) defined code switching as the process of shifting from one linguistic code to another depending on the social context or conversational setting. It is the act of using learners first language (L1) or learners mother tongue, while teaching in the class where the language of instruction is not the learners first language. Code switching occurs in the speech of bilingual

speakers who are able to speak both languages (learners' language and the official language) with some degree of competence (Akunove et al, 2012) as stated in Alaa and Tarig (2016). Akindele and Adegbite (1999) describes code switching as a means of communication which involves a speaker alternating between one language and another in communicative events. A speaker must have communicative competence in both languages for them to be able to alternate.

Reasons for Code Switching

There a number of reasons why speakers code switch. Some of these are:

- To fulfill a need: This happens when speakers cannot express themselves in one language, they might switch to the other language for better communication. This always happen when a speaker is tired, angry, upset or not fluent in the language.
- To express solidarity: Code switching is also used when a speaker wishes to express solidarity with a particular social group.
- To exclude others: This often happen between friends and between parent and children, code switching can also be used to exclude others from a conversation.

Code switching can be inter-sentential (done at sentence boundaries), intra-sentential (done in the middle of a sentence) or extra-sentential (switching of either a single word or a phrase or both (Owlcation, 2019). Code switching plays a facilitating role in helping learners and teachers engage in sharing knowledge and avoiding a situation where the teacher presents the subject matter in English to a passive learner (Mzamani, 2019).

Code Switching in Mathematics Classrooms

Code switching has served so many functions in mathematics classrooms. it is practiced by teachers and students in giving an explanation, requesting help, helping peers, making self-corrections, moving from one activity to another and clearing misunderstanding. Uys (2010) noted that code switching happened mostly when teachers were explaining the subject matter, building student understanding, confirming students' understanding, and using humor and when there is need to discipline students. Because students' understanding of the subject matter is the main priority of the teacher, the students have been the main reason for code switching when a teacher is in the classroom. Code switching helps to ease the teaching and learning in the classroom.

Code switching has positive effect on both the teacher and the learner. It helps the student to understand the difficult aspect of the lesson. It helps them to participate actively in the class. Niesche (2009) argued that code-switching is important in delivering lessons since it enhances students' understanding, especially those who come from rural areas. Instructions in mathematics classrooms can be easily absorbed by students if the instructors code-switch. For teaching and learning to be effective, especially on the part of learners, there is need for comprehensive input and if learner does not understand the language of instruction, they may not be able to learn the subject matter effectively. In a class where the language of instruction is mainly English language, students hardly talk or talk very little, they only listen and copy notes. Teachers who insist on using English language during their lesson ended up talking to themselves. Zabrodska (2007) noted that in an academic sphere, bilingual pedagogical practice can help learners overcome communication barriers in their classroom environment.

Mzamani (2019) in his own view gave reasons why mathematics teachers should code switch. They are as follows:

- Because learners lack sufficient knowledge of English language which is the language of instruction.
- The language of mathematics is very challenging and learners find it difficult to understand.
- Code switching help teachers to bond with learners and inspire them to love mathematics.
- Code switching serves as a mediation tool that blusters participation in class.
- Code switching helps teachers evaluate whether a learner understand the content taught or not.

Literature Review

Language is an important aspect of the curriculum, they are both means to an end and an end in itself. It plays a key role in teaching, learning, understanding and communication in mathematics. The importance of the language of instruction in a mathematics classroom cannot be sidelined. Many researchers have carried out research on code switching in a mathematics classroom. Khairul et al (2018) in their work titled 'Code Switching in Mathematics classroom: Relationship between students' attention and attitude and their learning success found out that 81% of the student were of the opinion that code switching should be used in the mathematics lesson. 86% agreed that code switching in mathematics lesson helped them in learning the subject and 96% agreed that their mathematics lecturers uses code switching while teaching. Their response was also correlated with their satisfaction in learning and there was a significant relationship between the two variables. Liswani (2016) in his study on impact of code switching on learners' participation during classroom practices concluded that code switching benefitted learners' participation in English medium classroom. Olusegun (2011) investigated code switching and its implication for teaching mathematics in primary schools in Ile Ife, Nigeria concluded that use of code switching in multilingual mathematics classroom does not result in deficiency in learning, but is a useful strategy in classroom interaction and efficient way of transferring knowledge to students. Olagunju (2013), carried out a research on the topic 'Code Switching as a Teaching Strategy: Implications for English Language Teaching and Learning in a Multilingual Society' and discovered that code switching is important to the teaching of language and other subject at the foundation level to draw the interest of the learners.

Statement of the Problem

Every educational policy always specifies the approved medium of instruction at a given level of education. For tertiary level of education in Nigeria, the official medium of instruction is English language. Many authors like Olusegun (2011), Liswani (2016) and Khairu et al (2018) have established the fact through their studies that code-switching has always led to improved learning in mathematics. Many of the studies conducted within and outside Nigeria confirmed the positive contribution of instruction through the medium of first language to students learning. However, the situation of colonized countries is such that many nations with diverse interests are lumped together, hence clear cut policies are not made and implemented. Inasmuch as Nigeria cannot implement the indigenous language properly for now and sole instruction via the English language is not yielding the desired result,

educationists must always find a way out. Scholars cited earlier have taken the lead but the few studies on the subject matter in Nigeria have not covered all the geo-political zones in Nigeria. This study is an effort to find out the likely result obtainable when the experiment on code-switching between English and Hausa languages among Hausa speaking students is conducted.

Research Hypotheses

1. H_0 : There is no significant difference in the performance of Pre-NCE students taught Statistics using code switching and those taught with only English Language.
2. H_0 : There is no significant difference in the performance of Pre-NCE students taught Mechanics using code switching and those taught with only English Language.

Methodology

The population of this study consists of the Pre-NCE students admitted into FCE Katsina in 2019/2020 session, all those that were admitted for Mathematics related courses were used for this research work because they are few (30 in number). Two of their second semester courses (Statistics MAT 024 and Mechanics MAT 023) were selected for the experiment. All the Pre-NCE students understand Hausa language very well although two of the students were exempted because they are not Hausa speakers. The students were taught a topic in MAT 024 and a topic in MAT 023 by their respective lecturers in English (without switching to Hausa Language), after the lessons, the students were examined by the course lecturer. After one week the students were taught the same topic but now the lecturers were asked to code switch specially to explain difficult terms, after the lessons, the students were examined by the lecturers (they were not given the same questions). The mean of the scores of the first and second test were analyzed using student t statistics (Paired Sample Statistics). SPSS (23) statistical package was used to analyze the data.

Data Analysis

Hypothesis 1: There is no significant difference in the performance of Pre-NCE students taught Statistics using code switching and those taught with only English Language.

Table 1

Paired Samples Statistics						
		Mean	N	t	Df	Sig (2-tailed)
Pair 1	CSW	8.14	28	5.236	27	.000
	NCSW	3.50	28			

From table 1, the mean of the student when they were taught a topic in Statistics with code switching is 8.14 and the mean when they were taught the same topic with only English language is 3.50, the t calculated is 5.236 and the p value is .000.

Hypothesis 2: There is no significant difference in the performance of Pre-NCE students taught Mechanics using code switching and those taught with only English Language.

Table 2

Paired Samples Statistics						
		Mean	N	t	Df	Sig (2-tailed)
Pair 1	CSW	13.10	21	3.674	20	.002
	NCSW	8.10	21			

From table 2, the mean of the students when they were taught a topic in Mechanics with code switching is 13.10 and the mean when they were taught the same topic with only English language is 8.10, the t calculated is 3.674 and the p value is .002.

Discussion of Results

The result from table 1 above shows that the mean 8.14 of the students when they were taught Statistics using code switching is higher than the mean when they were taught with only English language also the t calculated 5.326 is less than the tabulated value , and the p value .000 is less than the level of significant 0.05, therefore the null hypothesis is rejected, that is there is a significant difference in the performance of students that were taught Statistics with code switching and those taught with only English language. From table 2 also the mean 13.10 of Pre-NCE students when the teacher code switched in Mechanics is higher than the mean 8.10 when the teacher used only English language, the t calculated 3.674 is less than the t tabulated and the p value .002 is less than the level of significant 0.005, here also the null hypothesis is rejected and this shows that there is a significant difference between the performance of Pre-NCE students that were taught Mechanics with code switching and those that were taught with English language only. This study agreed with Olagunju (2013), Olusegun (2011), Liswanu (2016) and Khairuetall (2018).

Conclusion

The findings from this research revealed that code switching has a significant effect on Pre-NCE mathematics students' performance, that is they perform better when the lecturers alternate between the official language of instruction (English Language) and the learners first language, therefore lecturers should be encouraged to practice code switching when teaching especially when the lecturer noticed that the students are not active and when explaining difficult terms.

Recommendations

Based on the findings of this study, the researcher wishes to recommend that Mathematics teachers should be encouraged to code switch when teaching, most especially when the learners are new in the system and that code switching should not be seen as an abomination in our institution of higher learning because most developed countries uses the learners first language as the language of instruction. Code-switching for now has not been given official backing, governments at various level should take the bold step to do the right thing. If most researches are showing that code-switching is making positive contribution to learning in various disciplines, the executive and legislative arms of governments should give the necessary official backing and this should be timely.

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