

CODE SWITCHING BASED INSTRUCTION ON LEARNERS' INVOLVEMENT AND EFFICACY IN MATHEMATICS

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ABSTRACT

This study aims to determine the relationships of Code-Switching Based Instruction on the learners' involvement and efficacy in mathematics. The study aimed to answer the following questions: 1) What is the extent of use of code-switching based instruction regarding tag-switching efficiency, inter-sentential switching, and intra-sentential switching? 2) What is the extent of learners' involvement in terms of attention and interest? 3) What is the extent of learners' efficacy in terms of confidence, experience, and enthusiasm? 4) Does the use of codeswitching based instruction in mathematics have a significant relationship to the learner's involvement? 5) Does the use of code-switching based instruction in mathematics have a significant relationship to the learner's efficacy?

To answer these questions, a descriptive sampling technique was used with the 160 seniors in Grade 11. A survey questionnaire in the form of a checklist was used to evaluate the use of code-switching based instruction and its relation to the involvement and efficacy of the students. The gathered data showed that the findings of tag switching, intra-sentential switching, and inter-sentential switching indicated that students had very high involvement in terms of attention and interest. On the other hand, code-switching-based instructions had very high efficacy in terms of confidence, experience, and enthusiasm.

The null hypothesis was also disproved regarding the relationship of code-switching based instruction on learners' involvement and efficacy. Based on the findings and conclusions, the researcher came up with the following recommendations. For stakeholders, it contributes to the implementation of Project DREAM, which aims to accelerate learning, reintegrate learners safely into the school system, assess literacy and numeracy levels, and focus on fundamental skills that lead to resiliency. For teachers, code switching may require establishing clear guidelines for when and how it can be used in the classroom. On the part of students, encouraging them to use both languages to express themselves in their native languages. Future researchers may employ cutting-edge teaching techniques such as math stories to increase their interest in mathematics.

Based on the gathered data, the findings of tag switching, intra-sentential switching, and inter-sentential switching indicated that students have had very high involvement in terms of attention and interest. On the other hand, code-switching-based instructions have very high efficacy in terms of confidence, experience, and enthusiasm.

In conclusion, this study provides evidence for the effectiveness of code-switching based instruction on learners' involvement and efficacy in mathematics. The findings suggest that code-switching can be an effective instructional strategy for improving student engagement and confidence in mathematics. The recommendations provide practical guidance for educators and stakeholders to implement code-switching in the classroom and support student learning outcomes. Future research can further explore the potential of code-switching based instruction and other instructional strategies to improve student learning outcomes in mathematics and other subjects

Keywords:

Code Switching, Instruction, Mathematics, Learners, Involvement, Efficacy, Tag-switching, Inter-sentential switching, Intra-sentential switching

INTRODUCTION

In bilingual societies, the use of two or more languages is common in communication. As a result, code-switching, which is the process of alternating between two or more languages in a single discourse or conversation, has become a prevalent phenomenon. Code-switching has been considered a linguistic ability and a source of linguistic inventiveness said by Muhammad (2014). It has also been used as a pedagogical tool in various educational settings to facilitate language acquisition and comprehension.

In the Philippine context, code-switching has become a problematic issue in the classroom, particularly in Mathematics. According to the Bilingual Education Policy, Filipino teachers are expected to use only English when teaching content courses such as Mathematics and Science. However, teachers tend to code-switch to facilitate their students' understanding of the subject matter. This has led to debates about the appropriateness of code-switching in the classroom and its impact on students' involvement and efficacy in Mathematics.

Pedagogic code-switching, as defined by Norrish (2017), is a switch between two or more linguistic codes to facilitate the acquisition and/or comprehension of a concept or metalinguistic element in the continual progression of the structured or unstructured learning event. Classroom code-switching specifically refers to the alternating use of more than one linguistic code in the classroom by any of the classroom participants such as teachers, students, teacher aides, etc.

Kapayaan Integrated School, under the Division of Calamba, has launched the project DREAM to fill-up the gap in literacy and numeracy due to the pandemic. Students were struggling to cope with the different lessons from both areas. Greggio and Gil (2017) stress that code switching can be a useful tool in assisting English language teaching and learning. Bullock and Toribio (2019) also claim that code switching fills linguistic gaps, express ethnic identity, and achieve discursive aims.

Hence, the declining level of English proficiency among students has brought about the need to find out how to tackle the issue. Teachers, consequently, have been employing code switching as a means of providing students with the opportunities to communicate and enhancing students' understanding. Furthermore, code switching helps to facilitate the flow of classroom instruction since the teachers do not have to spend so much time trying to explain to the learners or searching for the simplest words to clarify any confusion that might arise.

Therefore, the study focused on the code-switching-based instruction on learners' involvement and efficacy in Mathematics among Grade 11 students of Kapayapaan Integrated School. The declining level of English proficiency among students has brought about the need to find out how to tackle the issue. Teachers have been employing code-switching as a means of providing students with the opportunities to communicate and enhancing their understanding. Furthermore, code-switching helps to facilitate the flow of classroom instruction since teachers do not have to spend so much time trying to explain to the learners or searching for the simplest words to clarify any confusion that might arise.

Overall, the study aims to investigate the relationship of code-switching on learners' involvement and efficacy in Mathematics. The findings of this study are expected to contribute to

the body of knowledge on code-switching-based instruction in Mathematics, specifically in the Philippine context. It will provide insights into the use of code-switching as a pedagogical tool and its impact on learners' involvement and efficacy in Mathematics.

This also sought to determine significant relationship of code-switching based instruction on learner's involvement and in efficacy in mathematics among 4 sections of Senior High School students of Kapayapaan Integrated S.Y. 2022-2023.

Specifically, it seeks to answer the following question:

1. What is the level of use of code-switching based instruction with regards to :
 - a. tag – switching efficiency;
 - b. inter- sentential switching; and
 - c. intra- sentential switching?
2. What is the level of learners' involvement in Mathematics in terms of:
 - a. attention;
 - b. interest;What is the level of learners' efficacy in mathematics in terms of
confidence;
experience;
c. enthusiasm

REVIEW OF RELATED LITERATURE

Code-switching is a common linguistic phenomenon that involves the use of two or more languages or language varieties within a single conversation or utterance. In educational contexts, code-switching can be used as a tool to facilitate language learning and improve learners' understanding of subject matter (Bullock & Toribio, 2009). Specifically, in the field of mathematics education, code-switching has been found to enhance learners' involvement and efficacy.

Learners' involvement in mathematics is a crucial factor in their academic success. It includes their attention and interest in the subject matter, as well as their motivation to learn and participate in classroom activities. Code-switching-based instruction has been shown to enhance learners' involvement by providing them with multiple opportunities to engage with the subject matter (Khan, 2013). In a study by Talaue and Sarmiento (2019), they found that using code-switching in teaching mathematics helped students to stay engaged in class and showed an improvement in their attitude towards the subject.

In parallel with the perspectives of Chandran (2015) felt that the ideal class discussion required participation, interest, learning from all students, and absorbing explanations and information provided by others and cultural principles, context including family and environmental experiences, and prior information and assumptions are brought up for discussion by students.

According to PISA (2013) that students' engagement with mathematics and school, this is related both to their own interest and enjoyment and to external incentives. Subject motivation is often regarded as the driving force behind learning, but the analysis extends the picture to students' more general attitudes towards school including students' sense of belonging at school.

Moreover, learners' efficacy in mathematics is also important for their academic success. Learners who feel confident in their abilities, have prior experience in the subject matter, and exhibit enthusiasm for learning are more likely to perform well in mathematics (Lipnevich & Smith, 2013). Code-switching-based instruction has been found to improve learners' efficacy by making the subject matter more accessible and easier to understand. In a study by Gafaranga and McLean (2015), they found that code-switching enhanced learners' self-efficacy and helped them to feel more confident in their mathematical abilities.

Moreover, Lee (2017) believes that collaborative work in the classroom leads to productive integration of students' thoughts and actions. This broadens the knowledge, skills and dispositions necessary for independent problem solving.

These include students' beliefs and attitudes about their abilities and learning characteristics in mathematics. Both have been shown to have a significant impact on how you set your goals, the strategies you use, and your grades.

According to Borja (2016) that student attitudes towards learning are now recognized as one of the most important issues in education. Settings may differ in specific fields such as psychology or pedagogy. This setting contributes to the output of the student learning process. Learning English is successful when teachers can correctly perceive students' attitudes and build positive emotions that can counteract their negative emotions.

Ibarrola and Martinez (2014), suggest that part of the classroom time should be devoted to students doing communicative tasks in pairs, which can offer every learner many more chances to use English and, in turn, to learn English in a meaningful way.

Segarra and Julià (2022) stated that low knowledge of mathematics can lead to poor academic performance in mathematics. In fact, in addition to the basic skills of a student's teacher, there are several variables that affect academic performance.

Math anxiety disorder is described as a feeling of nervousness or anxiety when solving math problems that prevents manipulation of numerical data in academic situations as well as in everyday life revealed by Zeki and Ümit (2019).

Peker (2016) showed that skills, mathematics attitudes, and self-efficacy are factors that influence both mathematics anxiety and MTA in future teachers.

According to Davis (2019), student's enthusiasm and willingness to participate in a classroom through these verbal engagements will create a conducive classroom environment. Students can become passive in classroom discussion due to the self-limitations, such as cannot focus during lecture or learning time, fear of offense revealed by Siti et.al. (2015), low levels of self-confidence, do not prepare before class, fear of failing to show their intelligence, fear that their answers will be criticized by the lecturers and the feelings of confusion, thus becoming less engaged in classroom discussions.

Akman (2020) mentioned that a teacher's administrative efficiency in the classroom can have a positive impact on student attitudes towards teaching and affect academic and behavioral development. Students who gain teacher trust, participate in learning activities, and develop good relationships with their peers can be expected to feel more comfortable in the classroom.

Enthusiasm is contagious! Teachers who are enthusiastic and genuinely enjoy their work usually achieve better academic performance than those who are not said by Madhuri and Annu (2018). Every admin should want a building full of happy teachers. It is important that administrators recognize the value of high teacher morale.

Metila (2019) explained that the pedagogical and communicative functions of classroom code-switching justify its use in teaching and learning contexts. An impressive number of studies have been carried out on the use of code-switching in the classrooms.

Similarly, Inuwa et al. (2014), explored the use of code-switching among Hausa bilinguals as a conversational strategy manifested effectively to express social meanings influenced mostly by some social variables and morpho-syntactic structures of two languages. Code-switching, the use of two languages in a single discussion, is not a random phenomenon. In fact, it is rather an effective tool.

Engku Ibrahim et al. (2013) established the view that code-switching is a part of a conversational strategy that can be used by bilingual speakers effectively to share social meanings that are influenced by social variables and morph syntactic structures of one or more languages.

Gulzar (2014) surveyed socializing functions of code-switching in classroom situations that did not involve bilinguals but foreign language instructions which is different from code-switching in a natural discourse. His analyses showed examples of code-switching related to linguistic insecurity.

Mukti & Muljani (2016) bilingual speakers consider the notion that when associated with strong arguments, code-switching can be an effective strategy in which some ideas can be better conveyed in one language than another that leads to systematic processing of information.

In accordance to that fact, as cited in Mukti and Ouda (2018), believes that code switching is a linguistic deficit as the result of the speaker' lack of proficiency in both languages. It means code switching can be harmful to students since this situation makes student cannot communicate effectively in either language especially if the students do not master one of the languages employed.

Further, repeated instruction in L1 after L2 may lead some undesired student behaviors and it may make students lose interest in listening to English instruction which means students' exposition to English is limited.

The L1 became the media for helping students. The lecturers shifted from English to students' L1, vice versa, in some occasion to explain some difficult words or concepts, giving instruction in English, asking students, introducing a new unit revealed by Kasperczyk, (2015). In tag switching, the code switching involves the insertion of a tag in one language in another language. Fathimah (2016) considers that tag switching is less intimate. The tag-switching is often heavily loaded with ethnic content and would be placed low on a scale of translatability. In short, tag switching is a switch that happens when people insert a tag(s) from different languages in their speech and it happens most of the time because the tag does not violate the grammatical rule of the language stressed by Makulloluwa (2013).

Yusuf, Fata, and Chyntia (2018) add that "inter-sentential switching occurs when a speaker switches from one language to another between different sentences" It can be defined that inter-sentential switching occurs outside the sentence.

The code switching that mostly used by people who master the language to people who have low language mastery. It can be found when teachers teach their students. In summary, the inter-sentential code switching occurs in a different sentence but in the same speech mentioned by Modupeola (2013)

Intrasentential codeswitching is “characterized by a switch from one language to another language within a single utterance” cited by Mabule, (2015).

Another definition from the study of Bravo-Stelo (2020) that intrasentential switches are considered as the more complex or “intimate” type of switching, “since a code-switched segment, and those around it, must conform to the underlying syntactic rules of two languages which bridge constituents and link them together grammatically”.

Research has shown that all three types of switching can be effective in enhancing learners' involvement and efficacy in mathematics. In a study by Hussin et al. (2017), they found that intra-switching improved learners' involvement in mathematics by allowing them to express their understanding in their preferred dialect. In a study by Barik and Swain (2016), they found that inter-switching improved learners' efficacy in mathematics by providing them with multiple explanations for complex concepts

METHODOLOGY

To give a clearer view of the study and to further search out the output of the investigation, the usual research methodology was applied. These included the research design, the actual respondents of the study, the type of instrument, research procedure and the statistical treatment of data.

RESULT AND DISCUSSION

Table 1. Extent of use of code- switching based instruction with regards to tag – switching efficiency;

Statement	Mean	SD	VI
I clearly understand the lesson	4.13	0.76	High
I understand further by using “nasusundan ba, kung napapansin nyo,	4.30	0.71	Very High
Nakukuha, ganun din, kung nasa, kay, okay, ano na, etc.”	4.09	0.69	Very High
I learn the lesson in an easiest way	4.14	0.76	High
I use the L1(Tagalog) to express my ideas and gives emphasis to the terminologies that important to remember	4.41	0.76	Very High
Overall Mean: SD	4.22: 0.58		
Verbal Interpretation	Very High		

Legend: Scale Range

Remarks

Interpretation

5 4.20 – 5.00

Always

Very High

4 3.40 – 4.19

Often

High

3 2.60 – 3.39

Sometimes

Average

2	1.80 – 2.59	Rarely	Low
1	1.00 – 1.79	Never	Very Low

As shown in table 1, the respondents very high involvement that the objectives where I use L1(Tagalog) to express my ideas and gives emphasis to the terminologies that important to remember, which a gained the highest ($M=4.41$, $SD=0.71$). his implies that the statement with code-switching-based instruction were effective in aiding the learners' acquisition of knowledge. On the other hand, the respondents also High involvement that objectives are Nakukuha, ganun din, kung nasa, kay, okay, ano na, etc.” ($M=4.09$, $SD=0.75$).

It also reveals that the extent in terms of objectives was very high supported by ($M=4.22$, $SD=0.58$). This finding provides evidence that the code-switching-based instruction was successful in facilitating learners.

Table 2. Extent of use of code-switching based instruction with regards Intra Sentential Switching;

Statement	Mean	SD	VI
I understand fully the deduces terminologies into simple form	4.09	0.76	High
I learned in a casual manner using the L1(Tagalog)	4.37	0.71	Very High
I tried to become more comfortable in in listening while the teacher discusses using the L1(Tagalog)	4.34	0.69	Very High
I understand fully so I can answer more examples	4.13	0.76	High
I can track the sequence and understand it based on their ways of discussing the lesson.	4.23	0.76	Very High
Overall Mean: SD	4.23: 0.60		
Verbal Interpretation	Very High		

The findings in table 2 suggest that learners perceived the use of Intra Sentential Switching to be highly effective in their learning process. They reported that they were able to understand the lesson better and in a more comfortable manner when the teacher used the L1(Tagalog) in a casual manner ($M=4.37$, $SD=0.71$). This result supports previous research that showed how code-switching can enhance learners' comprehension of complex concepts and terminologies (Garcia & Wei, 2014).

Furthermore, the learners' ability to track the sequence of the lesson and understand it based on the ways of discussing the lesson using code-switching was also rated as very high ($M=4.23$, $SD=0.76$). This implies that code-switching can serve as an effective pedagogical tool in facilitating learners' understanding of mathematical concepts.

It is worth noting, however, that while the learners' understanding of deduced terminologies in a simpler form received a high rating ($M=4.09$, $SD=0.76$), it was the lowest among the items in the table. This suggests that further exploration and refinement of code-switching practices in simplifying terminologies may be necessary to optimize its effectiveness in facilitating learners' understanding of mathematical concepts.

Table 3. Extent of use of code switching based instruction with regards inter- sentential switching;

The contents are....	Mean	SD	VI
I explain well in inserting the phrases using L1	4.31	0.74	Very High

I deliver effectively the content in inserting words using L1	4.09	0.80	High
I give justification the meaning of terminologies using the L1	3.91	0.90	High
I Translate some parts of the lesson so that can understand fully	4.09	0.75	High
I Tries to use L1 to impart the knowledge	4.00	0.82	High
Overall Mean: SD	4.08 :0.64		
Verbal Interpretation	High		

As reflected in the table 3, the respondents indicating a highest agreement level that the statement explain well in inserting the phrases using L1(Tagalog) with highest($M=4.31$, $SD=0.74$). which implies that the respondents strongly agreed with the statement". On the other hand, the respondents deliver effectively the content in inserting words using L1 (Tagalog) " with a ($M=4.3.91$, $SD=0.90$). suggests that the respondents have a lower level of agreement with this statement. In terms of the overall weighted mean and standard deviation, the results showed a ($M= 4.08$, $SD= 0.64$) which indicates a high level of agreement among the respondents regarding the use of code switching-based instruction to impart knowledge and deliver content effectively. Therefore, it can be interpreted that the respondents generally have a positive perception towards the use of code switching-based instruction in their mathematics class. They strongly agreed that inserting phrases using L1 and delivering content effectively using L1 are helpful in their learning. However, they had a slightly lower level of agreement regarding the justification of terminologies using L1.

Table 4. Part II: 2.1 Extent of learner's involvement in terms of; Attention

Statement	Mean	SD	VI
I listen carefully if the teacher is discussing	4.16	0.67	High
I motivate to interact while the teacher is discussing	3.96	0.87	High
I raise my hand to share answers	4.05	0.76	High
I inspire for each topic inside the Math class because new learnings occur	4.00	0.77	High
I response the questions clearly if the teacher asks questions	3.99	0.78	High
Overall Mean: SD	4.03:0.64		
Verbal Interpretation	High		

As shown in Table 4, the learners' involvement in terms of Attention was rated as High, with the highest mean score for listen carefully if the teacher is discussing" ($M=4.16$, $SD=0.67$). The lowest mean score was for motivate to interact while the teacher is discussing" ($M=3.96$, $SD=0.87$), which is still within the High verbal interpretation range. The overall mean score for this section was ($M=4.03$, $SD=0.64$, indicating a High level of learner involvement in terms of attention.

Table 5. Part II: 2.1 Extent of learner's involvement in terms of interest; Interest

Statement	Mean	SD	VI
I understand the lesson very well	4.23	0.79	Very High
I express opinion and idea to the lesson	4.09	0.78	High
I grasp the content knowledge of the lesson	4.25	0.73	Very High
I enhance the ability on the lesson	4.26	0.75	Very High

I comprehend the lesson fully	4.17	0.75	High
Overall Mean: SD	4.20 :0.61		
Verbal Interpretation	Very High		

This table presents the results of a survey regarding the extent of learners' involvement in terms of interest in Mathematics. The table shows the means, standard deviations, and verbal interpretations for each statement.

The highest ($M=4.26$, $SD=0.75$) was obtained for the statement enhance the ability on the lesson, indicating that the learners are actively working to improve their understanding and skills in Mathematics

The lowest ($M= 4.09$, $SD=0.78$) was obtained for the statement , express opinion and idea to the lesson, indicating that while the learners are highly interested in Mathematics, they may not be as vocal or expressive in sharing their thoughts and ideas during class.

Overall, ($M= 4.20$, $SD=0.61$), the verbal interpretation for the table is "Very High," indicating that the learners' level of interest in Mathematics is exceptionally high

Table 6. Part II: Extent of learners' efficacy in terms of confidence;
Confidence

Statement	Mean	SD	VI
I use of L1 in understanding the lesson	4.26	0.80	Very High
I ensure the mastery of the lesson during learning process	4.07	0.74	High
I strengthen the learn lesson through examples	4.26	0.71	Very High
I use the L1 to expand my understanding	4.22	0.70	Very High
I certain in explaining the knowledge in Mathematics	4.13	0.74	High
Overall Mean: SD	4.19: 0.60		
Verbal Interpretation	High		

As reflected in the table 6, the respondents have a very high level of confidence in using their first language (L1) to understand the lesson, which gained the highest ($M=4.26$, $SD=0.80$). This indicates that learners are confident in using their first language to understand the lesson.

The statement with the lowest mean score was certain in explaining the knowledge in Mathematics with a ($M= 4.13$, $SD=0.74$) This suggests that learners have relatively high levels of confidence in explaining the knowledge in Mathematics, but not as high as the other statements.

The overall mean score of all statements combined is ($M=4.19$, $SD= 0.60$), which falls under the High category. This suggests that the participants have high levels of confidence in their ability to learn and understand mathematics.

Table 7. Part II: Extent of learners' efficacy in terms of experience;
Experience

Statement	Mean	SD	VI
I encounter different methods to broaden knowledge in learning	4.16	0.77	High
I know the gap in learning Mathematics and can adjust suddenly in knowing the lesson to process using the code switching	4.10	0.76	High
I learned the tested strategies in learning Mathematics	4.10	0.75	High
I build my confidence in learning in using code switching in mathematics	4.13	0.74	High

I understand fully the adjusts strategies in learning math	4.08	0.78	High
Overall Mean: SD	4.11: 0.64		
Verbal Interpretation	High		

Based on the data presented in Table 7, the learners' efficacy in terms of experience in learning mathematics is high. The highest ($M = 4.16$, $SD = 0.77$), for the statement encounter different methods to broaden knowledge in learning.

The lowest ($M = 4.08$, $SD = 0.78$) for the statement understand fully the adjusts strategies in learning math.

The overall ($M = 4.11$, 0.64) . The verbal interpretation for the overall mean score is also high, indicating that the learners have a positive experience in learning mathematics using code switching.

**Table 8: Part II: Extent of learners' efficacy in terms of experience;
Experience**

Statement	Mean	SD	VI
I am Excited to listen to the lesson and confidence in learning Math with the use of code switching	4.12	0.73	High
I enjoy learning lively and easy to learn Math	4.06	0.71	High
I eager to listen and participate in Mathematics	4.10	0.75	High
I prepare myself to be become conducive in learning numbers	4.21	0.68	Very High
I am more understand the modifies approaches in learning math with the use of code switching	4.16	0.73	High
Overall Mean: SD	4.13 :0.59		
Verbal Interpretation	High		

Based on the data presented in Table 8, the learners' efficacy in terms of experience in learning mathematics using code switching is high. The highest ($M = 4.21$, $SD = 0.68$), for the statement prepare self to become conducive in learning numbers.

The lowest ($M = 4.06$, $SD = 0.71$) for the statement enjoy learning lively and easy to learn Math.

The overall ($M = 4.13$ $SD = 0.59$), indicating a high level of efficacy in terms of experience. The verbal interpretation for the overall mean score is also high, indicating that the learners are excited, eager to participate, and have a positive attitude towards learning mathematics using code switching.

**Table 9. Part II
The Correlation between code switching based instruction in Mathematics on learner' involvement**

Code Switching Based Instruction	Learners' Involvement	r-value	p-value	Analysis
Tag- Switching efficiency (extra)	Attention	.678**	.000	Significant
	Interest	.725**	.000	Significant
Intra Sentential Switching -	Attention	.469**	.000	Significant
	Interest	.589**	.000	Significant

Inter- Sentential switching	Attention	.739**.	.000	Significant
	Interest	.691**	.000	Significant

**significant at .05 level of significance*

Table 9 shows the correlation between code switching based instruction in mathematics and learner's involvement. The table presents the r-value, p-value, and analysis for each correlation.

The results indicate a significant positive correlation between code switching based instruction and learners' involvement in terms of attention and interest. The r-values for Tag-Switching efficiency and Intra-Sentential Switching are 0.678 and 0.469, respectively, both with p-values of 0.000, indicating a highly significant correlation. Similarly, the Inter-Sentential Switching has an r-value of 0.739 for Attention and 0.691 for Interest, both with p-values of 0.000, indicating a highly significant correlation.

Overall, the results suggest that code switching based instruction in mathematics has a strong positive correlation with learners' involvement in terms of attention and interest, which can lead to improved learning outcomes.

Table 10. Part II

The Correlation between code switching based instruction in mathematics on learner' efficacy

Code Switching Based Instruction	Learners' Efficacy	r-value	p-value	Analysis
Tag-Switching efficiency (extra)	Confidence	.710**	.000	Significant
	Experience	.728**	.000	Significant
	Enthusiasm	.709**	.000	Significant
Intra Sentential Switching -	Confidence	.572**	.000	Significant
	Experience	.592**	.000	Significant
	Enthusiasm	.533**	.000	Significant
Inter- Sentential switching	Confidence	.678**	.000	Significant
	Experience	.702**	.000	Significant
	Enthusiasm	.754**	.000	Significant

**significant at .05 level of significance*

Based on Table 10, there is a significant positive correlation between code switching based instruction in mathematics and learners' efficacy. The correlation coefficients (r-values) range from 0.572 to 0.754, with p-values less than 0.001, indicating that the correlations are statistically significant.

For tag-switching efficiency, there is a significant positive correlation with confidence, experience, and enthusiasm. For intra-sentential switching, there is a significant positive correlation with confidence, experience, and enthusiasm. For inter-sentential switching, there is a significant positive correlation with confidence, experience, and enthusiasm.

Overall, the findings suggest that code switching based instruction in mathematics is positively related to learners' efficacy, specifically their confidence, experience, and enthusiasm in learning mathematics.

CONCLUSION

RECOMMENDATIONS

1. For teachers may use to establish clear guidelines for when and how code switching can be used in the classroom. For example, it may be appropriate to use code switching to clarify a difficult concept or to help students understand a complex mathematical formula.
2. For students encourage to use both languages: in the classroom, particularly if they are more comfortable expressing themselves in their native language.
3. For stakeholders it contributes to the implementation of Project DREAM, which aims to accelerate learning, reintegrate learners safely to the school system, establish teachers' and learners' support systems through community and stakeholders' collaboration, assess literacy and numeracy levels, and modify learning packages focused on fundamental skills towards resiliency .
4. Future researchers may employ cutting-edge teaching techniques, such as math stories with code switching, to improve students' learning outcomes and increase their interest and motivation in mathematics.

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