Conference Paper

Code Switching and Its Implications for Teaching in the English Language in Math Lessons by Early Childhood Education Teachers

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Abstract.

Interactions between students and between students and teachers are the key to successful learning. This study examines whether code-switching to using English for teaching Math in Semarang's Early Childhood Education or PAUD programs can improve student interactions. This study investigated how early childhood education teachers implemented code-switching to English instructions for young learners. According to the findings of the study, early childhood educators utilized English, Indonesian, and Javanese interchangeably. The results indicated that the implications of code-switching in school are an approach to acquiring literacy because students can use different languages in a natural and meaningful manner while participating in classroom activities. The study shows that using code-switching in multilingual mathematics classrooms is a beneficial strategy to improve student interactions in classroom activities and is an effective method of transferring knowledge to students. The study further proves that code-switching implications do not result in a learning deficiency.

Keywords: Code-switching, English for Young Learners, English for Math, Instruction

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1. Introduction

Using more languages within utterances or code-switching is usually practiced between those with two or more used languages in the country. In multilingual Asian countries such as Indonesia, it is typical for English and other foreign languages to be interchanged and mixed in speech. In teaching English to young learners, code-switching becomes the best strategy for teachers and students. The reason for switching among the languages commonly used in the classroom is the underlying causes of understanding the given instruction (1). Code-switching involves two or more language interactions and serves linguistic functions with social and psychological implications that teachers consider (2).

The understanding that appears as the result of switching will give the awareness of its use in the classroom discourse to improve the student's knowledge of the instruction given by the teachers during the teaching-learning process. There are some purposes for switching in the classroom practice. Some of them are to force solidarity and intimate relationship with the students. It helps the students to understand the instruction given by the teachers and do the required action based on those instructions.

It is advisable for teachers can begin a lesson in one language, then switch to other languages to help students concentrate more on learning activities and comprehend the study in those languages (3).

With regard to the previous statements, Sadunih et al., (2018) describe topic switches, affective functions, and repetitive tasks as the functions of teacher code-switching. Topic switching implies When the instructor modifies their language based on the subject taught, it means he or she tells topic switching. This code-switching activity is most prevalent in grammar instruction, where the student focuses on the new information. In Affective functions, the teacher uses code-switching to express emotions and develop rapport with students. On the other hand, in repetitive functions, the teacher's usage of code-switching clarifies the meaning of a word. It emphasizes the significance of foreign language content to improve comprehension.

Education aims to equip individuals with the skills and knowledge necessary to function in society. Typically, the primary objective of education is the dissemination of knowledge. The fact that education involves the transmission of knowledge and skills and the arousal and development of the learner's intellectual capacities emphasizes the significance of language use in instruction (5). Effective communication between teachers and learners is the most crucial aspect in the effectiveness of the teaching-learning process. It also depends on the teachers' creativity in building teaching communities to support students to deepen the learning of the target language and enhance the creation of safe and stimulating environment as pedagogical strategies (6).

Attaining basic skills and knowledge and improving the production and reproduction of knowledge can both enhance and hinder education quality. Implementing the medium of instruction or language in education programs is a must (7). Consequently, where children from various linguistic and socio-cultural backgrounds are present, language is a significant issue, particularly in multilingual classrooms. Furthermore, students can acquire the target language skills in a social context through the socio-cultural approach assistance. In this instance, to express and share ideas, thoughts, and emotions, enabling language learners to participate in a speech community is part of the function of language in communication. Therefore, it is the responsibility of English

teachers to help students develop strategies for gaining mutual understanding and then co-constructing and producing output (8) .

Particularly when the taught material or concepts are not in the learners' native tongue, the language of instruction can also be problematic. For students whose native language is not English, certain subjects, such as Mathematics, may be challenging to learn in English. To better understand the subject matter in learning English for Math for kindergarten students in their native language, supplementing English with their native language (code-switching) can be an alternative to improve communication (3,5,9) .

As part of this study, we undergo the investigation of code-switching implications for teaching English for Math in Kindergarten or early childhood education in Semarang. Particular attention will be crucial to using three languages (English, Indonesian, and Javanese) in English for the Math lesson at TK Islam Tunas Melati Semarang.

Language-in-Education Policy in Indonesia

The educational objectives stated in Law no. 20 the Year 2003, Chapter II, article 2, state that national education aims to develop the ability and form the character of a dignified nation civilization to educate the nation's life becomes the fundamental guidelines of this study. Developing the potential of learners to become a man of faith and sensitivity to God Almighty, noble, healthy, knowledgeable, capable, creative, independent, democratic, and responsible citizens is the further aim of the law that greatly influences the going of this study (10). In addition, the study also takes Article 28 of Law No. 20 the Year 2003 as the fundamental guidance. That article states that Early Childhood Education is a coaching effort to develop the child's physical and spiritual well-being so that they are prepared to enter further education.

The provision of English Math bilingual learning for early childhood education focused on developing value-based mathematics education is an important part of creating superior and qualified human resources. At the beginning of students' knowledge of learning, it needs to consider the ability to think critically and creatively which can be facilitated through mathematics (9,11).

This policy envisions a bilingual education model implementation until there is a determination that they are proficient enough in the official language (English) to serve as the new teaching medium in which children get the permission temporarily to use their home languages as a teaching medium. In Bilingual education programs, there is an allowance where the communication between teachers and students is bilingual (7,11–13). They can switch from the learners' native language to English based on their requirements. Observations indicate that a child's basic literacy or numeracy concepts

acquisition in one language will easily understand those concepts and knowledge in other languages acquired later on (11,14–16).

There must be possible answers to the educational issues created by using English as a teaching medium in multilingual mathematics classes. Using primary language as a supplement to English is an appropriate method for teaching mathematics to students in multilingual classrooms where primary languages are useful resources for students (6–8,17). This study analyzes the value of code-switching as a conversational tool in kindergarten classrooms when English for Math learning occurs.

Statement of the Problem

Using code-switching in the classroom is neither a symptom nor an indicator of a teacher's inadequacy. Instead, it is a well-executed teaching approach. Code-switching in the classrooms, especially with certain kids, can increase communication and relationships (2,3,8). According to this research, using code-switching to develop learning vocabulary, calm learners, review assigned work, and build interaction with students is beneficial for teachers and students. Nevertheless, in Indonesian early childhood education, none have looked into the use of code-switching in bilingual math classes. TK Islam Tunas Melati Semarang was the place of the study on code-switching and its implications for the teaching of mathematics. The results show that it is essential for the early childhood classroom and spontaneous acquisition.

2. Method

2.1. The Design of Research

TK Islam Tunas Melati Semarang was the center of this investigation into code-switching and its impact on math instruction. Therefore, the instruments used in this study to elicit replies from respondents are going to be questionnaires. We also observed classroom interactions between teachers and students and recorded our observations. We could distinguish the different English dialects used in kindergarten math classes because of this design. We also analyzed the shared properties of these languages and discussed their impact on teaching and learning English for Math among younger learners.

2.2. Research Population and Sampling Technique

One teacher of early childhood education and thirty students from TK Islam Tunas Melati Semarang comprised the research population. The teacher and students from the most

advanced level of early childhood education, TK B, participated in this study. We chose the TK B level because it is at this level that teachers would do the activity of transition from the use of the mother tongue to English. Moreover, the students already have a great deal of learning experience, preparing them to continue their education in grade 1 of elementary school.

2.3. Data Collection

Interviews, both organized and unstructured, as well as participant observation, were the basis for this study's data collection. Language use in multilingual classrooms when instructing kindergarten pupils in English for Math was one of the topics covered in the interviews. The teacher was questioned regarding the following topics: (1) what language(s) they typically use during English for Math lessons and why; (2) whether or not they code-switch; (3) why they code-switch; and (4) what the teacher believes are the implications of using code-switching as a communicative strategy in teaching English for Math to kindergarten students. We asked students about their code-switching preferences and motivations during the interview.

2.4. Validation and Verification of Data

In order to guarantee that respondents submitted honest responses, There is a requirement that they attend school and participate in math classes taught in English. We looked for and took notes on various classroom language usage habits throughout each lecture. After completing each lesson and interviewing each respondent, we compared their responses to what transpired in class. Because of this effort, the study can now be considered credible, reasonable, and doable.

2.5. Procedure for Data Analysis

The first is identifying the language(s) used to teach kindergarten students English for Math. Next is the analysis and discussion of the characteristics of the languages and their effects on English for Math. In addition, the implications of code-switching as a communicative strategy in EFL classrooms for young learners came to the discussion session.

3. Result and Discussion

In data analysis, we classified the data into three functional categories from the eight excerpts of data compilation based on the most frequent instances of classroom code-switching. Class management is the first category, scaffolding is the second, and social discourse is the third. First, the teacher can use code-switching to show authority when running the classroom and giving orders. The other reason for code-switching at the school is to bring attention to important key terms. In the classroom, code-switching is another technique used to demonstrate the instructor's preference for one language over another by downplaying the importance of the target language. Second, the teacher uses code-switching to help students learn by explaining hard or new ideas in the L1 language. Code-switching can also keep a conversation going by translating new words or repeating a full sentence in the L1 language. Code-switching in the classroom also makes it easier to show how you feel, which could encourage students to keep talking. The teacher uses code-switching to show when he or she is switching from formal school talk to less formal social talk or vice versa. The teacher also uses code-switching to make her students' interactions less formal and get to know them better. In the following sections, we will examine how the teacher uses code-switching in school.

3.1. Classroom Management

The most prevalent cause for code-switching by a teacher is classroom management. Excerpt 1, line 02 indicates that explicit classroom instructions are one of the most prominent forms of code-switching.

Excerpt 1

((One student has hidden two grapes of 10 grapes used for learning number in Englilsh for Math lesson while being counted by his friend))

01 Student <one grape, two grapes, three grapes, four grapes…..>

02 ⬜ Teacher [>yuk di hitung bareng anggurnya yang di bawah meja, setelah itu kita makan sama sama.

Angguré kanggo bareng bareng yo, terus mengko di maem bareng bareng yo nduk<]

03 Student ((smiles to the teacher and slowly takes the two grapes under the table and starts counting it))

The student engages in a slow conversation with another student and has concealed two of the ten grapes used as counting objects in number learning. The teacher

interrupts the students' conversation and issues an order demanding that the student take the two grapes under the table. Code-switching is a powerful semantic strategy for combining two languages for social purposes (12,15,18–20). Code-switching can be a powerful tool in smoothing the conversation and interaction, so the teacher code-switches to Indonesian. Nevertheless, the instructor chose to code-switch to Javanese, presumably due to the student's higher fluency in Javanese and to elicit an immediate response. The code-switching approach is practical because, in line 3, the student promptly replies to the directive with a loud sigh and complies by slowly removing two grapes from beneath the table. Other examples of code-switching as a discourse signal are evident in Exhibit 2, Line 8, where the teacher uses code-switching to underline the significance of attending to classroom teaching and student activities. The most prevalent cause for code-switching by a teacher is classroom management. Excerpt 1, line 02 indicates that explicit classroom instructions are one of the most prominent forms of code-switching.

Excerpt 2

((The teacher is starting with an introduction of what will be leant for today's lesson))

Teacher: Today we are going to learn numbers using traditional food

⬜ Ada banyak jajan pasar yang bisa kita hitung.

⬜ Jajan pasaré okeh banget cah. Onde onde, klepon, nogosari, lan liyané.

Students: yes, bunda.

Students: Asikkkk

Teacher: Listen carefully to the instruction, class. Don't be noisy.

⬜ dengarkan baik baik aturan mainnya yahhh.

In excerpt 2, the teacher uses English, Indonesian, and Javanese to inform students of the lesson's topic and emphasizes the importance of listening to the instructions for the game or activity. The benefits of code-switching are in providing vocabulary and keywords comprehensible to all learners (19,21). In line 2, the teacher improves learners' grasp of the particular lesson topics by offering a direct Indonesian and Javanese interpretation of strength. In line 4, a learner exhibits his comprehension by demonstrating how he knew how to respond to his teacher. He may have equated power with compliance and a pleasant grin. The lecturer may have predicted that the pupils would be unfamiliar with the concept of power as a means of controlling something or someone. For them to grasp the particular lesson theme and prevent possible misconceptions, she presented them with the literal translation. Consequently, the teacher's utilization of code-switching is a tactic to assure that every student understands the

concept of strength in this context. In line 7, the teacher underlines that all learners must appreciate the importance and significance of instructions.

3.2. Scaffolding

Language is crucial for conceptualization and deductive reasoning in general and mathematics in particular. Code-switching is one of the language methods used to enhance comprehension. The use of code-switching by the teacher is the deployment component of the scaffold for learning used to assist multilingual students who are being taught English as the language of instruction and learning. Before the next autonomous learning activity, a code-switching scaffold clarifies cognitively demanding concepts or instructions. With the use of multilingualism or planned teaching, the teacher employs code-switching methodically (7,11,12,22). In excerpt 3, the teacher recognized that the phrases "plate," "table," and "yummy and delicious" may have a new meaning that the learners had not experienced previously.

Excerpt 3

((The students are counting numbers of seashells from one plate into another plate))

Teacher: There are two plates on the tables

 Two plates, dua piring. On the table, di atas meja.

 Ada dua piring di atas meja.

 How many plates on the table? (Teacher points at the two plates on the table)

Students: two plates

Teacher: We have lots of jajan pasar on this plate (Teacher points at one plate full of jajan pasar or traditional snacks that can be bought in traditional Market)

There are klepons. The colours are green and they are yummy and delicious. Enak dan Lezat. Yummy and delicious.

Students: Yummy and delicious. Enak dan lezat.

Teacher: Let's count together and put it on the other plate. One, two, three, four,.....

Students: one, two, three, four.....

When the teacher has presented "table," "yummy and delicious," and "plate" on lines 02 and 07, the teacher will present students with new vocabulary and a sentence on line 03 to enable them to continue the conversation and specifically promote children's understanding and application of vocabulary to increase their vocabulary

growth (4,8,16,19,23). The intersentential code-switch on line 3 and the intrasentential code-switch on lines 02 and 07 are excellent examples of how the teacher samples from her L1 when teaching the target language with, with the help of one simple unit 'piring,' 'meja,' 'enak dan lezat', dan 'Ada dua piring di atas meja'. The main activity is for students to count the traditional snacks on one plate and transfer them to the other while counting for the whole-class activity, followed by independent practice. Using a scaffold can lessen the students' difficulty independently performing the counting object activity. In lines 01, 03, 06, and 07 of excerpt 4, the teacher repeats the sentence in Indonesian and Javanese when the students do not respond as a scaffold for learning code-switching as a strategy for maintaining a conversation in multilingual classrooms.

Excerpt 4

((Teacher assigns the students to take a number of fruits in the basket and put them on a plate, then give it to someone))

Teacher: Kirana, take two carrots in the basket. Di kerangjang yah,

Student: (Smile and do what is instructed by the teacher)

Teacher: Put the two carrots on the pink plate, Kirana. Letakkan dua wortel di atas piring merah jambu.

Student: (Smile and do what is instructed by the teacher)

Teacher: Give it to Ms. Masha.

Berikan ke Ms Masha

Aturke Ms. Masha.

Student: (Smile and do what is instructed by the teacher)

Teacher: Now, Averros's turn

Take three apples in the Basket, Averrros…… Good.

Put it on the pink plate…….. Good.

Give it to Ms Ani……………. Good.

Now, Rara's turn…………………

Excerpt 4 demonstrates the teacher's implementation of a scaffold for learning code-switching by employing both intrasentential and intersentential code-switching from English to Indonesian and Javanese to comprehend students' comprehension of the given instruction. This scaffold to code-switching strategy in a multilingual classroom is effective enough to develop students' understanding of the given instruction so that the following students can do the same activity independently without the teacher's code-switching implementation in the next activity

3.3. Social Discourse

The teacher can also utilize code-switching to transform the discourse from a formal to a less formal environment, where the translanguaging signifies the transition from school-related themes to a more interpersonal and less formal context (2,3,9). This activity demonstrates code-switching as the teacher attempts to draw a 'rambutan' fruit on the whiteboard but finally supported by the real fruits to get the accurate description of the fruits in students' minds identified in excerpt 5.

Excerpt 5

((Teacher assigns the students to guess the names of fruits as many as possible before practicing addition and subtraction with those fruits))

Teacher: Okay, students we are going to learn numbers by counting fruits. But before that, we play puzzle first. Mari kita bermain tebak tebakan.

Student: Horray

Teacher: What is the name of fruits that have lots of hair. Apa nama buah yang mempunyai banyak rambut.

Student: Jagung?

Teacher: Jagung. Corn. Okay. It has lots of hair. But it is not fruit. Bukan buah yahhh. I will draw it for you.

Students: kecil dan berambut (laughing). Apa yahh?

Teacher: I will show you the real fruit and erase my drawing fruit (laughing). Gambaripun kurang saé.

Students: Rambutannnnnnnnnnn.

Students: Aceeeeee. (Laughing)

Teacher: Okay, good. We call it 'rambutan' or 'Ace'. Let's count together the 'rambutan' fruit in the basket. One, two, three, four, five……

In line 1 of Excerpt 5, the teacher uses code-switching, a tool of social discourse that is informality, to create a relaxed atmosphere in the classroom, thereby making the teaching and learning process more enjoyable for young students. In line 05, the teacher depicts something on the whiteboard that should resemble a 'rambutan' fruit, leading students to guess what the instructor is drawing. Students laugh as they guess, and in line 7, the teacher gives up by erasing her drawing and presenting the students with the actual fruits, explaining that she cannot draw well. Furthermore, the teacher uses intrasentential code-switching for the fruit 'rambutan' in Indonesian or 'ace' in Javanese to demonstrate that no English word can adequately represent that fruit's name. In

this example, the teacher uses codeswitching to form less formal relationships with her students and strengthen their bonds (2,4,5,8). When the teacher reverts to English in line 10, the discourse shifts back to a more formal school discourse. This code-switching activity is also apparent in Excerpt 6, line 05, where the teacher's code-switching to Indonesian and Javanese elicits laughter from the students.

Excerpt 6

((Teacher assigns the students to guess the names of fruits as many as possible before practicing addition and subtraction with those fruits))

Teacher: Okay, who wants to count how many Klepons on the plate. If correct. You can taste it. Enak dan lezat sekali. (smiling).

Student: (raise the hand and start to count)

One, two, three, four, five……. Eleven. Eleven klepons

(smiling happily)

Teacher: Okay, good. Very good. Now, let's taste it together. Yummy and delicious, right? Enak dan lezat sekali

Student: Yes, Yummy and delicious. (Smiling)

Teacher: Next, who wants to try. Ayo ayo ayo di coba di coba. Yummy

and delicious. (Smiling to the students)

Initially, in line 2, the teacher code-switches to Indonesian to clarify how tasty the klepons are. This code-switching will incentivize students to practice counting traditional foods in English and classroom communication. The teacher's informal communication and interaction are effectively lower the affective filter, which encourages students to participate actively in classroom practice and makes them eager to sample the traditional food known as jajan pasar, klepon.

4. Conclusion

The investigation of a single teacher's classroom code-switching is inadequate to generalization the effects, roles, and reasons for code-switching. This single case study of a teacher and her students illustrates that the teacher's code-switching appears to occur as a planned means of bridging linguistic barriers. In English for Maths, a curriculum built primarily for young learners, code-switching can serve as an excellent classroom management technique and a scaffold for second language acquisition. There have been numerous explanations concerning the distinction between discourses. Additionally, intersentential and intrasentential code-switching maintain the flow of the discussion.

Code-switching instances include introducing new concepts or repeating a complete sentence in Indonesian or Javanese.

On the other hand, intrasentential examples include the introduction of new vocabulary or the filling in lexical gaps and meanings using Indonesian or Javanese (16–19,23). The instructor code-switches exclusively and frequently to Indonesian or Javanese. It may only benefit students who speak Indonesian or Javanese with the teacher in linguistically diverse classrooms. One could argue that the most equitable method for teaching the target language is to adhere to the English-only policies. Despite frequent code-switching and the teacher's use of multimodality and other instructional tactics, there is a persistent concentration on the TL.

Notwithstanding, this investigation can guide future studies, as a large-scale study could gather additional information on code-switching habits in ESL or EFL courses in Indonesia. This study and ongoing studies have demonstrated that ESL teachers regularly code-switch, which is common in bilingual and multilingual environments (5,6,14,22). Nonetheless, the monolingual language policies impact guiding papers and, as a consequence, teachers, which might lead to the idea that code-switching by teachers is disgraceful and, consequently, a sense of guilt. On the contrary, this study indicates how code-switching can be valuable for teachers and students as a classroom management tool, a learning scaffold, and a relationship-building technique. Effective ways for using the first language and mother tongue could be developed and taught to teacher candidates with additional research. As a result, there would be a more united usage of the first language and mother tongue in ESL or EFL courses, promoting a more equitable learning atmosphere.

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