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Using code-switching as an empowerment strategy in teaching mathematics to learners with limited proficiency in English in South African schools

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Teaching and learning mathematics in South Africa (SA) is characterised by serious challenges because the pass rate in Mathematics is always below the expected level. The introduction of the Curriculum Assessment Policy Statement (CAPS) ushered in new hope that the situation would improve. However, teachers still encounter challenges when they use English as the medium of instruction because learners fail to comprehend the challenging mathematical concepts presented to them in a language which is not their home language. This paper investigates how code-switching can be used as an empowerment strategy to help learners improve their performance in mathematics. Qualitative research methods were used to collect data and the findings reveal that code-switching can be successfully used to facilitate teaching and learning.

Keywords: bilingual; code-switching; mathematical expressions; multilingual; paragon; perimeter

Introduction

Across the globe code-switching is a common strategy used by teachers to disseminate knowledge to learners in bilingual and multilingual contexts. Researchers have developed and suggested numerous functions of code-switching to demonstrate how it can be used to empower learners (Auerbach, 1993; Poplack, 1980) and to describe bilingual and multilingual speakers' ability to express themselves in two languages (Romaine, 1989). They have also suggested how it can be used as an educational resource to help learners acquire proficiency in a second language (Setati, 1998) and to demonstrate its sociolinguistic impact among people who use it (Gardner-Chloros, 2009). To date, studies on code-switching have grown exponentially; hence, other new functions on its uses have been suggested. This article focuses on the manner in which code-switching is employed in teaching mathematics in multilingual classes in SA as a strategy to help learners improve their performance.

In a review on code-switching, Setati, Chitera and Essien (2009:76) argue that "the issues on multilingualism and mathematics education in SA are undoubtedly complex and political." This can be attributed to the fact that the government has granted 11 languages official status without prescribing which should be the language of learning and teaching (LoLT). Therefore, School Governing Bodies (SGBs) are caught in a dilemma of either choosing the local home language or English as the LoLT. In some areas attempts were made to promote mother tongue education, however, the majority of parents perceive English as a better language that has some sort of material power to provide learners with better jobs and salaries (Ncoko, Osman & Cockcroft, 2000). Therefore, code-switching is being practiced in most schools as gap filler in situations where teachers lack sufficient vocabulary or in cases where they try to emphasise important points.

People who are fluent in English are perceived as intelligent and capable of navigating their way from lower class to middle class or from middle class to upper class in society. Most parents prefer that their children learn through the medium of English as people who are proficient in English are likely to be employed compared to those who are not proficient in English (Posel & Casale, 2011). However, translanguaging in bilingual and multilingual classrooms helps to make learning possible where learners have low proficiency in English and teachers serve as facilitators in class (García & Wei, 2014). It provides learners with a pedagogic advantage and helps them to understand the lessons better. In the same vein, Probyn (2009) argues that using the home language in the classroom has a negative impact as it derails learners from acquiring proficiency in the second language (L2), which is the LoLT. Parents play an important role in choosing the language that should be used as the medium of instruction. Instead of choosing their native language, they choose English as LoLT in the hope that it will empower their children to acquire better jobs.

Other studies conducted in different countries where English is used as a second or a foreign language provide background on code-switching. Salehmohamed and Rowland's (2014) study conducted in Mauritius, revealed that code-switching serves as an important support in a mathematics classroom. Similarly, Lim and Presmeg (2011:158) investigated how two languages were used to teach mathematics in Malaysia and concluded that "the main function of code-switching is to ensure pupils understand." Another study conducted in a Korean university revealed that code-switching helped to promote effective learning in situations where English is used as a second or foreign language (Kim, 2015). This paper, therefore, in line with what other researchers uncovered in different parts of the world, provides evidence on how code-switching can be used as an empowerment strategy in SA as well.

Literature Review

Code-switching is the communicative practice where the speaker skilfully switches from one language to another without disturbing the flow of ideas. Poplack (1980:583) states that “code-switching is the alternation of two languages within a single discourse, sentence or constituent.” It mainly occurs in bilingual or multilingual communities where the interlocutors switch from one language to another for a specific purpose. Myers-Scotton (1993:vii) defines code-switching as “the use of two or more languages in the same conversation” because each language has a social role to play in bilingual or multilingual contexts. Hughes, Shaunessy, Brice, Ratliff and McHatton (2006:14) broaden the scope by indicating that “code-switching is a linguistic feature of stable bilingual communities” as code-switchers should have a better understanding of the two languages and culture.

Poplack (1980) proposes three types of code-switching, which she labels as tag switching, inter-sentential switching, and intra-sentential switching. The three types of switching were popularly researched in the 1980s to evaluate how they effectively help learners improve their performance at school. Canagarajah (1995) argues that code-switching helps learners with low levels of proficiency in the L2 and identifies the macro and micro functions of code-switching that are useful in the classroom. Auer (2009) proposes four types of code-switching: insertional, alternation, discourse related, and participant related. In a period of more than three decades, code-switching has undergone different stages and several functions have been proposed, which could benefit learners with low levels of proficiency in the target L2. Currently, researchers focus their attention on translanguaging, which Hurst and Mona (2017) regard as a socially just pedagogy that can be effectively implemented in South African institutions.

Although there is sufficient evidence to confirm that code-switching has more prospects in scaffolding learning to improve learners’ performance in mathematics (Setati, 1998), a prevailing perception exists that code-switching disturbs the smooth running of lessons and derails learners from acquiring proficiency in English, which is the LoLT. Palmer (2009) argues that some teachers in the United States of America (USA) regard code-switching as a sign of linguistic weakness and that it must be discouraged in order to help learners acquire proficiency in English, which is regarded as a language of power. However, the situation in the USA is vastly different from that in SA where learners struggle to acquire an average level of proficiency in English to enable them to interact with the teacher. Code-switching serves a sociolinguistic purpose

where learners easily switch from their first language (L1) to L2 to help them improve their performance.

Teachers are expected to play a leading role in affording learners an opportunity to employ code-switching, which serves as a strategy to promote linguistic and cultural diversity in multilingual communities. Chikiwa and Schäfer (2016) investigated teacher’s code-switching practices between IsiXhosa and English, and then proposed that it must be done consistently and with precision to support learners from diverse backgrounds. However, it is important to note that mathematics teachers are not willing to improve their mathematics vocabulary and engage in recent trends on how to teach mathematics effectively. A fuller understanding of the prospect of using code-switching in South African schools is necessary to enlighten all stakeholders involved in the education sector about the prospects of code-switching. Reyes (2004) opines that code-switching should be regarded as an indicator of bilingual competence by learners rather than as a symbol of cognitive confusion, as viewed by some researchers.

Moreover, Diaz (1983) claims that bilingual learners easily switch to their mother tongue while doing complex tasks in a second language as a means to clarify doubts and misunderstandings encountered in the second language. They also switch to their mother tongue when trying to prove to the teachers that they do understand the content presented, although they can hardly explain it in English. This article is premised on Myers-Scotton’s (1993) model of markedness, which specifically focuses on code-switching in an African context, which requires more investigation because African languages do not have the same structure as European languages. In some cases the meaning of the sentence is slightly distorted or the flow of information is disturbed because the two languages have different structures. Muysken (1995:177) avers that code-switching is “a quite normal and widespread form of bilingual interaction,” which can take place in any situation, irrespective of whether the alternated languages developed from the same root or not.

Deumert (2005) studied language contact between English and Afrikaans and highlights that code-switching is a common practice that can be viewed as a marker of community solidarity. This aspect of code-switching is usually applied where speakers are proficient in two languages and they easily switch to show listeners that although they speak the popular language, they still have contact with the local language. Speakers also code-switch to highlight that they understand the sociolinguistic use of grammar in both languages, which enables them to use the two languages with caution (Gardner-Chloros, 2009). It is important to note

that in classrooms where two languages are in contact, teachers end up engaging in translanguaging practices to help learners improve their performance (Krause & Prinsloo, 2016)

Use of appropriate vocabulary

The performance of South African learners in Mathematics is abysmally poor. Some of the main reasons can be attributed to a lack of sufficient mathematics vocabulary which learners are expected to use to solve complex mathematical expressions. Cummins (2000) astutely drew the attention of researchers and language planners by indicating that for learners to progress in their studies, they should have a particular threshold of proficiency in the language which is used as the LoLT to enable them to communicate academically. He made a clear distinction between Basic Interpersonal Communication Skills (BICS) and Cognitive Academic Language Proficiency (CALP) to demonstrate that it is more demanding and time consuming to master the language used in content subjects. Nel and Müller (2010) give priority to the teachers' limited level of language proficiency in SA as having a huge impact on helping learners acquire appropriate knowledge as outlined in policy documents. Davis and Renert (2013) argue that proficiency in the L2 must be supplemented by the teacher's broader disciplinary knowledge in Mathematics, which helps them to articulate all content prescribed for learners.

The esoteric nature of mathematics vocabulary and unique symbols makes it challenging for learners who have very low proficiency in English (the LoLT) to understand the subject content presented. Learners should have sufficient vocabulary knowledge, which is a key factor to help them succeed in learning mathematics (Kenyon, 2016). On the other hand, teachers fail to clearly explain some of these mathematical terms and unique symbols to the learners due to limited proficiency in English. Hence, they find themselves in difficult positions when they realise that learners fail to understand and they are forced to code-switch to promote curriculum access, classroom discourse management, and interpersonal relations (Ferguson, 2003). Code-switching also helps learners to build good vocabulary in mathematics in both languages, which is one of the pillars of promoting multilingualism.

In most cases mathematics teachers hardly think about improving their knowledge of mathematics, and hence they have insufficient "content and pedagogical knowledge" that can enable them to empower learners with recent knowledge on mathematics (Stols, Ferreira, Pelsier, Olivier, Van der Merwe, De Villiers & Venter, 2015:12). Code-switching is a sociolinguistic strategy that can help both teachers and learners to build vocabulary in English, and to make the meaning of some difficult

mathematical terms understandable. It is imperative for learners to have adequate vocabulary in mathematics, which could ultimately enhance their pedagogic knowledge of mathematics.

Research Methodology

The study was designed to evaluate how code-switching can be effectively used as empowerment strategy for learners who use English as second language to improve their performance in solving challenging mathematical equations and word problems. A qualitative methodology was used to purposefully select three teachers from a group of 31 teachers responsible for teaching mathematics in one circuit in Limpopo Province, SA. The selected participants have taught Mathematics at Grade 7 level for between 11 and 21 years. A purposeful sampling strategy was used to select teachers to participate in the study as it would be time-consuming to observe and interview all mathematics teachers in this particular circuit.

Data was collected through classroom observation and semi-structured interviews with the selected participants. The collected data was transcribed, carefully sifted and then analysed to evaluate the impact of different types of teachers' code-switching when teaching mathematics through the medium of English to learners who use English as second language in rural schools. The results were arranged according to different themes that emerged from the analysis and these were used in the discussion and presentation of the results.

Classroom Observation

Classroom observation was chosen to enable me to observe how teachers use code-switching in class. It also provided the opportunity to observe learners' participation and the challenges they encountered in learning mathematics. Three contact sessions were arranged with the participants to be observed in their natural settings in order to avoid disturbing how they performed their duties.

A pre-observation meeting was arranged with each of the participants to assure them that the visit was for research purposes only and that they should teach freely as if no one was observing the class. Pre-observation helped the participants to teach as they did on a daily basis, although I realised that they tried to use English as much as possible and did not resort to code-switching as much as they would normally have done in the absence of an observer. I took field notes during all the observed lessons to compare the frequency of code-switching by different teachers. The three teacher participants were observed in three different lessons each, but only one lesson was used as an example to evaluate the pragmatic nature on how code-switching can be used in class.

Interview with Teacher

After the classroom observations I interviewed each teacher in an interview which lasted about 30 minutes. The main purpose of the interview was to acquire an in-depth knowledge about the functional use of code-switching and what was likely to happen if the teacher refrained from using code-switching, and also to evaluate the impact of the overuse of code-switching. I also endeavoured to evaluate the different purposes of code-switching that teachers employed as well as the effectiveness thereof in empowering learners to improve their performance.

Results and Discussion

Data collected through classroom observations and semi-structured interviews was analysed to evaluate the impact of code-switching among learners with low levels of proficiency in English (LoLT). Teachers understood that the learners in their classes had low levels of proficiency in English and that they (teachers) were supposed to guide the learners step by step in learning challenging mathematics concepts. Evidence garnered from classroom observations revealed that teachers code-switched for several reasons, which helped them to encourage learners to be positive about learning mathematics. Learners often encounter linguistic difficulties in expressing ideas using mathematical terminology, thus they resort to code-switching to fill the gaps or emphasise important points. This is in line with Setati and Adler (2000) who state that teachers are compelled to allow learners to code-switch freely in order to promote participation in class.

Results from the observations reveal that code-switching provides better learning outcomes than instruction in English only as teachers did not rebuke learners who inserted L1 words or phrases to finish their sentences when they got stuck when responding in English. To determine the extent to which code-switching was used as an empowerment strategy, three transcripts of classroom observations were used. This helped me to compare the manner and reasons for code-switching. To protect participants' anonymity, they are referred to as teachers A, B, and C. The excerpt below shows how Teacher A approached the lesson.

Excerpt 1

Teacher: *Good morning, Class.*

Learners: *Good morning, Sir!*

Teacher: *We have a visitor today. Let's clap our hands hi va amukela.*

(Learners clap their hands in unison.)

Teachers: *Hi ta dyondza hi perimeter of polygons. Is there anyone who can tell us what the perimeter of polygons is?*

(No response.)

Teacher: *Have you ever heard ku ri kuna perimeter of a polygon in mathematics? (pause) I mani a*

tivaka kuri what a perimeter is kumbe what a paragon is?

(No response.)

Teacher: *Do you have any idea of what I am talking about? Xana a mi swi tiva kuri perimeter of polygons i ncini naa?*

Learners: *No.*

Teacher: *Ok. Let me start by indicating that a polygon is a flat shape enclosed by three or more straight lines. That is any flat shape leyi nga rhendzeriwa hi three or more wa tilayini ta straight* (The teacher demonstrates on the board by drawing the shapes.)

The above example demonstrates that teachers sometimes encounter challenges when learners fail to comprehend new mathematics content presented to them in English. When the teacher introduced the concept of polygons, all learners were stunned as they had never heard of polygons before, and only after the teacher employed code-switching did they begin to understand.

In another lesson, Teacher B preferred to use English most of the time and approached the same subject matter in a slightly different manner.

Excerpt 2

Teacher: *Good day, Class.*

Learners: *Good day, Madam.*

Teacher: *Today we have a visitor in our class who has come to make an observation. Let's welcome him by clapping hands.*

(Learners excitedly clap hands in unison.)

Teacher: *Our lesson today is based on perimeter of polygon. I wonder if you have any idea on what perimeters of a paragon is?*

(No response.)

Teacher: *Let's open our books on Chapter 5 and look at the pictures displayed.*

(Learners open their books and recognise the pictures displayed.)

Learner A: *A perimeter of paragon is a picture yo fana na rectangle.*

Learner B: *Perimeter of a paragon va vula triangle.*

Teacher: *Let me help you. A polygon refers to a flat shape that is enclosed by three or more lines like this* (she demonstrates by drawing an example of a triangle on the board). *Yi nga va a triangle kumbe rectangle as the two of you have said. Do you now understand what a paragon is?*

Learners: *Yes, Madam.*

Teacher: *Hi ta languata eka six types of polygon which are as follows: triangle with three sides, quadrilateral with four sides, pentagon with five sides, hexagons with six sides, heptagon with seven sides, and octagon with eight sides.*

Although there are minor differences, the third excerpt paints a similar picture.

Excerpt 3

Teacher: *Good morning, Class.*

Learners: *Good morning, Sir.*

Teacher: *Namutlha hina muyeni laha Klilasini. Hi komberiwa ku ti khoma kahle, understand?*

Learners: *Yes, Sir?*

Teacher: *Hi ta dyondza about the perimeter of polygons.* (The teacher wrote, Perimeter of Polygons, on the board.) *Is there anyone who can explain kuri the perimeter of polygons swi vula yini xana?*

(No response.)

Teacher: *I know that some may think that leswi I swi harhi swo chavisa ngopfu.*

(Learners burst out laughing.)

Teacher: (Sternly looked at them and quickly said): *The perimeter of polygons is a geometric figure which is the length of the boundary of the figure. Perimeter yi vula ku leha, that is the length, ka ti layini ta le handle, ta any figure leyi hi nga ta dyondza hi yona, is that clear?*

The three examples above clearly show how teachers employ code-switching for different purposes in class. These range from using code-switching either as an icebreaker to introduce a new topic, or to clarify curriculum content and/or to compensate for learners' limited vocabulary when dealing with new content. In their study on code-switching between English and Turkish, Üstünel and Seedhouse (2005) found similar functions, which included, but were not limited to, giving translation of difficult concepts, providing verbal feedback, and as a means of discipline.

Data sources on classroom observation further reveal that teachers use code-switching differently because no guiding principles to direct the use of code-switching exist. Probyn (2009) argues that code-switching is a way of bringing the vernacular into the classroom through the back door, because teachers use it as a means of intensifying their relationship with learners. Switching from English to Xitsonga helps teachers and learners interrogate challenging concepts in what Ferguson (2003) regards as bilingual negotiation for the meaning of the sentence taken from the learners' textbook. It is an empowerment strategy that teachers and learners use to enhance communication in class during the imparting of knowledge.

Moreover, 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 passive learners. From an intensive review of teaching mathematics in multilingual classes, Setati et al. (2009) point out that language is a major determinant of success in the learning of mathematics in SA. Teachers resort to code-switching in an effort to solve the language dilemma, yet it must be done systematically and consistently for the benefit of learners (Then & Ting, 2011). All the functions that teachers should achieve through code-switching should be clearly indicated to avoid a situation where the meaning of the subject content becomes complicated due to excessive use of code-switching.

Siyepu (2013) criticises the South African education system for relying on a cookbook approach in which the learners are provided with the formula

without having a broader understanding of how strategies are used to derive the formula. Learners should understand all basic steps in mathematical calculations and independently tackle problems similar to those done by the teachers in class. Chikiwa and Schäfer (2016:254) opine that teachers should use "mathematics registers in indigenous languages" to minimise the level of inconsistency in the use of code-switching and improve learners' understanding of mathematical concepts. The Department of Basic Education (DBE) should thoroughly plan how code-switching should be implemented in class for the benefit of learners who regard mathematics as a difficult school subject.

Analysis of Data from the Interviews

Data obtained from the interviews was carefully transcribed and analysed to evaluate teachers' perceptions on code-switching and how it helps empower learners gain competency in mathematics. Several ideas emerged during data analysis and were sequentially arranged under five themes, which focussed mainly on the topic under discussion. The themes are briefly discussed below.

Learners lack sufficient knowledge of English, which is the language of learning and teaching

As learners in SA learn English as a first additional language, one must know that their level of comprehension is at a very low level. Two of the three participants agreed that the DBE should take drastic steps to help learners improve their proficiency in English where it is used as LoLT. Some participants argue that they are compelled to code-switch timeously to help learners keep abreast of the subject matter presented. One participant had this to say:

Our learners have insufficient knowledge of English, which is the LoLT in our school, and this reduces their comprehension of complex mathematical concepts. In order to solve the situation I am compelled to utilise code-switching to help clarify some challenging mathematics problem.

The above statement demonstrates the teachers' dilemma because the subject policy does not allow code-switching in class. The challenge is that learners do not easily understand challenging mathematics word problems when teachers use English only. The learners become passive and copy whatever the teacher writes on the board without any idea of how to apply the information presented.

The language of mathematics is very challenging and learners find it difficult to understand

The language of mathematics is a specialised discourse, which needs careful analysis and exposure to avoid making confusing calculations. Teachers have a double challenge of teaching the language of mathematics and of focusing on difficult word problems, which require careful understanding. The

participants unanimously agreed on this issue, but some participants cautioned that code-switching should be controlled to ensure that teachers do not fall in a trap of using L1 to teach and then translating into L2. One participant indicated as follows:

I only use code-switching when I realise that there is a need to code-switch, although sometimes it comes automatically. But I have noticed that some teachers in our school teach all content in mother tongue and translate to English as they claim learners do not understand when they use English.

The statement above reveals that teachers engage in code-switching when they realise that learners find it challenging to understand the content presented in English. In some cases, teachers go to class poorly prepared and then teach in mother tongue claiming that learners do not understand when they use English only in class.

Code-switching serves as a mediation tool that bolsters participation in class

Two of the three participants pointed out that code-switching was a useful tool which bolsters communication in class. When the teacher attempts to use English only, this communication is lacking, and learners become passive, as very few learners have the courage to contribute in class. However, one participant indicated that learners get used to the situation where code-switching is used, but that teachers must encourage them to use English when communicating in class. One participant said: *“It is not easy to avoid code-switching in a bilingual class particularly in our case where learners are expected use English in class.”* Circumstances beyond their control force teachers to breach the departmental policy of using English only as medium of instruction. However, one participant insisted that he mainly used English in class and that his learners tried their best to interact with him in the target language.

Code-switching helps teachers evaluate whether learners understand the content taught

A thorough analysis of the participants' responses indicates that they believe that code-switching helps them to evaluate whether the learners understand the content taught. It also helps them to emphasise important ideas that require critical understanding in the language that the learners fully understand, after which the switch back to English is made to maintain the flow of information. One participant responded as follows: *“Learners also make use of code-switching to demonstrate to the teachers that they fully understand the subject matter taught and they can easily explain to the teacher employing code-switching when they get stuck.”* Code-switching helps learners to fill the lexical gap to understand the content taught, which ultimately helps teachers gauge the manner in which they teach mathematics. It also affords teachers the opportunity to review their lesson plans and presenta-

tion as a means to help learners improve their performance.

Code-switching helps teachers to bond with learners and inspire them to love mathematics

All participants indicated that code-switching was an empowerment strategy that helped them develop a strong bond with learners. It afforded teachers with an opportunity to interact more with learners, thus inspiring their interest in mathematics, which most regard as a challenging subject. One participant remarked that *“inserting words or phrases from learners' native language helps them to concentrate more as well as to respond to questions without fear of making grammatical errors.”* This strengthens the bond between the teacher and learners as they communicate easily without struggling to construct sentences in English only. Another participant indicated that *“allowing learners to code-switch helps them to realise that mathematical concepts can be easily understood in their mother tongue.”* Thus, code-switching promotes active engagement between the teacher and learners who regard their teacher as a mentor and facilitator rather than a custodian who wants to fill the empty vessels with knowledge. Code-switching also gives learners an opportunity to create a sound relationship with the teacher, while at the same time empowering themselves to understand mathematics.

Results obtained from the interviews supplement those gathered through classroom observation. During class observations I realised that the learners were passive when teachers presented new knowledge in English, and the learners expected the teachers to explain the information in their L1 to help them understand. The results confirm that code-switching is an unavoidable practice in bilingual or multilingual classes, which corroborates Ncoko et al.'s. (2000) finding that code-switching is useful in multilingual classes. This is mainly due to the fact that the majority of learners have low levels of proficiency in English, which was the LoLT in all the sampled schools. The findings are also consistent with what Chikiwa and Schäfer (2016) conclude in their report on consistency and precision in teachers' code-switching practices. Chikiwa and Schäfer (2016) opine that mathematics texts are written in highly formal language, which is challenging for learners to comprehend. Therefore, teachers switch codes as scaffolding to help learners conceptualise what the lesson is all about, and help them to acquire basic mathematics knowledge through the use of the learners' L1.

The findings of the study are in line with a study conducted by Jegede (2011:51) in Nigeria. Jegede (2011) opines that code-switching serves as a communication strategy that bridges “the gap of linguistic competence between the two languages.”

Chitera (2009) observes that code-switching in mathematics classrooms in Malawi cannot be avoided as it promotes communication between teachers and learners. However, mathematics teacher educators in Chitera's (2009) study were only allowed to code-switch as a means to verbalise their thinking as the majority of participants were not fluent in English. Kim (2015:45) found that in one Korean university code-switching "has motivational underpinnings," which enhance communication between teachers and learners.

Butzkamm (1998) refers to the insertion of the L1 during a lesson as a conversational lubricant which anchors communication between the teacher and learners. Additionally, Sampson (2012) provides other functions of code-switching which include strategies for dealing with communication breakdown, the importance of exposure to and practice of the target language, as well as the need to prepare learners to use English in class. Sampson (2012) compares instances where code-switching is used to instances where English only is used in class. Inserting L1 while teaching through L2 promotes language diversity, which is one of the pillars of the South African education system. It is then not surprising that when participants in this study realised a breakdown in communication, they skilfully resorted to code-switching in a bold move to steer the lesson forward. However, Akyeampong, Lussier, Pryor and Westbrook (2013) propose that in order to produce learners who are capable in mathematics and reading, serious changes should be made in teacher education. Teacher education lays the foundation and helps prospective teachers evaluate how code-switching can promote academic achievement when teaching challenging mathematics content that requires critical thinking and analysis.

Conclusion

The article delineates how code-switching can be used as an empowerment strategy to scaffold primary school learners to improve their performance in Mathematics, which is one of the most challenging subjects for South African learners. The article provides empirical evidence of teachers' practices in classrooms in their endeavour to engage learners to participate, and to demonstrate that they understand the content presented. This is in line with Sert's (2005) assertion that code-switching is a useful technique that can scaffold beginner learners to cope in class. The study also managed to uncover different reasons why teachers constantly code-switch instead of strictly using English as LoLT. To improve the current situation, the DBE should critically evaluate all sociolinguistic factors that can help learners acquire knowledge in mathematics and other subjects without fear of being ridiculed when they fail to express themselves fluently in English.

The article also highlights the significance of code-switching as an empowerment strategy that can be used in multilingual classrooms to help learners improve their performance in Mathematics. It further proves that code-switching has a socio-cognitive function of helping learners realise that their L1 can be used to serve the same function as the L2, which is perceived to be a language of power. Interestingly, Moore (2002) expounds that code-switching provides a sociolinguistic approach essential to help learners acquire and use the L2 effectively. When learners switch codes in response to teacher's questions, it encourages them to make meaningful contributions in class. In the process the teacher should play a leading role in guiding learners to use mathematical language to get acquainted with the appropriate discourse (Thompson & Rubenstein, 2000). Mathematical language is a specialised discourse which is hardly used outside the classroom for social purposes, therefore, teachers should take the learners' level of comprehension into consideration.

Clear guidelines on the use of code-switching as a strategy to empower the learners who struggle to comprehend mathematical knowledge should be put in place. As the Constitution of the Republic of South Africa, 1996 (Republic of South Africa, 1996), promotes multilingualism among all South Africans, code-switching can be regarded as another strategy to promote multilingualism.

In a nutshell, code-switching is a viable strategy that empowers learners to enhance their academic performance in Mathematics, which the majority of South African learners struggle with. It is an effective strategy that can help learners keep abreast with scientific developments and puzzling new terminology that needs critical understanding. In line with what Setati and Adler (2000) propose on the prospects of code-switching in mathematics classes, I suggest further investigation into the issue to help researchers develop an appropriate methodology that teachers can use to help learners improve their performance in Mathematics.

Notes

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