

Home Language and the Language of Learning and Teaching in Mathematics Classrooms

Percy Sepeng

*University of South Africa, College of Education, Department of Mathematics Education,
Box 392, UNISA, 0003, South Africa
E-mail: sepenp@unisa.ac.za*

KEYWORDS Home Language. Learning. Teaching. Mathematics. Response

ABSTRACT Second language (English) learning of mathematics is common in South African mathematics classrooms, including those in the Eastern Cape Province of South Africa where isiXhosa speakers are taught in the language that is not spoken at home by both teachers and learners. The purpose of the present research is to investigate issues of language, both home (isiXhosa) and the language of learning and teaching (English) in multilingual mathematics classroom settings. The semi-structured face-to-face teachers' interviews generated qualitative measures. The interviews with four teachers in four schools were aimed at understanding their perceptions about the use of languages in the teaching and learning of mathematics. Teachers' responses indicated that they are faced with a complex situation of using English and isiXhosa in a dual role when teaching mathematics to reap some benefits (if there exist any) that come with such a pedagogical approach in the mathematics classroom. In addition, it appeared that teachers perceive the use of languages in the classrooms were generously influenced in absentia by the Language in Education Policy that was introduced to schools for implementation prior to the curriculum reform in post-apartheid South Africa, which is not easily accessible and understood by the teachers.

INTRODUCTION

In South Africa, prior to Nationalist Rule in 1948, there was a relatively loose policy of 'mother tongue instruction' which varied from province to province (Hartshorne 1992). After the Nationalist Government took over power in 1948, legislation was passed and the resources necessary to establish Afrikaans alongside English as a fully-fledged official language of teaching and learning (LoLT) in South African schools were extended (Adler 2001). All learners in minority, white, coloured and Indian schools were required to take both Afrikaans and English throughout the basic education of their schooling, one language spoken at home as first language, and the other either at first or second language level.

The Bantu Education Act of 1953 changed the language policy in South African schools which fell under the government's segregated Department of Education and Training schools (that is, schools for Black children) to extend the use of mother tongue and Afrikaans. By 1959 all eight years of primary education were done in mother tongue and secondary education used English and Afrikaans for instruction in a ratio of 50:50 in these schools. To implement this new policy all teachers in Black schools were given

five years to become competent in Afrikaans via the intensive in-service Afrikaans language courses that were offered by the government (Hartshorne 1992). This official language-in-education policy (LiEP) was specifically and explicitly designed to serve the apartheid state, but it met with fierce resistance culminating in the 1976 Soweto Revolt (Kane-Berman 1978).

The new South African constitution adopted in 1996 for a democratic South Africa has given the country eleven official languages, with nine African languages (Setswana, Sepedi, Sesotho, Tshivenda, siSwati, Xitsonga, isiNdebele, isiZulu and isiXhosa) being added to English and Afrikaans, the only two languages that were empowered with official status during the apartheid period. The constitution encourages the government of the day to take practical and positive measures to elevate the status and advance the use of indigenous languages that were previously disadvantaged and marginalised by the apartheid government (Constitution of the Republic of South Africa 1996). The constitution states that everyone has a right to receive education in the official language/languages of their choice in public educational institutions where practicable and multilingualism has been given educational weight by the South African

Schools' Act (SASA) which promotes on-going LiEP initiatives (Adler 2001).

Language of Learning and Teaching: Colonial vs. Home Language

As investigated earlier, the importance of language in learning (Secada 1992) and the mediating role of language in meaning making and instructional practice (Lerman 2001) have been the focus of significant research during the past few decades. There are on-going debates among scholars on the appropriate language to be used as LoLT, and the implications or gains of using colonial languages (for example, English in South Africa) or language(s) used by learners at home (for example, isiXhosa). Chitera (2009) explored that, some are in favour of colonial languages; others prefer use of home languages. She argues that the use of colonial languages is perceived to offer more benefits for the learners because these languages are commonly used widely elsewhere in the world. In addition, these languages are seen as a symbol of power, status, prestige and access to social goods (Setati 2005a).

Other researchers (Setati et al. 2008) called for pedagogical strategy that employs the use of learners' home languages deliberately and transparently (or invisibly) to solve real-world mathematics problems in primary classrooms of South Africa. They argue for the increased use of the learners' home language, along with use of English, through dialogue and discussion in order for learners to acquire mathematical reasoning skills.

Teachers' and Learners' Perceptions: English vs. isiXhosa

Studies (for example, Barkhuizen 2002; Webb 2010) conducted amongst isiXhosa first language learners throughout the Eastern and Western Cape provinces reported that most of the learners articulated the belief that speakers of African languages, such as IsiXhosa, do not need to study their home languages because they know speaking the language already. In South Africa, the newly democratic elected government, through the LiEP policy, promotes multilingualism by allowing the schools to use more

than one language of learning and teaching (Setati et al. 2002). In reality, the LiEP has met significant field constraints. Taylor and Vinjevoold (1999) illustrated that most schools are not opting for home languages as LoLT policy and practice, and that there is a consequent increase in English language instruction and decrease in primary language instruction in South African classrooms.

Implications of Language-in-Education Policy on the Teaching and Learning Mathematics

It is also widely acknowledged that education policies and language-in-education policies are determined by economic interests and political ideologies (Taylor and Vinjevoold 1999). The LiEP in South Africa implies that mathematics teachers and learners have to negotiate, agree, and decide which language to use, how and when to use it, in the teaching and learning of mathematics in multilingual classrooms. In previously marginalised schools of South Africa, mathematics teachers may prefer to use English, which is the learners' second language, but which they believe provides learners access to power, social goods and prepares them for tertiary education (Setati 2005a).

Adler (2001) researched out that, learners whose language of learning and teaching is not their home language tend to communicate in their home language when solving group mathematics tasks in multilingual classrooms. In these classroom settings, teachers have to make a decision whether to promote code-switching between the two languages with the purpose of developing meaning or just to disregard the LiEP, and continue to use English only as LoLT. Setati's (2005b) study in multilingual classrooms of South Africa reveals that teachers are more concerned with providing the best instruction possible that will give learners access to social class, power, higher education and employment. She argues that mathematics teachers feel guilty to code-switch as a teaching strategy because it may deprive their learners of an opportunity to acquire proficiency in English. Therefore, mathematics teachers may be faced with the challenges of disregarding and relegating the LoLT as defined in the LiEP, and rather use whatever they deem to be helpful to their learners.

Objectives of the Study

The study endeavours to explore issues of both home language and the language of teaching and learning that come to play in the teaching and learning of mathematics. The researcher wanted to understand why teachers preferred a certain language practice over the other to support classroom discourse(s). Further, the study wanted to establish which language (English or isiXhosa) they preferred to teach mathematics, and to engage learners in classroom interactions, and why.

METHODOLOGY

Research Design

Denzin and Lincoln (2003) submitted that, a research design is a plan that indicates how the researcher intends to investigate the research problem. The study that is reported in this paper used a pre-test–intervention–post-test design. To meet the purposes of the paper, it was investigated that, what the situation was in terms of language uses when teaching Mathematics as well as how participating teachers' perceived the roles of language(s) as a recourse and/or tool to enhance learners' understanding of concepts taught in multilingual classrooms. Therefore, open-ended interviews were conducted in order to make sense of issues of language(s) in these classrooms.

The Instrument

The interview questions were based on issues of language (home and/or language of learning and teaching) use in the teaching and learning of Mathematics. The questions probed teachers' perception on roles of language use as a pedagogical tool in multilingual classroom settings. The issues of the language of learning and teaching and language spoken at home, addressed in this study, formed the basis of the research questions and sub-questions (Creswell and Plano Clark 2007). The open-ended interview questions were also used to measure the extent at which the language policy in their schools influences their current practice regarding the use of languages in their multilingual mathematics classes. All four teachers were asked the same questions in the same order. In-

terview questions were in English, but interviewees were free to use language of their choice. These data gave insight into the use of language and strategies that are employed in the teaching of real word problem-solving.

The reasons that were provided by the four teachers on their personal language preferences and/or choices, and perceptions about the use of languages in the teaching and learning of mathematics were analysed qualitatively.

Sample

The main aim of the sampling in the study reported here was, among others, to select possible research participants because they possessed characteristics, roles, opinions, knowledge, ideas or experiences that may be particularly relevant to the research (Gibson and Brown 2009). The sample consisted of four purposively selected mathematics teachers in four township junior secondary schools. The four schools chosen were a convenience sample of a cluster of similar schools in Port Elizabeth. All the schools are situated in the Nelson Mandela Metropole and are functional (as opposed to dysfunctional – which is the case in many instances in South Africa), have similar characteristics in their approach to teaching and learning contexts and are public and previously marginalised schools. The schools draw learners from low economic status. isiXhosa is the language that they use at home and when they play and communicate informally at school.

Ethical Issues

The study reported in this paper requested and secured an *informed consent* from the four teachers participated in the interview session after prior permission to conduct research, was granted by the Education, Research Technology and Innovation Committee (ERTIC) of the Nelson Mandela Metropolitan University. After the ethics clearance was approved and awarded, the principals and key teachers of the participating schools were approached, where their roles as participants, rights to choose to participate or not to participate in this study were explained to them. The participants in the study reported in this paper were assured of confidentiality and that participation was voluntary, and given a guarantee that they could withdraw from

the study at any time and that no personal details would be disclosed. Confidentiality of all the information collected in the schools was also ensured, and that no portion of the data collected, whatsoever, would be used for any purpose other than this research.

RESULTS

Few extracts are used as examples from teacher interviews, and are presented below. All the names of teachers and schools in these extracts are pseudonyms and transcriptions were not edited.

Transcript 1: Which language(s) do you use to support communication in your classroom and why?

Extract 1.1

Teacher A: Normally when I'm teaching mathematics I'm using English because I want my learners to get used in the questions for English, because maybe during the exam time they will not be asked by me, they will be asked by somebody else, so I want them to get used, using the language even if I'm teaching mathematics.... The problem that I am having is to translate the words from English to Xhosa [*meaning isiXhosa*], because usually we are using alphabets... so it will be difficult to teach in Xhosa.

Teacher A is a first isiXhosa speaker using English to support communication in his classroom. He prefers to use English because it is the language of assessment, and he portrays learners' home language as a 'difficult' subject to use for teaching in his classroom. The teacher's use of first personal pronoun "I" suggest his own identity and positioning as a mathematics teacher and the expected role he plays in his classroom. He did not mention the implication(s) of using English on his learners and their positions in this regard. The observations also revealed that Teacher A and the learners held different positions resulting in different identities. This became clear when he said, "*The problem is to translate words from English to isiXhosa*", and

without mentioning if his learners had the same problem of translating between the two languages. The following extract indicates that Teacher B exercised the same choice of language use but offered different reasons for her choice.

Extract 1.2

Teacher B: Basically I use English...[*pauses*]

Researcher: Why?

Teacher B: Firstly I'm not isiXhosa speaking, so I rather refer to the language that I can speak fluently... I don't really face problems because at least I understand the language, so I don't have a problem; I even give *them* the liberty to speak in isiXhosa when *they* are in class, because the most important idea is for *them* to understand rather than to speak the language on its own.

The teacher's preferred language for conversation in her classroom is English because "*I am not isiXhosa speaker*" and can easily refer to the language that she can speak fluently. While explaining reasons for her preferred language of communication in her classroom, Teacher B used the first personal pronouns "*I*", "*them*" and then "*they*". The use of these pronouns suggested the identities and positioning of both the teacher and the learners, and their expected and negotiated roles filled by each party according to their positions. In Extract 9, the way "*them*" is used identifies learners as the key element of her classroom, holding almost the same position within classroom discourse. This was also confirmed during observations of her classroom, where she frequently used learners' home language as an invisible resource through peer-to-peer translations of mathematical terms, and re-voicing as a strategy to re-phrase and re-word difficult mathematical concepts.

Extract 1.3

Teacher C: I use their mother tongue which is isiXhosa; because sometimes you could continue in English and you discover later that they really did not understand what you actual wanted to put through,

so it's easier for them sometimes when you explain in their mother tongue.

Teacher D: I'm using isiXhosa and English, but if I want to emphasize I use isiXhosa... Mostly I use isiXhosa. I think my learners don't understand me, so I prefer to use isiXhosa, the language they are using at home...., but we are using English books.

Researcher: OK

Teacher D: Using isiXhosa for teaching and English for assessment works just fine because I use factorization, expression, and monomial because I don't know these words in isiXhosa, so I use those terms.

Teachers C and D used the learners' home language for most of the classroom interactions, including teaching and learning activities. The teachers' choice of language seemed to be influenced by her learners' linguistic competences. Teacher D's belief that *"I think my learners don't understand me, so I prefer to use isiXhosa, the language they are using at home"* and Teacher C's notion that *"You could continue in English and you discover later that they really did not understand what you actually wanted to put through"* suggest that these teachers prefer isiXhosa to communicate in the classroom. Teacher D also uses code-switching as a strategy to engage learners in classroom discourse. In her classroom practice, she regards English as a language of assessment and for using in learner and teacher support materials, but not necessarily for teaching and learning.

Transcript 2: Which language do you prefer to use when clarifying concepts that are being taught in the classroom? Why?

Extract 2.1

Teacher A: Sometimes not most of the time, just for few seconds I translate when I want to emphasise something, I can translate the English word into Xhosa, so that they can be able to grasp what I'm teaching to them.

Researcher: Do you switch between the two languages?

Teacher A: Yes, but in Xhosa I am just teaching it for few seconds, but mainly I use English. Sometimes if I am using too much English, I will find that, I can see my learners, you can see them that they do not understand this thing, let me use their language. You find that when I am using their language they understand me, but I like to teach mostly in English

Teacher B: I wish I could speak isiXhosa sometimes, because the things that you really want to explain but you can't really get to the point, so I wish I could speak isiXhosa then I would use both languages.... I use English and support it in isiXhosa, what I actually do is: when I teach a concept, obviously in every class there are learners that are fluent in English and who are fast learners, so they are sort of my assistants, because when I explain if they get the concept then I will ask them to teach or say it the way they understand and by so doing everyone gets it, but of course we've got the few that might remain behind.

Extracts 2.1, present two responses of teachers about their preferred language used for clarifying concepts in the classroom. Teachers A and B agree that using only one language is not sufficient when explaining concepts that are being taught and learned. For example, Teacher B used the language of learners and learners themselves as *"my assistants"* to explain and translate English words to isiXhosa. She engaged learners in such a way that opportunities to negotiate rules of engagement during mathematical discourse in the classroom were created. Teacher A mostly used English to unpack and explain concepts during his lessons. However, he acknowledged that *"when I am using their language they understand me, but I like to teach mostly in English"*. He preferred English over the language he claimed produced better understanding of concepts being taught. The frequent use of personal pronoun *"I"* suggested that Teacher A holds position of power and authority on how learners should learn mathematics.

Extract 2.2

Teacher C: It should be English, but as I have mentioned before, I prefer to use isiXhosa as these learners are very weak in English... so to put it across in isiXhosa makes things easy for them.

Teacher D: isiXhosa
On the other hand, Teacher C and D prefer using isiXhosa when clarifying mathematical concepts that are being taught in the classroom. In Extract 2.2, Teacher C acknowledges that although English is the LoLT in his school, "*I prefer to use isiXhosa*". He uses learners' home language as a strategy to simplify the mathematical content being learned, because "*to put it across in isiXhosa makes things easy for them*". The following transcript, Transcript 3, addresses teachers' views on the language used during word problem-solving.

Transcript 3: Which language do learners use as a resource in order to understand word problem solving? Why?

Extract 3.1

Teacher A: The learners are using Xhosa, sometimes I ask them in English but they will answer me in Xhosa, but what is happening is that I always encourage my learners to speak, even if you speak Xhosa, I accept that because I'm encouraging my learners to participate that is the most important thing, so that if they are wrong I can correct them or if they are wrong I can guide them, that is what I normally preach to them, that is the way of encouraging them to participate because you won't know Mathematics if you just fold your hands, but if you

are speaking it or writing something on the chalkboard or you are writing something on a piece of paper that is what I like from my learners.

Researcher: Are they [*learners*] scared to use their home language (isiXhosa)?

Teacher A: No they are not afraid because I say to them as long you are speaking in my class you can use any language and then I will correct you if you are wrong, that is what I'm preaching with my learners.

Extract 3.2

Teacher B: I think basically they are using isiXhosa and it's all because of their background, they are speaking isiXhosa all over except in class. They only speak English in class and I've noted that even in the English lessons they are having a problem because they sometimes refer things in isiXhosa, so I've noticed it's just me at the end of the day who is probably speaking English. But my idea, really, since I'm teaching a content subject which really requires them to understand the concept more than the language.

Teacher C: I think, its English because word problem are the difficult part of the Mathematics to interpret words into an equation, I think English will be the better language to use because isiXhosa will be very much difficult to interpret these word problems.

From Extract 3.2, Teacher C thinks learners use English to solve word problems. The text from the above extract seems to contradict what he claimed earlier: "*These learners are very weak in English*". This contradiction seemed to be brought about by the dilemmas encountered in multilingual classrooms. The observations during his (Teacher C) lessons revealed that learners used isiXhosa to communicate and solve problems in their groups, but immediately switched to English when engaged by their

teacher, in very brief and simple turns of utterances. The text in this extract also provides another pedagogical perspective about the expected roles of the teacher compared to those of his learners in classroom discourse.

Extract 3.3

Teacher D: isiXhosa

Researcher: Why do you think learners choose isiXhosa?

Teacher D: Maybe, they choose English because the text books are written in English, but when I'm teaching I'm using isiXhosa, whereas it is English in the text book, but the instructions are in English and I'm using English for instructions.

The teacher's voice in extract 3.3 provides a correct picture of how and when learners use language to solve word problems. According to Teacher D, learners use isiXhosa in most of their discussions, but would "*choose English because the text books are written in English*" every time they express their solutions in written form. In addition, observations in this classroom revealed that both the teacher and learners used English to translate and re-voice contexts embedded in word problems. Teachers were asked about the strategies that they employ in the classroom to improve and encourage learner participation and discursive talk.

Transcript 4: Do you provide learners with opportunities to talk, discuss, argue, and engage in dialogue when you teach? How?

Extract 4.1

Teacher A: Yes, that is what I normally do; I give them classwork... I encourage them that you can work in pairs, you can *discuss* it. ...I can say that do it alone because we have done this last week or at the beginning of the year so you can do alone.... I'm always encouraging them to work in pairs or I even encourage them to go to the board and do the feedback on the board.

Teacher A describes how he uses cooperative learning techniques to "*encourage them to work in pairs*" during his lessons. His strategy to engage learners in classroom discourse included allowing and encouraging learners to write their solution statements at the board for feedback purposes. In so doing, effective classroom interaction was not realised in this classroom. Only a few confident and brave learners benefited from this exercise by taking the most chances of standing in front of the others and explaining how a problem is solved. Teacher B, unlike Teacher A, had a strong belief in "*peer interaction and teacher to peer interaction*", and a challenge that she faces is how to achieve whole classroom interaction, as seen in Extract 4.2.

Extract 4.2

Teacher B: Very much. Mathematics requires that a lot, there's a need for interacting, there's a need for peer interaction, there's need for teacher to peer interaction, so we do involve them so much.

Researcher: How do you go about doing that, what are those strategies that you employ usually in the classroom?

Teacher B: Sometimes, it's guided discovery, there's a concept that I want them to discover, I just lead them to that concept for them to *discuss* it and discover it, so its peer interaction among them or it can be them and me.

The text in the extract shows that the teacher knowledge that exists in multilingual classrooms cannot be easily translated and equated to productive and successful pedagogies that result in maximum classroom interactions. When asked about the strategies that she employs to engage learners in discussion in the classroom, Teacher B describes "*guided discovery*" as a strategy to guide and allow learners to co-construct their own knowledge. In the process, she believes that peer and teacher to learner interactions will occur.

In Extract 4.3, Teacher C has strong ideas about how to involve learners in the teaching and learning of mathematics. These include allowing social interaction and creating conducive atmosphere in teaching.

Extract 4.3

Teacher C: I always try at all times to be friendly with these kids, you know when you teach Mathematics and if you always come to class being angry and so on with them you'll discover that it doesn't work, but although sometimes they will take advantage if you are too friendly, I just encourage even those who don't want to talk, just to *speak...* feel free to *voice out* your opinion, if its correct or incorrect its fine as long as you are able to stand up and say what you want, to say without fear.

Teacher C presents and portrays a mathematics teacher as someone who should be approachable to learners. The text in Extract 4.3 paints a picture of a teacher who *"always try at all times to be friendly with these kids"* when teaching, to draw them into active participation within classroom discourse. His strategy to involve these learners includes telling them to *"feel free to voice out your opinion"* and to say what is on their minds *"without fear"* of embarrassment before fellow peers.

The teachers were also asked about the language that they use the most for teaching mathematical word problems in the classroom. All the teachers' responses indicated that they use English for teaching word problem-solving. The transcript below presents a few selected extracts that are used as examples of teacher responses.

Transcript 5: Which language do you mostly use to teach word problem-solving? Why?

Extract 5.1

Teacher A: Ok, I use English, but I know my learners they are having a problem in answering the word problems, to assist them I also use the Xhosa language because I think they understand better the word problems in Xhosa than in English.

Teacher B: I use English.

Teacher C: I use English... sometimes it is difficult especially word problems, it is difficult for them to interpret it in isiXhosa, so what I always say to them, if you don't understand try to read it over and over and a meaning comes after a certain time, but I do try there and there to explain it in isiXhosa, but that's a difficult part in Mathematics to teach those word problems.

Teacher D: I teach in English, but in some areas I use isiXhosa. Because they write in English, the tests are in English not in isiXhosa.

It is very clear in the texts of Extract 5.1 that the language of teaching word problem-solving is English in all the classrooms. From these texts, it can be argued that mathematics teachers in these schools, just as in other countries such as Burkina Faso, Ethiopia, Malawi, and Niger (Brock-Utne and Alidou 2005; Chitera 2009), are somehow familiar with the official LoLT required for the schools. However, these teachers have not received pedagogical support on how to implement the policy in multilingual contexts, where the LoLT is not the learners' home language. All teachers use English and then switch to isiXhosa when necessary. These teachers argue that teaching word problems in isiXhosa is very difficult, because of the limited vocabulary of mathematics terms in isiXhosa. Teacher B uses English only, because the learners' home language is not her home language. As such, Teacher B uses learners as resources to re-voice and translate for peers during the lesson.

DISCUSSION

English second language studies conducted amongst isiXhosa speakers in the Eastern Cape Province of South Africa (for example, Mayaba 2009; Webb and Webb 2008; Webb 2010; Sepeng 2014a, 2014b) have reported that learners are not interested in learning to read or write in their home language. These researchers attributed this notion to the fact that isiXhosa have long since been marginalised and devalued. Contrary to these findings, data presented in the present study suggest that isiXhosa does have a place alongside English, playing a dual role of language of teaching and learning math-

ematics in multilingual classrooms (Sepeng 2013, 2014a). Teachers' responses also highlighted the fact that it is difficult to persuade learners to speak English during a mathematics lessons, unlike in other studies conducted elsewhere on the African continent, where it was indicated that teachers use coercive measures to force learners to speak in the foreign languages used as LoLT in those classrooms (Alidou and Brock-Utne 2005; Sepeng 2014b). As such, these researchers argued that the use of a foreign and/or unfamiliar language as the language of learning and teaching makes teachers use traditional and teacher-centred teaching methods. In this study, and other reports presented elsewhere (Sepeng 2013, 2014a), it was also acknowledged by the teachers that the use of both English and learners' home language may present unique problems, where a single word could have multiple meanings when translated. Secada's (1992) studies in the US pointed to findings of a significant relationship between the development of language and achievement in mathematics. Secada reported that oral proficiency in English in the absence of teaching in learners' home language is negatively related to achievement in mathematics. The use of language in the classrooms were generously influenced in absentia by the LiEP that was introduced to schools for implementation prior to the curriculum reform in South Africa, which is not easily accessible and understood by the teachers.

Language Policy in the School and the LiEP

Howie's (2003, 2004) studies provided corroborative evidence of the damaging effects of apartheid language-in-policy, which while not making English accessible to all learners, denied them an opportunity to use their home languages for learning and teaching. In particular, the LiEP in South Africa promotes multilingualism by allowing learners and teachers to use more than one language of learning and teaching (Setati et al. 2002). The new LiEP is acknowledged by few teachers as 'good but not accessible to them' and has already met significant on-the-ground constraints. Similar to the finding by Taylor and Vinjevald (1999), schools do not opt for learners' home language(s). This situation was anticipated in this study because mother tongue instruction has a bad image among speakers of African languages (Setati 2002).

Although, all schools in this study chose English as the LoLT, it is widely reported that much code-switching takes place between English and isiXhosa (Mayaba 2009; Webb 2010; Webb and Webb 2008b). Some researchers (for example, Peires 1994) found that speakers of African indigenous languages do not find it necessary to study their mother tongue at school because they feel that they are already fluent and competent in the language. This is contrary to the results of this study as it indicates that both English and isiXhosa are used together, and both learners and teachers lacked competence in their home language. As such, although the teachers acknowledged the dilemma of using English as LoLT in the participating schools, they preferred and continued to use English as the language of instruction (Barkhuizen 2002; Brock-Utne 2002).

CONCLUSION

The present study demonstrates that teachers are faced with the complex situation of using English and isiXhosa in a dual role when teaching mathematics to reap benefits that appeared to come with such a pedagogical approach in the mathematics classroom. What is also questionable for the teachers was the effectiveness of such a strategy and its implications on mathematics teacher practices in multilingual classroom settings. Further, the paper seems to suggest that the use of languages in the classrooms were generously influenced in absentia by the Language in Education Policy. Teachers' perceptions about language use in mathematics teaching and learning appeared to suggesting that the social and economic benefits that are associated with learning English are key factors in terms of learners' devaluing isiXhosa (their home language) and, as noted in the literature home language literacy competence suffers.

RECOMMENDATIONS

Based on the findings of the present study and multiple contexts of teaching and learning mathematics in multilingual classrooms of South Africa, it is suggested that the curriculum designers and policy decision makers should bear in mind the dilemmas that are brought about by the issues of languages discussed in this paper. It is against this background that the study rec-

ommends that teacher educators should plan, design, and present their teacher professional development activities in a way that takes into cognisance the role(s) of languages in teacher education. Further, the curriculum advisers should also be acquainted with ways and means of supporting teachers in employing pedagogical approaches that allows for multiple uses, if not dual-use, of learners home languages as a detectable resource in the teaching and learning processes.

REFERENCES

- Adler J 2001. *Teaching Mathematics in Multilingual Classrooms*. Dordrecht, Netherlands: Kluwer Academic Publishers.
- Barkhuizen GP 2002. Language-in-Education Policy: Students' perceptions of the status and role of Xhosa and English. *In Science Direct*, 30(4): 499-515.
- Brock-Utne B, Alidou H 2005. *Active Students – Learning through a Language They Master*. Namibia: In GTZ Report.
- Chitera N 2009. *Discourse Practices of Mathematics Teacher Educators in Initial Teacher Training Colleges in Malawi*. PhD Thesis, Unpublished. Johannesburg, South Africa: University of Witwatersrand.
- Constitution of the Republic of South Africa 1996. *Statutus of the Republic of South Africa*, No. 8. Pretoria, South Africa.
- Creswell JW, Plano Clark V 2007. *Designing and Conducting Mixed Methods Research*. Thousand Oaks, CA: SAGE.
- Hartshorne K 1992. Foreword. In: R McGregor, A McGregor (Eds.): *Education Alternatives I*. Kenwyn: Juta, pp. 1-14.
- Kane-Berman J 1978. *Soweto: Black Revolt, White Reaction; White Man, We Want to Talk to You*. Johannesburg: Ravan Press.
- Lerman S 2001. Cultural, discursive psychology: A socio-cultural approach to studying the teaching and learning of mathematics. *Educational Studies in Mathematics*, 46: 87-113.
- Mayaba N 2009. *The Effect of a Scientific Literacy Strategy on Grade 6 and 7 Learner's General Literacy Skills*. MEd Dissertation, Unpublished. Port Elizabeth: Nelson Mandela Metropolitan University.
- Peires M 1994. Code-switching as an aid to L2 learning. *Southern African Journal of Applied Language Studies*, 3(1): 14-22.
- Secada W 1992. Race, ethnicity, social class, language and achievement in mathematics. In: D Grouws (Ed.): *Handbook of Research on Mathematics Teaching and Learning*. New York: National Council of Teachers of Mathematics, pp. 623-660.
- Setati M 2002. *Language Practices in Multilingual Classrooms in South Africa*. Doctoral Dissertation, Unpublished. Johannesburg, South Africa: University of Witwatersrand.
- Setati M 2005a. Power and Access in Multilingual Mathematics Classrooms. *Proceedings of the 4th International Mathematics Education and Society Conference*. Centre for Learning and Research, Griffith University, Australia.
- Setati M 2005b. Teaching mathematics in a primary multilingual classroom. *Research in Mathematics Education*, 36(5): 447-466.
- Setati M, Adler J, Reed Y, Bapoo A 2002. Incomplete journeys: Code-switching and other language practices in mathematics, science and English language classrooms in South Africa. *Language and Education*, 16(2): 128-149.
- Setati M, Molefe T, Langa M 2008. Using language as a transparent resource in the teaching and learning of mathematics in a grade 11 multilingual classroom. *Pythagoras: Journal of the Association for Mathematics Education of South Africa*, 67: 14-25.
- Sepeng P, Webb P 2012. Exploring mathematical discussion in word problem-solving. *Pythagoras*, 33(1), 1-8.
- Sepeng P 2013. Exploring mathematics classroom Practices in South African multilingual settings. *Mediterranean Journal of Social Sciences*, 4(6). doi:10.5901/mjss.2013.v4n6p627.
- Sepeng P 2014a. Learners' voices on the issues of language use in learning mathematics. *Int J Edu Sci*, 6(2): 207-215.
- Sepeng P 2014b. Use of common-sense knowledge and reality in mathematics word problem solving. *African Journal of Research in Mathematics, Science and Technology Education*, 18(1): 14-24.
- Taylor N, Vinjevold P 1999. *Getting Learning Right: Report of the President's Education Initiative Research Project*. Johannesburg, South Africa: Joint Education Trust.
- Webb L, Webb P 2008. Introducing discussion into multilingual mathematics classrooms: An issue of code switching. *Pythagoras: Journal of the Association for Mathematics Education of South Africa*, 67: 26-32.
- Webb L 2010. *Searching for Common Grounds: Developing Mathematical Reasoning Through Dialogue*. PhD Thesis, Unpublished. Port Elizabeth: Nelson Mandela Metropolitan University.