What teacher educators consider as best practices in preparing pre-service teachers for teaching Mathematics in multilingual classrooms

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This paper reports on an investigation into what teacher educators consider to be best practices in how to prepare pre-service teachers to effectively deal with the challenges of teaching Mathematics in multilingual contexts, and how what teacher educators consider as best practices inform their own classroom practice. Twelve teacher educators (TEs) from four universities in a province in South Africa participated in the study. Through a qualitative analysis of the interviews, five practices emerged as best practices for these teacher educators: the use of code switching, the creation of an environment of trust in the classroom, the use of one (rather than two) medium of instruction, namely English, the use of linguistic metaphors that the languages present in the class potentially provide for use in mathematics, and, finally, the creation of an awareness of the multilingual context in which pre-service teachers would teach at the end of their qualification. Given that most teachers in South Africa teach in multilingual classrooms and teacher education research on mathematics education has not, thus far, focused on multilingual mathematics education, it is hoped that these five practices would serve as an inducement for both teacher educators and researchers alike. The author also cautions against the adoption of imported practices from other countries and argues that in delineating practices that are more likely to work in the South African context, it is important to bear in mind the distinctive nature of multilingualism in South Africa.

Keywords: multilingual mathematics education; teacher educators, practices, pre-service teachers

Introduction

Concerns on improving the quality of teacher education have followed quite an interesting trajectory over the past centuries. It can be argued that the paradigm shifts in what constitutes quality mathematics teaching have aligned themselves very intricately to the shift in the perception of the nature of mathematics, what constitutes mathematical knowledge and what it means to engage with mathematical activity (Wood, 1996). Over the years, from the notion of mathematics as "a set of rules and formalisms invented by experts, in which everyone else is to memorise and use to obtain unique correct answers" (Romberg, 1992: 453), most psychologists and educationists now conceptualise mathematics as involving the understanding of mathematical concepts as well as the ability to communicate mathematically. Moschkovich (2002), for example, holds that in addition to algorithmic competence, solving word problems and using mathematical reasoning, interaction/communication in the mathematics class is also important in the teaching and learning of mathematics. Hence, the argument advanced by both research (Pimm, 1987, 1991; Adler, 2001; Setati 2005; Sfard, Nesher, Streefland, Cobb & Mason, 1998; Moschkovich, 1999, 2002) and curriculum (DoE, 1997, 2002) is that learning to communicate mathematically is one of the central aspects of what it means to learn school mathematics. From this new understanding arise not only questions regarding mathematics

knowledge for teaching and pedagogic content knowledge, but, fundamentally, questions concerning teachers' knowledge of the use of language(s) to create epistemological access to the mathematics content. The situation takes on an added complexity in multilingual classrooms. In multilingual classrooms of learners whose home language is not the language of learning and teaching (LoLT) and who are not yet proficient in the LoLT, teachers are faced with the triple challenge of striking a balance between attention to mathematics, attention to English (LoLT) and attention to mathematical language (Barwell, 2009). It can be argued that it is not a given that pre-service teachers would acquire the skills required in dealing with this challenge by the mere experience of being in a multilingual environment, but rather through some form of formal teaching or enculturation.

The question is: How are teachers trained to deal with teaching mathematics to multilingual learners whose first language is not the language of instruction? This paper reports on the first of two phases of a wider research study which investigated the pedagogic/discursive practices of teacher educators who are preparing pre-service teachers to deal with the complexities of teaching mathematics (in multilingual classrooms) to learners who do mathematics in a language which is not their home language.

The study was informed by the anthropological perspective of situativity which holds that, in context, different discourses give rise to different kinds or forms of knowing (Putnam & Borko, 2000) and that the pattern of language used by teachers and students within and about a particular content area (mathematics in the case of this study) would determine the nature of enculturation into the discipline and would invariably lead to the internalisation of the ability to engage in discursive mathematical practices in particular kinds of ways (Brilliant-Mills, 1994). The knowledge, skills and practices of the teacher educator in bringing this to bear, namely creating an enabling environment for the learning of mathematics, cannot be underestimated. In a multilingual pre-service class, therefore, the practices used by the teacher educators make teaching a central focus of the professional learning experiences for the pre-service teachers. Using the anthropological perspective of situativity, the main aim of this first phase of the study reported in this paper was to describe, interpret and interrogate teacher educators' practices in pre-service multilingual mathematics classrooms and what, given their context, they consider as the best practices in creating opportunities for epistemological access in multilingual mathematics classrooms. Hence, in this paper, the following specific question is of interest: What do teacher educators consider to be the best practices in how to prepare pre-service teachers for teaching mathematics in multilingual classrooms and how does what they consider as best practices inform their own practice? In this paper, the term "practice" is taken to incorporate the mathematics-related activities that teacher educators engage in deliberately with the aim of enculturating pre-service teachers into the dynamics of teaching mathematics (in multilingual contexts).

One size fits all?

As Broeder, Extra and Maartens (2002) rightly pointed out, South Africa presents a complex and interesting picture of multilingualism. This is due not only to its political history of apartheid, but also to its very distinct nature of multilingualism. Of the eleven (official) languages in South Africa, nine are indigenous African languages. These African languages can be grouped into two major groups based on their linguistic distance (Linguistic distance is taken as the extent to which two or more languages differ from each other/one another with regards to, amongst myriad other characteristics, vocabulary, grammar, written form, structure and semantic aspects of the language and their status): The Sotho languages and the Nguni languages.. The languages in each of these groups are mutually intelligible (this is not the case with the remaining two African languages: Tshivenda and Tsonga) and are linguistically very "close". Because of this mutual intelligibility of languages, it becomes easy for one to learn the other indigenous languages. It must be noted that this is not the case with most multilingual settings in other African countries. The example of Nigeria is a case in point. Even though there are over 250 indigenous languages in Nigeria, most of them are very autonomous in the sense that they share very little (if at all) common vocabularies. In most classrooms in most cities in Nigeria, there might be about 10 completely different

languages present in the classroom, so much so that if the teacher uses his/her home language to teach, a good number of learners would not understand and would be thus, disadvantaged.

Elsewhere (Essien, 2010), I have argued that in her comparison of the South African linguistic context to that of Nigeria, Cele (2001) ignores both the fact that the Nigerian indigenous languages are mostly autonomous and mostly linguistically very distant from one another. She also ignores the fact of the existence of the Pidgin language. This has serious implications for her recommendation that "the South African education language policy should be modelled after countries like Nigeria that in spite of many indigenous languages existing in their cultural fabric, English is used as an official unifying factor" (Cele, 2001: 192). I argue that not only are the colonial legacies or the historical contexts of language development in a country important in determining what the best practices are in teaching and learning, but also important is the nature of the languages (indigenous and otherwise) present in the country in question. Hence, practices that have been proven to work in multilingual classrooms elsewhere may not necessarily be the best practices in the context of South Africa.

Teaching/Learning Mathematics in English as a second language

Although the South African constitution and the Language-in-Education Policy make provision for learners to learn in any of the eleven official languages of their choice, research has shown that due to economic, political and ideological factors, most learners prefer to learn mathematics in English, a language which for most, is not their first or home language (De Klerk, 2002; Setati, 2008). Learners who come from homes where the language of learning and teaching is the only language spoken at home are to some extent familiar with the linguistic structures they encounter in the mathematics classroom (Cuevas, 1984) even though they still have to deal with the mathematics language (Pimm, 1987). Research (Adler, 2001; Barwell, Barton, & Setati, 2007; Gorgorio & Planas, 2001) has shown that this is not the case with learners whose home language is not the language of teaching and learning. These learners need to deal not only with learning mathematical concepts, but also the language in which these concepts are embedded (Barwell, Barton, & Setati, 2007). In fact, underachievement in Matric examinations (mathematics) in South Africa has been found to be more prevalent amongst learners who use English language less frequently at home (Simkins in Taylor, Muller & Vinjevold, 2003) and in areas where English is less frequently used at home. Mathematics educators dealing with learners whose first language is not the language of instruction thus need to be conscious of the complex process of not only learning a second language (Cuevas, 1984), but also the even more complex process of learning (mathematics) in a foreign language.

Research design

In order to address the critical questions which this research sought to explore, a qualitative case study approach was adopted. Case studies involve detailed contextual analysis of a limited number of events and their relationships and can strengthen what is already known through previous research (O'Leary, 2004). My choice of a case study was motivated by its ability as a research method to bring new variables or understanding to the fore. Semi-structured interviews focusing mainly on teacher educators' practices in multilingual classrooms were conducted with teacher educators and tape-recorded.

Sample

This first phase involved the interviewing of twelve teacher educators at four universities in a province in South Africa. All twelve TEs were involved in training pre-service teachers for both the GET and the FET phases. Because of the distinct nature of multilingualism in South Africa as argued above, in the selection of participants for the study, all the teacher educators who were newly employed in the participating universities, but who had experience in teacher education from other countries were systematically excluded from the study. Teacher educators who were newly employed and had no previous experience in teacher education were also excluded from the study since the interviews took place at the beginning of the academic year. Those who were newly employed in the participating universities, but had experience in

teacher education in other teacher education higher institutions were, however, considered for interviews in this phase. Furthermore, teacher educators teaching either of (or both) mathematics methodology and mathematics content courses were included in the study. The table below presents a list of the teacher educators involved in pre-service teacher training in the institutions where the research was conducted and how many were interviewed:

Table 1: Number of teacher educators in the institutions of research

Institution	Total no. of TE	No. of TE interviewed
A	2	2
B	4	2
C	3	3
D	9	5
Total	18	12

Of all those interviewed, three speak more than one of the African languages of South African, four are Afrikaans speaking, one was not a South African, and one had English as the first language. As at the time of the interviews, of the six teacher educators who were not interviewed, two declined to participate in the study, and the others were new to the participating universities.

All twelve teachers selected for the study were involved in teaching multilingual mathematics pre-service teachers. Amongst other questions, TEs were asked what, for them, constitutes the best practices with regards to preparing pre-service teachers for teaching mathematics in multilingual contexts, whether or not TEs think pre-service teachers need to be apprenticed into particular ways of teaching mathematics in multilingual contexts and what TEs think needed to be done to accomplish this.

Ethical considerations

Access to the universities was negotiated with the heads of the school (faculty) of Education of each university and the teacher educators were asked for a written consent to participate in the research. The teacher educators (and research institutions) were informed by the researcher that their anonymity would be protected.

It is my contention that the community of teacher educators is different from the community of teachers. The former is much smaller, more academically and research inclined, and more conversant with one another's institutional and historical contexts. This makes research in teacher education an ethical mine-field. In this light, in all the publications resulting from this study, I have refrained from both describing the teacher educators involved in the study and the context of the institutions as doing either or both of these would put the anonymity of the teacher educators or the research institutions in jeopardy. Following from this also, the pronoun, "she would be used for all the teacher educators in this study to protect the anonymity of the TEs.

Data analysis and discussions

In what follows, I discuss the five practices that emerged as best practices in preparing pre-service teachers for teaching mathematics in multilingual classroom.

The use of Code switching

Ayeomoni (2006: 91) defines code as "a verbal component that can be as small as a morpheme or as comprehensive and complex as the entire system of language". Given this definition, a single morpheme in the Zulu language, for example, can be regarded as a code, as is the Zulu language itself. Code switching has been defined by many researchers and scholars. In this paper, I take code switching as a term which covers the phenomenon of alternating between two or more languages in the same conversation.

A noteworthy finding in this study was that all twelve teacher educators were in a position where they could not code switch in their classrooms (for various reasons such as the language infrastructure of the classes they were teaching or their inability to speak the African languages). The context depicted in Excerpt 1 was typical of most of the teacher educators in the study.

Excerpt 1

R	Do you sometimes code switch?
TE	Elm, for me, it is difficult because of the background. Because the students we have here are from all over South Africa. You find students as far as Venda. In fact, even in the class, we have Vendas, Spedis, Shangans, we've got Zulus who are in the majority, we've got Xhosa and Ndebele. So, for me as a lecturer, when to code switch is going to be a problem, because some would not understand. It would disadvantage others when I try to…

Even though as teacher educators they did not code switch in class, they all agreed that code switching is a good practice, which could have added value to their teaching. All twelve teacher-educators, therefore, said they encourage code switching by the pre-service teachers in their classes. They do so by asking learners for mathematical expressions in their home languages, by asking learners to interpret/translate to the teacher educators when a pre-service teacher asks questions in another language not familiar to the TE, by encouraging learners to do group discussions in a language they are comfortable in and/or by using metaphors that the different languages in the class potentially provide for use in mathematics (I will return to this last point in a later section). Excerpt 2 is indicative of the sentiments of other TE with regards to this:

Excerpt 2

R	Ok, do you notice any linguistic challenge when you visit them during teaching practice?
TE1	My usual resolve is that if you see that your learners are grappling with the language, break the concept in as many parts as possible. Let the learners bring in some input, maybe *call a learner and say, how would you explain it in Xhosa.* Then the learner would explain in Xhosa and you ask: have you understood? Yes. ...
TE2	Ok, What I realise is that they use code switching a lot... I don't have a problem because the learners would benefit. And I always encourage them that they can only code switch if they realise that the learners have a problem with understanding something. It should not be a matter of making things easy for them [pre-service teachers]. It should be to the advantage of the learners... The medium is English, and from there, they can only code switch where there is a need.

TE1 uses the practice of asking pre-service teachers to explain concepts in their home language in the hope that this would enable epistemological access to concepts which the pre-service teachers are struggling to understand. What is interesting is that TE2 also encourages code switching as a strategy of teaching, but on one condition, namely that it is for the benefit of the learners in the class and not as a strategy for enabling the pre-service teachers to switch to a more comfortable language for them in order to communicate their message. In the above teacher educator's practice, she tries to get learners who are not proficient in English to ask questions in English and only employs the services of a translator as a last resort. This strategy of persuading pre-service teachers to communicate mathematically in English resonates with the strategy used by other TEs who also encourage their pre-service teachers to present lessons or tasks in English so they can enrich themselves linguistically in the LoLT and become better at communicating mathematically in the LoLT. In this regard, Kasule and Mapolelo (2005: 611) note the following concerning the dilemma of being an African teacher:

African teachers know that they must enhance learners' exposure to the English language, must overcome their own sense of inadequacy in that language, and must ensure that learners are prepared for higher education and that outside world, so they must not code switch; but they must ensure that learners understand and participate in classroom talk...

This is exactly what TE2 envisages when she discourages her pre-service teachers from code switching to make up for their English language deficiencies, and when she and the other TEs encourage their pre-service teachers to communicate in English despite their pre-service teachers' low proficiency in English. In a study by Setati (2008), it was also found that both teachers and learners who position themselves in relation to English are concerned with access to social goods (higher education, jobs, etc). The conclusion that can be drawn from the above discussion is that even though code switching is an important strategy for access to mathematics in multilingual classrooms, sometimes the deliberate use of English is essential for enculturating pre-service teachers into the (English) mathematics register. In my estimation, the call by de Klerk (2002) for policies and practices which cater for the development of concepts in home languages while at the same time ensuring adequate access to English, is pertinent not only in the early education of learners, but also in pre-service teacher training.

Creating an environment of trust

Trust is also important for teaching in a multilingual context according to the TEs. It is important that the pre-service teachers do not feel that the TEs look down on them because of their language deficiencies or/ and that the TEs are not negatively critical of their culture as evident in excerpts 3 and 4:

Excerpt 3

I got my degree in Afrikaans and later on had to study in English for my honours degree… So, I can identify with my students in many ways. It is difficult and they are scared and it is intimidating and overwhelming, and we need to create that environment where they can comfortably risk things, risk making mistakes, risk talking English and learning the language while they are learning the subject specific discourse.

From the TE's utterances in excerpt 3, it can be deduced that what constitutes the best practice for this TE is the creation of an environment where pre-service teachers can risk making mistakes when they speak English, that is, where they are not shy to express their mathematical thinking in the language they are still learning even as they speak, and where pre-service teachers see their linguistic inadequacies as an opportunity for becoming linguistically enriched. This sentiment is also echoed by the TE in except 4:

Excerpt 4

R	Given your vast experience of teaching both in-service and pre-service teachers, what can we learn from you in terms of what it means to teach in multilingual pre-service classrooms of pre-service teachers preparing also to teach in multilingual classrooms?
TE	It is important that we acknowledge the fact that our students are coming to our classrooms with a multitude of backgrounds... And not only acknowledging it, but making it apparent from the word go, that you respect them, and that you think that they can make a contribution; that the learning process is a 2-way street. For me, that has worked over the years, because that also sets the tone for respect and for trust. Because of trust, the student knows he/she would not be ridiculed if he/she makes a mathematically or grammatically incorrect statement. I look at this whole thing as some kind of immersion in the context of South Africa, and we must be very careful not to take another country's model of multilingual situation as model for South Africa.

It can be argued that some form of teacher-learner trust is required in any classroom (including a monolingual context where the pre-service teachers and the TE share the same language). In a multilingual context such as that of South Africa, the issue of trust takes on an added importance in the creation of an environment

conducive to learning. The nature of multilingualism and, therefore, any attempt at suggesting what the best practices for teaching and learning are for a country, as I have argued previously, depend not only on the nature of the languages (indigenous and otherwise) present in the country in question but also on the colonial legacies or the historical contexts of language development in a country. In South Africa where mother-tongue education was used as a tool for suppression – a tool for "institutionalised racism of apartheid" (Pluddeman, 2002: 47) - and where English was synonymous with superiority, power and whiteness, and fluency in English was perceived as an "emblem of educatedness", the issue of creating or building trust between (especially monolingual, namely only English speaking, and bilingual, namely only English and Afrikaans speaking) TEs and their pre-service teachers, and of creating an environment where pre-service teachers feel comfortable to speak English without fear of ridicule or criticism, becomes essential in multilingual classrooms. To go back to Cele's (2001) recommendations, the issue of the creation of an atmosphere of trust is a typical example of where colonial history plays an important part in what is perceived as a best practice for a particular context. The remark, therefore, by the TE (in excerpt 4) that South Africa "must be careful not to take another country's model of multilingual situation as model" is of critical importance.

The use of Afrikaans and/or English as media of instruction

It must be noted that at the micro-level of the individual universities, what teacher educators considered as best practices to some extent was a function of the educational university contexts in which they find themselves. It is, therefore, not surprising that some of the practices mentioned by teacher educators from historically black universities were not a concern for teacher educators in historically Afrikaans medium universities and vice versa. In excerpt 5 below, the teacher educator from a historically Afrikaans university was responding to the question about what she considers as best practices given her (multilingual) context of teaching:

> *You know at the beginning, I had Afrikaans and English in two separate classes. Then I said no, no, one class. At the beginning, they didn't like it, but now they are actually fine with that. And I think it is a good way to do this because, if they are going to be teachers, they'll get all kinds of learners in one class. And so at university, it's not gonna help if you are going to sit in only Afrikaans class. So, I think this is a way of learning how to cope when you are out there as a teacher. That is why I also advise my students that they go to a school that they are not used to. So if you attended a rural school, you try to go to a different kind of school. Or if you attended some kind of a modern school, try to do your school practice in a different school.*

Excerpt 5

What comes out forcefully in this excerpt is that for the TE, the best practice for preparing pre-service teachers to deal with the challenges of teaching in multilingual contexts is not to have separate classes for pre-service teachers according to their language background at the university or teacher training level. Her conviction that this is good practice is foregrounded by her advice to pre-service teachers to go to a different school to what they are familiar with during their teaching practice. In the TE's own practice, even though her university allows for a course in the first year to be taught both in English and in Afrikaans and for the pre-service teachers to choose which of these classes to attend, she merged the Afrikaans and the English class together in order to give all pre-service teachers the opportunity to acquaint themselves with the cultures of others. Her reason for this is because when they (pre-service teachers) become qualified teachers, "they'll get all kinds of learners in one class".

The use of linguistic metaphors

When asked about best practices, three of the teacher educators interviewed identified the use of linguistic metaphors that the different languages in the class potentially provide for use in mathematics. This is evident in excerpt 6 from one TE:

Excerpt 6

..for me the best practice would be if I know the languages to such an extent that I can use the metaphor of the languages. If I knew these languages, I would still teach in, say, a shared language, English for instance. But if I were aware of imageries evoked by the different languages [present in the class], I would make a point of bringing that in. I am talking about something like, if you think of the concept of multiplication. There is a lovely Zulu word for multiplication called *phinda phinda*, right? When they don't understand and you say 'it's like *phinda phinda*', ...they say '*ohhhhh, repeat repeatedly*'. And they understand it. So if I know more of those, I would use them and make explicit in teaching. If I knew them, I would bring them in to enrich mathematical discussions. And I think it can help English speaking people to generate more interesting cases of mathematical applications.

For the teacher educator in excerpt 6, good practice would be to be able to use multiple languages to engage with pre-service teachers using different metaphors and imageries around a mathematical register in the different languages present in her class to enable epistemological access.

Another related best practice for teaching in multilingual class for this TE is the ability to use subtle differences for expressing a mathematical idea/word that exist in one language to enrich discussions around the mathematical concept under consideration. She cites an expression in the Zulu language that expresses the concept of multiplication – *phinda phinda* – "repeat repeatedly" and how she uses the few words she knows in some of the pre-service teachers' home languages to teach in class. Studies (see for example, Arzarello, Robutti and Bazzini, 2005) have shown that the use of analogical representations (metaphors) can help in the development of mathematical concepts. This, in my opinion, is much more so if in a multilingual class the metaphors are in the home languages of the learners and are used to enrich classroom discussion around a particular mathematical concept.

The creation of awareness of the multilingual context pre-service teachers would be teaching after their qualification

Even though excerpt 7 reinforces the importance of linguistic metaphors in multilingual mathematics classrooms, behind this smokescreen is the importance of the creation of an awareness of the pre-service teachers' future context of teaching. The TE in excerpt 7 cites an example with white pre-service teachers who do not know the African linguistic structures and do not think there is a big problem in the class since they believe that once the learners are proficient in English, that is all they need.

Excerpt 7

Let me give an example; many white students that are here, are not aware of the complexity of the African language structures. And I see it and I talk to them about it. They don't think there is a big problem in the class. "If I can speak English and the teacher speaks English, that's fine" – that's what they think. Whereas, my black students, …I was once in a class where the students were trying to understand the mathematical term for the spatial term, 'behind' in 4 dialects in Shangan. They couldn't agree on the meaning of the term in their language. And the white kids were surprised because they couldn't understand why that was a problem. Of course, for them they only have one word for it. What I'm saying is that depending on your background, your understanding of the problematic situation of language is sometimes very limited. The white kids are not familiar with this, the white teachers are not familiar with this – *the whole thing of double language, kafasi fasi – double language to show steps of big, bigger biggest* – different terms for showing your degree of comparisons. So, in this country, I think there is definitely a need for people to be

aware of the complexity of language imbedded in culture. The language structure of the African languages is different from English.

Excerpt 7 foregrounds the TE's awareness of her context of teaching and the pre-service teachers' lack of awareness of the important role language plays in multilingual contexts of teaching. As Wagner (2007) argues, students need to be able to problematise language in such a way that they come to the realisation that language problems are inherent in mathematics classroom discourse.

Besides the issue of linguistic structures which both teacher educators and pre-service teachers need to be aware of, five teacher educators strongly think that creating an awareness of the complexity of teaching mathematics in multilingual contexts (starting with teacher educators themselves) is important in dealing with the teaching and learning of mathematics in the South African context. They also indicated that at the undergraduate level, a module or a course which focuses on language issues in the teaching and learning of mathematics in multilingual classroom needs to be introduced. As I have argued elsewhere (Essien 2010), even though a course at university level that attends to teaching and learning in multilingual classrooms is essential, creating an awareness of the multilingual context of teaching and learning and what it entails should be a thread that runs through the entire teacher education mathematics curriculum.

Conclusion

The findings from this study clearly indicate a strong awareness on the part of the teacher educators about i) the context of their classroom practice and ii) the prospective context in which the pre-service teachers would be teaching at the end of their undergraduate studies. This awareness runs through what these TEs consider as best practices in enculturating pre-service teachers into the complexity of teaching and learning mathematics in multilingual classrooms. At the micro level of the universities, it can be argued that the delineation of what constitutes the best practice for the TEs in this study was, to some extent, dependent on the immediate educational contexts in which teaching and learning occurs at the universities. Such contexts included the context of teacher education, the context of the individual universities involved in the study, the language infrastructure of the classroom, and who the teacher educator is (that is, whether the TE is monolingual, bilingual/multilingual). As Barwell (2009) argues, these different contexts (at the micro-level in universities) have something of a wider value to contribute to teaching and learning in the South African multilingual contexts.

The question that remains to be answered is: to what extent should teacher training institutions adopt some or all of the five practices delineated by the TEs in this study? In South Africa where most of the classes are multilingual and where most learners, despite their low English language proficiency, choose to do mathematics in English (Setati, 2008), one of the challenges for teacher education institutions, teacher educators and researchers alike is to legitimate practices that would equip pre-service teachers to deal with the complexity of teaching effectively in multilingual mathematics classrooms. Investigating what teacher educators themselves consider as best practices is an integral part of that process.

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