

Using video-stimulated recall interviews: teachers' reflections on the teaching of algebraic functions in rural classrooms¹

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ABSTRACT

This paper has emerged from a qualitative study based on exploring Grade 10 rural mathematics teachers' discourses and teaching approaches while teaching algebraic functions in Acornhoek, Mpumalanga Province in South Africa. The topic was explored through individual semi-structured interviews, unstructured classroom observations and Video-Stimulated Recall Interviews (VSRIs) with five teachers from five different school sites representing multiple cases. Both participating schools and teachers were purposively selected for the study. The current paper focuses primarily on the data from VSRIs, which allowed teachers to revisit and reflect on recorded lessons. Teachers' reflections and comments made during the viewing of the video footages were analysed using Fairclough's Critical Discourse Analysis in relation to Professional Learning and Change theoretical framework. The benefit of using VSRIs is that it enabled teachers to question their own teaching, in turn positioning them better to interrogate and problematise the taken-for-granted nature of their classroom work. This method did not only complement the data from the other two methods used in the study, but also allowed teachers to configure alternative courses of action and utterances during teaching in the classroom that challenge and modify their teaching practices.

Keywords: mathematics, algebraic function, Video-Stimulated Recall Interview, rural, teaching

INTRODUCTION AND BACKGROUND

In current education research globally, there is a continuing need for 'more and better data-based studies on rural schooling dynamics, coupled with a great deal of literature on administrative issues and problems in the operation of these institutions' (DeYoung, 1987: 129). DeYoung's argument was that there 'exist[ed] an urban bias to most educational research' in the United States at that era 'and, for that matter, around the world' (DeYoung, 1987: 128). While this postulation was made three decades ago, the dearth of educational research located within rural areas and schools still prevails globally and in South Africa. There is very limited high-quality rural education research with teachers and learners, particularly in mathematics education due to the continued dominance of urbanised research (Nkambule et al., 2011; Balfour, 2012). According to Nkambule et al. (2011: 341), 'rurality and rural education have been marginalised bodies of knowledge in South Africa' in both the apartheid and democratic dispensations. This results in the silencing of rural teachers' and learners' voices about their educational experiences as

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well as overlooking the alternative forms of knowledge which can be accessed only through researching within rural contexts and schools.

In South Africa, some scholars are slowly focusing on researching various aspects of rural education (Moletsane, 2012; Masinire, 2015; Mafunganyika, 2016; Mbhiza, 2017; Nkambule, 2017). However, to date, the paucity of mathematics education research focusing on rural teaching and learning in South Africa has not been able to offer rigorous insights into rural teachers' mathematics teaching and their experiences of teaching the subject within rural contexts. Accordingly, if the urgency of improving the standard of rural education in South Africa generally, and mathematics performance in particular is seriously considered, research that fosters rural practicing teachers to reflect on their classroom practices for the purpose of professional learning should be understood. Notwithstanding the need to research more with rural teachers to expand the scope of the research locale in mathematics education research, the use of Video-Stimulated Recall Interviews (VSRIs) in mathematics and other school subjects can be of help even for teachers in urban and township schools.

Teacher professional learning can be promoted when teachers value disruptions and doubts as rich sites for learning about their work and when they make links between their practical knowledge and experience of teaching within their classrooms (Field & Latta, 2001). According to Dewey (1938), teachers' participation in classroom activities does not necessarily lead to 'educative experiences' unless it is attuned to purpose and directed with specific curricular ends in mind. This resonates with Field and Latta's (2001: 887) iterations that 'the possibility of becoming more experienced arises only when something happens to us beyond what we anticipate', suggesting that practising teachers' development of craft knowledge comes about through the acknowledgement of effective and defective teaching practices in their classrooms (Reitano, 2006). One way of supporting teachers to reflect on their teaching is through conducting VSRIs, which is helpful in the identification and examination of teachers' thinking and decisions during teaching, as well as the reasons for particular actions during the teaching and learning processes in the classroom (Reitano, 2005).

Reitano (2005: 382) posited that conducting VSRI with teachers allow them to 'relive' an episode of classroom teaching by 'providing, in retrospect, an accurate verbalised account of his/her thought processes'. In the study that is reported in this article, videotapes of observed lessons on algebraic function within rural mathematics classrooms allowed teachers to watch videos of their own teaching, revisit scenes from the videos and reflect on their teaching practices. This article intersects with Kennedy's (2006) research on the development of teachers' 'craft knowledge' which includes concerns about lesson structure and flow, coverage of content and learners' learning. That is, the use of VSRIs allowed rural mathematics teachers in this study to reflect on their teaching of algebraic function in terms of the relationships between their teaching practices and learning outcomes in observed lessons.

LITERATURE REVIEW

Defining a rural area and rural teaching

The conceptualisation of the term 'rural' remains neither consensual nor uncomplicated, considering different perspectives about what constitutes rural which results in different interpretations across different countries and sometimes even within a country. Rural areas are almost always viewed with deficit perspective which associate them with social ills such as poverty, illiteracy, poor learner achievement, underdevelopment, to mention just a few (Hlalele, 2012; Mukeredzi, 2013). For example, Mukeredzi (2013) draws from Chikoko (2011: 92) and defined rurality as 'synonymous with remote area and refers to an underclass model describing a notion of rurality in social development' resulting in viewing these contexts in negative terms. Taking a non-deficit paradigm of rurality, I view a rural area as a space in which human existence, daily activities such as teaching and learning as well as community development

is sustained without help of the jurisdiction of the metropolitan authority (Maringe, Masirire & Nkambule, 2015). While the challenge for rural researchers is how to define 'rural', for rural teachers the challenge entails grappling with their own identities as well as their specific perceptions of what rurality entails and how the opportunities unique to their rural areas influence their teaching.

In order to understand teachers' teaching of algebraic functions within rural mathematics classrooms, I situate the discussions of teachers' mathematics teaching in Walker-Gibbs, Ludecke and Kline's (2015) notion of 'Pedagogy of the Rural'. Pedagogy of the Rural is an approach that captures the complexity of rural place and space through challenging deficit understandings of what teaching within rural contexts really means. Walker-Gibbs et al. (2015: 1) stated that

Pedagogy of the rural is an approach to conceptualise rural understandings as a pedagogy that is not a pedagogy 'for' or 'about' but rather 'of' the rural'.

In this sense, pedagogy is the way in which teachers' daily activities and realities in the rural 'acknowledge and are sensitive to what the rural brings to their teaching, and about pedagogical tact: knowing what to do when you don't know what to do' (Walker-Gibbs, Ludecke & Kline, 2018: 302).

Of concern for this paper is that, although some studies exist on teachers' teaching of algebraic functions in mathematics in South Africa (Mugwagwa, 2017; Malahlela, 2017), rural mathematics classrooms, with their unique knowledge base, remain under-researched in post-apartheid South Africa. Notwithstanding the deficit understanding of rural areas briefly discussed above, some research studies presented some evidence suggesting that the quality of teachers within rural schools may be lower than of urban teachers (Hlalele, 2012). For example, Gardiner (2008: 13) states that rural areas and schools are difficult to reach '... as the physical conditions in schools are inadequate and learner performance in comparison to schools elsewhere (e.g. townships) is at a lower level'. Despite prominent emphases that teachers remain important players in ensuring quality learning and teaching within rural schools, limited research has been conducted to assist teachers in rural areas in South Africa, especially in mathematics education.

While the challenge for rural researchers is how to define 'rural', for rural teachers the challenge entails 'grappling with their identities and specific perceptions of the rural' and how the opportunities unique to their rural areas influence their teaching (Walker-Gibbs, Ludecke & Kline, 2018: 302). Thus, in this study, having conversations with teachers about their classroom practices with an aid of videos of their teaching presented opportunities to understand how teachers' experiences of rurality helpfully shape their teaching of mathematics within rural classrooms.

Dearth of mathematics education research in rural schools

In South Africa, mathematics education is frequently viewed to be of appalling standards, especially in rural and farm areas which have traditionally been viewed as deficient, as discussed above (Moletsane, 2012). According to Mbatha (2014), understanding the different challenges and success stories that occur within rural schools is essential, considering that 62% of South African schools are located in rural areas. While this is the case, Venkat et al. (2009: 11) mentioned that the dearth of mathematics education research 'done in rural schools is problematic given that the majority of South African learners are educated in these contexts, as urban contexts continue to be explicitly and solely focused upon...'. Despite this acknowledgement of marginalising rural schools in research, the research locale bias is still noticeable a decade later in mathematics education research, even from Venkat and colleagues. In an attempt to address the research gap, this paper focuses on teachers' reflections on their classroom discourses and approaches while teaching algebraic functions within rural mathematics classrooms.

Regarding teachers' content knowledge and pedagogical approaches, Nkambule (2017: 192) argues that 'teaching in rural settings ostensibly requires relevant knowledge and skills to cope with various eventualities and challenges, and teacher's ability to meet the challenges and responsibilities'. In this paper I suggest that in order for teachers' professional learning and change to occur, researchers should desist from 'researching on' (rural) teachers but adopt a position of 'researching with' teachers if the urgency of helping teachers reflect on their teaching practices and configure strategies to improve their classroom practices is a goal of research. By researching *on* teachers, I mean research that treats teachers as objects of research, where a researcher adopts a position of power over research processes and owns analyses and interprets the information provided by participants, on their own. In contrast, researching *with* teachers entails research in which teachers and researchers share power over research processes, and where teachers themselves, with some guidance from the researcher interpret the data that are available to them. While research processes such as member checking could have same 'validation effect', I am of a belief that teachers' interpretations of their own teaching practices can suggest areas for their learning needs about their classroom practices.

Mathematics education research has broadened to include the variety of factors such as language and mathematics, ethnomathematics, mathematics discourse, to mention just a few (Khuzwayo, 2005; Adler & Ronda, 2015). However, it is noticeable that researching with rural mathematics teachers has been overlooked, especially focusing on their discourses and approaches while teaching the subject. One way of enabling rural teachers' reflections about their classroom practices and supporting effective ways to teach mathematical contents is engaging in video-stimulated recall conversations about their classroom discourses and approaches during teaching (Reitano, 2005). Making explicit the thinking behind the classroom teaching practices of rural mathematics teachers was made possible in the current study through the use of observations of the participants' teaching and associated VSRI. VSRI provided another means for the teachers to articulate their personal constructions of good and bad teaching of algebraic functions based on their experiences as rural mathematics teachers. Below, I discuss how professional learning and change in relation to Fairclough's Critical Discourse Analysis (1997) are used in this paper as a theoretical framework.

Professional learning and change and Critical Discourse Analysis

Various studies have argued that there are limited opportunities within rural settings that foster in-service teachers' professional development (Masinire, 2015; Barrett, Cowen, Toma & Troske, 2015). The current view of mathematics teacher professional learning is that professional learning programmes that focus on teachers' learning about their teaching in and from practice are reported to be more likely to result in long-term changes in their teaching practices (Brodie, 2014). According to Muir and Beswick (2007), professional learning focuses on teachers' learning and reflection on their classroom practices for the purpose of improving their teaching and in turn learners' academic performances. In relation to this, Lovitt and Clarke (1988) posited that in order for successful learning to take place, reflections should take place as close to teachers' working contexts as possible. These authors proposed that doing this offers teachers opportunities to reflect and receive feedback from a critical friend. In this study the researcher and the reflection process entails a conscious commitment by rural mathematics teachers. The general consensus is that for research to effectively foster teacher professional learning and change, they must be willing to challenge their own teaching practices and capitulate perennial beliefs should these be found to be defective (Brodie, 2014).

While the aim of using VSRI in the current study was to help rural mathematics teachers reflect and configure appropriate teaching practices during mathematics teaching, I did not advocate a prescribed programme for teachers. Similar to some previous studies (Reitano, 2005; Rosaen, Lundeborg, Cooper, Fritzen & Terpstra, 2008), a partnership was established with participating mathematics teachers within

rural schools to engage in professional dialogue about their observed teaching practices. In line with the focus of the reported study, Clarke (1997) illuminated that the researcher plays a crucial role in guiding teachers' reflections and this can bring about changes in teachers' teaching practices. One way of enhancing teachers' reflection on their teaching practices is through VSRI with teachers as will be discussed later below.

In relation to professional learning and change, I used Fairclough's Critical Discourse Analysis (CDA) to derive categories from the responses given by the teachers, which includes the nature of their reflective responses (Muir & Beswick, 2007). Professional learning and change are limited to what is said and represented during conversations with the participants about their teaching practices, while CDA also focuses on how participants speak about and represent phenomena through language. This means participants' responses during reflective conversations cannot be limited to the structures of the social system, but are shaped by multitude of issues that CDA reveal and interrogate. CDA helps in 'uncovering the relationship between language, society, power, ideology, values and opinions' (Rahimi & Riasati, 2011: 108). The aspect of language is essential in the construction of knowledge and 'reality', and is contended to be influenced by socio-cultural and political dynamics of which professional learning and change does not pay attention (Fairclough & Wodak, 1997). Thus, all VSRI transcripts in the form of written texts were analysed by using professional learning and change in relation to CDA to deconstruct these texts 'to come up with their intended ideologies' relating to mathematics teaching in general, specifically the teaching of algebraic functions in rural classrooms (Rahimi & Riasati, 2011: 111). The following section details the methodology espoused for this study.

METHODOLOGY

This study was located within a post-structural research paradigm that aimed to gain insight into rural Grade 10 mathematics teachers' discourses and approaches in the process of teaching algebraic functions. I used a qualitative research approach for this study (Creswell, 2013). The qualitative approach is appropriate for this study considering that it is regarded to be 'a systematic subjective approach used to describe life experiences and situations to give them meaning' (Burns & Grove, 2003: 19). This approach enabled me to understand rural teachers' teaching practices in their uniqueness, the nature of the rural setting as well as what it means for them to live and teach in that setting. In this study, I immersed myself into the lives of the participants to understand the teaching of algebraic function as experienced by teachers within rural contexts and mathematics classrooms.

The study reported in this paper was developed as a multiple case study in that it presents multiple realities in the context as reported through the perspectives of five teachers from five different school sites as the information about their teaching of algebraic function was observed, analysed and interpreted (Simons, 2009). The use of a case study design enables the researcher to understand a particular phenomenon within some bounded context and activity of boundary (Creswell, 2013). The bounded context in this study is rural Acornhoek mathematics classrooms, and the activity of boundary is the teaching of algebraic functions. The schools were purposively selected on the basis of their participation in various projects conducted by the Wits School of Education, which includes Wits Rural Teaching Experience (WRTE). The five teachers were also purposively selected since teachers needed to have knowledge and experience of teaching Grade 10 algebraic functions within rural mathematics classrooms. Table 1 below illustrate some of the teachers' biographical information for each of the five participating teachers. I use pseudonyms to conceal teachers' true identities for the purpose of ensuring anonymity in the study.

Table 1:
Teachers' biographical information

Pseudonym	Gender	Mathematics Education qualifications	Number of years teaching	Institution trained at to become a teacher
Zelda	Female	Bachelor of Education	5 years	University of North West, South Africa
Mafada	Male	Honours in Mathematics Education	20 years ²	Giyani College of Education, South Africa
Tinyiko	Female	Bachelor of Education	5 years	University of Venda, South Africa
Mutsakisi	Female	Bachelor of Education	30 years	University of Zimbabwe
Jaden	Male	Bachelor of Education	17 years	College of Education in India

In line with the qualitative research approach, Creswell (2013: 52) stated that 'the backbone of qualitative research is extensive collection of data, typically from multiple sources of information'. In the larger study, I used three data generation methods: individual semi-structured interviews, unstructured non-participatory classroom observations and video-stimulated recall interviews. In this paper I mainly focus on the information teachers provided during video-stimulated recall interviews in relation to their observed teaching practices in the classroom. I observed and videotaped a sequence of mathematics lessons on algebraic functions and used the videos to engage the teachers in a process termed 'video-stimulated recall interview'.

Paskins, Sanders, Croft and Hassel (2017: 1) define VSRI as 'a method whereby researchers show research participants a video of their own behavior to prompt and enhance their recall and interpretation after the event'. Along similar lines, Gamoran (2003: 13-14) postulated that using VSRI enables teachers to develop 'a different kind of knowledge for teaching-knowledge not of what to do next', but rather knowledge of how to interpret and reflect on classroom practices'. In the study reported here, following each observed lesson, the video footage was viewed by the researcher and each individual teacher and discussions related to the viewing and interpretations of the video footages were audio-taped and transcribed verbatim.

All viewings of the videos for all five teachers were conducted in private rooms, prior to which each teacher was given a set of their footages to watch and make any comments about their teaching and whether or not there were any critical incidences that stood out for them. Giving the teachers the video footages allowed them 'to decide for themselves what they want to focus on...' which supports them to be

in control of stopping the tape at any time when they see themselves making decisions, describe what they were doing at the time, what alternatives they had considered and what they decided (Reitano, 2006: 3).

Data analysis

Marshall and Rossman (1999) described data analysis as a process in which researchers bring order, structure and meanings to the mass of the data generated to address the purpose of the study. In

2 While Mafada has 20 years teaching experience, he stated that he sees himself as a beginner mathematics teacher because it was his first time teaching mathematics in 2018 since his teaching career started. While he is a qualified mathematics teacher, he has been teaching Physical Sciences throughout the years.

qualitative research, data analysis entails the process of making sense from the information provided by the participants about a phenomenon under scrutiny, themes, categories and regular similarities (Creswell, 2013). Nieuwenhuis (2007: 99-100) captured the essence of qualitative data analysis well when he opined that '... qualitative data analysis tends to be an ongoing and iterative process, implying that data collection, processing, analysis and reporting are intertwined, and not necessarily a successive process'. Thus, data analysis for the study commenced during the process of data generation and I created units of analysis through assigning codes to the information provided by the teachers (Muir & Beswick, 2007). Data from classroom observations were also analysed according to categories of which were frequently referred to during discussions with teachers. Teachers' responses showed complexity with the understanding of the teaching of mathematics, specifically algebraic functions within rural classrooms, and I was careful during the coding of the information that they provided which resulted in three themes: *examining current actions and envisioning future actions, disowning self, and rushing to complete work for compliance*.

FINDINGS AND DISCUSSION

The study findings and discussion presented in this sub-section focuses particularly on the impact that the video-stimulated recall interview process had on teachers' practices as well as the nature of their reflective comments resulting from the cooperative viewing of the video footages and from having professional discussions with the researcher. In this paper, I focus primarily on three themes: *examining current actions and envisioning future actions, disowning self, and rushing to complete work for compliance*. The first theme focuses on teachers' reflective comments which suggest an awareness of key aspects of their teaching that constrained the creation of a supportive classroom environment for all learners, and teachers' willingness to implement changes in subsequent lessons. Examining current actions and envisioning future actions comprises of three sub-themes: *inadequate content knowledge requiring thorough lesson preparation, inappropriate choice of examples requiring better choice, and focus on active learners requiring a balance*. The second theme addresses teachers' positioning in relation to reflecting on their teaching. That is, in cases where teachers felt some parts of their lessons were not carried out effectively, they indicated that the person on the video was someone else and not them. The last theme focuses on teachers' reflections on why they adopt particular pedagogical actions even in cases where such actions do not promote learners' mathematical learning. Jaden and Mutsakisi reflected that the reason why they rush to finish the work is that they want to be on par with the pace-setter to ensure compliance.

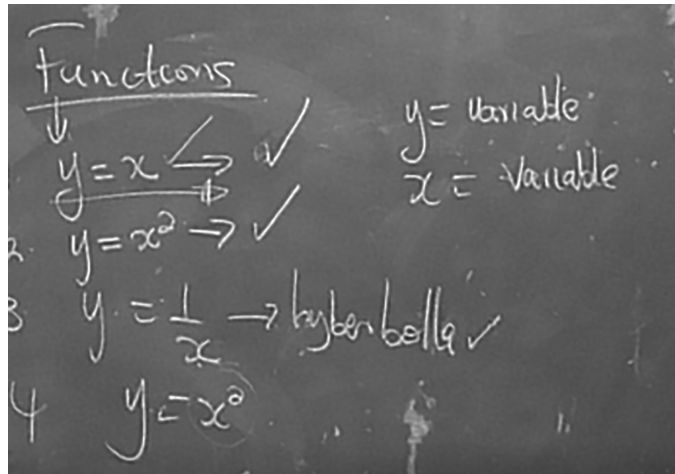
Examining current actions and envisioning future actions

This theme represents instances of teachers' self-awareness about their own cognition-in-actions as we engaged in stimulated recall interviews. Teachers' comments demonstrated that they became aware of aspects in their own actions during teaching. Mafada, Tinyiko and Zeldi reflected on their actions in relation to their lack of understanding of concepts due to lack of lesson preparation, use of inappropriate examples and focus only on active learners respectively. Of importance for this theme is that these teachers reflected and talked about the ways they intend to do things differently in future lessons to ensure effective teaching of algebraic functions. Teachers' reflections were prompted by the questions in the video-stimulated recall interviews, and while they cooperatively watched the videos of their observed lessons.

Inadequate content knowledge requiring thorough lesson preparation

Lesson planning is an important first step in the teaching process which helps in identifying a course of action to effectively reach goals and lesson objectives (du Plessis, 2017). In the current study, Mafada reflected on the content he taught in his first observed lesson and admitted that his lesson was not coherent due to lack of planning (see picture 1 below).

Picture 1:
Mafada's introduction



At the beginning of the lesson, Mafada wrote the different families of algebraic functions on the board, explaining to the learners the names of each function written on the board. Picture 1 shows what Mafada wrote on the board at the beginning of his lesson. The following excerpt represents Mafada's explanatory talk during the introductory stage of his lesson:

That one represents (he reaches for a textbook to remind himself of the type of function $y = x^2$ represents), we said that one represents (paging through the textbook), represents a parabola. So, we haven't started with this one. We said the third one is where y is equals to one over x , and what did we say that one? We said that one represents (reaching for a textbook), we said that one represents a hyperbola, we haven't started with the parabola, I said this one will be our third lesson.

While it is expected that a textbook is used as a reference tool during teaching, Mafada appeared not to know what type of a function $y = x^2$ represents. This was evidenced by paging through the textbook before saying that the equation represents a parabolic function. During VSRI, Mafada acknowledged that he never consulted the curriculum documents to understand the contents specifications and sequence of the topics for Grade 10 mathematics. While this is the case, he stated that the questions I asked him about the curriculum and lesson planning prompted him to check the curriculum documents to ensure relevance for the grade he is teaching as well as lesson planning to ensure that his explanatory talk during teaching is effective (Adler & Ronda, 2015). Mafada said:

Now, I won't take chances niya nghena tllasini being unprepared (now I won't take chances, I will not go to class unprepared) because ni fikelele level yin'wani (I have reached a new level, I think also the learners will benefit. That day we looked at the small function of y is equals to x squared and how to draw a table, so now we are going to look at the shape, to see what influences the shape and the shifting, because I think it will be fine. And I think it will be good because we are going into the same class.

Mafada iterated that by participating in the study, he realised that thorough planning for his lessons was necessary since for the first observed lesson he just went to class to teach the contents from his own vestiges of memory of what the topic on functions entailed. That is, he taught the lesson without first checking content specifications and delimitations for the topic in Grade 10 as enshrined in the curriculum document. According to Lotz-Sisitka (2009: 63), vestiges of teacher memory are 'linked to the past curriculum or their

own life world experience'. Thus, considering that Mafada acknowledged that he did not prepare for the lesson and the last time he taught mathematics was 20 years ago, the response above suggests that he taught the lesson from own experience of how the topic should be taught from 20 years ago. This is further elucidated by his response during VSRI when asked about content specifications in the CAPS curriculum for algebraic functions at Grade 10 level. He stated that

Remember last week when we spoke neh, I said I did not look at CAPS, but you advised me to go and check the policy so that I can also see what the government requires me to cover. Isn't because of the strike we just came back to school today, so I will check with the teacher that was teaching to see what the policy say.

This response illustrates that Mafada did not check the content specifications from the curriculum document to understand the delimitations for the algebraic functions' topic in Grade 10, which could be interpreted as one of the factors that shaped the manner in which he taught the lesson. His choice of words 'I won't take chances' in the earlier excerpt and 'I will check with the teacher' in the excerpt above suggests that he has realised from our conversations that lesson planning is an essential aspect of teaching. While it could be argued that this should be part of any teacher's repertoire, engaging in VSRI with Mafada seems to have made him realise the need for thorough lesson preparation instead of teaching from vestiges of own memory. Rural teachers such as Mafada were not trained adequately and are not conversant with the content specifications in the curriculum documents. Accordingly, it is important that teachers in rural schools are constantly reminded through workshops and research about what the curriculum entails. Although it can be argued that the Department of Education does all it can to offer teachers support through school visits by subject advisors and workshops in which teachers are re-skilled, there are still challenges in rural areas and schools.

Inappropriate choice of examples requiring better choice

VSRI involves examining actions that teachers took 'and their consequences, questioning the results, and envisioning future actions' (El-Dib, 2007: 28). In this study, Tinyiko noted that some of the examples she used during teaching did not serve the purposes intended. She reflected on the relationship between her espoused examples and the quality of learners' responses during classroom interaction. She said

that was a weird example, cutting a ball into two equal halves, it becomes a sphere, it is not even a semi-circle, so (she laughs), at least if I could have used a circle, that is why kids were giving me something, their answers were just nje. When I use demonstrations of something physical, next time I will make sure that it has an impact on what I am teaching.

This response suggests that Tinyiko realised during the viewing of the recorded lesson that the examples she used did not represent the general principles of the algebraic functions concept. Her choice of words 'I could have used a circle, that is why kids were giving me something, their answers were just nje' demonstrate that she is aware that the examples she used during teaching did not have relevance to the topic and they did not explicate the properties of specific concepts related to algebraic functions as well as the rules associated with the concepts she was exemplifying.

Throughout the classroom observations for Tinyiko, it became clear that the examples she used during teaching were constructed spontaneously during teaching and not pre-planned, resulting in the disjuncture between the examples and the explanations of the principles of the concept. Tsamir, Tirosch and Lovenson (2008) define an example as the description of the concept definitions and the features of the concept. Of importance to note is that the reflection process with an aid of videos of recorded lessons allowed Tinyiko to examine her exemplification, evaluate their consequences for the learning of algebraic functions and realised that they did not represent the key features of the concept. Tinyiko's utterance

When I use demonstrations of something physical, next time I will make sure that it has an impact on what I am teaching

suggests that the reflective conversations allowed her to reflect and envision future actions when it comes to the choice of examples to ensure relevance and links with the concept of algebraic functions.

Focus on active learners requiring a balance

Teachers have a teaching responsibility to ensure that all learners are actively engaged during teaching and learning processes. While this is the case, some teachers find it difficult to configure strategies to best involve learners in the learning process, especially in classrooms characterised by conditions that are not conducive for learning such as overcrowded classrooms. The following excerpt demonstrates Zelda's realisation during VSRI that during teaching, she tends to focus only on the learners who actively participate in learning and leaves the ones who do not interact with her.

Researcher: Do you see anything wrong with this learner?

Zelda: Who is this? oh Neo (she laughs)

Researcher: Is he the only learner who is disengaged during learning? Because you seem to focus more on those who are active in class.

Zelda: (she laughs), yeah I see now... but it's overcrowded, I have seventy something now in class, it is difficult to attend to all the learners' needs, sometimes you can't even move between the desks, but I see I leave some behind. I will try to check more on who is not participating next time and engage them when I am teaching.

This excerpt reveals that classroom conditions such as overcrowded classrooms, which is prevalent in rural schools can result in a teacher focusing only on learners that are active participants during teaching and learning, which could result in biased learning affordances for learners who do not participate. Of importance to note is that engaging in a stimulated recall interview made Zelda to come to a realisation that she leaves other learners behind during teaching. The statement 'sometimes you can't even move between desks, but I see I leave some behind' signifies that Zelda acknowledges the challenge of teaching in an overcrowded classroom, but also the need to ensure that all learners are active in classroom participation. In addition, the choice of words 'I will try to check more on who is not participating' suggests that Zelda envisions a course for future action when it comes to involving learners in learning. However, she is also aware that it is not going to be easy considering the class size especially considering her choice of words 'I will try'.

Furthermore, previous studies demonstrated several benefits of using video recordings for teacher reflection (Fadde & Rich, 2010; Brouwer, 2011). However, very few studies explicated how video-stimulated recall conversations influenced the process that resulted in teachers seeing the need to change their teaching. In this study, teachers' reflective comments illustrated that videos facilitated change because it helped them to: (a) focus on parts of the lessons that facilitated and/or constrained learners' learning, (b) identify areas that needs much work in their teaching such as meeting the curricular specifications, and (c) configure alternative strategies to facilitate learners' learning of mathematical concepts. Teachers' utterances during video-stimulated interviews reveal that this process creates opportunities for changes in teachers' own beliefs and their practices during mathematics teaching, especially considering their choice of words, 'Now, I won't take chances' (Mafada), 'yeah I see now' (Zelda) (Warfield, Wood & Lehman, 2005). While this is the case, some teachers' responses suggested that they viewed the reflective activity as a 'vilifying process'. Thus, Tinyiko made utterances that the teacher on the videos is 'not her', especially in parts of the lessons where she felt her classroom explanatory talks and interactions with learners were not effective.

Disowning self

My theoretical assumption was that the process of viewing video footages with teachers would be a great tool to stimulate reflections and raise awareness about their classroom practices. However, one of the teachers, Tinyiko, iterated that the teacher in the video footages was someone else and not her. She referred to some issues such as how she spoke during teaching, her physical appearance and the ways she communicated mathematical ideas during teaching. Some of the comments were unsurprising, especially considering that the process of teachers viewing video footages of their own classroom practices is not intricately part of their professional work. Thus, the theme discerned from the information provided by Tinyiko is called 'disowning self' and details the teacher's utterances that the appearance, actions and statements she exuded during teaching does not resonate with how she views herself as a mathematics teacher. To exemplify this, Tinyiko stated that

This woman is not me, she does look like me, but it's not me, maybe she is my twin sister. Just look at the mouth.

As we continued watching the video, Tinyiko further stated that

You could even listen to the English, ayayayaya! (the sound signifying that something is unusual), iyoo! The faults!

Researcher: Why are you specifying that now you are moving from 'linear into functions'? Is linear not a type of function?

Tinyiko: It is, that is why I am saying it wasn't me!

I searched the literature for similar accounts in previous studies that used VSRI but there seemed to be a lack thereof. Of importance to note is that, in cases where Tinyiko viewed her teaching and content knowledge as effective and 'correct' respectively, she did not 'abandon self'. One reason for this could be that Tinyiko viewed the process as a way to vilify her teaching practices instead of engaging in conversations for reflective purposes to improve her teaching. Tinyiko's case is not an isolated case, in the sense that various similar cases have been noted with some of the other participating teachers, especially in cases where they believed they had not taught their lessons effectively.

Rushing to complete work for compliance

Rushing to complete and being on par with the pace-setter while learners do not understand the contents of the subject matter might constrain learners' successful learning (Msimanga, 2017). During VSRI in the current study, Jaden emphasised the need to always be on par with the pace-setter to ensure that when the curriculum advisors visit their schools, he can be seen as compliant when it comes to the pacing of the topics. When asked about why they rush through examples even in cases where learners appear not to understand the contents, Jaden and Mutsakisi stated that they focus specifically on curriculum coverage since the curriculum advisors monitor teachers' progress according to the pace-setter. Consider the excerpt below:

Jaden: I am following the curriculum neh, so then each and every topic that I am supposed to teach yeah I have a pace-setter and everything is there... our time is too limited you see, so I haven't finished the specified work and our CAs (Curriculum Advisors) are coming, they are checking. I must follow the pace-setter, so if I want to teach these functions, I can give them class activities, investigations and assignments, but all this will waste time, I won't finish the work on time and Grade 10, too many chapters are there.

Researcher: So, you are rushing to finish the topic?

Jaden: Yeah, yeah, then after that I can go back and do revision, so then I do a smaller test and if they don't understand that particular topic I do corrections on that.

Researcher: But what would happen if the CA was to come and you are not done with the topic?

Jaden: It's not possible here, (he laughs). You are teaching in a school, it is not possible; you have to finish the topic in time, so each and every week there is a content tracker there, so you see we have to complete the tracker.

The teacher's responses above suggest that he views the learning and teaching processes to be about curriculum coverage and completing written activities rather than to be about learning. The words 'I must follow the pace-setter...' and 'you have to finish the topic in time' in Jaden's statements above suggest that he fears that should he not cover all contents specified in the pace-setter by the specified time, when the CAs come and review content coverage there would be consequences. Similar to Jaden's utterances, Mutsakisi also mentioned the need to cover topics in time to ensure compliance, she said:

I understand that functions require much time for learners to understand, but there is not much one can do because we are rushing to finish the curriculum in time or else heads must roll. The district officials want to see proof that you have covered the topics on time as specified in the pace-setter they give us.

From this statement, it can be discerned that Mutsakisi is aware of the prevalent difficulty related to learners' understanding of algebraic functions. However, due to fear that 'heads must roll' if the district officials visit the school for monitoring and evaluation and there is no 'proof that you have covered the topics' within a specific time, she rushes through the concepts to ensure that she is on par with the pace-setter. The time provided to teachers to cover the syllabus in schools is inadequate, and as a result, teachers often rush through concepts even when learners do not understand so that they can be seen as compliant whenever district officials visit their schools to assess their progress. According to Mavuso and Moyo (2014), the core purpose of educational districts and subject advisors in South Africa is to support the delivery of the curriculum content and also to provide pedagogical evaluation of teachers' teaching as well as to advise for improvement. Of concern from the teachers' statements above is that supervision and monitoring from subject advisors seem to be a veritable tool for checking and vilifying teachers' job performance rather than seeing the process as enhancing the professional development of the teachers and improving the techniques of teaching. Thus, the discussion suggests the need for training subject advisors and teachers to understand that education supervision and monitoring is the art and science of improving teaching and learning.

CONCLUSION

In summary, the teachers saw the engagement in video-stimulated conversations as important because it gave them the opportunity to reflect and learn more about their classroom practices which they often take for granted during mathematics teaching. Video-Stimulated Recall Interviews prompted teachers to plan lessons that would be more relevant to their learners' and context's needs. An interesting learning experience that was cited was the deepening of teachers' knowledge of the curriculum specifications, which some teachers overlooked and others were not informed about. In addition, engaging in post-lesson discussions allowed me to critically assess teachers' intentions and motivations for presenting the lessons in the manner they did during teaching, to understand their thinking about the topics taught as well as their communication with learners during classroom interactions. Based on previous studies, it has been demonstrated that the teachers would teach differently if they reflected on their teaching practices (Wood, Cobb & Yackel, 1991). The teachers' engagement in reflection activity in my study shows that the process is beneficial for their professional learning and change of their classroom practice as it becomes a generative development.

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