

The Challenges Experienced by Foundation Phase Numeracy Teachers.

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Abstract

Post apartheid educational reforms have endeavoured to have educational opportunities accessible to all learners. However the reforms have been met with numerous challenges as the professional development of teachers to implement them was either absent or not effective enough to provide teachers with the content knowledge and attitudes necessary to embrace the policy requirements. At the implementation level, teachers faced some challenges in the teaching of numeracy content. It was the purpose of this study to explore and analyse challenges experienced by foundation phase numeracy teachers. In pursuing this purpose qualitative data were used to answer the research question: *what are the challenges faced by foundation phase teachers in the teaching of numeracy?* The results explicate challenges in the learner differences, incomplete homework, high rate of absenteeism, overcrowding and lack of resources, curriculum reforms, staff meetings and the language of instruction, Recommendations made include the code switching from English to learners' first language to facilitate connections between home and school experiences as the use of a first language alone has problem on the mathematical register for both learners and teachers.

Keywords: Foundation phase; numeracy; mathematics; curriculum reforms, professional development.

Introduction

Since South Africa's first post-apartheid elections in 1994, the education system has undergone various curriculum reforms. These reforms started from Curriculum 2005 (C2005), to Revised National Curriculum Statements (RNCS), and then to National Curriculum Statements (NCS) (DoE, 1997; 2002). Mathematics has been labelled the queen of the sciences with justification, because it plays a major role in facilitating learning in subjects like art, music, architecture, engineering, and many other domains. The subject is also used as a filter to sieve school leavers for selected jobs. Due to the utility value of mathematics, the subject is core in the school curriculum. Given this background about mathematics, learner performance in the subject is generally low. This is corroborated by the results drawn from a sample of Grade 4 learners across the country which indicated that learners scored on average below 50% in literacy, numeracy, and life skills, with the average for numeracy being 30% (DoE, 2000). The low performance in the subject can be partly attributed to poor teaching methods prevalent in some schools. Despite the reform curriculum advocating for learner-centred instruction, some teachers have not changed their traditional teaching methods due to the poor training they received. Poor training on the side of teachers was caused by factors such as the confusing language of the new curriculum as well as the ill-preparedness on the part of trainers (Review Committee, 2000). They teach learners the same way as they were taught during their school days. Because some of the teachers did not learn mathematics at primary school and are assumed to have

insufficient mathematics content mastery, traditional teaching methods accountable for low performance in the subject have been perpetuated in some schools.

Realizing the central role played by teachers in the teaching and learning process the RNCS policy document emphasizes that:

All teachers and other teachers are key contributors to the transformation of education in South Africa. This policy envisions teachers who are qualified, competent, dedicated and caring. These teachers will be able to fulfill the various roles outlined in the Norms and Standards for Teachers. These include being mediators of learning, interpreters and designers of Learning Programmes and materials, leaders, administrators and managers, scholars, researchers and lifelong learners, community members, citizens and pastors, assessors and Learning Area Phase specialists (DoE, 2002).

Attempts to inculcate this vision among teachers are in progress in different provinces where various teacher professional development programs are organized. These programs are also aimed at changing teachers' and learners' perceptions on the images they have about mathematics, as well as creating conducive learning environments for teaching and learning in the foundation phase. One such program is in Free State Province where a group of 30 foundation phase teachers are participating in a program to improve their professional competencies. This study was conducted on teachers to trace challenges they face when implementing the new curriculum in this phase. The research question that guided the study was, *What are the challenges faced by the foundation phase teachers in Free State Province when implementing the new national curriculum?* To answer the given research question, several literatures were consulted. Secondly, focus group interviews were conducted to assist in the provision of rich descriptive data.

Literature Review

Numeracy is a term not widely used in a field known as mathematics education (Baker, Street and Tomlin, 2003). For Barton and Hamilton (1998), numeracy may involve the use of, or interpretation of, numbers or numerical information, calculations and diagrams. Numeracy is sometimes confused with mathematics. There is a difference between numeracy and mathematics; however this study will use the two concepts interchangeably. Numeracy somehow involves the use of numbers, calculations or diagrams in social practice, whilst mathematics involves some degree of abstraction or concern with structure (Barwell, 2004).

Mathematics is not merely counting, measuring, or manipulation of formulae. In its essence it is a way of thinking using deductive and inductive reasoning. Basic numeracy skills in the foundation phase provide a springboard for learners in the early years of formal learning to form a firm foundation for understanding higher order mathematical concepts. Such understanding may facilitate proficiency in mathematics in the secondary schools and beyond (DoE, 2008). It is assumed that numeracy is one of the critical skills of education which learners need to develop in the early years that enables them to solve problems in their everyday lives. Therefore, the importance of numeracy skills can lead to competences

that can open doors to a rewarding future, and a lack thereof may keep these doors closed. For instance, a pass in mathematics in grade 12 is usually used as a filter to screen school leavers according to different career options.

Poor grounding on numeracy learning at primary school level has ripple effect in that one of the fundamental factors of poor learning outcomes on numeracy learning can inhibit further learning in mathematics. A logical implication of this observation is that foundation phase teachers have the sole responsibility to plan and organize the classroom in such a way that conducive learning environments are created that may lead to effective teaching and learning of numeracy (Evangelou and Sylva, 2007). Such instructional environments may encourage learners to explore, discover, to work independently and cooperatively, and to take responsibility for personal and collective learning and understanding of numeracy. Conducive learning environments at the foundation phase may be created if teachers ensure that the classrooms are equipped with concrete learning materials that will stimulate learner engagement in teaching and learning activities that make sense to them (Geary, 2006). Learning environments that engage this age group in play, deductive and inductive reasoning with concrete objects may provide them with the opportunity to experience meaningful access to basic numeracy concepts. Such instructional practice implies that teachers need to carefully design learning activities that can help learners to gradually develop competencies that go beyond the informal learning at home and nursery schools (DoE, 2008).

Similar to this work is the findings of the study conducted by Robinson (2002) which outlined some challenges facing teacher reform in South Africa in 2001. In his work, Robinson (2002) highlighted some debates that provided examples of the type of contestations existing in teacher reforms in South Africa. These are described in several debates. The first debate revolves around an organizational and pedagogical model for large-scale re-training of teachers in a new curriculum. The original C2005 training was based on the cascade model which meant that a core of people who were trained in the new curriculum would then train district officials. These officials were then expected to 'cascade' the information to classroom-based teachers, usually during in-service courses lasting three to five days. Little or no follow-up support in classrooms took place. The cascade model was not a solution, it also had some problems. The review of C2005 identified problems such as a 'watering down' and/or misinterpretation of information, a lack of confidence, knowledge and understanding on the part of trainers, and a mismatch between outcomes-based education and the models of training used in the workshops. In addition, training was seen as removed from classroom realities, and focused on mastering new and difficult curriculum terminology rather than on the substance of teaching (Review Committee, 2000).

The second important debate revolves around the need for policy coherence and articulation in teacher reform. According to Robinson (2002), those who are expected to implement new policies will not do so if they do not understand the contents of the new policy, or the purpose of the new policy, or if they cannot identify with the values and principles contained in the new policy. This is what Parker (2001) called 'system fatigue', where teachers end up attending weekly training workshops, which were not co-ordinated, or of particular relevance which served more to disrupt teaching than to develop it.

A third and final area of the debate is that of the starting point for teacher reform. As Robinson (2002) explained, business trusts and development agencies are allocating quite a lot of funding to educational reforms in South Africa, but there appears to be different conceptions of where reform should begin and where it should be going.

Literature on the challenges of teaching mathematics show that similar issues prevailed during the apartheid system (1948 – 1994) where the Department of Education and Training (DET) schools used the students' home languages as the medium of instruction for the first four years of schooling, replacing them with English in grade five, which had devastating effects on teaching and learning (Macdonald, 1990a, b; Van Rooyen, 1990). In Mathematics, teachers demonstrated insufficient mastery of such elementary concepts as fractions and decimals. Mathematics was typically taught on the procedural rather than conceptual level (Taylor and Vinjevold, 1999b). Teachers had difficulties in interpreting visuals such as charts, graphs and maps, and avoided using them in teaching (Nykiel-Herbert, 2004).

Methodology

In this research, an interpretive qualitative approach was used to explore the challenges of the foundation phase numeracy teachers. Qualitative data was collected by means of focus group interviews. We conducted focus group with thirty teachers at the resource centre. Participants were purposively selected (Cohen, Manion and Morrison, 2000; Maree, 2007) due to their involvement as foundation phase numeracy teachers. Foundation phase is one of the phases in the South African primary schools which starts from grade R (reception year) to grade 3. We offered numeracy workshops to the foundation phase teachers during the three workshops conducted in January, March and September school vacations. Focus group interviews assisted in addressing research issues that could not be adequately investigated through individual interviews or survey measures alone (Stycos, 1981), and to have a quick turnaround from implementation to findings (Vaughn, Schumm and Sinagub, 1996). The sample of teachers was drawn from an education district of the Free State Province, South Africa. The participants comprised thirty teachers (twenty-nine females and one male) teaching numeracy in the foundation phase. The imbalance in the number of teachers by gender is normal in South Africa where the foundation phase grades are mainly taught by female teachers. Each school was represented by three teachers. During discussion, five focus groups were formed by members from different schools. This helped in getting rich data that addressed similar problems encountered in schools. Qualitative techniques were used to analyse the data by describing the transcribed information obtained from the focus group interviews. In the analysis, data was organised into categories and later, patterns and relationships among those categories were identified (McMillan and Schumacher, 2001; Rubin and Rubin, 1995).

Results of Empirical Data

The findings from the focus group interviews highlighted several challenges which are classified under the following categories: learner differences, incomplete homework, high rate of absenteeism, overcrowding and lack of resources, curriculum reforms, staff meetings, and the language of learning and teaching. These challenges are briefly outlined below.

The findings revealed the learner differences; this refers to learners not at the same level of learning. There are gifted learners and less gifted ones. Participants highlighted learner difference as a challenge and explained it in this way:

“You have your gifted and less gifted learners in your class. Gifted learners acquire the given content quickly whereas, the less gifted take their time to understand the learning content, and as such you have to repeat the lesson time and again. This is also wasting time for us as teachers, because you cannot proceed with other aspects of learning while the group is still lagging behind.”

It is clear that gifted learners got bored easily when they are not stretched academically to their optimal levels. The findings indicated that some of the teachers could not select appropriate content that challenge learners. This was possible because some of the learners had not attended pre-schools prior to joining grade 1. These learners experience some learning difficulties that participants explained as follows:

“We have learners who did not attend pre-schools, particularly those who come from the farmstead. Learners with learning difficulties cannot differentiate between numbers, such as 2 and 5; and 6 and 9.”

The findings also revealed that most of the learners were orphans and stayed with their grandparents or in child-headed families. These learners cannot be assisted with their homework and on other challenges they face at school. Learners who have parents, in some cases their parents/guardians wrote the work for them. High rates of absenteeism by learners especially during winter months affected the progress of both teaching and learning resulting in some learners being far behind their peers' academic levels.

Overcrowding and lack of resources were also found in the data analysis. These are general problems in many public schools. Participants raised these issues and state:

“Overcrowded classrooms made it difficult for us to give individual learner the necessary attention required. Other primary schools in this district experienced a teacher pupil ratio of 1:34 which was regarded as too high to manage.”

Overcrowding also make it difficult for equal distribution of resources which in turn affects quality teaching and learning.

Continuous curriculum reforms demotivate some of the teachers. When teachers attempted to master and grasp the existing curriculum, the new curriculum emerged in which they also needed new knowledge and understanding to implement. These changes have also caused a lot of administrative work for the teachers who have to battle with massive paper work at the expense of teaching and learning time. Staff meetings were also a contributing factor. This results from the meetings that are held during school hours. These meetings sometimes affected tuition as some teachers were found to be members of the school management team (SMT), and are expected to attend all the meetings.

The language of learning and teaching (LOLT) in the foundation phase is always the learners' first language. In this case, teachers are expected to teach numeracy using the learners' first

language, of which in this study Sesotho is the language used. Similarly, one of the learning outcomes (LO1) requires learners to read and write number names in their first language. Teachers viewed this requirement differently and they came out with the following view:

“The child’s first environment of learning is his or her home (community). This does not mean that the learner will start learning at school, he comes to school already knowing how to count few numbers and knowing the number names, although s/he does not know how to write numbers. Our learners watch television regularly, and the language used in their favorite channel ‘Cartoon Network’ is English. This is where they learn English. Children come to school already knowing numbers in English, whereas we teach them in Sesotho. This lead confusion to children.”

The question of language does not only affect the writing of numbers, even the prescribed books that are used for teaching and learning are written in English. Participants responded to this issue in this way:

“There are limited numbers of teacher and learner books written in Sesotho. Those available do not consider the same dialects. This frustrates us as teachers as you have to make some translations.”

The findings revealed that the writing of number names in Sesotho is difficult to learners, the names are too long and difficult for learners to spell them correctly. To support this finding, participants explained:

“In the annual assessment learners could not understand the instructions well. For example, the instruction was written in Sesotho as “taka” of which was easy to be understood if it were written as “draw”; “menahanya” which would be easily understood if it had been written as “double”. Learners usually fail the examination due to lack of understanding of instructions given in their first language.”

Discussion and Conclusion

The aim of this article was to explore the challenges faced by foundation phase teachers in Free State Province when implementing the national curriculum. The sources of data to this study are foundation phase teachers who participated in the numeracy workshop. In answering the research question, the findings revealed the following challenges: learning differences, completion of homework, high rate of absenteeism, overcrowding and lack of resources, curriculum reforms, staff meetings and the language of learning and teaching. These challenges greatly affect the instructional strategies extolled by the curriculum instruction needs to emphasize methods of exploring, investigating, reasoning and communicating on the part of all students. In particular, teachers should view their roles as guiding and helping students to develop their mathematical knowledge and power (Hawkey, 1990). The curriculum, informed by constructivist philosophy, encourage allowing learners of mathematics (including teachers) to work through activities themselves, usually in groups, so as to make sense of the mathematics they learn. Changing teachers’ perceptions and empowering them to empower learners with skills encouraged by the constructivist learning theorists cannot be done simply by reading topical books, or going to an inspiring lecture of finding the best available teaching aids and textbooks. The best-planned curriculum in the best equipped school will also not be sufficient to make the change. It is not the resources alone that have anything to do with real learning, but how the resources

are used (Hewit, 1991). It is the curriculum implementation where the challenges faced by the foundation phase teachers in the study emanated from. Based on the requirements of the foundation phase policy, it is recommended that the code switching from English to learners' first language should be applied to facilitate connections between home and school experiences as the use of first language alone has problem on the mathematical register for both learners and teachers

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