

**THE IMPLEMENTATION OF MOTHER TONGUE
INSTRUCTION IN A GRADE 6 NATURAL SCIENCE CLASS**

BY

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DECLARATION

I, Mawethu Elvis Nocanda, declare that the contents of this mini-dissertation represent my own work, and that the dissertation has not previously been submitted for academic examination towards any qualification. Furthermore, it represents my own opinions and not necessarily those of the Cape Peninsula University of Technology.

Signed

Date

ABSTRACT

This mini-dissertation describes the difficulties faced by educators who teach Natural Science in Grade 6 using isiXhosa mother tongue instruction. The researcher has investigated how educators dealt with Natural Science terminology when they were teaching Grade 6. The sample consisted of 10 educators from 10 schools in Gugulethu who were teaching Grade 6 Natural Science. The researcher used a focus group interview of 10 educators from 10 schools in Gugulethu.

The researcher unpacked the issues of teaching Natural Science in mother tongue instruction, as it was the policy of the Western Cape Education Department (WCED). The researcher looked at the measures put in place by the WCED to pilot schools, such as resources and training of the educators. As a researcher I looked broadly and compared educational policies in other neighbouring countries, such as Mozambique and Swaziland, to South Africa. In a purposive sample, one was likely to get the opinions of one's target population, but one was also likely to overweight subgroups in one's population that were more readily accessible. Researcher also consulted some literature such as that of Baker, Alexander, Brock-Utne etc.

In conclusion, the researcher used exploratory studies for hypothesis generation, and by researchers interested in obtaining ideas of the range of responses on ideas that people had. However, in this study the researcher used the qualitative methods, with a focus group interview, to gather data on the implementation of mother tongue instruction in a Grade 6 Natural Science classes. The findings of the study seem to indicate that learners understand better if they are taught Natural Science in isiXhosa mother tongue. Therefore, recommendations pose a number of challenges to those committed in the implementation of mother tongue instruction in the Western Cape schools.

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ABBREVIATIONS

BA	Bachelor of Arts
BEd	Bachelor of Education
BTech	Bachelor of Technology
CPUT	Cape Peninsula University of Technology
DET	Department of Education and Training
DoE	Department of Education
FDE	Further Diploma in Education
FP	Foundation Phase
GET	General Education and Training
HOD	Head of Department
IP	Intermediate Phase
JPTD	Junior Primary Teachers Diploma
L1	First Language
L2	Second Language
LoLT	Language of Learning and Teaching
LTP	Language Transformation Plan
MT	Mother Tongue
NCS	National Curriculum Statement
NGO	Non-Governmental Organisation
NS	Natural Science
OBE	Outcome Based Education
PTC	Primary Teachers Diploma
RNCS	Revised National Curriculum Statement
SMT	Senior Management Team
SP	Senior Phase
SPED	Senior Primary Education Diploma
STD	Senior Teachers Diploma
UCT	University of Cape Town
WCED	Western Cape Education Department

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CHAPTER ONE

1.1 MOTHER TONGUE INSTRUCTION IN NATURAL SCIENCE

This study emanated from three concerns that have affected the researcher's practice and development as an educator in the current transformatory teaching environment. Firstly, the poor pass rate in Natural Science and Mathematics is of great concern. As a Natural Science educator, the researcher acknowledged that results in a subject at senior certificate level required introspection (general reflection by educators teaching the subject in the schooling system). What can educators do at the primary level to improve matters?

Secondly, Department of Education (2001) states that, the current policy initiative pointed towards a greater need for the introduction of mother tongue instruction beyond the first three years (Grade 1-3). The extension of mother tongue instruction into the Intermediate and Senior Phase of the General Education and Training (GET) band would have direct implications for my practice as a Grade 6 Natural Science educator.

Thirdly, the absence of clear and official guidance as to how Natural Science concepts and terminology should be utilised, resulted in a concern around whether uniformity could exist, arise. Who would determine how certain Natural Science concepts would be translated? Would my interpretation be the same as colleagues teaching the same learning area in other schools? This uncertainty in my mind became the key driver of this study.

Thus, this study set out to investigate how Natural Science educators dealt with the challenges of translating the Science terminology into isiXhosa when teaching Natural Science learning area. The argument that this study advances is that learning areas such as Natural Science are difficult to teach in isiXhosa, as there is not enough or uniform terminology to solidify Natural Science. The National Curriculum Statement (NCS) calls for the teaching that is rendered through mother tongue instruction from

Grade R- 6 (Department of Education, 2001). This was a positive call but the question remains, is it possible to teach Natural Science in isiXhosa?

The study adopted these sentiments as key underlying assumptions and moved from the view that if mother tongue implementation was to assist in improving learning outcomes in Natural Science, extensive thoughts, ideas and opinions needed to be harnessed to guide future planning in this regard. Ideally, common understanding and agreement must be negotiated and agreed on with regards to scientific concepts which will be translated, before implementation takes place. Currently, in my own practice (and from anecdotal evidence gathered from other educators in the learning area) code switching is the norm. This, in practice, means that we teach in English but utilise mother tongue to explain the key concepts. The practice does not produce the desired outcome of a better understanding of the concepts.

The majority of educators who are currently teaching Natural Science (NS) as a learning area were trained to offer it in English. Therefore, there was a general view among the isiXhosa-speaking educators that isiXhosa did not have precise science terminology to assist them in teaching the Natural Science learning area. This study analysed the problems encountered by educators when using isiXhosa to teach in the Grade 6 Natural Science class. In this study, mother tongue refers to a language children naturally acquire at home (Heugh, 2000). As an educator in a township school in the Cape Town area, my focus will be isiXhosa as mother tongue.

1.2 BACKGROUND

This study was inspired by the need to explore how educators dealt with the challenges they encountered in explaining certain scientific concepts when they are teaching Natural Science using isiXhosa. There is no equivalent isiXhosa terminology in place to guide the educators in teaching Natural Science in Grade 6. Teaching of Natural Science was generally difficult because the terminology in this learning area was not easy to explain to the Grade 6 learners, though there might have been some concerns in other content learning areas such Mathematics, Technology and Geography, as one component of the Social Science learning area. The Western Cape Language Policy of 2008 was adopted to promote mother tongue instruction in lower

Grades (Bloch & Mahlalela, 1998). It can be argued that teaching and learning in mother tongue has benefits, as learners understand better when they are taught in their mother tongue (Bloch & Mahlalela, 1998).

The concern was that, although it was good for the learners to be taught in their mother tongue, there was no common, consensual approach in teaching Natural Science using mother tongue. Uniformity and adequate materials are crucial to guide educators and learners in the process of teaching and learning in mother tongue. The policy says that, the process of teaching and learning must take place in the mother tongue (isiXhosa) (Department of Education, 2001).

Again, it can be argued that, when learners learn in their mother tongue they develop strong foundation in thinking and imagination. However, if there were no guidelines in place, educators would use their own explanation of the terms or concepts and there would be no uniformity in teaching and learning of the learning area.

1.3 MOTIVATION FOR THE STUDY

Reflecting on how my interest in the issues addressed in this dissertation first began, I recall my involvement in a course, which I did at the University of Cape Town, Further Diploma in Education (FDE). The course was one of the few taught in English and since my interest was in the teaching of Natural Science using mother tongue instruction I was encouraged to participate in a series of seminars. Little did I know that my participation in those seminars was to determine my future research interests in relation to language policy of the Western Cape as well as mother tongue instruction in Natural Science.

The study will provide valuable information that supports the offering of Natural Science learning through mother tongue, as well as provision of the mother tongue learning materials. Teaching in mother tongue is seen as contributing towards developing strong foundation in thinking and imagination. Therefore, the study hoped to contribute to this ideal by advancing and contributing to this body of knowledge.

1.4 PROBLEM STATEMENT

This study explores the nature of the difficulties faced by educators in the implementation of mother tongue instruction in a Grade 6 Natural Science class in order to make sense of science concepts, so that a glossary of science terms can be developed.

1.5 AIM OF THE STUDY

Based on the statement of the problem articulated above, one clear research aim emerged: To investigate how Grade 6 Natural Science educators deal with the challenge of interpreting science concepts using mother tongue isiXhosa instruction. This research's aim is addressed by the research questions that follow.

1.6 RESEARCH QUESTIONS

The problem statement led to three research questions posed in the study to address both the statement of the problem and to achieve the research aims.

Research Question one: What is the relationship between mother tongue instruction and the learning of Natural Science in Grade 6?

Research Question two: How do educators interpret Natural Science concepts using mother tongue instruction?

Research Question three: Which strategies do educators use to address the challenges of using mother tongue instruction in a Grade 6 Natural Science class?

1.7 LIMITATIONS OF THE STUDY

The study was conducted in South African schools at the time when mother tongue was at its infant stage of development. Therefore, the study was limited in the sense that mother tongue instruction in Grade 6 had just been implemented. Because the study was conducted in 10 primary schools in Gugulethu and limited to isiXhosa as mother tongue, the findings might not be applicable to other regions or provinces.

1.8 METHODOLOGY

1.8.1 Research design

The study was conducted qualitatively because qualitative studies aim for depth rather than quantity of understanding (Henning et al., 2004). The study was conducted in a setting that was bound by the theme of the inquiry, and these kinds of studies cannot usually be extensive, unless there is a large team of investigators (Henning, 2004). The researcher was aware of the advantages of the qualitative study because, in qualitative study the focus is on the everyday lived world of the interviewee and his or her relation to it. Qualitative approaches also interpret the central themes of meaning of what is said, as well as how it is said. Also, in qualitative studies the interview seeks qualitative knowledge expressed in normal language, it does not aim at quantification (Kvale, 1996).

1.8.2 Data collection techniques

The study used a focus group interview. Focus groups are useful for orientation to a particular field of focus, for developing themes, topics and schedules for subsequent interviews or questionnaires (Cohen & Manion, 1994). The advantage of the focus group was to generate hypotheses that drive from the insight and data from the group. A focus group is a contrived setting, bringing together a specifically chosen section of the population to discuss a particular theme or topic, where the interaction of the group leads to data and outcomes (Cohen & Manion, 1994). Also, the researcher was aware of the disadvantages of the focus group method, which include the possibility that participants may not turn up on the day of the interview. Furthermore, the

participants may be reluctant to participate in the discussion of the topic in question (Cohen & Manion, 1994).

1.8.3 Population and Sampling

1.8.3.1 Population

Ten schools were drawn from schools in the Metropole South and Metropole Central areas of Cape Town.

1.8.3.2 Sampling

This study employed purposive sampling because it was very useful for situations where you needed to reach a target sample quickly, and where sampling for proportionality was not the primary concern. With a purposive sample you are likely to get the opinions of your targeted population, but you are also likely to overweight subgroups in your population that are more readily accessible (William, 2008). Purposive sampling was also useful when populations were so widely dispersed that cluster sampling would not be efficient. The method is often used in exploratory studies, e.g. for hypothesis generation and for researchers interested in obtaining ideas about the range of responses on opinions that people have.

Purposive sampling allowed the researcher to sample with purpose in mind, hence ten educators who were teaching Natural Science from ten different schools in Gugulethu area were included (William, 2008). The researcher used a minimum number in order to obtain the minimum sample size that accurately represented the population being targeted (Cohen & Manion, 1994).

1.8.4 Data analysis

The researcher analysed data using principles borrowed from grounded theory. Firstly, coding played an important part in the analysis. Coding of data is central both to grounded theory and to most of the programs developed specifically for qualitative analysis (Henning, 2004). The following steps were followed in analyzing data: assessing codes, determining categories in data, assigning themes, determining patterns and giving interpretations.

1.9 TRUSTWORTHINESS OF THE RESEARCH

To maintain trustworthiness of this study, the researcher collected data systematically and was thorough in analysing the data. Trustworthiness in a qualitative study can be regarded as a fit between what the researcher records as data and what actually occurred in the natural setting that is being researched. This method does not strive for uniformity, as two researchers who are studying a single setting may come up with different findings, but both sets of findings might be reliable (Cohen & Manion, 1994).

1.10 ETHICAL CONSIDERATIONS

Protecting the confidentiality of participants was of high priority in the execution of this research.

Prior to every interview, every participant received a full explanation of his or her rights during and after the interview sessions. The purpose of the study was explained, as was my position as a student researcher at the Cape Peninsula University of Technology.

Before proceeding with the study, I obtained permission from the Western Cape Education Department (WCED) and the school principals.

1.11 STRUCTURE OF THE REPORT

- **Chapter One**

The aim of Chapter One was to provide the background, motivation and the rationale for the study. Furthermore, the problem statement of the research, research questions and ethical considerations were described.

- **Chapter Two**

In Chapter Two the researcher outlines the literature review of this research and compares the policies of two neighbouring countries, Mozambique and Swaziland, to that of South Africa.

- **Chapter Three**

Chapter Three outlines the methodological stance of this research. It also describes the data collection methods and interview schedule that the researcher used. The researcher will also explain why he opted for a qualitative study.

- **Chapter Four**

Chapter Four will facilitate understanding of the data analysis procedures based on the discussions of the focus group that the researcher worked with.

- **Chapter Five**

In Chapter Five general conclusions, findings and recommendations are discussed.

1.12 CONCLUSION

This chapter concludes by emphasising the point that educators who teach Natural Science in Grade 6 may find it difficult to explain certain concepts using mother tongue instruction, in this case isiXhosa. Also there appears to be a need for the Department of Education, particularly the Western Cape Education Department (WCED) to develop material that will guide educators and promote uniformity in the teaching of mother tongue instruction in Grade 6 Natural Science classes. Thus, one had to consider the views of researchers in this field in answering the research question in the chapters to follow.

CHAPTER TWO

2.1 LITERATURE REVIEW

2.2 Exploring mother tongue as instructional medium

The key objective of this literature review is to explore what other commentators have to say about the implementation of mother tongue instruction. The view of Brock-Utne, Desai & Qorro (2003) informs a large part of this review. Their opinions seem to provide a clear understanding of the mother tongue instruction concept and its use in schools.

Brock-Utne et al. (2003) argue that mother tongue education allows learners to develop cognitive skills and the learners could focus on the learning area being taught without having to struggle with language issues. It is crucial that education policy makers should be made aware of these arguments when formulating policies so as to ensure that learners are not disadvantaged by challenges associated with language. The focus of early learning experience should be on the primary education level as this is the phase where learners are shaped. Brock-Utne et al. (2003) discuss mother tongue instruction in education in Norwegian and Holland examples where learners are taught in their mother tongue while English is taught as a subject. The researchers note that most Norwegian learners speak English relatively well. English there is taught in an engaging way and for communication.

The above observation might be perceived as disadvantaging the Norwegian and Dutch learners in the acquisition and development of English. However, Brock-Utne et al. (2003) provide a different view when they cited the South African example where learners were taught in English from Grade 4 to 12 and yet many left school poor in English speaking competency. This contradicts the perception that if mother tongue is used as a medium of instruction, this disadvantaged learners in their development of English. It also became clear that instructing learners in English from early stages did not make them competent English speakers. The position of mother tongue instruction is that African languages are not generally used as mediums of

instruction in primary schools, except in pilot projects such as mixed English and isiXhosa classes (Brock-Utne et al., 2003).

Schools were informed about the Western Cape Education Department (WCED) Language Transformation Plan (LTP) in Circular 004/2007, which announced the plan, as well as the orientation workshops that took place in the first year. The Language Transformation Plan complemented the National Language in Education Policy of 1997 and all other relevant legislation, including the National Curriculum statement (NCS). These documents were to assist schools in the formulation of schools Language Policy. The National Language in Education Policy of 1997 committed the country to bilingualism (Department of Education, 2001). Generally speaking, this meant adding other languages into a strong mother tongue base.

After 1994 South Africans had hopes of seeing mother tongue education being used in schools, but there was still a lack of progress in attempts to implement the new language policy. Moreover, English and Afrikaans still remained the media of teaching and learning in all English and Afrikaans medium schools (Kamwangamalu, 2000). This applied to all schools, irrespective of their mother tongue that might not be English or Afrikaans. For example the Xhosa, Zulu and SeSotho speaking schools still use either English or Afrikaans as their language of teaching and learning, whereas they should be using their mother tongue, more especially in Natural Science, so that learners can understand the concepts.

Baker (2006) argued that, educators who taught Natural Science had to make sure that they were code switching in order for the learners to grasp the concepts. However, they were not using the same isiXhosa explanation, and that created problems in teaching and learning. Baker (2006) acknowledged that, bilinguals appeared to understand the symbolic demonstration of words in print earlier than monolinguals (using one language) as they saw printed words in two ways. In turn, that may have facilitated earlier acquisition of reading. Moreover, it could be argued that when learners started learning in their mother tongue they found it very easy to understand the second language, that being English, so learners became bilingual. That meant they could be fluent in two languages but they had to start in their mother tongue.

The researcher fully supported mother tongue education because it allowed learners to develop cognitive skills, and they could focus on the learning area being taught without having to struggle with language issues as articulated by (Brock-Utne et al., 2003). However, the problem remained in teaching Natural Science in isiXhosa. As I mentioned earlier, there are critical scientific concepts such as condensation; evaporation; solidification; crystallisation; potential energy, and these concepts were not easy to translate into isiXhosa. These challenges were compounded by the fact that in township schools learners were discussing Natural Science in English, which was not their first language (Alexander, 1989).

According to the National Curriculum Statement (NCS) of South Africa, the core purpose of the Natural Science Learning Area was to promote learners to be scientifically literate. As the country and the rest of the world became increasingly scientific and technological, it was essential that people were informed about decisions that impacted personal and political decisions (Nelson & George, 1999). The NCS, as similarly expressed in other research (Hand, Brain, Prain, Lawrence & Yore; 1999), promoted scientific literacy by developing and using process skills such as predicting, observing and recording; and applying scientific knowledge, facts and theories; as well as applying this knowledge and skills to make responsible decisions which impacted science, society and the environment (DoE, 2006). Therefore, if learners are exposed through their mother tongue, they would be able to understand scientific terminology without having difficulties.

2.3 NATURAL SCIENCE AND MOTHER TONGUE INSTRUCTION

Yore & Treagust (2006), however, argue that curricula which stressed democratic, socio-economic and personal well being placed less emphasis on learners' cognitive tools and communication abilities. They argue that communication and cognitive skills were necessary to maintain scientifically literate individuals. Yore & Treagust (2006) further contend that curriculum which stresses Natural Science literacy should also focus on empowering people to be in the discourses of science, i.e. reading, writing and talking Natural Science. Webb et al. (2007) suggested that contemporary scientific literacy involved the skill and the willingness to apply scientific habits of

mind in a wide range of social contexts, where the individual took an active and participatory approach, such as engaging in debates and discussions.

The Western Cape Education Department was, at the time of writing, in the fifth year of a pilot project involving 16 schools, which was called the Language Transformation Plan. It intended to promote mother tongue education for a period of six years. In this project Natural Science and other learning areas were being taught in isiXhosa and thus far it was being reported that isiXhosa learners were doing well in class, their academic performance was improving, and learner and educator confidence was growing (Department of Education, 2001).

Alexander (1989) states that, learners develop a strong foundation in thinking when concepts are formed and learned in their mother tongue. Learning another language such as English becomes easy for the majority of children when they use what they have already been taught in their mother tongue to help them learn the new language (Alexander, 1989). This then supports the claim made by Bloch & Mahlalela (1998) that first language acquisition improves second or third language accomplishment. The South African schools must develop a similar model from the Foundation Phase, where the Language of Learning and Teaching (LoLT) is the mother tongue. Subsequently, in the Intermediate Phase educators should also teach in the mother tongue, so that the learners can grasp the concepts in their own home language. It must be considered that, learners do not have to learn everything in English in order to learn English. At the same time, a major difficulty with pursuing mother tongue teaching and learning beyond Grade 3 is that materials in most learning areas have not been developed, e.g. textbooks (Mati, 2001).

In line with these reports, Brock-Utne et al. (2003) indicate that examination results improved where mother tongue instruction was employed in the early years of basic education. Brock-Utne et al. (2003) made reference to countries such as Botswana, Kenya, Mali, Nigeria and Tanzania which were exploiting this approach. According to them, using first language instruction also contributes towards second language acquisition. The contestation around mother tongue instruction is not only a South African phenomenon but also an international challenge. In South Africa, LoLT dominating in the majority of the schools is English, which is not the mother tongue

for the majority of children entering its schools. This observation is supported by Brock-Utne et al. (2003) when they argue that, in many of the township schools the medium of instruction is officially English. The educators, who share a primary language (isiXhosa) with the learners, tend to use the primary language a great deal in class to make sense of the learning material for the learners. The term 'township schools' refers to previously disadvantaged or ex – Department of Education and Training (DET) schools. Deumert (2000) argues that these schools had been single medium and had taught additional languages only as the second languages.

Language planners such as Alexander (1989) have called for commitment to the establishment of multilingual schools, to fulfil the constitutional provision which supports the thinking that African languages should be used and taught in schools as a medium of instruction. However, Deumert (2000, 413) argues that, “there are few teachers who are prepared to teach in bilingual schools, and the teaching material is not yet available or is limited for the higher grades”. If you go to township schools particularly, educators are code- switching (code- switching refers to the alternative use of two or more languages) because they are trying their best to get the learners to understand the concepts (Alexander, 1989).

2.4 SOUTH AFRICAN CONSTITUTIONAL IMPERATIVES

It would appear as though what we have not done very well in South Africa is to manage the provisions which the constitution and the legislation have put at our disposal. When looking at the need to accommodate our linguistic diversity, it was somehow felt by the planners that educators needed to replicate what had been done with Afrikaans, 11 times over, since there are 11 official languages in the country. People then felt they had to establish a whole series of substructures to deal with the development of the indigenous languages in order to try to inform the decorated chairs to catch- up with Afrikaans. Now the danger in having a catch-up 11 times over is that you have to expand vast financial resources in the establishment of duplicate substructures which require office equipment, administration systems, etc. (Alexander, 1989).

South Africans have moved a long way towards identifying a language policy, but when it came to actually having it enacted by Parliament, people shied away from that and came out with simply a national language framework, which is not a piece of legislation. One cannot have a set of regulations which does not establish who is going to do what, when and how. If people are thinking in terms of short-term development and empowerment of a small group of people, then they go with English not isiXhosa. Moreover, if people are saying they are concerned about development in South Africa and the sub-continent in the medium to long term, then they need to look at the way in which language facilitates access to services in education, which children can actually understand (Alexander, 2002).

In order to promote literacy levels, educators obviously start at the bottom and they have to start in the mother tongue, otherwise the talk of a learner centred system of education will not work. Language is a class issue and when we speak about language in constitutional and legislative terms, we are talking about so-called standard languages (Alexander, 1989).

The Education Department became aware of the fact that the children cannot read in the Language of Learning and Teaching (that is English in most of the schools) and that part of the problem is the fact that this language of instruction is not mother tongue based. Even when it is mother tongue based, teachers do not have the capacity to teach reading and writing. Research shows that, about 80% of learners in South Africa are not able to read and write at the required levels of Grade 3, Grade 6 and, as shown in a recent study, by Grade 8 (Heugh, 2000). However, there was a perception that children who could not read and write would be leaving school at the end of Grade 9 (Heugh, 2000).

2.5 RESOURCES

The resources in some areas were a problem when it came to distribution, especially in primary, secondary and tertiary education the resources are always a concern (Heugh, 1999). Even if you go to the universities you will find that there are very

limited bursaries to promote African languages and also there are no language policies to encourage students to learn African languages (Heugh, 1999).

South Africans need to promote the use and the development of African languages. I think most of us, when we say that, almost automatically think that the government should take the lead.

2.6 MOTHER TONGUE: AN AFRICAN PERSPECTIVE

The researcher in this study compared South African policies to those in its two neighbouring countries, Mozambique and Swaziland. The researcher will start with Mozambique and try to show how that country deals with the issue of mother tongue education.

2.7 MOZAMBIQUE

Mozambique is a multilingual country, with about twenty indigenous languages. The dominant language is Portuguese, the language of wider communication and the only official language of Mozambique. Portuguese is also considered the language of national unity. In Mozambique, there are also communities of Asiatic origin, which use Asiatic languages in familiar and religious contexts only. Arabic is studied in this context in Koranic schools (madressas), mainly in the north of the country.

The implementation of bilingual education, covering 15 languages, began in 21 schools (about two or three schools in each province) which were chosen to test and validate the new bilingual curriculum. In the areas neighbouring the 21 experimental schools, where the mobilisation of parents for the introduction of bilingual education had already begun, the communities demanded adult bilingual literacy as well. This does not mean, with the new curriculum, that all languages would be implemented at the same time; this would depend on the availability of teaching materials. However, the major challenges were materials development and teacher training. The preparation for the introduction of these languages in primary education benefited from the experiences of adult literacy, even if these experiences were limited (Cummins, 1986).

2.8 SWAZILAND

The languages spoken in Swaziland are SiSwati and English. Swaziland's language policy, although still not explicitly stated, many education documents which allude to the language policy are available to the public. Although Swaziland is regarded as a monolingual country, with SiSwati as the only indigenous language, Zulu is also spoken as a home language in southern Swaziland on the border between Swaziland and KwaZulu-Natal. English is spoken by a very small percentage of people and it is Swaziland's second language. However, English and SiSwati are both official languages of Swaziland (Mbatha, 1999).

Although 95% of the population can speak SiSwati very fluently, the number of people who can read and write fluently in SiSwati is lower. SiSwati is taught in schools as a subject, where children learn to read and write in it, but when it comes to using it daily for reading and writing, this is hardly emphasised other than in SiSwati lessons. Children read and write SiSwati only in school, during SiSwati lessons. Out of school they speak the language only in their home and community environment (Dlamini, 1996). Hence, verbal communication among the Swazi people is predominantly in SiSwati, while almost all written communication is done in English.

The Swaziland education system follows a transitional bilingual-education policy with a strong emphasis on English. Officially, SiSwati (mother tongue) is the medium of instruction from Grade 1 to 3. However, from Grade 4 onwards English is the medium of instruction right through to the tertiary levels. SiSwati remains to be taught as a subject only throughout primary and high school, and becomes a subject of specialisation for educators at the primary and secondary training colleges. Furthermore, there are no special programmes of mother tongue education in Swaziland as sometimes found in other countries, whereby the mother tongue is used as the language for teaching initial literacy (Mbatha, 1999).

Research has shown that in Swaziland when they were given an English proficiency test about 20% of the children who passed the test were mainly from early English urban schools. 80% of the educators administered the test in SiSwati, giving all explanations in SiSwati. 80% of the children did not understand the test instructions

which were in English, hence educators resorted to the mother tongue.. Again children in rural schools were not fluent in English, thus the teachers used the mother tongue to teach English (Mbatha, 1999).

One of the main successful projects in mother tongue education was the completion of a book, *Chaza Ngive* (Vilakati & Sibanda, 1997). The book is used for teaching SiSwati in secondary schools and colleges of education. This is a dictionary or reference book for teaching SiSwati literary and phonetic terms. It was successfully completed in 1997 and serves as a very rich source to teachers and as a textbook for teacher trainees and students in the African Languages Department of SiSwati. Some advantages of using vernaculars are that, the vernaculars serve as stepping stones and allow learners to adjust to schooling and also help them to understand concepts they would have found difficult in another language. A child should be taught using the language that he/she knows best, and that ideally is the mother tongue, in view of concept formation and the way in which knowledge is constructed and transmitted to others (Mbatha, 1999).

Mbatha (1999) argues that concepts formation in the child's early years is better facilitated by a language which he/she speaks and uses in his/her daily life, than a foreign language whose values and symbols he/she does not know. The mother tongue also helps to safeguard the child's cultural identity.

2.9 CONCLUSION

The literature review has illustrated that there are advantages of using mother tongue instruction in Grade 6 classes, especially in the Intermediate Phase, because research showed that learners learned and understood better when they are taught in their mother tongue (isiXhosa in the context of the current study). This does not only apply to South Africa, it also applies to other countries as well. The researcher made a comparison of South Africa to its two neighbouring countries Mozambique and Swaziland to show that this mother tongue challenge is not a South African issue only since it affects other countries as well. Also, the researcher looked at Norway as an international country and saw that they too have a language issue just like South Africa.

The literature review touched on the National Curriculum Statement and the National Education Policy of 2007, because those are the main policies that act as guides of what schools are supposed to do when it comes to teaching and learning. The literature also mentioned the fact that educators who were teaching Natural Science in Grade 6 did not use the same method in terms of terminology in class, in other words they taught using their own terms instead of using one terminology when explaining certain concepts so that there is uniformity among the educators. To make matters even worse, these educators were practicing in the same area of Gugulethu (Mbatha, 1999). Also, the researcher mentioned that in his opinion Grade 6 Natural Science learners must be taught in isiXhosa because they understand better in their first language. However, the problem remained the lack of resources. The reviewed literature also highlighted this problem of a shortage of resources such as textbooks and dictionaries written in the mother tongue isiXhosa.

Because of the investigative nature of this study, a qualitative research design was employed to ensure that the data collection process was dynamic and searching in nature. The research design that this study adopted is discussed in detail in the next chapter.

CHAPTER THREE

3.1 RESEARCH METHODOLOGY

3.2 INTRODUCTION

In this chapter, the researcher explains the preparations that had to be done for the study, and highlights some challenges that were encountered. Firstly, the research design will be discussed. Secondly, a detailed conceptualization of the qualitative research methodology will be provided. The research instrument, which employed focus group interviews, as well as the sampling techniques, selection of research site and data collection analysis method will be outlined. Conclusion of the chapter is also provided.

3.3 RESEARCH METHODOLOGY

This section puts into perspective the research design and approach, and further discusses the data collection instruments, data analysis and trustworthiness of the research. The researcher provides reasons to justify the choice of the above and explains how they were used.

3.3.1 The research design

3.3.1.1 Conceptualizing a qualitative study

“A qualitative approach is an inquiry in which researchers collect data in face-to-face situations by interacting with the selected participants in their natural settings” (Mouton, 2001: 107). The mode of inquiry could be interactive or non-interactive (McMillan & Schumacher, 2001). This research was interactive and qualitative in nature because the interviewer attempted to document the world from the point of view of the participants, and mainly collected data from the participants that formed part of the study. Furthermore, as a qualitative researcher, the interview was interested in understanding the participants’ experiences in context (Denzin & Lincoln, 2000).

Qualitative research seeks to cover both a factual and a meaning level, though it is usually more difficult to interview on a meaning level. This is usually done through interviews. It is necessary to listen to the explicit descriptions and meanings, as well as to read what is said between the lines. The interviewer may seek to formulate the implicit message and send it back to the subject, thus obtain an immediate confirmation or disconfirmation of the interviewer's interpretation of what the interviewee is saying (Kvale, 1996).

The qualitative research interview aims at obtaining nuanced descriptions from the different qualitative aspects of the interviewee's life world, it works with words not with numbers (Kvale, 1996). The researcher employed a qualitative approach because the numbers were not important in this study.

The research design was aimed at gaining a schematic overview of the problems experienced by Natural Science educators who were teaching Grade 6 using mother tongue instruction in Gugulethu Primary schools. The researcher had to categorize which language teachers were using in explaining some of the terms in Natural Science.

A research design is a plan to investigate the research question and to make sense of the data gathered in a scientific manner (Mouton, 2001). The specific design selected for this study used 10 primary schools as the sites for obtaining data. The 10 primary schools situated in the Gugulethu area, more or less had the same kind of learners and parents as well. The reason the researcher selected this research design was because the study was an empirical one, and of a qualitative nature. The study aimed at providing an in-depth description of a small number of phenomena (Mouton, 2001). Therefore, a phenomenological research approach will obtain valid and reliable results as it focuses on human lived experiences, in this case educators were able to know how Grade 6 learners responded when they were taught in their mother tongue in Natural Science.

In order to address the research aims of the study, a qualitative approach using 10 primary schools in Gugulethu Township were used. Wiersma (1995) states that a qualitative research is done for the purpose of understanding social phenomena,

“social beings used in a broad sense”. To help clarify the purpose of this study, Taylor & Bogdan (1984) argue that qualitative research methodology is commonly used to handle the complexity of issues involving human behaviours.

There are a number of reasons for the use of a qualitative approach to the research in this thesis, most significantly its purpose of providing some insight into the perceptions of mostly educators from Gugulethu Township. This methodology allowed for the educators’ views to find expression within a framework that did not evaluate its worth primarily in terms of objectivity or the ability to draw generalisations from it. It also sought to incorporate into it a mode of understanding that is more interested in “meaningful relations to be interpreted.” (Kvale, 1996: 11) However, qualitative research has value in this thesis since in most parts of the thesis extensive use was made of qualitative data.

The context of this research is the nature and the extent to investigate how Grade 6 Natural Science educators deal with the challenge of interpreting science concepts using mother tongue instruction. The purpose of this research is to investigate new or little known phenomena and to discover themes from participants’ meanings (McMillan & Schumacher, 2001) on the difficulties faced by educators in the implementation of mother tongue instruction in a Grade 6 Natural Science class, in order to make sense of science concepts, so that a glossary of science terms can be developed.

3.3.2. Data collection instruments

The instrument used to collect data was the focus group interview. The focus group relies on the interaction within the group who discuss a topic supplied by the researcher (Cohen & Manion, 1994). The focus group is useful for orientation to a particular field of focus, in developing themes, topics and schedules for subsequent interviews or questionnaires. It generates the hypothesis that derives from the insights and data from the group. The focus group is good at generating and evaluating data from different sub groups. The researcher was aware of the disadvantages as well of the focus group that participants may not turn up on the interview day, therefore it

was advisable to organise more participants. The interviews were semi-structured interactions between the researcher and one or more individuals. The researcher considered the interview to be qualitative because the method helped to construct the social reality that the researcher wanted to investigate.

Firstly, this study used the focus group interview where the researcher had to organise educators who were teaching Natural Science in Grade 6 using mother tongue instruction. This ensured that participants had something to say and felt comfortable enough to say it. The researcher made sure that the meeting was balanced and prevented it from veering off the point, i.e. keeping the meeting open-ended but to the point. Also, the focus group generates hypotheses that derive from the insight and data from the group. However, the focus group is a contrived setting, bringing together a specifically chosen section of the population to discuss a particular theme or topic, where the interaction of the group leads to data and outcomes (Cohen & Manion, 1994).

Secondly, as a researcher I organised the venue and made sure that the entire questions that were going to be asked were properly put on their tables. The participants attended the interview and as the researcher I made sure that my tape recorder was fully charged. It was really important for the researcher to organise someone who would take notes whilst the interviews were in process because backup was vital.

Thirdly, the researcher introduced himself to the panel and briefly told them about the background of the study. After that the researcher gave each of them a chance to introduce him/herself. Educator A from School A was holding PTC and JPTD. Educator B came from school B and her qualifications were STD, BA and BEd. Educator C introduced herself from school C and she was holding SPED. Coming to another educator D who was from school D, his qualifications were HDE and BEd. The next educator was educator E from school E who was holding HDE. Educator F was coming from school F and her qualifications were SPTD. Educator G from school G was having BA and HDE. Educator H was coming from school H and his qualifications were BA and HDE. The next educator to introduce herself was educator I coming from school I and she was holding BA and HDE. The last educator to

introduce himself was educator J who was coming from school J with BTech as his qualifications.

After everybody had introduced him/herself the interview started and all participants engaged themselves in the discussions. As the researcher I had to see to it that we were discussing relevant questions of the topic. The interview lasted about three hours. Interview schedules were used only because I strongly believed that they would get me to the significant data required to accomplish the aims of the study.

3.3.3 Population and Sampling

3.3.3.1 Population

Ten schools were drawn from schools in Metropole South and Metropole Central districts.

3.3.3.2 Sampling

Purposive sampling is a kind of sampling that allows the researchers to sample with a purpose in mind (William, 2008). This implies that the researchers start their projects usually with one or more specific predefined groups they are seeking. For instance, this study was limited to 10 primary schools in Gugulethu. Purposive sampling is also useful when population is so widely dispersed, as in Gugulethu, such that cluster sampling would not be efficient. Furthermore, a purposive sample outlines the procedures employed to get access to the research site, participants and the role of the researcher as a part of research the process.

Purposive sampling allows the researcher to purposefully ask individuals to participate by giving their valuable insights to a set of questions that seek to investigate a phenomenon. With a purposive sample, you are likely to get the opinions of your target population, but you are also likely to overweight subgroups in your population that are more readily accessible (William, 2008). The sampling method was often used in exploratory studies, e.g. for hypothesis generation and for researchers interested in obtaining ideas of the range of responded on ideas that people had. However, in the case of this study, the researcher used the qualitative

methods with self-developed interview schedules to gather data on the implementation of mother tongue instruction in a grade 6 Natural Science class.

3.3.3.3 Participants selection and sample size

The researcher then needed to select the participants for the research. Both these schools environments comprised of educators from different traditional histories, backgrounds, cultures and perceptions. In the qualitative methodology, the focus is not on numbers therefore my sample size was composed of 10 participants, that is one educator who was teaching Natural Science in Grade 6 per school. The study included educators because they are the ones who best know the problems they encounter with regard to teaching of Natural Science using mother tongue in a Grade 6 class. The sample comprised of five female and five male educators in each school because the researcher did not want the study to be seen as being gender biased. For the purpose of this study, the interviewer asked for volunteers and also approached the participants purposefully to avoid a situation where people may be reluctant to participate. The following criteria were used to select educators:

Educators should be:

- educators who had been teaching for more than five years the Grade 6 Natural Science;
- Teachers with knowledge of curriculum and policies because there is a lot of chopping and changing of the curriculum;
- knowledgeable and well-informed about Natural Science; and
- female and male educators because I did not want this study to be gender biased.

3.3.4. The role of the researcher

The term “human as an instrument” refers to the major role of the researcher as research instrument in the qualitative research process. Patton (2002, 14) states, “in the qualitative research, the researcher is the instrument”. This implies that the vigour

of a researcher's social relationship with the participants or human-to-human relationships requires the study to identify the researcher's role and status within the group. In this study, the researcher played the key role of both a participant and a researcher (McMillan & Schumacher 2001).

Firstly, in the role of participant, researcher used interpersonal skills, involving; creating trust, keeping good relations, being non-judgmental, respecting the norms of the situation and displaying sensitivity with regard to the ethical issues. McMillan & Schumacher (2001) advocate that by using these skills, the researcher relates to the participants as a human being, and not as an inhuman creature. I thus had an unshaken self-awareness and clear consciousness of whose voice was being recorded in data.

Secondly, the researcher started by building the role of a researcher at the first meeting with the participants when the research objectives were explained. McMillan and Schumacher, (2001) also advocate that a researcher needs to return to the participants for the scheduled interviews to ask questions in order to ascertain, get and be mindful of the lived experiences. As a researcher, I was also expected to be a good listener and be able to reflect accurately on the feelings and thoughts of the participants. Because of my personal experiences as a teacher, in my researcher role I could more readily identify the observed processes and the subtle participants' meanings, areas in which those researchers who had never been teachers might lack the knowledge and the experience.

3.3.5. Research Sites selection

This study was limited to only 10 schools in Gugulethu Township. The researcher used 10 primary schools that are in the same area. Purposive sampling was employed because it allowed me as a researcher to sample with a purpose in mind (William, 2008) since the population of interest was spread out over a larger area. The study also chose to employ purposive sampling since it allowed me to purposefully ask individuals to participate and give their valuable insights to a set of questions that sought to answer the research matter. Gugulethu Township has 17 primary schools but the researcher limited himself to 10 primary schools because these schools offered

more depth to the understanding of mother tongue instruction in Grade 6 Natural Science classes. This selection also made the study more manageable.

3.4. DATA COLLECTION

3.4.1 Data collection process

Creswell (2002) states that, data collection is a strategy to get information in a more systematic manner from the participants through interviewing, talking and listening without interjecting one's opinion. Data collection started in August 2010 and ended in the same month. Data collection included gathering of background information, getting views about the teaching of Natural Science using mother tongue instruction in a Grade 6 class, as well as the effects of mother tongue instruction on educators' explanations of the science terms.

A typical interview lasted between one and two hours in length. Focus group interviews would get me to the significant data required to accomplish the objectives of the study. A focus group interview can be defined as a discussion in which a small number, usually between six and twelve respondents, under the guidance of a moderator, talk about topics that are viewed to be of special relevance to the study in answering the research question. Fundamentally, a focus group interview is a way of listening to people and learning from them (Madriz, 2000: 835). The focus group interviews in this study helped to create a candid, normal conversation that addressed in depth the selected topic (Vaughan 1996: 4). In order to promote such an in-depth discussion on the topic I would encourage interaction among the members of the group.

3.4.1.1. Interview schedules

Since the researcher was working with 10 different schools, interview schedules allowed participants from different sites (Bogdan & Biklen, 2003). Bogdan & Biklen (2003) state that interview schedules allow for open-ended responses and are flexible enough for a researcher to note and collect data on unexpected dimensions of the topic. Interview schedules are also primarily meant to gather comparable data across

sites. Interview schedules ensured that as a researcher I carefully decided how best to use the limited time available in the interview situation.

Patton (2002) states that interview schedules assist in the interviewing of a number of different people in a more systematic and comprehensive way by delimiting in advance the issues to be explored. Furthermore, interview schedules ensure consistency and promote comparability. McMillan & Schumacher (2001) state that interview schedules involve direct interaction between the participants and they are flexible and adaptable. Interviews allow the responses to be probed, followed up, clarified and elaborated to achieve specific accurate responses. As McMillan & Schumacher (2001) also state, the interview schedules allowed me plan the questions prior to interviewing, and enabled me to keep these questions open-ended in order to explore the issues in the course of the interviews. The researcher gave each participant the questions and explained to them the ground rules, such as the need to respect one another, not interjecting when someone is speaking, the need for cell phones to be switched off, etc. The researcher explained to the participants that the questions would be asked in the way they were written on paper, and that the respondents had a right to ask questions for clarity purposes.

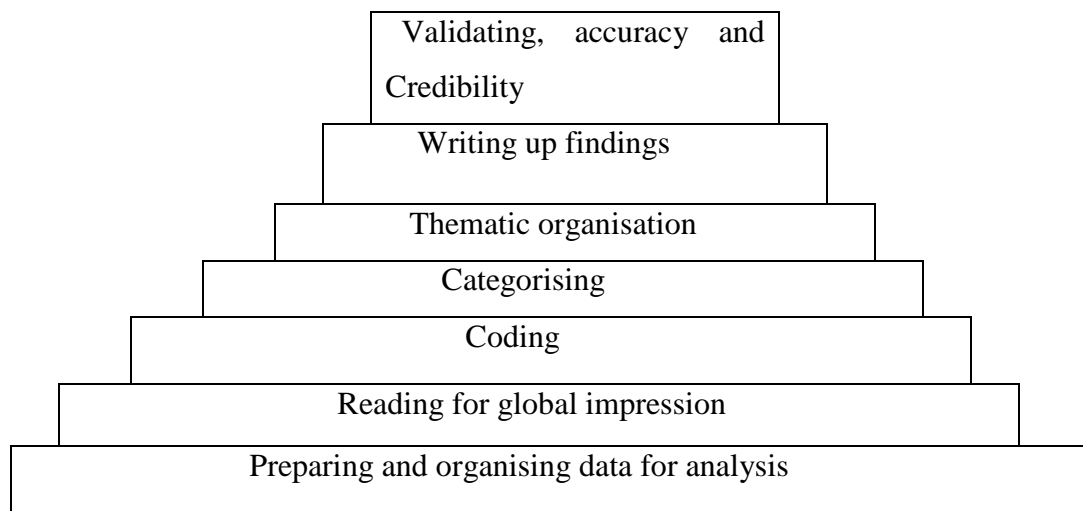
3.5. DATA ANALYSIS METHOD

The researcher analysed data using principles borrowed from grounded theory. Firstly, coding plays an important part in analysing and there is a need to establish its historical origin. Coding of data is central both to grounded theory and to most of the programs developed specifically for qualitative analysis (Henning, 2004). The following steps should be followed: reading data, assessing codes, determining categories in data, assigning themes, determining patterns and giving interpretations.

McMillan & Schumacher (2001: 267) observed how “analysis was a reasoning strategy with the objective of taking a complex whole and resolving it into relevant parts or chunks of meaning, social scenes or events”. In other words, qualitative analysis transforms data into findings. Coding is also a form of analysis to identify the properties of identified categories and themes in data. Thus, analysis in this study involved essentially making sense of data collected and using the results of this process to answer the research questions, as was stated in Chapter One.

The purpose for selecting data analysis procedures was to represent the data fairly and to communicate the purpose of the study, and understand what the data revealed (Patton, 2002). The purpose for selecting data analysis methods is also to monitor and report the analytical procedures and processes as fully and as truthfully as possible. The management of data is therefore very important to provide a holistic description of the entire research process and findings at the end of the study (Patton, 2002). Grounded theory is among other special research methodologies that fit into the broader traditions of fieldwork and qualitative analysis and are data-driven. The qualitative data collected for the research was analysed using description, interpretation and explanation. Precisely, the researcher for the analysis transcribed the interview recordings. Data was categorised thematically to uncover the experiences, views and opinions of the participants.

3.5.1. Protocol of data analysis (Henning, 2004, 104/109)



3.5.2. Validating accuracy and credibility

Cohen & Manion, (1994) argue that internal validity seeks to demonstrate that the explanation of a particular event, issue or set of data which a piece of research provides can actually be sustained by the data. They go on by saying that the findings must accurately describe the phenomena being researched. Cohen et al. (1994) says

that external validity refers to the degree to which the results can be generalized to the wider population, cases or situations.

Patton (2002) argues that validity and reliability need to be considered in terms of qualitative research involving the description of human experience and not the control and predictions of variables. In qualitative inquiry, the researcher is an instrument. The validity, meaningfulness and insights generated from qualitative inquiry have a stronger correlation with the information richness of the cases selected and the observational or analytical capabilities of the researcher, than with the sample size (Patton, 2002).

It is also argued that validity is the property of knowledge and not of methods (Patton, 2002). This view implies that it does not matter whether the knowledge comes from ethnography or from an experiment; the participants may still be asked the same kinds of questions about the ways in which the knowledge was valid. The term validity also refers to the degree to which scientific explanations of phenomena match the realities of the world. In the current qualitative research, both internal and external validity was used to address the trustworthiness of the findings (Patton, 2002).

3.5.3 Writing up findings

The findings were the results that the researcher obtained after the analyses. They were the findings with regard to the context of teaching Natural Science using mother tongue instruction in a Grade 6 class, and the findings in terms of the focus that was the educator who is teaching Grade 6 Natural Science using mother tongue instruction. At the end of the process, the researcher had to relate the findings to the existing theoretical orientation and illustrate whether it was supported or falsified by the new interpretation. Mouton (2001) advocated that interpretations also meant taking into consideration the contrasting interpretations of data, and demonstrated what a level of support data renders for referencing. Interpretations also allow the reader to have access to rich and detailed descriptions on the implementation of mother tongue instruction in a Grade 6 Natural Science class.

Interpretations also enable the readers to draw their own interpretations about meanings and significances (Patton, 2002). The researcher therefore hoped to produce

a written final case study narrative, a detailed, reader friendly and descriptive depiction of the findings on the research phenomena.

3.5.4 Thematic organization

Henning (2004) advocates that theoretical organisation involves coding and categorising, followed by extracting and constructing themes from the categories. Inventing a thematic framework includes both logical and intuitive thinking and ensuring that original research questions are fully tackled (Huberman & Miles, 2002).

3.5.5 Categorising

Categorising was a step in the analysis where data was grouped or organized “to identify possible themes, interpretation and questions” (McMillan & Schumacher, 2001: 465). The researcher used the data that he had collected as a guide in deciding what a category should be called. He then grouped together the categories that were related to each other.

3.5.6. Coding

Coding involves an examination of the data and then a definition of actions or events within it to assist the researcher to receive new perspectives on the material and to focus further data collection (Charmaz, 2000). Codes were created as the researcher worked through the data and selected accordingly, based on what the data meant to him. Transcripts were re-read and units of meaning identified, marked and labelled.

3.5.7. Reading for global impression

A set of data was selected from the educator’s interview schedules and provision was made for notes and the writing of codes. The study was written in order to obtain a global impression of the content (Henning et al., 2004).

3.5.8. Preparing and organizing data for analysis

Data are not often obtained already in an analysable form therefore they need to be prepared before the analysis process can begin. The need for data preparation is crucial when a researcher has used tape, audio and video recordings (Sapsford &

Jupp, 1996). In the case of my study, tape recordings were used. The purpose of analysis in this case is usually for the transcribing of the recordings or to produce a summary of what is on them. The form of transcription partly depends on how much information the recording supplies (Sapsford & Jupp, 1996).

3.6. TRUSTWORTHINESS OF THE RESEARCH

To maintain trustworthiness of this study the researcher collected data systematically and was careful in analysing the data. Trustworthiness in a qualitative study can be regarded as a fit between what the researcher recorded as data and what actually occurred in the natural setting that was being researched. This is not to strive for uniformity, two researchers who are studying a single setting may come up with different findings, but both sets of findings might be reliable (Cohen & Monion, 1994).

3.7. CHAPTER SUMMARY

This chapter provided some justification of the research design that outlines a phenomenological approach to the study. It also provided justifications on the used sampling methods. Research strategies and techniques that ensured trustworthiness were also outlined. In addition, the chapter provided a clear direction for the way in which the fieldwork (research process) was undertaken. In the next chapter, this design is applied and the results are presented within a narrative involving description and explanation. This narrative, description and explanation is intended to provide the reader with adequate information on the subject that was under investigation.

CHAPTER FOUR

RESULTS OF THE ANALYSIS OF EMPEIRICAL DATA

4.1. INTRODUCTION

This chapter provides an overview of how data was analysed. The extracts from the interview transcripts are used to support the conclusions and interpretations. The chapter is structured in the form of themes by which questions were asked.

As indicated in Chapter Three, data was collected using a focus group comprising of 10 Natural Science educators in Gugulethu. The responses to the questions asked from the focus group interviews were categorised as follows:

- **Curriculum change** (the question being).
What is your understanding of mother tongue instruction?
- **Resources.**
Are there any advantages or disadvantages of using mother tongue instruction in Grade 6 when teaching Natural Science?
- **Piloting policies before implementation.**
Is there any support you receive from Western Cape Education Department (WCED) regarding assessment of Natural Science?
- **Sufficient support and guidance from Head of Department (HOD).**
What, in your view, can the HOD do in addressing the mother tongue instruction?
- **Formation of committees.**
Do you have learners that are experiencing difficulties in Natural Science?
- **Assessment.**
What type of assessment do you use with Grade 6 learners and in which language do you assess learners?
- **Lesson plan.**

Do you require assistance from other educators in the design of work schedules and lesson plans?

- **Natural Science terminology in mother tongue isiXhosa**

How can you explain some of the concepts to the learners to make sure they understand Energy and Change?

4.2 Curriculum change

The participants in the focus group seemed to have many methods when it came to the teaching of Natural Science in a Grade 6 class. Educators mentioned the main reason for using these methods is in response to the chopping and changing of the South African curriculum. The education system in this country must be consistent in order for us to get better results in Natural Science, and this consistency must start at primary level. Heugh (1999) states that, most of the schools in Gugulethu are using English as the medium of instruction but educators have to code switch often when teaching. Alexander (1989) supports that view, noting that learners cannot learn through memorisation because when they forget one word it becomes a problem. Also, learners learn better when the concept is introduced in their mother tongue, that being isiXhosa. Then they can be introduced to the second language as they progress to the next level.

The participants in the focus group highlighted the introduction of Outcomes Based Education (OBE), which allowed the freedom of educators to let the learners to learn on their own and use any language of their choice, while they had to assess in English not in their own mother tongue. The outcomes-based learning requires educators to provide effective learning environments, so that they can support their learners to: develop into independent and autonomous learners, display a sense of responsibility by making informed choices, learners to learn at their own pace, to work collaboratively in group work, to extend boundaries of the classroom to community influences and to openly use their diversity of languages, culture, backgrounds, experiences and knowledge.

OBE sees the learners as the ones who can discover themselves with the help of the educators. Therefore, learners were not regarded as empty vessels into which can be

poured information to be memorized. The Department of Education again came up with another policy of Language of Learning and Teaching better known as LOLT. This move advocated for the teaching of all content subjects in the mother tongue. This has its advantages and disadvantages in terms of the environment of the schools, and the educators had to adapt to that situation (Department of Education, 2002).

When we look at the past education system one will find that there were learners who enjoyed the privilege of being taught in their own mother tongue in subjects such as Mathematics and Science, an example of this is Afrikaans. Therefore, it is clear that South African education has not been consistent for the past years before and after 1994, the year in which democracy was attained. Having all these issues of Natural Science being taught in mother tongue isiXhosa in this case, there were mixed feelings among parents and some of the educators that it would disadvantage the learners, especially when it came to the issue of them being prepared for the tertiary level, because if mother tongue instruction starts at primary level it must also be introduced in high schools and, ultimately, at university level.

The Revised National Curriculum Statement (RNCS) was another big change that happened in South Africa. The participants agreed with the fact that educators were told to teach using dictionaries because there might be words which they will need to explain when teaching. When it comes to educators, they noticed that learners did not understand Natural Science terminology that is why they had to use mother tongue when teaching, so as for learners to grasp the concept, as is illustrated in the following transcript:

...in 1990 we were using the old method of memorization and it was not effective at the time. I didn't even have a choice of indulging a mother tongue so, I had to push the kids through in English because that was the only language I was going to assess them in and to help them through terminology, which was quite a bit hectic for them. I had to go through memorization. (Transcript A)

4.3 Resources

For the past years resources had been a problem in South African schools, more especially those which were disadvantaged before. The cry from many people was to close the gaps within the educational system, because there were those schools which did have resources, such as the former Model C schools, and so had an advantage when it came to resources. As I mentioned earlier on, South Africa changed its curriculum time and again but the problem was that schools were not provided with the required resources. An example of this is that, when the Revised National Curriculum Statement (RNCS) was in place there were no resources in place and, as a result, educators had to struggle not knowing what to do, as the sentiments expressed below indicate:

...to me it is still the same because when they implemented OBE, there was a lack of materials. My teaching was about teaching and writing on the board. I see no difference between the past and present. (Transcript B)

4.4 Piloting policies before implementation

The majority of participants indicated that it is crucial that programmes or policies are piloted first before they are implemented. An example that was given was of the schools in Gugulethu that were working with the WCED to pilot teaching and assessing of Natural Science in isiXhosa. The schools welcomed the programme, hoping that it would improve the WCED systemic tests results in Grade 6, because there was a systemic evaluation that was taking place in the Western Cape Province. However, the participants went on to highlight that the WCED did not provide them with resources such as books, charts, dictionaries, etc. The concern of the participants was that the department introduced such a promising programme but failed to provide schools with the necessary resources. One educator indicated that “...schools cannot be expected to pilot programmes without prior arrangements and sufficient resources. The interviewees suggested that this programme of teaching Natural Science in isiXhosa should start at Grade 4 up to Grade 6, that being the Intermediate Phase.

At the time of conducting this study this programme was meant only for Grade 6 learners, hence another concern of the participants was that, when the learners progressed to Grade 7 they were taught and assessed in English. Then one can clearly see that there is a lack of consistency as I have already mentioned before. When the learners progress to Grade 7 they find it difficult to cope in English because they would be coming from a background involving the use of isiXhosa in Grade 6. These were the concerns of the respondents, although they stressed that the isiXhosa mother tongue was a good idea, they pointed out that provision should be made to take the schools forward. The feeling of the participants was that there were still gaps in the language policy in South Africa because the mother tongue was not used at high school and university level. However, when it came to Afrikaans it was a different matter, as this participant observed: “...*that thing was meant only for primary schools, the Foundation and the Intermediate Phase. It hasn't been taken up to university level as compared to Afrikaners*” (Transcript D).

4.5 Sufficient support and guidance from the Heads of Department (HODs)

The participants in the focus group interviews, when asked about the help they received from the Heads of Department (HODs) regarding teaching Natural Science using mother tongue instruction, reported that they did not receive any assistance. The problem that the educators were encountering is that, they were not confident when it came to teaching Natural Science in isiXhosa mother tongue in Grade 6 classes. Also, the participants mentioned the fact that even the Western Cape Education Department had very few knowledgeable Natural Science Curriculum Supervisors and, whenever they invited them to their schools, they did not pitch. This was seen to be a huge problem in the schools in Gugulethu. Instead of getting help from the WCED the participants said that they obtained this help from Non Governmental Organizations (NGOs).

The interviewees, when asked about the development of the work schedules, indicated that their concern was that HODs did not involve them in this process. They just received something that had been produced by someone else. They felt that if the HODs invited the educators when they developed the work schedules things would be better because they, teachers, were the ones who knew what was happening in

classrooms. Moreover, they are the ones who could also be in a better position to explain some of the scientific terms, because some of the educators are coming from the Eastern Cape (EC) originally- they do not have a problem with isiXhosa. One interviewee had this to say regarding this issue:

...even the itranslation involve teachers because abanokwazi ukusitranslathela izinto zesiXhosa (the translation itself involves teachers because they cannot translate Xhosa words for us)
(Transcript C).

4.6 Formation of Committees

The participants in the focus group interviews had the view that the schools in the Gugulethu area should be clustered and have a Natural Science committee. The committee would meet to discuss the way forward regarding teaching Natural Science in Grade 6 using mother tongue instruction. This development would help the school educators of the area to be able to use some science words in isiXhosa so that there is uniformity when teaching.

4.7 Assessment

The problem that the interviewees were facing in the schools they taught at was that, the learners did not understand the questions in English so the teachers had to explain the whole questions in their mother tongue. One can see that there is a contradiction here because when educators teach they teach in both languages- that is English and isiXhosa, with the exception of School F in Gugulethu. Respondents agreed that they were code switching but again they felt that learners took a lot of time when completing the task. Educators had to translate the whole question paper when the learners were writing tests.

There was only one respondent from the pilot school that had no problem regarding this issue of assessing using English because everything was done in isiXhosa. My view in this matter is that, children are copy what their teachers do. If the educators were consistent in what they were doing they would not find problems in children's responses when it came to assessment. The group were worried about the results in

Natural Science, quoting the Grade 12 results for the past years, with the idea that we cannot separate the two languages because learners should have a background in Natural Science. The teachers claimed that mother tongue instruction must start at primary level, and the participants specified that learning and teaching should be through mother tongue instruction in order for us to get better results.

4.8 Lesson Planning

Respondents were asked to reflect on what they did when preparing a lesson plan. The response was that they did not need the help of HODs when planning because they were on the same level with their HODs in terms of knowledge. Interviewees stated that they did lesson planning in English not in isiXhosa. Some interviewees objected to the lesson plan by saying they saw no reason of planning prior to teaching because when they taught they might find themselves not doing what was in the lesson plan. The lesson plan was just a piece of paper not the real presentation. What were important were the methodology and how one presented the lesson.

4.9 Natural Science terminology in mother tongue isiXhosa

When asked about how they explained certain terms in a Natural Science class, the participants responded by answering the following questions, within their own understanding. Translations were as follows:

How can you explain the following concepts to the learners to make sure learners understand Energy and Change?

- Potential energy-----amandla agciniweyo
- Kinetic energy-----amandla entshukumo
- Solar-----amandla elanga
- Fuels-----izivuthisi/ izinikimandla
- Electric cells-----amalahle
- Chemicals-----?
- Conducting wires-----?
- Volume-----umthamo
- Vibrate-----intshukumo

- Assessment focus-----ugxilo lohlolo

How can you explain the following concepts when teaching Matter and Materials?

- Rusting-----umhlwa
- Solubility-----?
- Evaporation-----ulophu
- Magnetism-----kukubutha/ uzibuthe/isitsalane
- Condensation-----kukuguquka kolophu lube ngamathontsi amanzi
- Solidification-----luqino
- Distillation-----luguquko lolwelo oluxutywe nento ethile.
- Crystallisation-----?
- Thermometer-----isixhobo sokukhangela ubungakanani bobushushu
- Degree Celsius-----iqondo lobushushu

How can you explain the following terms in your mother tongue?

- Energy-----ukwazi ukwenza umsebenzi
- Power-----amandla
- Force-----ukutsala/ ukutyhala

It must be noted that although the participants were given sufficient time to translate the concepts, they did not provide answers to four of the concepts, which raises questions as to whether they themselves understood them or not. If they did not understand these concepts one might conclude that the claims made by educators that they had to code switch because of the lack of understanding of the learner was an excuse to cover up for their own lack of knowledge. However, it was clear that although they translated some of the few terms some terminology was new to some of the participants, although all these teachers were teaching in the same area, in the same Grade and same Learning Area as well.

4.10 Conclusion

In this chapter, the researcher commenced with a first level analysis of the raw data collected from the focus group interview in the different categories according to the interview schedule. A further critical analysis was conducted using various themes identified in the categories.

In Chapter Three the researcher had earlier outlined the research methodology. Chapter Five will discuss the findings then provide some concluding remarks, ending by making some recommendations for further research on this topic..

CHAPTER FIVE SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter will firstly restate the research question. The findings are presented according to the research questions. In presenting the findings the results of the empirical study in Chapter Four are compared to the literature reviewed in Chapter Two to determine the contribution the study has made to the existing body of knowledge in this field.

5.2 RESTATING THE OBJECTIVES OF THE STUDY

In Chapter One the following research questions were stated as objectives. Three research questions posed in the study to address both the statement of the problem and to achieve the research aims were:

- What is the relationship between mother tongue instruction and learning of Natural Science in Grade 6?
- How do educators interpret Natural Science concepts using mother tongue instruction?
- Which strategies do educators use to address the challenges of using mother tongue instruction in a Grade 6 Natural Science class?

5.3 SUMMARY OF THE STUDY

Chapter One: The aim of Chapter One was to provide the background, motivation and the rationale for the study. Furthermore, the problem statement of the research, research question and ethical considerations were described. The chapter concluded with a structure of the report.

Chapter Two: In Chapter Two the researcher outlined the literature review of this research. The researcher briefly looked at the neighbouring countries of Mozambique

and Swaziland, comparing their mother tongue instruction policies to South African policies.

Chapter Three: In Chapter Three the researcher outlined the methodological stance of this research and also explained the data collection and interview schedule that were used. The researcher explained why he had opted for a qualitative research design.

Chapter Four: Chapter Four facilitated an understanding of the data analysis, using the data generated from the focus group interview that the researcher used.

Chapter Five: in Chapter Five a general conclusion, findings and recommendations are discussed.

5.4 DISCUSSION OF FINDINGS

This section discusses the findings from the study. The findings are discussed according to the themes used in the data analysis in Chapter Four. In presenting the findings literature as reviewed in Chapter Two is used to support these findings.

5.4.1 Findings with regard to research question1: What is the relationship between mother tongue instruction and the learning of Natural Science in Grade 6?

- **Theme: Curriculum change**

In Chapter Two the literature stated that mother tongue helps in the understanding of subject terminology (see paragraph 2) and the outcome of the empirical study found that mother tongue instruction helps with the learning of Natural Science terminology. Therefore, it could be concluded that mother tongue can assist in the teaching of Natural Science to Grade 6 learners.

- **Theme: Resources**

In Chapter Two the literature stated that the resources in some areas are a problem when it comes to distribution, more especially in primary, secondary and tertiary education the resources are always a concern. The government does not provide enough money. For example, at primary level, where everything should start at to promote African languages, there is inadequate resource support. Even if one goes to the universities one will find that there is very limited bursaries to promote African languages, and also there are no language policies to encourage students to learn African languages. The outcome of the empirical study found that there is a need for resources in mother tongue Natural Science. Therefore it could be concluded that there is a need to put money aside for resources so as to develop materials in mother tongue isiXhosa.

- **Theme: Piloting policies before implementation**

In Chapter Two it was mentioned in the literature that The Western Cape Education Department is in the fifth year now in a pilot project of 16 schools in the province, which is called the Language Transformation Plan. For a period of six years it intends to promote mother tongue education. The outcome of the empirical study found that there is a need to pilot policy before it is implemented. Therefore, it could be concluded that the Western Cape Education Department should pilot its policy before it can be implemented, in order to check whether it will work or not.

- **Theme: Sufficient support and guidance from Head of Department (HOD)**

In Chapter Two the literature reviewed indicated that The Language Transformation Plan complements the National Language in Education Policy of 1997 and all other relevant legislation, including the National Curriculum statement (NCS). The study found that there is a need for HODs to be part of mother tongue instruction because they are the driving force of curriculum in schools. Therefore, it can be concluded that

workshops are the way to go in order for the Head of Department to be abreast of what will currently be happening in Natural Science classes.

- **Theme: Assessment.**

In Chapter Two the literature stated that in Swaziland, when they were given an English proficiency test, about 20% of the children who passed the test were mainly from early English urban schools. 80% of the educators administered the test in SiSwati, giving all explanations in SiSwati. 80% of the children did not understand the test instructions given in English, hence educators used mother tongue. The study found that when Grade 6 learners are assessed in Natural Science, they are assessed in English and learners do not even understand questions, as a result some of them fail the given task. Therefore, it could be concluded that mother tongue instruction should be implemented so as to get good results in schools.

Examination results improved where mother tongue instruction was employed in the early years of basic education (see Chapter Two).

5.4.2 Findings with regard to research question 2 how do educators interpret Natural Science concepts using mother tongue instruction?

In Chapter Two some of the literature reviewed showed that examination results improved when mother tongue instruction was employed in the early years of basic education (see paragraph 11) and the outcome of the empirical study found that educators see the improvement of learners in Grade 6 Natural Science when they explain science terminology in isiXhosa mother tongue. Therefore, it could be concluded that teaching Natural Science in Grade 6 classes using isiXhosa mother tongue instruction enables learners to grasp the concepts easily.

5.4.3 Findings with regard to research question 3: Which strategies do educators use to address the challenges of using mother tongue instruction in a Grade 6 Natural Science class?

In Chapter Two the literature stated that South African learners are taught in English from Grade 4 to 12 and yet they leave school poor in English speaking competency (see paragraph 3), and the outcome of the empirical study found that Grade 6 learners struggle when they are taught Natural Science in English, educators had to code switch with isiXhosa at times to make learners understand the concept. Therefore, it could be concluded that English is not a superior language when it involves making learners understand Natural Science concepts. Mother tongue instruction might be the way to go because even at home learners use their mother tongue isiXhosa for communication...

5. 5 Recommendations

Firstly, the promotion of mother tongue instruction is crucial because it will improve the results when the learners are being assessed. Therefore, it is important for the Western Cape Education Department to organize courses for educators that are teaching Grade 6 Natural Science, so as to make them teach the same way, more especially when it comes to the development of Science terminology. The goal for these courses should be to enable educators to teach with uniformity that means using and explaining the same Natural Science terminology.

The Natural Science educators should form committees in order for the schools in the Gugulethu area to be able to use the same terminology when teaching Natural Science using mother tongue instruction. This is a good idea and the schools need to promote mother tongue instruction because it will help the learners to learn home language (isiXhosa), and they will be able to use the isiXhosa language freely in the classroom. The committee should form a partnership with parents and retired teachers to promote the importance of teaching their children in isiXhosa mother tongue, so that those learners get support when they are given Natural Science homework.

Mother tongue instruction should be used for communication purposes, in transferring values and attitudes and in formulation of belief systems. In Natural Science classrooms there should be visible evidence of pride in educators and learners for their mother tongue. Learners' language in class should be used in understanding concepts of Grade 6 Natural Science. Educators should be familiar with the role of

language in the cognitive development of learners and to be familiar with theories of language development and learning and the link of language with learning itself. Educators should be aware that they can cause irreparable harm to a learner's personality if they ignore the learner's home language. These should be the issues that are driven by the committees in order to promote mother tongue instruction in Gugulethu schools.

Secondly, it is very important to pilot the programme before it comes to implementation. Thereafter, the Department of Education should put in place the policies that will be suitable for teaching and learning using mother tongue instruction. The WCED should make sure that all the resources that are needed are in place, such as teaching materials. The schools themselves should be an isiXhosa mother tongue environment, what the researcher meant by this was that when one enters the school yard one should see notices in isiXhosa and the paintings on the walls should be in isiXhosa so that everyone can clearly see that the school is an isiXhosa environment. It should be the same situation when one goes to the classrooms, one needs to see Natural Science drawings on the walls being labelled in isiXhosa language. By doing this the schools can be able to promote mother tongue instruction in Gugulethu schools. However, this cannot be done by Natural Science educators alone, every educator should be made aware of the school policy.

It was a good thing for South Africa to change the education curriculum after 1994, but the country does not appear to be consistent when it comes to curriculum. We are in a country that is chopping and changing its curriculum. What the Education Department needs to do is to set a time frame for its policies and also there must be a proper monitoring tool. This will help in knowing where the policy fails, if it fails, and we can gladly be able to rectify what we picked up that went wrong. Also, the learning and teaching of isiXhosa mother tongue should be modernized in the sense that it needs to be enjoyable, attractive and so on. To do this we need people or, rather, educators who are knowledgeable in this area.

5.5.1 Resources

This is a vital part in education, if we want to get good results we need to have enough resources. The WCED must make sure that schools are provided with enough resources, by putting money aside specifically for mother tongue resources. Talking of resources means books and teaching material that will focus on isiXhosa mother tongue. It is important for the WCED to build libraries in each school and there must be enough mother tongue books, so that these books are accessible to all the learners of the school.

Resources should be kept centrally and they should be distributed to the classroom if there is a need to do so. The school should have its policy regarding the library and the use of language. The use of the school library must also appear in the school timetable. The school should not take any educator who is not qualified to be a librarian. The WCED must employ librarians who are well qualified in mother tongue (isiXhosa) so as to be able to give support to educators and learners as well. Also, the school should have someone who is going to be responsible for the resources, so that the school does not find itself buying the same books or mother tongue dictionaries year after year. However, my recommendation is that these resources or books must link with the curriculum. This will need educators who know isiXhosa very well to write those books and create charts as well. However, this cannot be done overnight, it needs proper planning.

5.5.2 Support from HODs

The School Management Team (SMT) should be involved when it comes to mother tongue instruction, because at the end of the day it is not the responsibility of an educator who is teaching Natural Science. The School Governing Body (SGB) should play a role in making sure that mother tongue instruction is being implemented at the school, so that they sell the idea to parents, because at the end of the day it is parents' children who are taught in Grade 6 Natural Science mother tongue. Heads of Department should make sure that teaching and learning styles are implemented in a manner that suites the learner. However, classroom management is important as well as learner management. The principal of each school should liaise with the

Department of Education to promote mother tongue instruction. Also, parents should be involved in this process, they must be told about the importance of mother tongue instruction to their children.

5.5.3.1 Assessment

This is a crucial part in the curriculum and assessments need to be planned thoroughly before they can be implemented. It is important for the schools to have knowledge in delivering Grade 6 Natural Science in mother tongue instruction curriculum. Therefore, the schools should have assessment techniques and opportunities such as tests and examinations when it comes to mother tongue instruction. At the beginning of each year the schools should have a programme regarding school readiness and baseline assessment; this will help to assess the learners' level when they progress from Grade 5 to Grade 6. Also, parents should be made aware of the school readiness policy because they are the ones who send their children to school. The educators who recognize and understand the policy regarding mother tongue instruction should support parents. However, the school should be a monitoring support system in issues such as assessment of learner performance, examination policy and records of achievement, school reports, learner progression and moderation.

5.6 LIMITATIONS OF THE STUDY

The study was conducted in South African schools at the time when mother tongue is at its infant stage of development. Therefore, the study was limited in the sense that mother tongue instruction in Grade 6 has just been implemented. Because the study was conducted in 10 primary schools in Gugulethu the findings may not be applicable to other regions, provinces or countries.

5.7 AREAS FOR FURTHER RESEARCH

This is an exploratory study on a limited scale. Further research efforts in this field of research might focus on questions such as:

- How do learners communicate in Natural Science classes in Grade 6?

- How do learners respond when they are tested in Natural Science in English without explanation of questions by the teacher?

5.8 CONCLUSION OF THE STUDY

The study was organized into five chapters. In Chapter One the researcher presented the background of what motivated him to undertake this research.. The researcher discussed how he became interested in the issues presented in this dissertation, and what influenced him to pursue the topic of the study. Subsequently, the researcher presented the problem statement and the aims of the study. In the conclusion to the chapter the researcher also discussed the limitations of the study.

Chapter Two presented the literature review, and the researcher examined and compared South African education policy to other countries. Chapter Three presented the methodology. The research strategies and techniques that ensured trustworthiness were also outlined. The chapter also provided justifications of the sampling methods and theoretical framework used in the study. In Chapter Four the researcher commenced with a first level analysis of the raw data collected from the focus group interview in the different categories according to the interview schedule. Chapter Four also dealt with the research findings, which were divided into several themes.

Finally, Chapter Five includes a summary of research recommendations and presents a general discussion of the findings.

In conclusion, this study raised the following important points about mother tongue instruction in Grade 6 Natural Science classes:

- The department of education should be consistent when they are introducing policies;
- There should be no chopping and changing of curriculum;
- The medium of instruction in most schools is English whereas most of the learners come from an isiXhosa speaking background in the Gugulethu area. This does not seem to make logical sense;
- Educators were very much concerned about the unavailability of resources such as text books written in isiXhosa mother tongue, and dictionaries. This

causes them to find it difficult to explain certain words in isiXhosa when they are teaching Natural Science in Grade 6 classrooms; and

- When the WCED introduces certain policies or programmes, these must be piloted first before they are implemented, in order to increase their chances of success.

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Appendix A

Mr Mawethu Nocanda
1 Pama Ville
Koedoe Street
PAROW
7500

Dear Mr M. Nocanda

RESEARCH PROPOSAL: THE IMPLEMENTATION OF MOTHER TONGUE INSTRUCTION IN A GRADE 6 NATURAL SCIENCE CLASS.

Your application to conduct the above-mentioned research in schools in the Western Cape has been approved subject to the following conditions:

1. Principals, educators and learners are under no obligation to assist you in your investigation.
2. Principals, educators, learners and schools should not be identifiable in any way from the results of the investigation.
3. You make all the arrangements concerning your investigation.
4. The programmes of Educators are not to be interrupted.
5. The Study is to be conducted from **1st March 2010 to 23rd September 2010.**
6. No research can be conducted during the fourth term as schools are preparing and finalizing syllabi for examinations (October to December).
7. Should you wish to extend the period of your survey, please contact Dr R. Cornelissen at the contact numbers above quoting the reference number.
8. A photocopy of this letter is submitted to the principal where the intended research is to be conducted.
9. Your research will be limited to the list of schools as submitted to the Western Cape Education Department.
10. A brief summary of the content, findings and recommendations is provided to the Director: Research Services.
11. The Department receives a copy of the completed report/dissertation/thesis addressed to:

**The Director: Research Services
Western Cape Education Department
Private Bag X9114
CAPE TOWN
8000**

We wish you success in your research.

Kind regards.

Signed: Ronald S. Cornelissen
for: **HEAD: EDUCATION**
DATE: 28th December 2009

Appendix B

No 1 Pama Ville

Koedoe Street

Parow

7500

25 January 2011

Dear Principal.

My name is Mawethu Nocanda. I am a Natural Science teacher at Sonwabo Primary School. I am currently studying at Cape Peninsula University of Technology, doing a Master's Degree in Education. My research topic is: *The implementation of mother tongue instruction in a Grade 6 Natural Science class*. I request your permission for your teachers to take part in this research, as respondents, it will benefit most of us who are doing Natural Science, more especially the educators who are teaching Grade 6.

My research will adopt the interpretive theoretical framework because it seeks to address social phenomenon and realities. This theoretical framework allows me as a researcher to explore social realities.

Sampling

This study will be limited to Gugulethu Township. I am going to work with 10 primary schools that are in the township.

Sample size

In the qualitative methodology the focus is not on numbers, therefore my sample size will be composed of 10 respondents comprising of one educator per school. The study will focus on educators because they are the ones who best know the problems they encounter with regard to Natural Science teaching in their schools. I will include 5

female and 5 male educators from the 10 schools because I do not wish the study to be gender biased. For the purpose of this study, the researcher will ask the volunteers and also approach the respondents purposefully to avoid a situation where people may be reluctant to participate.

Data collection instruments

The instruments that I am going to use to collect my data will be the interview schedule. A typical interview is going to last between twenty and thirty minutes in length. An interview schedule will get me to the significant data required to accomplish the objectives of the study. The interview schedule aids in recording answers and is easier to conduct.

Data analysis method

The qualitative data collected for the research is going to be analyzed using description, interpretation and explanation. A professional for the analysis will transcribe the interview recordings verbatim. Data will be categorized thematically to uncover the experiences, views and opinions of the respondents.

Ethical Considerations

Protecting the confidentiality of interview subjects is going to be of high priority in the execution of my research. The following measures are going to be taken:

- Prior to every interview, the interview subject is going to receive a full explanation of his or her rights during the interview sessions and after the interviews. The project, its purpose and my position as a researcher at Cape Peninsula University of Technology is also going to be explained.

Before any proceedings with the study, I will access permission first from WCED, as well as the principals of all the schools.

Yours in Education
Mawethu Nocanda

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Appendix C

Topic: The Implementation of mother tongue instruction in a Grade 6 Natural Science class.

Respondents and their qualifications.

School A	Educator A	Qualifications PTC, JPTD
School B	Educator B	Qualifications STD, BA, BEd
School C	Educator C	Qualifications SPED
School D	Educator D	Qualifications HDE and BEd
School E	Educator E	Qualifications HDE
School F	Educator F	Qualifications SPTD
School G	Educator G	Qualifications BA and HDE
School H	Educator H	Qualifications BA and HDE
School I	Educator I	Qualifications BA and HDE
School J	Educator J	Qualifications BTEch

Appendix D

Focus Group Interviews Register

22 February

2011

Name & Surname

School

Contact No

Signature

1				
2				
3				
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8				
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10				

Appendix E

The implementation of mother tongue instruction in a Grade 6 Natural Science class:

My motivation is because I find it difficult to explain some of the Natural Science concepts.

I am a teacher of Natural Science at Sonwabo Primary School and I have been teaching this learning area for twelve years. At the same time, I was trained at Hewat College of Education, and majored in Natural Science. However, since I was introduced in this learning area, we were taught in English and it was the second language for me and I was forced to assess in English. I found it difficult to explain some scientific concepts in isiXhosa because there is no glossary for isiXhosa terminology.

As from 2007, the Western Cape Education Department (WCED) suggested that each school must do its own Learning Programme. There was a problem because teachers were struggling to compile Learning Programmes and Work Schedules, although teachers were located in the same area. The WCED came with a proposal that Learning Programmes and Work Schedules must be the same, that means they had to be uniform, more especially if we are coming from the same area.

“The work schedules will be sent out with a view to eliciting feedback. They will also be field- tested in selected schools. The documents will be circulated as guidelines in January 2009 and comments requested by July 2009. The work schedules will also be field- tested in July 2009. All comments will inform the further development of work schedules.” (Naicker, 2009: 1)

- The work schedule is a broad framework that offers a selection of content (Learning Outcomes and Core Knowledge and Concepts) for Grades 4 to 6.

- The work schedule gives a week by week outline of the content, and the work towards all three Natural Science Learning Outcomes.
- It covers all Core Knowledge and Concepts in the four standards of the Natural Science.

I have chosen two themes in Natural Science, that is 'Energy and Change' and the second theme is 'Matter and Materials'.

Role as Learning Mediator

1. Briefly discuss the different strategies you have implemented in your classroom since you started teaching Natural Science in Grade 6.
2. Have you been able to identify some of the learning styles of your learners? Have you been able to match the teaching strategies with their learning styles?
3. Do you have learners that experience difficulty in the Natural Science? Can you estimate the overall percentage of the learners with difficulty in Natural Science?
4. What kind of intervention strategies have you put in place for them?
5. In terms of the matching of teaching strategies and learning styles, identifying learning difficulties and providing intervention: Did your formal training involve the matching of teaching strategies and learning styles together with identifying learning difficulties and providing intervention?

Role as interpreter and designer of Learning Programmes

1. Did you request assistance in the design of the work schedules and lesson plans from your Head of Department (HOD)?
2. How often do you prepare lesson plans? Do you still require guidance from your HOD in this regard?
3. Do you design your own recording sheets and learning area schedules or do you use standardised formats?
4. Do you receive training in the development of learning programmes, work schedules and lesson plans in Natural Science?

Interview Questions:

2. What is your understanding of mother tongue instruction?
3. Are there any advantages or disadvantages of using mother tongue instruction in Grade 6 when teaching Natural Science?
4. How can you involve other educators who are in the Intermediate Phase in this matter of mother tongue instruction in the school you are teaching at?
5. Do you require assistance in the design of the work schedule and lesson plan from other educators?
6. What, in your view, can the Head of Department (HOD) play in addressing the mother tongue instruction in Grade 6 Natural Science class?
7. What role can the School Management Team (SMT) play in making sure they address the mother tongue instruction in Grade 6 Natural Science class?
8. Is there any support you receive from the Western Cape Department of Education (WCED) regarding assessment of Natural Science?
9. What type of assessment do you use with Grade 6 learners and in which language do you assess the learners?

Section 1

10. How can you explain the following concepts to the learners to make sure they understand Energy and Change?

- Potential energy
- Kinetic energy
- Solar
- Fuels
- Electric cells
- Chemicals
- Conducting wires
- Volume
- Vibrate
- Assessment focus

11. How can you explain the following concepts when teaching Matter and Materials?

- Rusting
- Solubility
- Evaporation
- Magnetism
- Condensation
- Solidification
- Distillation
- Crystallisation
- Thermometer
- Degree Celsius

12. How can you explain the following terms in your mother tongue?

- Energy
- Power
- Force

Appendix F

TRANSCRIPT OF THE FOCUS GROUP

Researcher: First of all I would like to thank you for coming to this research interviews. I am Mawethu Nocanda and I have been teaching for more than twelve years I think. Eeh... at the same time I was trained at Hewat College of Education where I was given eer... Learning area Natural Science in English whereas English is my second language. My first language is isiXhosa. So, when it comes to teaching I was also introduced to teach, actually I was forced and bound to teach using English and to assess in English without using mother tongue (isiXhosa) in Natural Science, and I taught Natural Science for twelve years.

But eeh... there are dynamics here, if we remember very well eeh... the Western Cape Education Department (WCED) came with the idea that all learning programmes must be done eeh... in English and there was a problem because teachers were struggling to compile learning programmes and work schedules. The WCED came with the proposal that learning programmes and work schedules must be done according to the area the learners are coming from. That means if we are in Gugulethu area we must have same learning programmes. Like eh ...for an example we cannot say learners must be taught about cows, pigs etc whereas they are living in the township not in farms or rather in rural areas. So they must be given something, which they can see on daily basis. That was the position. And.e...e

- The work schedule is a broad framework that offers a selection of content (Learning Outcomes and Core Knowledge and Concepts) for each grade 4 to 6
- The work schedule gives a week by week outline of the content, and the works towards all three Natural Science Learning Outcomes.

It covers all Core Knowledge and Concepts in the four standards of the Natural Science. But since my topic is on mother tongue instruction I would love our focus to be base on this issue.

I have chosen two themes in Natural Science, that is Energy and Change and the second theme is Matter and Materials. So these are the themes and questions I want

this group to engage in. We can interact to each other, it does not mean the answers must be directed to me. Okay. My first question is:

Role as Learning Mediator

6. Briefly discuss the different strategies you have implemented in your classroom since you started teaching Natural Science in Grade 6.

(Pause) Okay, can I repeat the question?

Briefly discuss the different strategies you have implemented in your classroom since you started teaching Natural Science in Grade 6. Like for instance, in terms of finding learners having difficulties in understanding certain concepts. What strategies have you implemented to make sure that the learners understand what you are teaching?

Educator A: Okay, Thanks, Ndlovu (researcher's clan) Mna (I) will begin to start as from when I was teaching Natural Science in Grade 6 that was around eeh... 1990 and at that time we were still using the old method, that is of memorization and it was not effective at that time. And..e..e, I didn't even have icheice indulging a mother tongue so, I had to push the kids or pull them through in English because that was the only language that I was going to assess them in and to help them through terminology which was quite a bit hectic for them. Even then, I had to go through memorization.

As the years went by there was this advert yenantsi (of) Outcomes Based Education (OBE). Then it was a different story, that we were free to wave against the languages, and there was specifically in 2004, I was at another school then, there came lento yenantsika LOLT (Language of Learning and Teaching). It was the advocacy of teaching content subjects in the mother tongue. Nayo (LOLT), it brought about its contrivances, it brought about advantages depending on inantsika position of an educator and the school environment.

But with all the suggestion that we came up with that it will be helpful and also quoting and comparing with the previous nantsika I mean advantageous group that is, Afrikaners had that advantage of having been taught in Maths and Science and other contents in their mother tongue, so what would be inantsika in Natural Science having been taught in isiXhosa, and that there were challenges okokuba (of), it would put our children in

disadvantage, when it comes to international level and also it comes for them being made ready to venture tertiary institutions because it would give a negative view to them being accepted and then because of those mixed feeling I- Natural Science in my experience, it has not been taught in mother tongue although we were given the leeway, that we might explain in the terminology in any language that would allow the kids to understand. That is how far I can say.

Researcher: Okay, is there anyone who can cheap in on this question? Or, can we move to our second question?

Researcher: Have you been able to identify some of the learning styles of your learners?

Educator A: It would be based on the same things that I have mentioned that, the kids learn better if I apply the flexibility of doing both English and isiXhosa. Even when it comes to assessing them you will get no response when you simply go and address them or question them in inantsika pure English but, when you add a bit of imother tongue or translation and then you will receive their response. They will come up forth-positive reaction with assessment.

Researcher: Can we move to our next question?

Educator B: Ukugcwalisela phaya, mna ndiqale ukutitsha (to add more, I started teaching) I- Natural Science ngo (in) 2000, which is I am not that old tradition. Although i... that old traditional teaching was chasing but to me it is still the same because when they implemented the OBE, there was a lack of materials. My teaching was about teaching and writing on the board. Do you understand? So, I see no difference between past and present.

Educator C: Can I come in? (Introduce himself) Eeh... From all what has been said here I will agree with my colleagues. I also started teaching I think in 2000, but I majored in isiXhosa and History, but you know when it comes to our schools more especially primary schools, you have no choice. You have to acclimatise and adapt. I also taught my learners what we called eeh... its...eeh... chalk and talk like in the old days.

But RNCS came and we said no, we need to traditional approach to hands on. And when we attended these workshops we were told that we cannot teach Natural Science without using dictionary because there will be some words like phenomena, so you may not understand or it may mean other thing and..e...e to add more, when you teach these terms

in class you will notice that they all glaring at you as you are doing this chalk and talk. But some of them are grasping to what you are saying. For an example, I was asked by other one, one day that, “*teacher can I answer this question in isiXhosa?*” I understand that the learner understands the question but he could not express himself in English.

Researcher: Okay, Lets quickly go to question number three if I’m not mistaken. Isn’t it?

All: Yes.

Researcher: Do you have learners that are experiencing difficulties in Natural Science? And if you do, can you estimate the overall percentage with difficulties in Natural Science?

Educator D: Yeah, eeh... mna (I) started teaching in 2000 but I started teaching Natural Science in 2003. So, what I found out is there are problems in understanding their second language (English). When I am teaching some, most of them do not understand the language so I decided to use both languages so that they can understand. When it comes to assessment some questions need idiscussion ethile ufumanise uba although ngoku besisenza into ethile funeka ucacise. Xa besi assessa in English they cannot move abakwazi ukuba bangacacisa loo question. Baya stugglisha to express themselves in a language.

Educator E: Ndizibulisele nam (I greet you). I am coming from another school. Eeh... I don’t know whether I will have much input in this because this is my first year teaching Grade 6 Natural Science. So, as I am starting this year, I have no experience in as much as other educators. But, I was teaching Natural Science in Grade 4 and 5. Umm... according to the difficulties in teaching Natural Science yeah, the kids, I mean the learners do struggle a lot, because you have to explain both, I mean using both languages Xhosa and English in grade 4 and 5. I just wanted to indicate that.

Educator F: Enkosi mfundisi (thank you teacher) I am Ms Educator F from another school. Eeh... ndititshe (I taught) u Grade 6 for two years Natural Science. So, thina, mna uhlobo endiyenza ngalo abantwana be Natural Science since isiXhosa simov(e) naso from Grade 4, besingena problem ebantwaneni because thina inantsika isiXhosa funeka uthi make sure ulisebenzisa ngesiXhosa lonke igama. Iterms zalo uzikhupha pha

ebhodini. Ibekwa strictly for umsebenzi wesiXhosa, so sine dictionary le ye languages zonke, iEnglish nesiXhosa. We are using that dictionary. (We in fact the way in which we I taught Natural Science to learners had no problem since I was teaching in isiXhosa in Grade 4).

Educator G: NguGrade bani? (Which Grade?)

Educator F: Grade 6. We are using loo (that) dictionary, idifficult yona. (it is a difficult one) Sifumaneka k if abantwana they move from Grade 6 to Grade 7, kubamnyama total kubamnyama nyani. (It becomes a problem when learners progresses to Grade 7, they cannot cope with Grade 7 work). For instance kule term sibanike iqestions bazikhuohela iqestions besenza umsebenzi. They don't understand itterms, iterminology ye Science. This term they were given questions to copy as part of their classwork, they do not (understand Natural Science terminology). So kwa Grade 7 they move to English and baba blank, imost yabo.

Researcher: So, if I may ask, why don't you make consistence? If that they are taught in isiXhosa in Grade 6 and then, they carry on to Grade 7.

Educator G: We are forced to do that.

Educator D: Can I come in? What you have just said, I think eeh... we were also asked in our school if we can teach our learners in isiXhosa but we haven't decided yet. So, I think the problem they are facing at their school is that, as much as our schools are the same. In this case we are starting at Grade R up to Grade 7, I mean that they also have senior phase within the same school. They are forced to change at Grade 7 because that thing was meant only for primary schools, the Foundation and the Intermediate Phase. It hasn't been taken up to university level as compared to the Afrikaners.

Researcher: Okay.

Educator H: (Introduced himself) Eeh... I was teaching Natural Science as from 99 but when I started teaching Natural Science it was 2003, eeh... what I can add is that ukufika kwam at the school I've noticed that learners do no have the background of the Natural Science. So, as Meneer (teacher) said that, the approach he used eeh...its actually started the.e..old style of teaching Natural Science. But what I can say I have a passion of Science and background of Natural Science. Eeh... first of all I did Biology eeh...and Science also, when it comes to teaching institutions. I also apply the language that I have, so what I ve noticed the eeh... kids, I asked my principal that can she allow me to teach

Natural Science from Grade 4 because there was a problem when they come to Grade 5 to integrate to terminology of Science. So, I come with the introduction of Science eeh... fortunately we use English to teach Natural Science.

So, I just need to explain and try simplifying these terms so as to understand. So, I started from Grade 4, 6 and 7. Eeh... sometimes I know eeh... the system we are using is different from the system that we were using before. So, I try to use the language of Science so that they can understand when they pass Grade 6 to Grade 7. They can apply that knowledge that they have from Grade 6. Eeh... now they can understand eeh... eeh... I am trying ukuthi we've got a committee where we discuss the difficulties we come across to teach Natural Science. Sometimes we swap as teachers, because you may find that other is good in teaching Energy and Change. Eeh... we write essays so that they can write what they understand about the Science. As from now I think we are having the same problem that other schools have mentioned.

Researcher: Okay, coming to question 4. What kind of intervention strategies have you put in place for the learners in a Grade 6 Science classroom?

Educator I: Into yokuqala mna endayenzayo kukuba nje ngokuba sisebenza le topic ndiba groupisha ndibanike iisub topics. (I first group them and give them sub topics). Le group izakucacisela iclasi ukuba kuthethwa ngantoni apha. (Each group will explain the content of the topic to class). Zonke zizibhala nge English ngoba sisebenisa iEnglish esikolwen. (This is written in English as it is in Language of Learning and Teaching in the school I am teaching at) So, loo nto inika ichance yoba nalo ebenga understadi ayive. (Learners who do not understand are assisted by groupmates). Mhlawumbi ndicinga ukuba xa ithethwa ngomnye umntwana uzayiva bhetele ngcono kunam and abe free nokubuza iiquestions xa iyi clasi yonke. (Children learn better when taught by others and they become free to ask questions for clarities). So, yaye yandinceda loo nto because kwaye kwa free nabaye abantwana. (That helped me a lot because most of the learners were free in class). Ngoku bazixoxela bodwa bafumane ichance yokuqonda, mhlawubi bebesoyika ukubuza kum. (Every learner now has an input in group discussions with no fear of voicing out his/her views).

Educator G: May I ask something? How is the response xa uba assessa? (When you assess them) Having discussed in groups, now when they write as individuals, how is the response? Is it positive? Is it the response you were expecting from them?

Educator I: At least, there was improvement especially kwezi learners bezisemva ke. Although bebe strugglisha nge grama ke. (To those struggling learners their grammar was not too good) You can see baya sokola igrana nesipelling. (They struggle with grammar and spelling). Ubone igama le English ulibhala ngesiXhosa. (They write English words in isiXhosa).

INTERVIEWS QUESTIONS

Researcher: Coming to interviews questions, what is your understanding of mother tongue instruction?

Educator A: Mother tongue instruction is basically teaching Natural Science in the language of the pupils of my classroom, if the pupils are Xhosa speakers, then I teach Natural Science in Xhosa which is their mother tongue. That's my understanding.

Educator C: Eeh... even so, I may say you teach them in English but even you will be calling energy will be still ienerji, it's a borrowed word.

Educator D: I energy amandla...

Educator A: Now you are contradicting yourself ke ngoku, because teaching the language in mother tongue we, in our mother tongue are so much limited and restricted when it come to language, we don't have a lot of words that are scientific, so we have to improvise and Xhosarize the words and by doing that we are misinforming the kids from the right concept. Especially that example of energy when we translate that or Xhosarize that we say, energy is- ngamandla. Whereas it is not that.

Educator D: Because we can say, amandla, power and force, these are different but in Xhosa are the same thing, and it's the same thing.

Educator E: Err...I think we also need to understand and appreciate the fact that languages differ from one another. So, I am trying to differ with you from what you are saying with amandla is only one word in esiXhoseni. Yet, that amandla at

isiXhoseni may mean different things. So, why I want to comment more on this, teaching Natural Science ngesiXhosa.

We need first of all we amaXhosa to have our language and try to develop it first before jumping to teach it, try to organise the vocal of isiXhosa in terms of Natural Science. If we can start there, then thing can be bettering all learning areas because there is that say, at least we must teach our kids from Primary School in our home languages as African people as the Afrikaners have started it long time ago because they have invested money. I remember when they were fighting the usage of Afrikaans in tertiary institutions, they have invested long time ago. That is what we must do in our home languages.

Researcher: Uhhh...

Educator F: To add more kule nto uyithethayo titshala nhe, Sifakwe kule pilot programme sizizikolo ezithile.(We are in a pilot programme in some of the schools). Sicinga ukuba sizakuprovidwa ngeencwadi, ngeeresources but, uDepartment uthi, “andinakuze ndibhale iincwadi neetextbook ngesiXhosa.”(We thought that we were going to be provided with resources but the Department stated clearly that it cannot write books in isiXhosa). Yinto abeyitsho ukuba ayicingi ibekhona totally itextbook yesiXhosa. Endingayaziyo ke yeyokuba why esithi abantu mabafunde ngesiXhosa, ngehome language whereas bengenawo umphako abawenzileyo for thina. (What surprises me is that, why they introduce such programmes whereas they do not have something in place).

Educator B: Now the thing lies to our leaders because this issue is a political issue, you see. You cannot just say the school must be a pilot because they are supposed to organise everything not to rush this thing.

Educator C: Even itranslation it involve teachers because abanokwazi ukusitratelata izinto zesiXhosa. (Translation should involve teachers because the department cannot translate English to isiXhosa).

Educator C: And people who know isiXhosa very well not just take anyone.

Researcher: Are there any advantages or disadvantages of using mother tongue instruction in Grade 6 when teaching Natural Science?

Educator C: I would say, everything has its advantages and disadvantages as well but the disadvantages we are afraid of is, it will disadvantage our learners, maybe they can be Scientist in future because they will be not be much in speaking eeh... English.

Researcher: How can you involve other educators who are in the Intermediate Phase in this matter of mother tongue instruction in the school you are teaching at?

Educator A: We have to form committees in the Intermediate Phase, and always meeting once in the forth night or twice in a term. And also, that will encourage ilento (the thing), icontinuity yeScience because our learners have a challenge of seeing Natural Science yakwa Grade 5 as something different from iNatural Science yakwa Grade 6, whereas its suppose to be continuation. That continuation can be connected if we do it thina (us) as Natural Science teachers of this Phase.

Educator F: Yes...

Researcher: Do you require assistance in the design of the work schedule and the lesson plan from other educators?

Educator D: Yes, there is a need.

All: Yes.

Researcher: What, in your view, can the Head of Department (HOD) play in addressing the mother tongue instruction in Grade 6 Natural Science class?

Educator A: In my view, it doesn't need to be the role of HOD. It's my role as an educator of Natural Science to see to it and that yena (the) HOD her or his role would be to encourage me.

Educator D: To monitor...

Researcher: What role can the School Management Team (SMT) play in making sure they address the mother tongue instruction in Grade 6 Natural Science class?

Educator A: To get feedback from the committee. Now they can ask feedback what we are up to and what we've been through. And also use their position to tack for the resources ze (of the) Department to get us more Science kit.

Researcher: Is there any support you receive from the Western Cape Department of Education (WCED) regarding assessment of Natural Science?

Educator E: Except for the things that are written on paper.

Educator A: They give us material to download....

Educator C: They give us the hard copies.

Educator B: There is a guy from Central Metropole District who comes to our school and assists us.

Educator E: I ask this guy to come to my class to assist but he never comes. He never avail himself.

Educator D: Most of the subjects advisors are Technology and other Learning Areas, there are few from Natural Science. Its only NGOs (Non Governmental Organization) that have people who know Science from the Departmental side none.

Researcher: What type of assessment do you use to Grade 6 learners and in which language do you assess the learners?

Educator E: Assessment is done in English.

Educator F: We do it in Xhosa.

Educator C: In terms of assessment strategies we got eeh...that assignments, projects research and role-play for those who are unable to write because they say we must accommodate them also.

Educator F: We experience ubunzima (difficulties) if we give abantwana ukuba mabokusebenza iresearch because iincwadi abazifumanayo zeze (learners to do research because there are no books) English, then kube difficult to translate. Even nabazali abakwazi kunzima nhyani because there are no resources apho banokuya elibrary bazifumane khona. (Even parents are struggling to help the learners).

Researcher: So, the problem is resources?

Educator B: There are no resources, if you are teaching them in class you must use both languages isiXhosa and English. When it comes to assessment there's a problem because you assess them in English.

Educator F: In Xhosa...

Researcher: Okay, that was the last part of this session good people. Also, let me take this opportunity to thank you. I know we spent more than three hours here and you did not complain for that. Really without you I would not have known what is really happening in the schools we are teaching at in the Gugulethu area, I thank you for your input in Natural Science mother tongue instruction issue. It clearly shows that

we do have educators who are still passionate of what they are doing, to teach the South African child. Thank you very much good people.