

EXPLORING THE FEASIBILITY OF USING SHONA AS A MEDIUM OF INSTRUCTION IN TEACHING SCIENCE IN ZIMBABWE

by

Oscar Nyaungwa

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Promoter : Prof. D.E. Mutasa

Co-promoter: Dr .M.L Mojapelo

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DECLARATION

I, Oscar Nyaungwa, declare that **EXPLORING THE FEASIBILITY OF USING SHONA AS MEDEUM OF INSTRUCTION OF TEACHING SCIENCE** is my work and that the sources I have used or quoted have been indicated and acknowledged by means of complete references.

Signature: MNyaungwa

ABSTRACT

The study explores the feasibility of using Shona as a medium of instruction in teaching Science in Zimbabwe. Although English has been the language of instruction since the advent of colonialism it has not been able to deliver for no tangible scientific and /or technological development has been seen in Zimbabwe. The research assumes that it is possible to achieve technical and scientific development in Zimbabwe using indigenous languages like Shona. It therefore seeks to find out if Shona can be effectively used to replace English as a language of instruction in the teaching of Science, achieving sound mastery of the subject in the process. In this research two grade four classes at Denzva School are studied. The classes are of the same size and academic potential. Their composition was systematical established after consulting the classes performance in the end of year grade three examinations. One group (the experimental class) is taught Science in Shona while the other group is taught Science in English. The two classes receive instruction in their usual classrooms and from one teacher, the researcher. In order to check mastery of content, the subjects write lessons and the researcher reviews tests in which individual pupil performance in the tests was recorded. The results of the two classes' performance are compared and commented upon. It is then deduced if Shona is effective and better than English as a language of instruction. Further the prevailing language policy in schools and government departments as well as the attitudes of parents and teachers are investigated through the use of questionnaires and interviews. Views gathered are commented upon and general recommendations made.

KEY TERMS

Language planning, medium/language of instruction, indigenous/African language, experimental class, control class, ideological orientation, language as right, language as problem, language as resource, language status, official language, mother tongue, language planning, status planning, corpus planning, acquisition planning and language policy.

DEDICATION

I dedicate this thesis to my family members, namely my wife Abigail, our two sons Takudzwa and Tafadzwa and two daughters Nyasha and Tatenda who endured a lot of family time without me as I laboured on this research

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CHAPTER 1

INTRODUCTION

"The African child's major learning problem is a linguistic problem." (Magwa 2001:1)

1.1 BACKGROUND

This study falls within the realm of language planning and language policy. It focuses on the feasibility of using Shona as a language of instruction in teaching Science. The research project is itself a result of observations the researcher made during the course of his life, his career as a teacher and as a headmaster. The researcher, an experienced and qualified teacher for twenty four years, whose substantive administrative experience spanned fourteen years, was tweaked by the rather poor academic performance in the primary school sector where he had vast experience teaching and administering. The researcher had experience teaching all grades in primary school, that is, from grade one to seven. The researcher was therefore quite qualified to conduct research in practical teaching.

The researcher's observations were that in Makoni district the urban schools generally tended to produce better grade seven results than the rural schools. One would wonder why. Could it be a matter of the socio-economic environmental differences or could it be steeped in socio- linguistics? On the other hand, another interesting observation was that both rural and urban schools produced better pass rates in Shona than in other subjects of the curriculum namely, English, Mathematics, Social Studies, Religious Education and Science. Again, this was intriguing and called for a convincing explanation. The researcher also noted that the performance of infant classes was generally much better than that of juniors during end of term examinations. This was so despite the fact that the tests would be similarly structured. The researcher suspected that the difference could be attributed to the issue of the language of instruction used at the different grade levels. A cursory look at district statistics tended to reveal that many secondary schools tended to score more and higher passes in Shona than in other

subject areas that are more academic than practical. Brief discussions with secondary school students and some teachers revealed that many such people tended to view Science and Mathematics as the most difficult subjects.

The researcher felt the need to investigate these sentiments and assumptions. Furthermore, the researcher went on to find out what scholars had written on the matter under investigation. The researcher discovered that the issue of using indigenous languages as media of instruction in education is a matter that has only gained attention recently especially in the developing world in general and Africa in particular. The researcher therefore felt the need to investigate the language policy situation in Zimbabwe.

Against this background and also convinced that the use of English as a language of instruction in education hinders more than facilitates children's learning, the researcher took the challenge head on and decided to experiment and find out the feasibility of using Shona in teaching on of the so called "difficult subject", Science. The grade four class was chosen as it is transitional. The Zimbabwean language policy on education stipulates that teachers can teach grade one, two and three in their mother tongue but from the grade four level all teaching is supposed to be done in English except when teaching Shona as a subject.

1.2 THE PROBLEM

Zimbabwe is a multilingual society. Besides English, Zimbabweans speak many other non-African languages that include Portuguese, Hindi, Afrikaans, Greek, Chinese, French and Italian. The two major indigenous languages that Zimbabweans speak are Shona and Ndebele. Other than Shona and Ndebele, Dembetembe, and Fortune (1996) note that there are other smaller languages that indigenous Zimbabwean speak. Those are Venda, Tonga, Hlengwe, Tswana, Birwa (a northern Sotho dialect), Doma, Chikunda, Sena and San. According to Doke, (1954) Shona is a language consisting of the dialects/ clusters Zezuru, Karanga, Manyika, Korekore, Ndau and Kalanga. Speakers are said to be "speaking dialects of the same language when they do

understand each other" (Dembetembe, Mulaudzi and Madiba 1987:7). As an example a Zezuru speaker and a Karanga speaker can converse and understand each other well. On the contrary, two speakers are speaking different languages when they cannot understand each other. For example, Zezuru and Hlengwe are clearly different languages hence, speakers of the two languages will not understand each other without an interpreter.

The multiplicity of languages is both a great resource and a potential source of problems. Problems arise when one thinks of social integration of society. In some countries the speakers of minority languages have risen against central government advocating for separatism and self rule fearing and resisting linguistic and political domination. A case in point is that of Ethiopia where insurgency arose from the issue of the use of native languages. The advantage arises in that the many languages can be used as vehicles of communication to effectively reach the various communities in society. The problem with the indigenous Zimbabwean languages cited above is that most are little known beyond the isolated pockets of society where they are found. The languages could be put to advantage if their status is raised and policies are put in place to have them used as media of instruction in education and to have them used in government business and media institutions. Many socio-linguists agree that all languages, whether they are major or minor, should be regarded as resources which should be made use of for the benefit of a whole nation. Dembetembe et al (1997:225) concur. They say:

All languages within given political boundaries should be respected and encouraged to co-exist in mutual harmony by the enactment of progressive language policies. This ought to be done irrespective of the origins of these languages, their political or economic power or the numerical strength of their speakers.

In Zimbabwe, what is lacking is that indigenous languages are not being put to maximum use for the benefit of the Zimbabwean nation.

English is a colonial language which was brought into the country by the British South African Company (BSAP) which colonized Zimbabwe in 1890. When the British (Colonizers) formed a government, they imposed their language on the Zimbabwean natives and made it official. The declaration of English as an official language was therefore based on socio-political and exploitative goals. The colonizers subjugated the natives, denigrated and trivialized the indigenous knowledge system of the Zimbabwean people. Declaring English the official language meant that English was to be used in all government business. It was used in law, in health, in administration, in the keeping of official records, in educational institutions as a medium of instruction and in many other sectors of government. English was the language of rulers, of the masters, a clear minority then. It was the language of the elite, the language of power and the language of control. The language policy that the colonizers instituted was Eurocentric. It was moulded along the European pattern and reflected the language policies back at their home.

With the advent of independence in 1980, Zimbabwe's languages policy in education remained the same. It was a carry forward of that of the colonisers. The Education Act of 1987 (amended thrice in 1990, 1996 and 2006) continued (like the pre-independence education policy) to stipulate English as the language of administration, the language of instruction in educational institutions and the language of international relations and wider communication as well. The Education Act only allowed Shona and Ndebele to be taught as subjects from grade one to university level. The other indigenous languages cited above were not even recognised. However, at independence, the status of Shona and Ndebele was raised to that of national languages but English continued to enjoy its status as the official language of business. The move by the Zimbabwean government to raise the status of Shona and Ndebele to national languages was commendable but government needed to stretch another mile and make them official. Meanwhile English continues to dominate Zimbabwe's linguistic scene.

English remains the medium of instruction in schools. It is taught compulsorily in schools and is a basic requirement on school certificates, especially at Ordinary level. Entry in

institutions of higher learning demands a pass in English at Ordinary level. Dembetembe et al (1997:235) aptly summarises this position. They say:

Even to this day there are former British colonies in Africa such as Zimbabwe and Nigeria where people who do not possess English at the General Certificate of Education (GCE O-Level) i.e. Credit in English are at a disadvantage in many ways. For one thing, they cannot expect to study at any college or university, and for another, they cannot hope to gain worthwhile employment either in the public or private sector. Such requirements convey to the blacks, both young and old, that one language is more important than another.

Soon after independence in 1980 the move by the Zimbabwean government to allow entry into teacher training college on the strength of a pass in Ordinary level Shona instead of the mandatory pass in English was a step in the direction although the move was driven by a dearth of prospective students with passes in English. As expected this was short-lived and unfortunate as the policy was reversed in no time.

Just like the Education Act discussed above, Zimbabwe's (Lancaster House) Constitution promotes English at the expense of developing indigenous languages. In this constitution the indigenous languages are given no legal status. A constitution safeguards all that belongs to a nation, including indigenous languages. Failure to safeguard a nation's linguistic heritage is a serious and regrettable shortcoming. This shortcoming will result in the marginalisation of the indigenous languages and inevitably the alienation of the indigenous people. This will also result in indigenous Zimbabweans losing their language, and with it their history and culture.

The 2010 constitution which the Zimbabwean people were crafting attempted to address this short-coming by giving indigenous languages their correct place not only as national but also official languages. One of the major reasons for ushering in a new constitution was to democratize government institutions and governance in general. The strategy instituted by COPAC (who were spearheading constitution writing) where outreach

teams conducted the collection of people's views using indigenous languages was the correct one. This strategy facilitated the process. Where the native people's language was not used, for example, in Beitbridge the project hit a brick wall.

Progress was only made when business was conducted in the native people's language. Thus democracy can only be guaranteed and put into real practice where the law and indeed the constitution of a country is in the people's languages. The generality of the people will find it easy to respect and abide by laws that they know, fully understand and partake in their making.

There is therefore, clear and unequivocal need for the post-colonial government of Zimbabwe to take a different and principled stance on a new language policy for Zimbabwe when the constitution is ushered in. The constitution and government of the day should empower the indigenous Zimbabweans by giving them the chance to participate in national issues and exercises using their own languages. According to Chimhundu (1997:13) over 90% of the Zimbabwean people speak indigenous languages. A very small percentage, much less than 10 can speak English to a meaningful and significant degree. The colonial regimes and their language policies alienated people from their languages. The situation remains the same in independent Zimbabwe. How, therefore, can Zimbabwe progress socially, politically, technologically and economically if this colonial hangover remains?

The alienation brought about by the continued use of English (a foreign language) as the official language is so entrenched that many indigenous Zimbabweans have come to accept it unconsciously. It appears many Zimbabweans across the board have come to think and accept that English is superior to indigenous languages. The knowledge that one language leads to advancement and success in life and an awareness that the knowledge of an indigenous language is not enough to lead one anywhere in terms of material success has greatly reinforced this mindset. It is therefore not uncommon to find many parents striving to send their children to former white only schools where they are assured of a thorough acquisition of English.

In the same vein, it is not uncommon to find Zimbabwean schools where pupils are forced to speak English only, once on the school premises. It appears, across the length and breadth of the country, especially among the young and so called educated, those who speak English through their noses like whites (do) are revered and held in high esteem. The researcher noted complaints by parents of some "zero (0)" grade pupils who grumbled about paying school levies for nothing as their children could not speak even a 'little' English.

In Zimbabwe, English appears quite a language of prestige. Socially, it is not uncommon to find adversaries quarrelling and shouting at each other in Shona, then suddenly switching to English to prove to each other and those around them how better educated than the other they are. Similarly, in many churches in Zimbabwe, where a whole black congregation is assembled, it is not uncommon to find an indigenous black preacher sweating it out, spreading the word in English with a fellow black translating the word to the preacher's mother tongue. Similar situations prevail in courts where the presiding officers, public prosecutors and their ilk spend hours doing their business in English; with multiple translations even where all parties involved are Shona first language speakers.

From, the above examples, it is clear that many Zimbabwean people's minds need decolonization. Decolonization starts with one appreciating one's true identity. An indigenous Zimbabwean should be proud to be black and be African. A black Zimbabwean should love and value his culture and native language. Once people realize and appreciate who they truly are, value their linguistic and cultural heritage then the process of mental decolonization will be on course. The process of decolonization starts with those in government and is facilitated and hastened when government takes cognizance of the importance and value of indigenous languages by raising their social status. Once the status of indigenous languages is raised to make them media of instruction in schools, the job is almost done as it is in schools where new values will be inculcated in all children. Children's learning will be made easier as pupils will understand better all they learn.

It seems the Zimbabwean child's major learning problem is a linguistic problem. To get a clearer picture of children's learning problem one merely has to look at pupils' performance in Shona and compare this performance with pupils' performance in other subject areas taught through the medium of English. Subjects like English itself, Mathematics, Science and Social Studies are cases in point. A rough check reveals that in primary schools passes in Shona are a lot higher than in the other subject areas taught through English. The glaring disparity in performance is most likely a result of the language barrier. In the Zimbabwean primary school, the rather overloaded curriculum offers a compulsory ten subjects. Of the ten subjects, nine should be taught in English as a matter of policy. The majority of Zimbabwean children are therefore taught the greater part of the school curriculum in a foreign language, a language they first hear at school, practice only minimally at school and hardly use at all at home. At school, where pupils are expected to learn English, the teachers are themselves not comfortable, competent and proficient in the language. One only needs to observe teachers teach in English and will be heartbroken and dismayed as the teachers make several linguistic bleeps and blunders in an effort to teach. If the teachers struggle, what of the pupils? If gold rusts what of iron? There is clear need to teach Zimbabwean children in their mother tongue.

This is only possible if indigenous languages are given national and official status. A good starting point will be raising the status of Shona and Ndebele first, then the other smaller languages gradually. The use of indigenous languages in education will have a double advantage. First, the teachers will teach confidently and effectively as they will communicate fully with their pupils. The second advantage is that pupils will understand issues, concepts and even their teacher better as they converse readily in the teaching learning process. Cases of pupils falling 'dumb' during the teaching learning process are quite common. This is usually so because pupils just don't know how to ask what they want to know if at all they will have understood anything. The Zimbabwean child's major learning problem is a linguistic problem. It is only until pupils are taught in their languages that their learning problems will be significantly reduced and overcome. It is only then that their learning becomes meaningful.

In Zimbabwe, it is Magwa (2009) and Mavesera (2009) who have advocated for the use of indigenous languages as media of instruction in education. Their lobby was good, well timed and relevant but needs supportive practical evidence to impress upon the government. Theirs was desk reading. This study will go a mile further; it will look at the practicability of using Shona as a medium of instruction in teaching Science. If the study succeeds then the main problem-the foreign language as a barrier to indigenous children's learning will have been solved. The practical evidence so generated and gathered will assist policy makers make relevant policies that will facilitate children's learning.

1.3 AIM OF STUDY

The study seeks to highlight and compare the extent to which English and Shona are used in different domains in Zimbabwe, explore the feasibility of using Shona as a language of instruction in Science subjects as well as compare the effectiveness of English and Shona as languages of instruction in teaching Science.

1.3.1 Study objectives

The objectives of the study are: -

- (a) To ascertain the status of ex-colonial and indigenous African languages in Zimbabwe.
- (b) To ascertain attitudinal patterns among teachers towards ex-colonial and indigenous African languages as languages of instruction and to place such attitudes in a proper historical perspective.
- (c) To highlight some of the implications of language attitudes
- (d) To investigate the feasibility of using Shona as a medium of instruction **in** teaching Science.
- (e) to compare the effectiveness of English and Shona as languages of instruction in teaching Science in Zimbabwe.

1.4 RESEARCH QUESTIONS

1.4.1 Main research question

The main research question is

- Can Shona be used in place of English to effectively teach Science?

1.4.2 Sub –research questions

- (a) Do English and Shona have the same status in Zimbabwe?
- (b) What are the attitudes of Zimbabwean people towards the use of English and Shona?
- (c) What are the attitudes of students and teachers (in Makoni district) towards the use of English and Shona as media of instruction in schools?
- (d) What languages policies prevail in Zimbabwean schools in line with government policy?
- (e) Is English more effective than Shona in teaching Science?

1.5 RATIONALE/JUSTIFICATION

Magwa (2009) and Mavesera (2009) have exposed the shortcomings in language policies in Zimbabwe's socio-economic development. Many others like Dube (1998), Magwa (2008), Mavesera (2009) and Chimhundu (1987) wrote extensively on the use of Shona in society. However none of the writers focused on the feasibility of using African languages, especially Shona, as a medium of instruction in schools especially in the teaching of Science. This is the gap which this research is trying to fill.

The main reason for undertaking this study was to find out the role Shona can play in the socio-economic, educational and cultural development of the indigenous people of Zimbabwe. "All languages should be regarded as resources which require to be made use of for the benefit of the whole nation" (Adegbija 1994). The languages of a nation are therefore likened to its natural resources like petroleum, minerals and other natural resources (Chombo, 1987 in Magwa 2009:13). A country endowed with only one natural

resource is poorer than one with many. Similarly, countries that are multilingual are better endowed than those that are monolingual. Languages, like natural resources, should be harnessed, developed and exploited for the benefit of a nation. In a clear national socio-economic development plan, language should be used to put the general populace in positions of power, influence and economic strength. Likewise, language should be used to help people gain employment, access wealth and gain entry into government and business. Thus indigenous languages should be viewed as resources not liabilities. They should be harnessed for national development.

National development should be championed and spear-headed by government. If development is really national, it should target all people, especially the majority for impact. In order for people to engage fully in socio-economic development, there is need for sound communication and inclusivity. For effective communication, central government should mobilize people through their (indigenous) languages to ascertain that they fully understand and comfortably and confidently articulate issues at stake. All information should be disseminated through the people's languages. Miller (2003:36) concurs. He writes, "The practice of denying the importance and value of a local language and its use serves to deny the right of certain language groups the ability to speak and partake in national issues. They will be silenced resultantly". All people in a country should be involved in making and implementing decisions. By being included in policy formulation and implementation the people will participate willingly and enthusiastically to achieve what they perceive to be their goals. It is therefore imperative to mobilize, reach and teach people in their indigenous languages. Be that as it may, if one looks at the number of indigenous languages in Zimbabwe this creates many challenges. Shona and Ndebele have been fairly more developed but clearly lag behind English. This means that these languages cannot be used to full advantage in the socio-economic, educational and cultural development of Zimbabwe.

In Zimbabwe, English is not only a national language, but also the only official language. Shona and Ndebele are not official languages though spoken and used daily by over 90% of the Zimbabwean population; they are merely national languages of limited use in the day to day running of national affairs in Zimbabwe. English thus has a higher status

than Shona and Ndebele. The other smaller languages like, San, Sena and Hlengwe have an even lesser status than Shona and Ndebele. There is therefore clear need to redress this imbalance. Presently many people think highly about English and look down upon Shona and other indigenous languages. In schools and other learning institutions learners are motivated to learn English and do not seem to appreciate the importance of a serious study of their mother tongue. In general many Zimbabweans do not seem to appreciate the fact that indigenous languages have in them as much good and beauty as that found in English. Many think that indigenous languages cannot be used as media of instruction in teaching other subjects areas especially those that they think and feel are difficult. The study seeks to prove a point: indigenous languages (especially Shona) are as good as any other languages in carrying out the different functions in society. All they need is good will and a chance. It is clear that our people have biased attitudes towards English hence the need to investigate people's attitude to English and indigenous languages in this study. These attitudes will be looked at against the proposal to use Shona as a medium of instruction in education in general and in teaching modern scientific concepts will thus be tried and tested. Lessons will be taught in English and Shona evaluations will be made. Recommendations will then be made.

The study will be of great benefit to government as it will help in language policy formulation when the correct policy has been put in place, those tasked with curriculum development will then do so from an informed position. Relevant books, literature and documents will then be made available in the people's languages. This will mean better understanding of issues and concepts taught. Language will no longer be a barrier to learning as is presently the case. The teachers' job will be lessened. No longer will teachers battle with the teaching of the English language first before embarking on the facts and concepts to be taught. The pupils will no longer be "aloof" during the teaching-learning process but will be active participants in their learning conversing fully, precisely and accurately when the need arises. In addition to these benefits there are some that will fall into place naturally if the Zimbabwean government raises the status of indigenous languages to national languages and makes them languages of instruction in education. These are:-

- (a) The Zimbabweans will develop a clear national identity built on a foundation of their national languages
- (b) The Zimbabwean people will develop a positive attitude towards indigenous languages and their heritage.
- (c) The raising of the status of indigenous languages to national languages will reduce dependency on English as a way of developing a language and nation.
- (d) The decision will ensure the development and growth of indigenous languages, literature and culture
- (e) The indigenous languages will start contributing towards innovation, scientific and national development.
- (f) The Zimbabwean students will have a chance to internalize concepts more easily as there will be proper understanding during the teaching-learning process.
- (g) The right of indigenous language speakers towards their languages will have been restored.

The issue of one's language as one's right is critical and overly important. All languages spoken in a territory need official recognition and state support. It is the peoples' right to be allowed to choose what language their children should be educated in. The best medium for teaching a child is the child's mother tongue. Any violation of this basic right traverses social justice. Once indigenous languages have been raised to the status of official languages then the indigenous people's linguistic and democratic right will have been restored.

The people will then be able to communicate wholly and meaningfully, partake in national issues of development and solve their country's problems. Solving problems entails the use of relevant thinking process, yet thinking can only be done through language. Bollinger (1975:236) supports and says, "Language is not only necessary for the formulation of thoughts, but is part of the thinking process itself". Much of our thinking is therefore facilitated by language, especially an individual's first language. This implies that in any country (Zimbabwe included) people need to have their own languages of education, literature and information dissemination. This is the prime aim and lobby of this study. If indigenous languages are harnessed and utilised as being

advocated, it follows that the populace's resultant thinking modes will come up with solutions indigenous and relevant to the Zimbabwean context.

1.6 THEORITICAL FRAMEWORK AND LANGUAGE PLANNING POLICY

1.6.1 Ideological Orientations

The study seeks to influence the generality of Zimbabweans and their government to seriously consider, adopt and use indigenous languages as media of instructions in the country's education system. Many a scholar has written extensively on this issue. Notable scholars include Ngara (1982), Chiwome and Thondlana (1992), Chimhundu (1980 and Mutasa (2004). However, it is Ngara's contribution that is pertinent to this study. In his work, Ngara asserts that English, Portuguese, French or any other language of wider communication should work alongside indigenous languages, they should be complementary. Further, he advocates the use of indigenous languages as media of instruction in all primary school grades but Magwa (2009) challenges him and advocates the use of indigenous African languages at all levels of the education system. The researcher supports Magwa and would like to corroborate this stance, then go a mile further by demonstrating the applicability of using Shona as a medium of instruction in teaching Science.

Granted, Zimbabwe like a few other African countries, is now putting slightly more emphasis on the use of indigenous African languages than the period before independence. Despite the progressive shift in policy, Zimbabwe does not have a clear language policy yet. Language policies come out of language planning while language planning itself is laid on the bedrock of ideology. Ideological orientations are important as language planning is normally influenced by the way language planners view language.

Ruiz (1988:4) defines ideological orientation as "a complex of disposition towards language and its role and towards language and its role and towards languages and their role in society". He distinguishes three types of orientations namely: -

- (i) Language as a problem
- (ii) Language as a right and
- (iii) Language as a resource

(a) Language as a problem

Those who subscribe to this ideology view language as, "..... an obstacle standing in the way of the incorporation of members of linguistic minorities into the main stream." (Madiba, Magwaza and Mulaudzi 1997:257). This ideology focuses mainly on solving language problems. Those who subscribe to it see a connection between the diversity of languages and social problems. They see multilingualism ultimately leading to a lack of social cohesion. According to Magwa (2009) this view tends to suit better those linguists who trained in European schools as they see monolingualism as normative and multilingualism as problematic. On the contrary language planners with an afro-centric view tend to see monolingualism as a problem and multilingualism as advantageous and normative.

Indigenous languages are not stumbling blocks to national unity, identity and development but are resources for people's aspirations and maximum participation in national development (Batibo, 2005:36). At the end of the debate the question still remains: what constitutes a language problem? Is it not in the eye of the beholder? Magwa (2009) cites two types of language problems, one linguistic and the other non-linguistic. He says linguistic problems are those found within the social and political framework. As such, any attempt to provide solutions to language problems should go beyond the language itself and to the community in which the language is used. A piecemeal approach to providing solutions will not suffice as the two are hardly functionally separable.

(b) Language as a right

This ideology recognizes the existence of language rights in any planning. Some examples of language rights will suffice.

- (i) The right to participate effectively in government programmes (Ruiz 1984:22)
- (ii) The right to use one's ethnic language in legal proceedings (Marcky 1979:49)
- (iii) The right not to be discriminated against on the basis of language (Macias 1979:88)
- (iv) The right to use one's mother tongue in the activities of communal life and,
- (v) The right to have one's mother tongue as medium of instruction in learning (Mackey 1979: 49)

In the language as a right orientation, different social groups claim certain rights which should be reflected by language planners. As an example minority groups in society, fearing discrimination by majority groups may demand specific linguistic rights. These linguistic rights will incorporate the minority group emotions, convictions, beliefs and a value for their language observes Mutasa (2004:30). The full participation of minority in national activities is guaranteed when their linguistic rights are considered and taken on board. National activities in which they will partake include administrative and judicial proceedings as well as exercising their sovereign rights like taking part in political activities like voting and campaigning for government posts.

In the case of this study, the language as a right orientation will be adopted.

(c) Language as resource orientation

This ideology stresses the importance to the nation of conserving and developing all of its linguistic resources. The approach, though not given enough attention by scholars, will be espoused in this study. If considered properly, this approach could solve some of the problems associated with language as a problem and language as a right perspective for a number of reasons. The language as a resource ideology can: -

- (i) Have a direct and positive effect of enhancing the language status of subordinate languages.
- (ii) Help ease tension between majority and minority communities
- (iii) Highlight the importance of co-operative language planning

- (iv) Serve as a more consistent way of viewing the role of non official languages in society
- (iv) Help to reshape attitudes about language and language groups
(Madiba, Magwaza and Mulaudzi 1997:258)

According to the language as a resource ideology, languages should be treasured. They should be taken as assets and be treasured like natural resources. Languages should be preserved; in the manner natural resources are preserved. If they are not preserved, languages, like endangered plant and animal species, will get to a point of extinction. Minority languages are threatened by politics, issues of globalisation as well as domination by majority and people. In multilingual societies, where the language as a resource orientation is most appropriate, the decision to select a language for national and official use depends on many factors. Those in power usually select languages on the basis of which one gives them the most and best advantages, but the less advantageous ones tend to be relegated.

Since Zimbabwe does not have a clear language policy yet, language planning in Zimbabwe would benefit a lot if authorities adopted the language as a right and language as resource ideology dispositions.

1.6.2 Language planning

There are basically three types of language planning that can be identified. These are status planning, corpus planning and acquisition planning.

Haugen (1966:673) says language planning is "..... the activity of preparing a normative authography, grammar and dictionary for the guidance of writers and speakers in non-homogenous speech community." Haugen's perspective on language planning is that of standardization. Language standardization is therefore a process of changing one speech variety into a preferred one for use in written form and in formal domains. The process includes codification and systemization. Fisherman (1997:79) sees language planning as "organised pursuit of solutions to language problems, typically at the

national level" Further Kennedy (1983:11) defines languages planning as a "problem solving activity concerned with deliberate change for specific aims, which may be social, political or educational. "It may be a mixture of all three. It can therefore be concluded that language planning is a deliberate effort to influence the behaviour of others with respect to language elevation (status planning), codification (corpus planning) and functional allocation (acquisition planning).

(a) Status language planning

This type of planning gives a language the status of an official language, national language or language of education. Such planning is done by government to fulfill the needs of government. If a language is selected and declared official, the language assumes various functions in education, parliament, judiciary, commerce and industry and government in general. Fishman (1974 6:80) calls status planning function planning as this type of planning is mainly concerned with functions the language is meant to serve. In Zimbabwe, Shona and Ndebele have not assumed these functions yet let alone the smaller languages like Venda, Tonga, Hlengwe, Tswana, Birwa, Sena and San. For instance, in the print and electronic media English still dominates the indigenous languages. There are many daily and weekly newspapers published in English in Zimbabwe. These include The Herald and Newsday (dailies) and weeklies like The Financial Gazette, The Standard and the Zimbabwean to cite a few against the only national Shona and Ndebele newspapers-Kwayedza/ Umthunywa.

With regard to electronic media, the two national television channels (one and two) mainly broadcast in English with a sprinkling of programmes in vernaculars. The so-called 75% local content in broadcasting appears a farce as there is a clear "lack" of programmes in local/ indigenous languages resulting in a monotonous repetition of programmes. As for radio services, two of the four channels broadcast mainly in English and two in indigenous languages. It is two channels broadcasting in English and two in Shona, yet the ideal situation would be at least three channels broadcasting in indigenous languages and one (or less) in English if we look at the number of speakers of the different languages.

Status planning is also concerned with the standing of a language compared to other languages. Two languages are of the same status if they are used in the same domains. If one language is national and official (as is the case with English in Zimbabwe) and the other is only national (as is the case with Shona/ Ndebele) then the two languages are not of the same status. The one with higher functions, English is the (H) variety while those slightly lower-the national languages, Shona and Ndebele, are the (LH) variety while those with the least and lower level functions like Tonga and Venda are the (L) variety, (Madiba, Magwaza and Mulaudzi 1997:196-7). When government decides to raise the status of a language say from (L) to (LH) or (H) then that is status language planning.

(b) Corpus planning

The key issues in corpus planning are codification and elaboration. Codification deals with the rules of grammar, the issues of spelling, the issue of word meanings and harmonisation of the language in general. Elaboration is mainly concerned with modernizing the language. Modernisation of a language is upgrading the various facts of the language to suit the contemporary world's political environment and technological issues. This means that there will be need to develop the target languages' registers and vocabulary. Corpus planning is usually done by linguists in conjunction with government officials. Linguists/ Scholars assist government by providing relevant theory. Government weighs in on matters of planning and financing, mobilizing the target population, implementation of programmes as well as their evaluation. Fishman (1974:117) sums up the process of corpus planning as "... conducted within a tension system of changing conflicted royalties, as modernity and traditionalism will always confront corpus planners as they work towards modernisation of a language."

(c) Acquisition planning

The aim of acquisition planning is to increase the number of speakers of the target language. Goals to acquire the target language, as well as the programmes to achieve

the goals are set. Hornberger (1990) identified three key issues on acquisition planning namely the setting of aims, the implementation of those aims and the evaluation of the aims. The essence of acquisition planning is to increase the chances of learning the new language, designing learning programmes and putting up relevant institutions. Learning the languages could be increased by enforcing its use in centres of learning like schools and colleges. The chances of increasing languages' speakers are increased if the language is used in mass media.

Once the status of an indigenous language has been raised there will be dear need to standardize the language through corpus planning. The dialects within the language cluster will have to be harmonised by instituting a common system of spelling and common vocabulary. This will iron out differences between dialects. The Shona cluster of dialects-Kalanga, Zezuru, Manyika etc has been put in place. However, the smaller minority languages of Zimbabwe, example, San, Hlengwe and Tonga have not been codified yet as literature in these languages is very scarce. Once a language has been codified, it will have to be modernised and the number of speakers will also have to be increased.

In Zimbabwe, since the declaration of Shona and Ndebele as national languages, there has been limited effort towards increasing the number of speakers of either language. If the number of speakers is to be increased then this has to begin in schools where presently the majority of the Zimbabwean population is. Schools are the best starting point as it is easier to learn a language when one is still young. Although pilot Ndebele speaking schools in Shona speaking areas and vice versa have been established, the effort, though commendable is a drop in the ocean. Such schools are facing many challenges some of which include the availability of relevant language teachers. In Makoni district there is one such school. There is great need for the Zimbabwe government to review their policy on language as well as evaluate the implementation of the rag-tag policy that is currently in place. There is great need to harness indigenous languages for national development, and to do so the government is called to raise the status of all indigenous languages, codify those that have not been and work towards increasing the number of people who speak them.

1.7 SCOPE OF STUDY

The study was carried out to establish the social status of English and compare it to that of Shona before and after Zimbabwe's independence in 1980. This was revealed by the diversity of areas in which the languages are used in official domains. The study also examined the attitudes of Zimbabwean people towards the use of Shona as a medium of instruction in the teaching of Science. The study examined the opinion of learners at different levels of education. It also established the opinion of teachers and parents on the issue of using Shona as a medium of instruction in schools. Opinions were sought from teachers in the Nyakuni Cluster (of schools) in Makoni South. The study proceeded to explore the feasibility of using Shona in teaching Science. This was done in a real classroom situation.

Practical teaching was done; two grade four classes at Denzva rural primary school were used. Lessons were conducted only at this school for easy comparability of results. The Science lessons taught were in English and Shona. They had the same objectives, content, methodology and progress check exercises. Data was gathered and results analysed. Different methods of collecting data were used.

Data on attitudes was collected through the use of questionnaires, while that on the status of English will be collected through the use of structured and non-structured interviews.

Data on pass rates on the progress check exercises pupils wrote at the end of each lesson taught will be compiled. Data on pupils' performance in examinations was mainly through the analyses of mark schedules compiled after the exams.

Results were analysed qualitatively and quantitatively. Findings from this study will be used for the benefit of the nation in general and interested parties in particular. Two classes used in this study were of the same size and about the same academic ability as the pupils were placed in these classes based on their performance in grade three. The

number of boys and girls in each class was not and could not be equal because of the results of the placement test. This means comparison of performance based on sex would not be fair and credible. The results of the progress check tests written after each lesson taught were those of the best twenty five pupils in each class. The results of the bottom pupils were not processed for the sake of the study as most of the bottom pupils in each class had little or no literacy at all. The results of their performance in the progress check exercise would not have helped much unless the evaluation exercise had been oral.

1.7.1 Structure of thesis

Chapter 1 Introduction

Chapter one begins by discussing the nature of the problem and its attendant background. It further discusses the reason for conducting the study as well as the aims and objectives of the study. Next the chapter discusses the study's limitations, language planning and theoretical framework. Finally, terms used in the study are defined and the structure of the thesis is laid out.

Chapter 2: Review of Literature

The chapter discusses literature pertinent to the study. First, the role of indigenous languages in Africa's socio-economic development is looked at. Next, the link between language and intellectual development is discussed. The attitudes of Africans towards their own languages is analysed and the reasons for these are given. Finally, perceived challenges in the teaching of Science are discussed and possible solutions are given.

Chapter 3: Theoretical Framework, Research design and Methodology

The chapter discusses the theoretical framework on which this research is based. The framework is that of language planning and language policy. The essence of language planning is discussed. These are types of language planning, orientation of language planning, decision making in language planning and policy formulation, the aims of and processes in language planning, language planning models as well as a few case studies in language planning and policy formulation worldwide. In this chapter, the

research design is also discussed. The type of data to be used, the methods of collecting this data and methods of sampling are dealt with. Finally the validity and reliability of data collected will be discussed.

Chapter 4: Data presentation, analysis and discussion

The chapter presents the findings from the interviews; the questionnaire and progress check tests. Summaries as well as analysis of the data are made. A comparison is made between this study and others. Similarities and differences were noted.

Chapter 5: Discussion

The chapter discusses further and in greater depth data presented in chapter 4. The issues discussed includes the attitudes of teachers, education inspectors, heads of schools and heads of government departments towards the use of Shona as a medium of instruction in schools as well as being raised to an official language. The prevailing language policy in schools as well as the feasibility of using Shona in Science teaching is also be discussed.

Chapter 6 Conclusion and recommendations

The chapter presents the summary and conclusion of the study. These will be based on the findings, analysis and discussion presented in chapters four five and six. Recommendations on the use and development of African languages in Zimbabwe in general and Shona in particular will be made

1.8 CONCLUSION

In this chapter, the central problem to be investigated was laid out. The study's aim, objectives, assumptions and scope were discussed. The theoretical framework in which the study is steeped was given. The study's delimitations were also looked at. Key terms used in the study were precisely defined. The next chapter reviews literature related to the study.

1.9 DEFINITION OF TERMS

Below are the operational definitions, abbreviations and acronyms used in this study.

Mother tongue: is the language a child is taught to speak from the day it is born, and is usually more comfortable to express him/herself in.

Indigenous language Refers to any of the languages spoken by native Zimbabwean black people other than English. It also carries the people's culture and history. Imported languages like English, French and Portuguese are not included in this category.

National Language Is an indigenous language whose status has been raised by a nation's government so as to be used in specific domains within that country. It is also a language

Official language Refers to the language selected by a government for use in its administrative work. It is the language that is used in courts, parliament, in public service as well as commerce and industry.

Languages of wider communication Is a common language used for communication by people who speak different languages.

Medium of instruction Refers to a language selected and approved by government for use in teaching school subjects such as History, Geography, Science and Maths. The language is used when writing textbooks, lesson plans, tests and examinations as well as in writing reports and other crucial documents.

Language planning Is a formal and usually scientific move by a government aimed at solving perceived language problems.

Status Planning deals with the role given to a language. The use of the specific language may be increased or decreased by government to suit their political aims.

Corpus Planning	deals with the structure and form of a language and usually tackles the issues of the target language's vocabulary, the development of registers, the style of writing as well as its pronunciation and spelling.
Acquisition planning	is a language planning aimed at increasing the number of speakers of a specific language.
Science	A primary school subject comprised of elements of Agriculture, Geography, Biology, Chemistry, Botany and Physics.
Shona	A Bantu language spoken by over 90% of Zimbabweans and comprised of many dialects including Karanga, Ndau, Korekore, Manyika and Zezuru
MOESAC	Ministry of Education, Sports, Arts and Culture

CHAPTER 2

LITERATURE REVIEW

“The main goals of Literature review are demonstrating familiarity with a body of knowledge, showing the path of prior research and how a current project is linked to it, integrating and summarizing what is known, learning from others as well as stimulating new ideas” (Neuman1991:89).

2.1 THE ROLE OF INDIGENOUS LANGUAGES IN AFRICA’S SOCIO-ECONOMIC DEVELOPMENT AND EDUCATION

Debate on the role of indigenous languages in Africa is not a recent phenomenon. It is fairly old and started just after the first African countries attained their independence. Africa is a multilingual continent of over 800 languages (Fortune and Dembetembe 1996:72). Despite Africa’s large endowment in languages, very few of these languages have been put to significant use in the socio-economic development of the host nations. The use of indigenous languages has been eclipsed by the languages in society. Adegbija (1994) and Hawes (1981) have written extensively on this topic. In Zimbabwe, the debate on the role of indigenous languages in the country’s socio-economic life is also not new but became pronounced with the attainment of independence in 1980. Many Zimbabwean scholars have contributed to this debate. Notable scholars include Ngara (1992), Mkanganwi (1992) Chimhundu (1998), Mutasa (2004), Magwa (2009) and Makanda (2009).

Central to the debate on the role Indigenous languages can play in Africa is the question of whether these languages can be of any significant use in Africa’s socio economic development matrix. The majority of Africa’s countries clearly fall into the category of the world’s least developed countries (LDCs). On the contrary, the first world countries are streets ahead of the LDCs in socio-economic development. They have achieved this significant development through the use of their own languages in education. In the same vein, some second world countries in Asia such as Korea, Japan and Malaysia

have achieved great feats in socio-economic development through the use of their own languages (Mazrui 1997).

The issue which this study seeks to explore is the possibility of using indigenous languages particularly Shona as a medium of instruction in education consequently enhancing the country's socio-economic and technological development. The Asian countries cited above are living examples. To achieve socio-economic development the ultimate ambition of any nation – the school syllabus should focus on and have a clear bias towards science, technology and mathematics teaching for it is in schools and tertiary institutions that the country's human resources base is prepared, and produced. It is also in learning institutions that the correct attitudes to work and development are inculcated and fostered best. Kishindo (2000:15) observes that it is “only in Africa where the most important, prestigious and powerful activities nation are conducted in what is for most of the countries a foreign language” It goes without saying that any meaningful development initiative in Africa should be conducted through the people's language for the best effect.

Moving along with the spirit and lobby for an African renaissance, socio-economic development can only be achieved through partnership and dialogue between those governing and the governed. In the development process, government should keep its citizens informed about development policies and goals instituted and how these will affect them. Information on policies, goals and implementation should be disseminated through the print and electronic media in a language the target population fully understands. If information dissemination and dialogue is conducted in a foreign language for example English, then not only is dialogue stifled and killed but the populace will be silenced, marginalized and alienated also. Language enables individuals to become “fully functional members of social groups to which they belong” (Mutasa 2002:240). One's language is therefore one of the most important possessions of mankind. It, therefore, cannot be overemphasized that in Africa and Zimbabwe's quest for scientific, technological and social development the vehicle of change is the people's language.

In Africa, colonial languages continue to dominate indigenous languages. In Anglophone countries, English is the official language, in Francophone countries it is French while in those countries colonized by Portugal, Portuguese is the official language. In his study of ten Anglophone countries namely Botswana, Ghana, Kenya, Lesotho, Nigeria, Sierra Leone, Swaziland, Uganda, Tanzania and Zambia, Hawes (1981) found the English was the official language in all the ten countries. The study also found out that English was the medium of instruction in education in all the ten countries. English was used as medium of instruction from grade three up to tertiary education while indigenous languages were used in grades one and two in eight of the ten countries. Two countries did not permit the use of indigenous languages then. Sierra Leone was one of the two cases. Hawes' (1981) study also revealed that in all the ten countries English was the language of examination in all subjects except the indigenous language. The situation has however improved thanks to efforts and lobbying by the Organisation of African Unity (OAU) now the African Union (A.U). The O.A.U made a number of decrees and declarations vis a vis the utilisation of African languages in member states' socio-economic development programmes. Notable declarations include: -

- The (1975) Intergovernmental conference on cultural policies in Africa and
- The 1976 Lagos Conference of Ministries of Education of African member states. The two declarations recommended the increased use of African languages as media of instructions in education.
- The 1986 language Plan of Action for Africa which encouraged member states to have clearly defined language policies and aimed at ensuring that all languages in member states were recognized and utilized.

This Action Plan saw some language policy reform in South African resulting in the promotion of eleven languages to official status. The languages were isiXosa, isiZulu, seSotho, Swati, isiNdebele, English and Afrikaans (Madiba and Magwaza 2002:260).

- The 1997 Harare declaration at the Intergovernmental Conference of Ministers on language Policies in Africa. This declaration aimed at inter alia moulding on Africa that acknowledges its ethno-linguistic pluralism where citizens can effectively

operate at local, regional and international level as well as an Africa where national languages are used to conduct scientific and technological discourse.

- The 2000 Asmara Declaration on African Languages and Literature which encouraged
 - (i) that African children attend school and learn in their mother tongue as a matter of right.
 - (ii) the rapid and effective development of Science and Technology in Africa using African languages.

- The 2006 Khartoum Declaration declared 2006 the year of African languages. At this meeting the African Academy of Languages (ACALAN) was set up with the aim of coordinating language policy and planning in Africa a key issue in the African continent's development agenda.

As a result of these efforts and lobbies many countries in Africa changed and improved their language policies. Instead of declaring and adopting English as the official language, a number of countries raised the status of their indigenous languages to national and official languages. Herbert (1992:37) notes that a number of countries such as Tanzania, Somalia, Sudan, Ethiopia and Guinea have managed to pursue an endoglossic language policy. In Tanzania, Kiswahili has been raised to the status of both national and official language. It is used in administration, trade union business, the judiciary, education and on radio and in newspapers. Further, Somalia has added Somali to English and Italian as official languages.

2.2 ATTITUDES

Despite the apparent progress made in promoting the use of African languages most people in Africa continue to have negative attitudes towards the use of indigenous languages in national issues. This is most likely due to colonial influence. When European nations came to Africa they fought, conquered and subjugated the African

people. They regarded themselves, their language and their culture as superior. They imposed their languages mainly French, English and Portuguese on the indigenes. This was the basis for the high regard with which these languages have been viewed in Africa ever since. The European languages were viewed and accepted as languages of the master, of power, of high position of status and of prestige. Many Africans began to look up to these languages of Europe as the master's languages and yearned to learn them. Without any shadow of doubt knowledge of European languages and had clear benefits and rewards. Those who could write and speak them readily gained employment and were able to share some of the position, power and prestige that went with their command.

Regrettably, after African countries gained independence African governments settled for the status quo. Language policies instituted in African countries in colonial and post colonial times basically remain the same. Colonial languages have consolidated their role as official languages. A cultural gap was maintained between what was done using European languages and what was done using African languages. The gap still remains today. Adegbija (1994:334) notes that educational systems have been used continually to firmly establish and maintain the hegemony of colonial languages. As a result, many of Africa's people are still unwilling to accept that indigenous languages are as good as colonial languages. Magwa (2009:10) cites the views of three nationals one from Namibia, another from Malawi and the third from Kenya. These views are somewhat representative of the attitudes of many in their countries. The Namibian national, writing to the editor of the Cape Times (Moodley 2000:110) argues that the advantage of learning English unlike learning an indigenous language is access and exposure to "an entire world of knowledge, skills, jobs, power, and influence". The writer further says that lack of English language skills is akin to being in prison. The Malawian national, writing to the National (newspaper) in 1996 argued that it did not require research to know that a child in English will learn better than a child taught in the vernacular. Finally, the Kenyan national reported that although the language of instruction in schools is officially Kiswahili, many parents in Kenya still prefer to send their children to schools where instruction is in English. The trend in Africa seems to be that of negative attitude towards the use of indigenous languages in education.

In Zimbabwe, English continues to dominate the linguistic scene with indigenous languages playing a lesser role. There are three main language groups in Zimbabwe. These are Shona, Ndebele and English. There are also minority languages that include Venda, Tswana, Sotho, Tsonga, Shangani, Nambiya, Afrikaans and Fanikaloo/Isilapalapa. Afrikaans and Fanikaloo are languages of oppression and domination. These were brought to Zimbabwe by Boers from South Africa around 1890 when Zimbabwe was colonized. Although Afrikaans is spoken by very few people as a first language, Fanikaloo has no known first language speakers.

The two languages are pidgins. They were coined to meet the communications needs between Boers and Africans at the workplace as there was no common language. The rest of the minority languages are native. According to the 1976 census 70% of the Zimbabwean people speak Shona, 14,6% speak Ndebele while 3,5% speak English as their first language. The remaining percentage constitutes the minor languages. Although most of the Zimbabwean people speak Shona and Ndebele and only 3,5% speak English as their first language, English continues to dominate the linguistic scene. Before independence, English was taught compulsorily in schools that catered for whites and those that catered for blacks. Shona and Ndebele the majority languages surfaced as school subjects only in schools for black pupils.

The same situation prevails in present-day Zimbabwe. The Zimbabwean government has not made any attempt to use local languages for educational purposes that is using Shona/ Ndebele as a language of instruction in the broader curriculum. Subjects like Science, Maths, and Social Studies, Home Economics, Religious Education, even Art, Music and Physical Education are still taught in English. Textbooks for these subjects are mainly written in English. Only one publisher, Longman Zimbabwe has attempted to use Shona, Ndebele and English in the writing of a social studies textbook for grades one and two. The three languages are used side by side to explain the same concept.

One of the reasons English continues to dominate indigenous languages is the functions that it is given by government. The choice of functions also reflect the attitudes of the government of the day. The functions that English serves across the nation are much

more than those served by indigenous languages combined. Ngara (1980:45) cites the domains in which English, Shona and Ndebele were put to use. These are tabulated below.

Table 2.1: Domains in which languages were put to use

Domain	English	Shona	Ndebele
Public administration	√	X	
Language of instruction (education)	√	X	£
Law courts	√	X	£
Official documentation	√	X	
Parliamentary publications	√	X	
As a lingua franca	√	X	
International communication	√	X	£
Radio and Television	√	X	
Religious worship	√	√	
School subjects	√	√	
Home language	√	√	
Scientific and technical records	√	X	

Key √ - *Functional* X – *Not functional* £ - *Limited function*

Table 2.1 reveals that English is functional in all the twelve domains while Shona or Ndebele is functional in three only. Currently Shona and Ndebele have been given some limited functions on radio and television broadcasting. According to Ngara (1980:20) this dominant status of English resulted from the fact that it was the language of the ruling elite. Who saw it advantageous to their rule. English has enjoyed this status for almost a century. The century of colonial rule resulted in black Zimbabweans developing a negative attitude towards their native languages and a very positive attitude towards English.

In numerous ways the whites led the blacks to think and believe that education was synonymous with the mastery of English. Ngara (op cit) observed that the negative attitude started to wane during the war of liberation and especially so among the youths. This was due to liberation war politics which stressed the need to be proud to be black and Zimbabwean. People and especially youths began to accept and appreciate their own languages and culture. However, despite this awakening, attitudes towards indigenous languages have changed insignificantly both at government and grassroots level. Thirty years since independence with a black government in total control English continues to dominate indigenous languages in all important spheres of life. The reluctance by the black government to raise the status of indigenous languages is indicative of a colonial attitude hangover.

With regard to people's attitudes towards the use of indigenous languages, respondents to a study carried out by Mutasa (1995) said that teachers felt that educating pupils using the mother tongue reduced proficiency in English. On the contrary Letsie's (2002) findings indicate that pupils who do not receive education through their mother tongue experience more reading problems than learners who receive it. The reading problems noted include a slow reading pace, lack of accuracy and poor comprehensive skills. In the study Letsie (ibid) advocates for the use of the mother tongue in early stages of schooling as the mother tongue greatly reduces the gap between school and home.

Teachers and parents interviewed were of similar opinion; they supported the use of mother tongue as a medium of instruction in education. In a study by Magwa (2009) only 27% of the respondents said they would accept the use of an indigenous language as a medium of instruction in their children's education while 73% of the respondents felt that instruction in secondary schools should be done in English. Interestingly, in the same study, most secondary school students clearly indicated that any lessons they would be taught in their mother tongue would be a lot easier to understand than any taught in English. In general, Magwa (ibid) summarily found out that Zimbabweans still have a negative attitude towards the use of indigenous languages in education and other domains.

Further, in a study by Makanda (2009), 27% of parents interviewed agreed to their children learning in an African language, the majority didn't agree. This revealed the extent of negative attitude towards the use of indigenous languages as medium of instruction in education. According to Makanda (op cit) negative attitudes obtain in all the ten provinces of Zimbabwe and are also characteristic of most Malawians. The reasons the various respondents 78% in Makanda's study gave for supporting English as a medium of instruction in schools included the following:

- The hostility of Africans towards studying their own languages.
- The multiplicity of languages so that all languages can not be used as media of instruction in education.
- The lack of technical development, personal and appropriate materials to implement the language policy.
- The high cost of implementing the policy.

The reasons given by Makanda's respondents were in line with the "fallacies" that Obanya (1999) noted in a similar study. It is clear many Africans still have a negative attitude towards their native languages. It would be interesting to investigate the attitudes of teachers and students in the communities in which this study takes place.

2.3 MEDIUM OF INSTRUCTION IN EDUCATION

As briefly alluded to above, only a few countries in Africa have been resolute to institute language policies that allow for the use of indigenous languages as media of instruction in schools. After gaining independence, many African governments expected their countries development path to follow the same route as that of the industrialised nations of the west. Their education plans also adopted western models and their curricula, curriculum content and teaching methods were similar to those of the west. Even the countries' language policies were based on western frameworks.

Bacchus (1981) agrees as he observes that language policies in many African countries states still reflect the western model. Be that as it may, some positive change has been

noted in a number of countries. Tanzania is one such country that has progressively changed its language policy. It raised the status of Kiswahili to official and national languages. Kiswahili is now used in the judiciary, in trade union work, in administration, in the media and in education as a medium of instruction (Herbert 1992:370.) Somalia has raised Somali to official language. Somali is used as medium of instruction in both primary and secondary school. Before the adoption of Somali as a language of instruction across Somalia, Northern Somalia used English while Italian was used in Southern Somalia. It is pertinent to point out however that Somali language policy still stipulates the use of English as medium of instruction for Advanced level and tertiary education. Many countries in Africa have generally tried to give their languages a greater role in education but have not gone far enough. Most of the countries still restrict the use of indigenous languages as media of instruction to the lower grades of the primary school. This is clearly a regrettable short coming. The Somali model is really the model to emulate.

Compared to the strides Somalia has made, Zimbabwe clearly lags behind. With three decades of independence gone under, Zimbabwe still uses English as a medium of instruction in the greater part of its education system. With the advent of independence however, some changes with regard to language policy were made. As an example minority languages like Tonga and Nambya were put in line for public examination at grade seven level. The Education Act of 1987 section 55 spells out significant changes and policy thrusts. The policy was enunciated in the Secretary's Circular Minute No. 5 of 1987. The document was revised and improved upon in the Secretary's Circular Minute No. 2 of 2001 titled Curriculum Policy: Primary and Secondary schools. The latter minute was further revised and updated in 2002 as Secretary's Circular Minute No. 3 some of whose provisions will now be discussed.

In its introductory remarks, the circular clearly states the policy goal as that of providing an opportunity for each learner to obtain maximum benefit from the school curriculum according to the learners' potential. This study seeks to investigate, inter alia, whether pupils will get maximum benefit educationally when they learn through their mother English. This can only come out clear through studies in which a control class and

experimental class are taught the same content under similar conditions using two different languages, Shona and English. Results of the pupils' mastery and understanding will then be compared. In the subsection on goals, the policy thrust is to implement the national goals of establishing a strong scientific, mathematical and technological base for economic development. Science, identified as one subject key to economic development has been targeted for research in this study.

The Zimbabwean education system expects pupils to develop skills and competence in science and technology. The Secretary's Circular proceeds to spell out the primary school syllabi expected outcomes. The first outcome is that learners will be expected to communicate freely in both the written and spoken form Shona / Ndebele and English. The second outcome is that learners will be expected to appreciate and apply science and technology and demonstrate creativity in the application to their daily lives and in the utilization of local resources. The second outcome on creativity makes interesting reading and provokes thought. Learners can only be creative in a subject they are quite conversant in.

To expect learners to be creative in subject learners cannot adequately understand, let alone articulate is to ask for too much. The lobby in this study therefore is that of teaching science in the learners' language to facilitate and enhance full understanding and articulation of the subject resulting in creativity and the full effective use of the knowledge and skills acquired in pupils' lives. As regards subjects to be offered in the primary school curriculum, Shona and Ndebele are offered up to grade seven. As for the minority languages Tonga, Ndebele, Venda, Shangani and Sotho (Secretary's Minute 2 of 2006); these were to be introduced in their respective areas as follows:

- Up to grade 4 in 2002
- Up to grade 5 in 2003
- Up to grade 6 in 2004
- Up to grade 7 in 2005

In January 2011, Zimbabwe's Ministry of Education, Sport, Arts and Culture (MOESAC) announced that the UNICEF sponsored Education Transition Fund will for the first time in Zimbabwe provide enough textbooks in the minority languages Tonga, Nambiya, Shangani and Venda. In February 2011 the MOESAC also announced that Tonga will be for the first time ever be examined as a subject at grade seven level. The delay in the public examination of minority languages clearly reveals that policies are easier said than implemented if we look at the time frame given in the Secretary's curriculum policy statement. The two moves by government are encouraging steps towards the development of indigenous languages.

According to the Secretary's Circular Minute (op cit) the secondary school curriculum has English, Shona and Ndebele as compulsory subjects up to O' level. This is a positive development as Shona and Ndebele had been compulsory only up to form two levels. Although Shona and Ndebele were made compulsory up to O' level they were made compulsory only as subjects but according to policy the medium of instruction from grade four up to the highest level of education was English. Further, in both primary and secondary school curriculum the time allocated to the teaching of Shona/ Ndebele and English is the same. For grades one and two the time allocated for each subject per week is four hours while four and half hours is allocated for each subject per week from grades three to seven. At secondary school junior certificate level it is three and half hours per week for English and three and half hours per week for Shona/ Ndebele. At face value the weight given to Shona and English appears the same but English continues to dominate indigenous languages as it is used not only to teach but also examine all other subjects.

In the same policy document, a full 'O' level certificate is said to consist of at least five subjects passed at grade C or better. The notable and commendable improvement in policy is that English, Science and Mathematics are no longer stipulated as being requisite for a full O' level certificate. However, there is a gulf between policy statement and what happens on the ground. It has been noted that tertiary institutions and employers still demand passes in English, Science and Mathematics at O' level for acceptance into their institutions. As an illustration, an Edgar's Stores Limited

advertisement for retail management trainees placed in the Newsday newspaper (04-02-11). One requirement for qualifications was O' level English and mathematics. In another Women University in Africa (News day 10-03-11) advertisement it was clearly stated, "The minimum entry requirements for undergraduate programmes are (inter alia) 5 O' level passes including English. Maths is a requirement in some programmes" (page 23) many examples abound. Once indigenous languages like Shona/ Ndebele are given more and key functions in government business and commerce and education then there will not be any need to recruit trainees or students on the strength of a pass in English at O' level. A lot of talent is put to waste due to this requirement.

Many of these jobs and courses can be done very well by those without passes in English but perhaps with passes in other languages. Many O' level graduates without passes in English have been found to excel in many jobs that are not hinged on the knowledge of English. The blind and blanket requirement for English is a serious shortcoming. Thus the curriculum of any nation should be made in such a way that it meets the individual attributes and needs of the country. It should facilitate the country's socio-economic and developmental goals. As the curriculum policy document just discussed reveals, the Zimbabwe government has pledged to establish a strong, scientific and technological base through strengthening the teaching and learning of Science and Mathematics. A strong scientific and technological base will facilitate and catapult socio-economic development but forthwith the subject science will be briefly discussed.

2.4 SCIENCE AND CHALLENGES TEACHING SCIENCE

Science is a body of knowledge built up by scientists. It is activities done by scientists in building knowledge. Science comprises facts, concepts, principles, hypothesis, laws and theories. Science is also seen as a way of viewing the world. (Aitken 1984:13 in Asimov, 1992) sees Science as a broad discipline comprising three major divisions namely Biology, Chemistry and Physics which can be further divided into biophysics, geophysics, electronics, biochemistry, inorganic chemistry and many others. It is also a dynamic body of knowledge permanently in a continuous state of change. This change

occurs in two ways. First, new knowledge is generated to fill gaps in previous knowledge and second, old knowledge is modified or replaced. As such scientific knowledge is historical and therefore only tentative. This means that it cannot be taken as absolute truth, it is subject to change and therefore probabilistic. Scientific knowledge originates in the real world and is therefore empirical (Newman 1991:5-10). Experimentation and observation are the basis of scientific knowledge. This makes it humanistic. Scientific knowledge is a product of human endeavour to understand nature through the identification of patterns in nature as well as attempts to put order on nature. Experiments or investigations carried out should be replicable so that the results can be compared and verified. Any findings or results should be made public according to scientific convention (Neuman ibid).

There are numerous reasons why man teaches and studies Science. Naturally man is inquisitive and curious. Studying science goes a long way in quenching this natural thirst for knowledge. In his quest to quench this thirst for knowledge, man comes to understand his environment. Once man understands his environment he will be able to control, manipulate and exploit it to his advantage. In an attempt to sustain himself, man has set out to study and teach Science so that it may help him achieve his ends. Many people think that it is especially important to teach Science to the primary school child as the child will be exposed to important skills at an early age.

Learning Science helps pupils develop clear and logical thinking which can then be used to solve practical problems. As an example, when faced with a bottle of coke to open but without an opener a pupil can use the mortise (of a lock) on a door frame to open the bottle using the principle of mechanism orders – fulcrum, load and effort. In opening the bottle using the door frame pupils will adopt and adapt the principle of mechanism orders to suit their situation, acquire knowledge and subsequently develop creativity, manipulative and problem solving skills.

Further, people teach and learn Science because it has produced and provided many artifacts that have eased people's lives. A whole range of artifacts can be cited ranging from scotch carts to airbuses, from canoes to ocean liners, from antiseptics and

antibiotics to anti-retroviral, from drums to the communication satellite and from fertilizers to Genetically Modified Foods (GMOs.) Without Science education these achievements would not have been possible.

It is important to teach Science as society critically needs men and women specifically trained and prepared for Science based occupations in industry, research and education. Even though they are few, these specialists include doctors and nurses, pharmacists, laboratory technicians, botanists as well as a wide range of engineers. Finally, Science is learned through language. Some of the language is specialized. It is technical and pertinent to the concepts, apparatus and scientific procedures in the subject but should naturally be set in the context of everyday life and language. Psychologists have established a close link between language and thought. Language facilitates thinking. It is through languages that we think, that we plan problem solving strategies, and that we workout and solve problems (Williams 1981:34) Science is a discipline of thought. Every word in a language relates a concept.

African children have more language and vocabulary in their mother languages than English. This abundant reservoir of concepts/ knowledge should be exploited to the full for the benefit of learners in particular and education in general. It is therefore prudent to teach Science in the language learners know best for the best effect and results. When all is said and done, it is pertinent to point out that Science teaching also inevitably results in the development of language and thought in learners. Having briefly discussed the rationale for teaching science in general the focus now turns to primary school science where this research is based.

At primary school pupils learn Environmental Science. In Zimbabwe the subject evolved over time. The subject started as Nature Study in 1954 and by 1975 the subject included Hygiene, Geography and History. The four subjects were further rationalized and merged into two subjects namely Environmental Science and Social Studies. In 1978 work on a new Environmental Science syllabus started. This work culminated in the production of an Environmental Science syllabus in 1982. The syllabus which contained thirteen topics was put into implementation (C.D.S Science Module 1983:709). The

years 1990-1993 saw the syllabus being revised and in 1994 a revised Environmental Science syllabus was put in place. Environmental Science itself is a study of the things man finds around him; land, in water and in air. In short, the physical environment comprises all natural things like soil, clouds, fauna and flora as well as some man made structures like roads, machines, houses, bridges and dams.

The new Science syllabus basically deals with two categories of physical environment concepts. The first category is that of simple concepts that include ecological, scientific and geographical notions some of which will be researched on in this study. Ecological concepts include change, variety, decay, habitat, growth and photosynthesis. Scientific concepts include properties, work, material, solutions and particles while geographical concepts include shapes, scale, attitude, location and space.

The second category deals with more abstract concepts namely cycle, system, energy, health, climate, resource conservation, balance, interdependence and productivity. The concepts are found at different levels in the primary school. The Environmental Science syllabus also aims at teaching pupils basic scientific skills. These are also in two categories namely that of making sense of something e.g. observing, manipulating, collecting, ordering, comparing, calculating, measuring and sorting and that of telling others about something include speaking, writing, describing, recording, displaying, drawing, making diagrams and modeling. (Better Environmental Science Teaching (BEST) workshop materials 1994). Many of these skills will be taught and tested during this research.

One key question when teaching primary school Science is that of which, language of instruction to use, English or the learner's first language. The position taken by most African governments including that of Zimbabwe is that of using local languages in the early grades that is from grade one to three. However, the position taken in this study is that the learners' first language should be used as medium of instruction at least up to grade seven level and at most up to O' level. Learners understand better when they are taught in their own language. The learner's first language is an effective link between the

school and the home. When taught in their own language learners are likely to see school work as an extension of their home environment.

This study strongly advocates the use of indigenous languages as medium of instruction and sees English and Shona in the same light. The two languages are equally good and effective in communicating educational concepts, none superior, and none inferior. The theory of language universal as propounded by Chomsky (1965) aptly asserts that all languages including Shona have an infinite capacity to express any ideas however complex (Zimbabwe National Teacher Education Course Child Development Module 04 1983:32) It is because of colonial domination that many people in Zimbabwe have internalized the myth that indigenous languages are not suitable for use as languages of instruction in education. This is clearly and absolutely not true as African languages can be fully developed to the extent that they can be used to teach and learn anything including the so called difficult subjects like Science and Mathematics. When pupils learn anything in general and Science in particular there are two main aims; that of developing the child's communicative competence as well as analytical competence (Bruner 1966:39).

Communicative competence is concept formation resulting from a child's interaction with its environment and child's interaction with the language commonly used by adults in the environment in which the child lives. The place of the mother tongue in a child's meaningful learning cannot be overstated. Analytical competence is the highest level of mental growth and concept formation. Language is supreme at this stage as analytical competence is established on communicative competence, itself built on the bedrock of a child's first language. It is analytical competence, the level of total abstraction which is used to think out solutions to problems. A language is the vehicle and instrument of thoughts. In Africa we need primarily African solutions to Africa's problems and likewise Zimbabwe needs Zimbabwean solutions to its problems. As such it is only prudent and ideal to use indigenous languages in education in order to enhance and facilitate analytical competence and generation of indigenous solutions to our problems.

Notwithstanding, the crystal clear and glaring evidence in support of the use of indigenous languages as media of instruction in education scholars such as Strevens in Lewis (1972) advance fallacious arguments that indigenous languages are not as precise as English in both vocabulary and grammar. This is a lame excuse. English itself, as explained in this study's introductory chapter did not begin as a wide language of diverse vocabulary as it is today. It borrowed many words from other European languages hence the richness in vocabulary these scholars allude to.

Similarly, where Shona words are not available for English words like oxygen, nitrogen, and carbon dioxide the solution is to adopt and adapt the English words morphologically, tonally and lexically into the borrowing language. As an illustration the word oxygen can be adopted and adapted to ***okisijeni***. Similarly, colour words not existent in Shona for example green, yellow, and blue can be adapted and adopted to ***girini***, ***yero***, and ***bhuruu*** respectively. This is how the Shona language can grow and modernize. Some of the scholars who advance the fallacious arguments of indigenous languages not being competent enough to teach Science include Strevens in Lewis (1972:60) cited in the D.D.S Science Module 709 (1983:94). He cites seven categories of concepts and language unique to Science which he feels pupils might find difficult.

These are: -

- (i) Linguistic additives:
 - (a) a-, non, pre-, and post-
 - (b) -ate, -ator, -able, -ible, -al, -ic, -ical, and -ize
- (ii) Some conceptual processes involved in Science such as classifying, measuring, observing, testing, predicting, and qualifying
- (iii) Some basic scientific concepts: observation, identification, classification, and experimenting
- (iv) Experimental notions: evaporate, volume, pressure, and vacuum
- (v) More abstract terms: force, attraction, repulsion and influence.
- (vi) Some theoretical concepts: evidence, irrelevant, law and principle

- (vii) Some mathematical concepts: class, unit, set, order, sequence, add, subtract, greater and less

A little searching tells us that most of Steven's terms find equivalent words in Shona. These include *chisi-* for non for example ***chisi (nga) nyungudiki*** for non-soluble, ***kucherechedza*** for observing, ***patsanura*** for classification, ***simba*** for force, ***murao*** for law/ principle, as well as ***tapudza/ bvisa*** for subtract to cite a few. At first sight the Shona words just cited appear awkward but if used over and over again they will naturally come to be accepted. Where appropriate terms appear elusive new words will be coined to fill the void. The linguistic shortcomings just cited are apparent and not real, they are just fallacies. The Shona Language is as good as any other languages, all it needs is to be given the chance and room to function and develop.

As revealed in this review of literature, it is true that there is now some commitment towards improving the status and use of indigenous languages by many African governments. The African Union as the organ of the Heads of state has greatly supported the development of African languages. The establishment of the Academy of African languages (ACALAN) was meant to develop African languages and to promote linguistic cooperation on the continent. Bamgbose (2001:4) says ACALAN aims at promoting the use of African languages, increasing the use of African languages in a variety of domains; using African languages as languages of learning and teaching and the dissemination of information to the masses through African languages. Similarly, the 2006 Language plan of action was meant to corroborate and buttress this new philosophy. This shift in thinking and action reflects an attitude change in the African governments.

African governments should make concerted efforts to spearhead the drive to change the attitude of their people towards the use of their native languages. Countries that have shown positive attitudes and consequently taken positive steps to use native languages in more social functions include South Africa, Kenya, Sierra Leone and Somalia to cite a few. In these countries indigenous languages are now being used in more formal domains than at the attainment of their independence. As for, Zimbabwe,

the majority government has been slowly moving towards the correct language policy albeit in a slow and rag-tag fashion. Shona and Ndebele have been given national language status but in practice they are not official as they are not used in the important and formal domains of life in Zimbabwe. They are not used in public administration, in schools as media of instruction, in parliamentary discourse and official record keeping mentioning a few domains. Yes, indeed the minority languages like Tonga and Venda have been given some recognition as they are now taught and examined as school subjects up to grade seven levels. In the same vein, they can also be used as media of instruction up to grade three levels. All this positive development is a culmination of the efforts and lobbies by scholars who include Ngara, Mutasa, Chimhundu, Magwa, and Makanda whose works have just been discussed in this review of literature.

2.5 CONCLUSION

The lobby in this research is that indigenous Zimbabwean languages should be used as media of instruction in primary school education up and through to O' level. The study also seeks to add another authoritative voice to that of scholars cited. Further and most pertinent and important, the study seeks to look at "real classroom practice"; the teaching of science-one of the so called difficult subjects-using the Shona language. To date, nobody known to the researcher has carried out such research in Zimbabwe. It is the first of its kind. All the scholars cited and whose works have been discussed above simply and merely desk read and dared not try putting into practice the theoretical stance they were lobbying for and advocating. Further, although Shona has been stipulated on paper as medium of instruction in education from grade one to three, its impact and use have not been investigated or evaluated. It has just been taken for granted. This research intends to shed some light in this respect.

Having reviewed relevant literature, the focus now shifts to a discussion of the research design and methodology.

CHAPTER 3

THEORETICAL FRAMEWORK, RESEARCH DESIGN AND METHODOLOGY

“There is a tendency to place research design into two categories, namely qualitative and quantitative, but they overlap,” (MDAFLAL 301,2011:17).

3.1 INTRODUCTION

The main concerns of this chapter are a discussion of the theoretical framework, research design and methodology. First, the theoretical structure on which the study is based is discussed. The theoretical framework upon which the research is grounded is that of language planning, language policy and the orientations/ideologies therein. Under research design, the format or research plan used is described. The issue of research participants and the sampling procedures used in their selection is discussed next. The chapter proceeds to discuss research instruments and the concomitant issue of their validity and reliability. The procedure through which data will be collected as well as plans for data presentation and analysis will be discussed. Finally, before the chapter closes with a summary of its contents, the issue of ethics and limitations in research will be tackled.

3.2 THEORETICAL FRAMEWORK

All research is based on a specific theoretical framework. As this research is steeped in language policy issues it is therefore imperative that the research be based on language planning and policy which is itself based on specific ideological orientations.

The study seeks to lobby the generality of Zimbabweans and their government to seriously consider, adopt and use indigenous languages as media of instruction in the country's education system. Many scholars have written extensively on this issue. Notable scholars include Ngara (1982), Chiwome and Todhlana (1992), Chimhundu (1998) and Mutasa (2004). However, it is Ngara's contribution that is pertinent to this

study. In his work, Ngaru asserts that English, Portuguese, French or any other language of wider communication should work alongside indigenous languages: they should be complementary. Further, he advocates the use of indigenous languages as media of instruction in all primary school grades but Magwa (2009) challenges him and advocates for the use of indigenous African languages at all levels of the education system. The researcher would want to establish if Magwa's findings apply, and also explore the feasibility of using Shona as a medium of instruction in teaching Science.

Granted, Zimbabwe like a few other African countries, is now putting slightly more emphasis on the use of indigenous languages than during the pre-independence period. Despite the progressive shift in policy, Zimbabwe does not have a clear language policy yet. Language policies come out of language planning while language planning itself is laid on a bedrock of ideology. Ideological orientations are important as language planning is usually influenced by the way language planners view language.

Ruiz (1988: 4) defines ideological orientation as "a complex of dispositions towards language and its role and towards languages and their role in society." He distinguishes three types of orientations namely

- (a) language as problem,
- (b) language as right and
- (c) language as resource.

Ruiz's orientations are a new way of describing language planning activities. The approach looks at people's attitudes towards languages in their communities. How they behave towards those languages and what they think about the languages. People's attitudes are viewed in relation to the functions of the languages in that particular society. If a language is used in important domains in society then the language is viewed positively and highly. If a language is used in not so prestigious roles in society people are likely to have a negative attitude to it. The issue of attitudes helps one to understand the motivations behind the adoption of specific language policies. Ruiz (Ibid) avers that orientations are basic to language planning because they delimit the ways we

talk about language and language issues. Orientations also determine the questions we ask as well as the conclusions we draw from the data.

3.2.1 Language as problem

Those who subscribe to this ideology view language as "... an obstacle standing in the incorporation of members of linguistic minorities into the mainstream" (Madiba, Magwaza and Mulaudzi 1997: 257). This ideology mainly focuses on solving language problems. Haugen (1972: 512) concurs. He says that language planning is called for whenever there are language problems with no program in place to solve them. Those who subscribe to the language as a problem orientation see a connection between the diversity of languages and social problems. They see multilingualism as ultimately leading to lack of social cohesion. The multiplicity of languages can be likened to the Biblical Tower of Babel as the existence of many languages may hinder communication within a society. The multiple languages may be a barrier to national unity, national development and social harmony as the various groups which make up the society may be part of linguistic cleavages which may be antagonistic to each other. The rivalry between Shona and Ndebele speakers in Zimbabwe is a case in point. The height of intolerance is epitomized by the formation of a political party Mthwakazi Liberation Front calling for the secession of Matebeleland from mainland Zimbabwe. Tsonope and Jansen (1991) observe the same. They say political leaders subscribing to this orientation view it as invoking secessionist, ethnic, regionalistic and other sentiments which are retrogressive and disuniting.

Magwa (2009) further observes that the language as problem view tends to suit better those linguists (who) trained in European schools as they see monolingualism as normative and multilingualism as problematic. On the contrary, language planners with an afrocentric view tend to see monolingualism as a problem and multilingualism as advantageous and normative. At the end of the debate questions still remain: what constitutes a language problem? How are the (said) language problems identified? How are the (said) language problems identified? How are the problems ultimately solved? And Are language problems real and not just mirages in the eye of the beholder?

Magwa (opcit) cites two types of language problems, on linguistic and the other non-linguistic. He says linguistic problems are those that are mainly concerned with the structure of language while non-linguistic problems are those found within the social and political framework. The Canadian example cited by Rubin and Shuy (1973: 60) suffices. In the Canadian province of Quebec, the move to replace English with French in work places and official domains was not motivated by linguistic factors but was aimed at redressing unequal access to work opportunities. As such, any attempt to provide solutions to language problems should go beyond the way language is used. A piecemeal approach to providing solutions will not suffice as the two problems are hardly functionally separable.

3.2.2 Language as right

Language as a right implies that all people, be they black, white or coloured, children or adults, are entitled to learn and use their own language in any capacity. At best this implies that every language should be used as a medium of teaching as it is the right of the speakers of that particular language to use it. By implication, all languages should be used, in the print and electronic media thus enabling every individual to access information in their language. Thus practice would be in line with the 1988 United Nations Universal Declaration on Linguistic Rights which states that indigenous people have the right to develop and promote their languages. They also have the right to use their languages for administrative, judicial, cultural and other purposes. Phillipson (1992) concurs and avers that indigenous people's children have a right to access education in their own languages. Likewise, the 1996 Barcelona Universal Declaration on Linguistic Rights sees languages as the right of an individual emphasizing non-discrimination, pluralism and community initiatives in language use. In short, the language as right ideology recognizes the existence of language rights in any planning. Some examples of language rights will suffice.

- (a) The right to participate effectively in government programmes (Ruiz 1984: 22).
- (b) The right to use one's ethnic language in legal proceedings (Mackey 1979: 49).

- (c) The right not to be discriminated against on the basis of language. (Macias 1979: 88).
- (d) The right to use one's mother tongues in the activities of communal life and
- (e) The right to have one's mother tongue as medium of instruction in learning (Mackey ibid).

In the language as right orientation, different social groups claim certain rights which should be reflected by language planners. As an example, minority groups in society, fearing, discrimination by majority groups may demand specific linguistic rights. The Tonga people in Zimbabwe are a case in point. At one time, soon after Zimbabwe's independence they refused to send their children to school because they were not taught in their one Tonga language (Sunday Times 24/07/11). Thus the linguistic rights of minority groups such as their emotions, convictions, beliefs and values can only be fulfilled if they are allowed to use their language.

The full participation of minorities in national activities is guaranteed when their linguistic rights are considered and taken on board. National activities in which they will partake include administrative and judicial proceedings as well as exercising their sovereign rights like taking part in political activities such as voting and campaigning for government posts. Despite all these advantages language as right may however create problems as it may reinforce ethnic tendencies. Individuals may not like to learn other languages other than their own. The Indian example-cited by Roy-Campbell (1994 : 139) in which a constitutional commandment to replace English by Hindi at India's independence as well as the subsequent three language policy imposed on the people met with much resistance as non-Hindi sections of India resisted learning Hindi as many felt there was no need to learn too many and unnecessary languages.

3.2.3 Language as resource

The orientation stresses the importance to the nation of conserving and developing all of its linguistic resources. Language as resource orientation also sees the promotion of more than one language as valuable. It thus suggests that each individual to be richer

cultural knows the richer the individual. This language orientation promotes communication beyond speech communities or linguistic boundaries. The orientation suggests that each language has a role to play and is therefore a complementary. For instance, indigenous languages provide a window to the knowledge and culture of the African community whereas international languages provide a communication. According to this orientation linguistic diversity is a valuable resource rather than a problem (McKay and San Ling Wong 1998). If considered properly, with language as a problem and language as a right orientations for a number of reasons. The language as a resource can

- (a) have a direct and positive effect of enhancing the language status of subordinate languages.
- (b) help ease tension between majority and minority communities.
- (c) highlight the importance of co-operative language planning.
- (d) serve as a more consistent way of viewing the role of non-official languages in society.
- (e) help to reshape attitudes about language and language groups.

According to the language as resource ideology, languages should be treasured. They should be taken as assets and be treasured like the natural resources. Languages should be preserved in the manner natural resources are preserved. If they are not preserved, languages, like endangered plant and animal species, will get to a point of extinction.

Minority languages are threatened by politics, issues of globalization as well as domination by majority languages and people. In multilingual societies, where the language as a resource orientation is most appropriate, the decision to select a language for national and official use depends on many factors. Those in power usually select languages on the basis of which one gives them the most and best advantages, but the less advantageous languages tend to be neglected and relegated. Language is therefore taken as “a consumer good, the decision to buy will be determined by a cost-benefit analysis” (Ridler and Pons Ridler 1986: 48).

3.2.4 The study's ideological orientation

Although the three orientations discussed above have great merits each, the ideological disposition adopted in this research is that of language as a right. The researcher feels that it is the child's right to be taught in a language they are articulate in, conversant with, adequately endowed in and fully understand. Inevitably, it is the use of the child's mother tongue in education that is advocated for. Scientific evidence suggests that teaching children through their mother tongue affirms their identity and is a good foundation for their intellectual development and (subsequently a country's) economic development (Chirinda, 2011: 6).

3.3 METHODOLOGY

In this section a clear and concise description of how the study was carried out is given. The research design will be discussed, the research instruments to be used will be explained, details of data collection procedures will be provided and data analysis plans laid out. Details of research participants and sampling procedures are also availed.

3.3.1 Research Design

According to Polit and Hungler (1996) a research design is a structural framework of the study that guides the research in planning and implementing the study while optimal control of factors that could influence the study is achieved. Similarly, Mouton (2001: 55) sees a research design as "a plan or blue print of how the researcher intends conducting the research." This means that the research design focuses on the kind of study being planned by the researcher and the kind of result aimed at. In short, this study aims at, inter alia, establishing whether Science is a difficult or easy subject, comparing pupils' performance in Shona and subjects taught in English, establishing the attitudes of primary and secondary school, teachers towards using Shona as a medium of instruction in education, comparing the effectiveness of teaching Science in English and teaching Science in Shona, assessing the policy implementers' knowledge of policy as well as their efforts towards policy implementation. The place of English in the day to day running of government departments will also be established. From this brief revisit of

the study's aims, it is inevitably clear that the research design will take the form of a descriptive survey and experimental design.

There are two broad categories of research namely quantitative research and qualitative research. Each category uses characteristic research methods. This research is educational and the research methods used in educational research are mainly those used in the behavioural and social Sciences relying most on the disciplines Psychology, Anthropology and Sociology (Best and Kahn 1993). Since research in these three disciplines utilizes experimental and quantitative methods educational research consequently utilizes these methodologies.

- I. Quantitative research is research in which the data gathered can be analysed in terms of numbers. It belongs to the paradigm of logical positivism. (Neuman 1997: 106) which is based on the assumption of the natural Sciences. The experiment/inquiry on practical teaching will be steeped in this paradigm. Qualitative research is characterized by the description of events, issues, persons and so forth in a specific manner without the use of numerical data but words. It is based on the phenomenological paradigm. (Neuman op cit) and it uses a variety of interpretive research methodologies. Patton (1990) says qualitative methods consists of three kinds of data collection methods namely
 - in-depth open and interviews
 - direct observation and
 - written documents

In this research a number of methods will be employed and results sought. The methods in the different areas will now be discussed.

3.3.2 Research Methods

In this study four methods will be used. These are the questionnaire, the interview, observation and the experiment.

3.3.2.1 Questionnaire

Borg and Gall (1996:320) describe a questionnaire as a form prepared and given out to respondents to secure responses to specific questions. Furthermore, Chikoko and Mhloyi (1995:69) write that questionnaires enable researchers to measure what respondents like, dislike or know as well as their opinion on something. In short, questionnaires are a series of carefully planned and appropriately worded questions or items put on paper in order to solicit information from a respondent who selects responses from a given set or completes blanks in spaces provided. Questionnaires may be highly structured or less so. Highly structured questionnaires are composed mostly of closed questions while the less structured questionnaires have more open ended questions.

Questionnaires have many advantages (Neuman 1997) Self administered questionnaires are cheap as they can be conducted by a single researcher reaching out to a group of respondents at any given time. The researcher can also clarify vague issues and questions to respondents in a particular group. Questionnaires are free of interviewer bias as they do not require the respondent's identity. Self administered questionnaires have a high response rate as they can be completed while the investigator waits to collect them.

In this study, the questionnaire will be used to gather information and opinions on the status of English and Shona as media of instruction, government policy issues, subject pass rates as well as respondents' professional and demographic details.

3.3.2.2 Interview

According to Collins (2000:177), "an interview is a face to face meeting between two or more people in which the interviewer asks questions while the respondent answers back".. In the same vein, Wilson (1993:15) describes a face to face interview as a standard interview schedule used for each respondent. Questions in the schedule have the same wording and order. The interviewer has a very small chance of varying the

question wording. Interviews may be structured or semi-structured. The structured interview is a research interview predetermined by a questionnaire or interview schedule. The interview is followed rigidly and produces replicable data. The semi-structured or open ended interview is an interview in which the investigator asks a lot of questions but is free to vary them or make up new ones that become important during the course of the interview. The technique may obtain information that may be missed in a structured interview although analyzing such information can be difficult though with often rewarding results (Tischler, 1986:52-3). Finally it is important to point out that researchers use interviews for three purposes namely:

- to explore a subject in order to identify important variables and relationships as well as to develop hypothesis.
- As a research tool to obtain core data and
- As a supplementary research tool to follow up unexpected findings or to pursue certain issues in greater depth.(Kellinger,1973.)

Neuman (1997:253) cites a number of advantages of the face to face interview data collection method. He says that the method has a high response rate, allows the investigator to ask all types of questions, from simple to complex, is good even when dealing with illiterates, is flexible and adaptable to different situations, and allows the investigator to probe issues for clarification. The method also allows the investigator to use gadgets like tapes and to use non-verbal communication. The investigator also has a chance to assess the validity of answers solicited from what he/she sees and what the respondent says.

In this study, face to face interviews will be used to solicit information from heads of schools and heads of government departments.

3.3.2.3 Observation

- Chiromo (2006:44) says observation is a research technique mainly hinged on gathering impressions of the surrounding world through human senses.

Observation itself is primarily watching but information from sight is complemented by that received from other senses- through hearing, smelling, touching and tasting. The combined information from these senses forms our observations, our mental images of the world and what is going on in it, (Forster, 1977). Observation is further described as a scientific tool with the following attributes. Observation

- Serves a formulated research purpose,
- Is systematically planned and recorded and
- Is subject to checks and controls of validity and reliability, (Sellite, Wrightman and Cook, 1959).

Observation has a number of advantages. Behaviour is recorded as it occurs, limiting distortions due to memory lapses observations. Complements information gathered through other methods and is therefore a useful check on such data an observer does not interfere with subjects under study and has the advantage of seeing phenomena people being observed may take for granted.

In this study, the observer is interested in the proportion of time teachers and pupils take in various research activities such as teaching and learning, group activities and answering progress check exercises.

3.3.2.4 *The experimental method*

This method seeks to find out by how much (if at all) a controlled condition deviates from the norm. Cohen and Marion (1985) say experimental research is concerned with identifying possible cause and effect relationships by exposing one or more experimental groups to one or more conditions and comparing the results to one or more groups not receiving treatment. Further, Chikoko and Mhloyi (1995:85) assert that the experimental method has two essential ingredients namely manipulation and control. This implies that the researcher should manipulate a variable or condition whose effect he/she wishes to study. This is the independent variable. The aim of the experiment is to

find out the effect of the independent variable upon some resultant variable. The resultant variable is normally referred to as the dependent variable.

The experimental method therefore deals with the phenomenon of cause and effect. The effect of a condition applied on something, for example, a group of people, is measured against that of a similar group on whom the condition was not applied. Control is thus one of the most important aspects of the experimental method.

The experimental method however has advantages. As the researcher is able to control when and where observations are made, this makes it possible for the investigator to make objective and accurate observations. The method also allows the investigator to repeat his/her studies or to have others repeat them. This greatly reduces the role of personal bias or chance factors.

In this research, two grade four classes are subjected to the experimental method. They are taught the same science content with the control class being taught in English and the experimental class in Shona. They are both tested using similar instruments and their results compared. Deductions and conclusions are then drawn and recommendations made.

3.4 THE ROLE AND STATUS OF ENGLISH AND SHONA IN ZIMBABWE

With regard to establishing the role and status of English and Shona in Zimbabwe the type of data sought will be qualitative. The method that will be employed will be that of consulting and reviewing relevant books. In this review of literature, the role and status of English as an international language and the role and status of English in Africa compared with African languages will be looked at. Similarly, the role and status of English and Shona in Zimbabwe will be reviewed. Works by foreign and local authors will be consulted. Authors who wrote on the Zimbabwean scenario for example, Ngara (1980), Ngara (1992), Mkanganwi (1992), Chimhundu (1998), Mutasa (2004), Magwa (2009) and Makanda (2009) will be perused and discussed.

3.4.1 Language policy in government departments

The enquiry on language policy prevailing in government departments will seek qualitative data. The method that will be used to gather this information is the interview. Eight heads or representatives of government departments will be interviewed. The government departments targeted are

- The police
- The courts
- Information
- Veterinary services
- Statistics
- Health
- District Development Fund
- Agriculture/Arax

The government departments targeted were those in Rusape or Nyazura.

3.4.2 Policy implementation, attitudes and practical teaching

In order to find out language policy knowledge teachers had as well as the teachers' attitudes towards the use of English and Shona as media of teaching, information will be sought using questionnaires. Data collected will be numerical and narrative. With regard to practical teaching it in Shona will be compared. Two classes (one control and one experimental) will be taught the same content by the same researcher using English and Shona respectively. A progress check exercise will be written after the teaching of each of the twenty lessons. The exercises will be marked by the researcher, the results/pupils' scores will be recorded, analysed then compared. The data collected will be mainly numerical. Other observations during the teaching-learning process will be noted, analysed and deductions made. This data will mainly be qualitative.

Although there is a tendency to place research design into two categories viz qualitative and quantitative as discussed above, the two often overlap. The different research methods are complementary rather than in competition. Write Bulmer and Warwick (1998).

3.5 RESEARCH SUBJECTS AND SAMPLING

Research subjects are the people from which research information will be extracted. It is not always possible to involve everybody informative in research. Where the population is too big to be all involved in research a few people/subjects who are representative of the potential/whole research group are chosen. The process of choosing the representative group is termed sampling. Tischler, Whitten and Hunter (1986: 35) agree. They describe sampling as “a research technique through which investigators study a manageable number of people called a sample selected from a larger population or group” This implies that the sample will be representative of the larger population and the findings of the research will therefore generalize to the larger group.

The primary aim of research is to come up with principles that have universal application. It would not be possible to study a whole population, for example all grade four pupils in Zimbabwe in order to arrive at generalizations. The study of such a population would require the services of thousands of teachers, an expenditure to the tune of millions of dollars and hundreds of thousands of class hours. Luckily, it is the process of random or systematic sampling which makes it possible to draw valid conclusions, inferences and generalizations on the basis of a study of a relatively small proportion of the population. In the study, the population is all the Zimbabwean grade four pupils, all primary and secondary school teachers as well as heads of all schools and government departments.

It would not be possible to study all these respondents in their entirety but for convenience, only a few will be sampled in a systematic or random way. However, many factors need to be considered when sampling. Samples should be small enough to be economic in monetary terms and in terms of time. Samples should be small enough in

order to make data analysis reasonable and manageable samples should also make available enough subjects to make the sample representative. There is therefore no fixed number or percentage that determines how big an adequate sample should be considering the factors discussed. The choice of Denzva Primary School and sister schools in their cluster was mainly for economic reasons and relatively easy access to subjects. The choice of the school meant an extensive cut in travelling costs and easier gate keeping arrangements. Instead of boarding buses the researcher simply walked to these schools even after working hours. The discussion now focuses on the different research subjects.

3.5.1 Heads of government departments

The choice of government departments in Rusape and Nyazura was chiefly related to cutting costs. These centres were closet to Nyakuni schools cluster where the main research was being carried out. The inquiry on language policy prevailing in these departments will clearly target heads of these departments whether male or female. Where the head of department will not be available a knowledgeable stand in will be interviewed. Out of twelve government departments easily accessible eight were randomly drawn from a hat, leaving out four.

3.5.2 Heads of schools and teachers

With regard to heads of schools, education inspectors and teachers there was not much choice. As for heads of schools, as long as the school was in Nyakuni cluster then he/she would be interviewed. Out of eight inspectors at the District Education office three were interviewed namely one inspector for Science, another for English and Shona and the head of the district education inspectorate. All primary school qualified teachers were requested to fill in a questionnaire. The inclusion of Geography and Agriculture teachers was for the simple reason that these two subjects were part of the primary school Science curriculum where the main part of the research was focused.

3.5.3 Pupils in the teaching experiment

The teaching experiment involved seventy grade four pupils at Denzva Primary School in Nyakuni cluster, ward 27 Makoni in Manicaland province. At the time of the research the school had an enrolment of 596 pupils and 16 classes. The school was established in 1927, is rural and enrolled pupils of a peasant background. The choice of Denzva school was strategic, convenient and appropriate.

According to the Poverty Assessment Study Survey (PASS) report (1997: 105), 71% of Zimbabwean schools were rural while 29% were urban, Denzva School fitted well into the majority category of schools – rural. Furthermore nine out of ten of Zimbabwe’s provinces had very old schools with Matebeleland North and South, Midlands, Masvingo and Manicaland featuring some of the oldest schools. Nationally 23% of Zimbabwean schools were less than 14 years old, 41% were between 40 and 60 years old while the remaining 29% constituted schools less than six years old and those over sixty years old.

In Manicaland, where Denzva school is situated, most of the schools 44.9% were in the over forty years old school’s category. It is in this category that Denzva school belonged as it was eighty two years old when this research was conducted. The size of Denzva School (by enrolment) made it suitable for the study. The statistics shown below PASS report (Ibid) are revealing.

Table 3.1: Pass report

No. of Classes	National %	Rural %	Manicaland
< 10	20.1	27.1	21
10 – 19	41.5	52.4	50
20 -39	31.8	19.8	25
40 +	6.3	0.7	3
No + known	0.3	0	1
Total	100	100	100

According to the above statistics, the majority of schools whether considered nationally, in the rural schools category or provincially as the case of Manicaland portrays were in the 10 – 19 classes category. This made Denzva School very representative as it had 16 classes fitting it well into that category.

The choice of Denzva School also had administrative advantages and convenience as the researcher was in charge and therefore based at the school. Costs were lessened and organizational challenges minimized. For the purposes of this research the grade four class was chosen as it is transitional. The language policy in force at the time of research stipulated the use of indigenous languages in the first three grades at primary school and directed that English as a language of instruction should start at the grade four level hence the choice of grade four pupils for this research. The majority of the pupils were in the nine to ten year age group.

The pupils all spoke Shona as their first language and English as their second language. The seventy pupils involved in the study were put into two groups of thirty-five pupils each. The classes' academic ability was almost the same as pupils were divided according to their end of year performance in grade three tests with the child in the first position allotted to one class and the child in the second position allotted to the other class. The allotment continued in such manner until the last and least performing pupil was allotted to a class.

This systematic sharing was meant to balance cases, a kind of group matching. One class was to be the control group and the other the experimental group. The choice of which class would be the control group and which the experimental group was reached randomly. Randomization entails pure chance selection. In the study's choice of control and experimental groups, randomization was achieved by tossing a coin, then assigning a group to control if heads appeared and to experiment if the toss were tails.

3.6 RESEARCH INSTRUMENTS

The research instruments that were used in this study are structured interviews, questionnaires, lessons plans and progress check exercises. The instruments are discussed below.

3.6.1 Heads of government Departments Interview Schedule

The investigation on language policy obtaining in government departments was done through interviews. An interview is simply a questionnaire administered orally. Interviews may be structured or semi-structured. An interview entirely pre-determined by a questionnaire or an interview schedule is a structured interview. This interview is rigidly followed and produces replicable data.

On the other hand a semi-structured or open ended interview is one in which there is a list of questions but the interviewer can vary the questions or add others during the course of the interview. Such interviews miss but the analysis of such interviews present many challenges. It should however be pointed out that interview schedules need to be thoroughly made. When an interview is conducted the respondent does not write the responses but gives the facts to the interviewee in a face to face situation.

The interviewer may record the responses on an audio/video recorder or may write responses on a pad. Once rapport has been established between the interviewer and interviewee, interviews usually yield more confidential information than questionnaires. The interviewer also has an opportunity to probe issues and clarify misinterpreted questions to evaluate the sincerity and insight of the respondent. With regard to the establishment of good rapport, interviewers of the same ethnic background as their subjects are usually more successful. Hursh-Ceasar and Roy (1976) assert that the task of interviewing is easier when the interviewer and respondents are alike in terms of social origin, religion, language and dialect, geographical area and can understand, appreciate and observe common customs. Sharing common customs reduces barriers to communication and is expected to improve acceptance.

Interviews are research instruments that are used for many purposes and reasons. Kerlinger (1973) cites three key purposes for which interviews are used. He says interviews may be used:

- a) to explore a subject in order to identify important variables and relationships and to develop hypotheses.
- b) as research tools to obtain core-data about a subject.
- c) as a supplementary tool to pursue certain issues in great depth.

In this study the interview will be used to obtain information on the language policy prevailing in government departments and to explore the subject as well as probe issues to greater depth. A structured interview comprising five questions was compiled (see appendix) The first question asks for the official language of business in the target department. The second question seeks to know the role English plays in five areas namely the recruitment of personnel, the training and certification of graduands, the writing of reports, the compilation of records as well as official communication. With regard to personnel recruitment the study seeks to find out if English was a requirement during recruitment for training.

As for training and certification of personnel the study seeks to establish the language of instruction during the period of training, the language used on graduation ceremonies as well as the language in which certificates are written. Further, the study seeks to find out the language used when writing reports at the work place as well as the language used when compiling records.

Finally, the language used in official communication will be investigated. This encompasses the language used over the phone, the language used in correspondence as well as the language used when conducting staff meetings. The third question seeks to establish the areas in which Shona plays a part in the day to day affairs of each department. The fourth question seeks to establish the opinion and attitudes of respondents towards the use of Shona (instead of English) as the official language of

business in their respective departments. The last question seeks to find out the reason for the attitude/opinion reflected in response to the fourth question.

3.6.2 Heads of schools and Education Inspectors Interview schedule

The enquiry on knowledge of language policy targeted heads of schools and education inspectors for a number of reasons. At the time of research, these men and women

- were in charge of policy implementation
- supervised policy implementers and implementation
- made crucial decisions on policy implementation
- were assumed to have thorough knowledge of language policy prevailing in schools.

The research instrument used to acquire the information on language policy was a twelve question structured interview (see appendix). The targeted heads of schools were the heads of four primary schools in Nyakuni cluster namely Handina, Matanhire, Rukweza, and Tokoyo as well as the heads of three secondary schools in the same cluster namely Handina, Rukweza and Mutungagore. The first question aims at investigating the authorities' knowledge of language policy prevailing in schools as well as the particular circular that enforces it. Question two through five tests the school authorities knowledge of the prevailing policy and how it should be implemented. The second and third questions investigate the Ministry of Education's position with regard to the use of Shona and English as languages of instruction in schools in general while the fourth and fifth questions specifically investigate the implementation of the prevailing language policy in the teaching and examination of the Science subject.

The sixth question investigates the school heads and inspectors' personal assessment of the teachers' comfort, confidence and competence when using English in the teaching – learning process. The seventh and eighth questions seek to find out the subject passed best at grade seven level and at Ordinary level examinations. The reasons for the pupils passing best the subject stated in the seventh question will be

sought. The assumption is that Shona (the children's mother tongue subject) is passed best. The Science pass rate is also sought with the aim of comparing the two pass rates. Finally, the tenth, eleventh and twelfth questions seek the opinions of the school heads and inspectors on the use of Shona as a language of instruction in the teaching of Science. The respondents were asked to give the reasons for or against the use of Shona as the language of teaching Science.

3.6.3 Primary and Secondary School teachers' questionnaires

The slightly different questionnaires were compiled to gather data-one for primary school teachers and one for secondary school teachers. A questionnaire is simply a data gathering instrument through which respondents answer questions or respond to statements in writing. It is used when factual information is required. When opinions instead of facts are required, an opinionative is used. Questionnaires may be administered to individuals or to groups. They can be sent by mail as may be administered over the phone with the interviewer recording responses. When questionnaires are administered personally they give the researcher an opportunity to establish rapport and explain the purpose of the study.

Questionnaires are of two types namely the closed form/restricted type and the open form/unstructured questionnaire. The closed form takes little time to complete, is relatively objective, keeps the respondent focused, is easy to fill out and is relatively easy to tabulate and analyse. The unstructured questionnaire invites free, response in the respondent's own words, has room for indepth answers as it has no stipulated responses. It, however requires greater effort on the respondent's part resulting in meager returns. Babbie (1973) suggests that a response rate of 55% is adequate, 60% good and 70% very good. Although it is difficult to estimate the percentage of questionnaire responses to be considered adequate, it is generally accepted that the smaller the percentage of responses the smaller the degree of confidence one may place in the data collected. In the same vein, unstructured questionnaires can be difficult to interpret, tabulate and summarise when writing the research report. From this brief discussion, it is clear that each type of questionnaire has both merits and limitations. In

this study, the questionnaires use both open and closed type items. A number of questions simply require ticking the appropriate responses.

After the completion of the questionnaires and their subsequent improvement after being critiqued by the researcher's supervisors the questionnaires were pilot tested: Ten questionnaires were pilot-tested in one primary school and ten in a secondary school. After the trials the questionnaire was improved. Corrections and adjustments to questions and statements were made. Sixty primary school teachers' questionnaires and forty secondary school teachers; questionnaires were printed.

The first part of the questionnaires (see appendix) asks for personal details of respondents. It seeks to establish the respondent's sex, age, subject or class taught, teaching experience as well as their academic and professional qualifications. These personal details will make it possible for the researcher to compare results according to sex, qualifications, experience and age.

The second part of the questionnaire seeks research information. The first question is on the subject passed best at a particular school or in a particular circuit. The second question is a follow up on why the subject given as a response to the first question was so passed. The researcher suspected that Shona would be passed best.

The third question aims at finding out the subjects teachers knew or felt to be difficult. The fourth question probes why the subjects in the third question are said to be difficult. The researcher suspected that the language of instruction hindered the pupils understanding of the content taught. Questions five through seven are meant to assess the teachers' knowledge and implementation of the policy on language of instruction. The researcher suspected that the teachers did not always follow policy due to challenges encountered through the use of English as medium of instruction. Questions 8a and 8b seek to find out the advantages of teaching and learning Science in English as well as disadvantages if any.

Likewise questions 10a and 10b are bent on unearthing the would be advantages of teaching Science in Shona as well as the disadvantages of teaching Science in Shona as well as the disadvantages therein. Finally, questions 9 and 11 are meant to reveal opinions and/or attitudes of various teachers in the use of Shona as a language of instruction in teaching Science.

3.6.4 Practical Teaching: lesson plans and progress check exercises

Before embarking on the teaching experiments the researcher first has to scheme and plan for the lessons to be taught. He will consult the syllabus currently in use: the 1994 Science syllabus as well as the class teachers for the topics and content to be covered. The topics to be schemed and planned for are listed below:

- Crop, Plants and Animals
- Health and Pollution
- Fuel and Energy
- Weather
- Materials and Technology
- Landforms and Maps

Three other topics, namely Water, Trees and forestry as well as Soil, Grass, and Grazing were left out as they had been covered already by class teachers by the time the research begins. Twenty-five lessons were planned for, the first five for teaching trials and the remaining twenty for the actual research. The lesson plans had one format. (see appendix) At the top of the detailed lesson plan were lesson details that include lesson number, the duration of the lesson, the topic being taught for example, Crop, Plants and Animals and the subtopic such as Small Creatures. Lesson plans bear the lesson objective(s) which are specific, measurable, attainable, realistic and time framed as well as the source of matter from which the content to be taught is derived.

The source of matter includes the grade syllabus and any relevant textbooks or sources. Next on the plan is the media or apparatus to be used in facilitating teaching and

learning. The apparatus include diagrams, charts, drawings and even live creatures to mention a few. The skills pupils learn include observing, measuring, comparing, and labeling will be spelt out next. The knowledge pupils are assumed to be in possession of is noted below the targeted skills. The lesson introduction (the spark that fires the teaching-learning process) is provided next.

The lesson is then developed through a series of steps until it winds off with a short concluding activity. The conclusion is usually a highlight or recap of the key issues/concepts taught. Below the lesson plan comes a progress check exercise with a mix of two or three types of questions. All in all, fifty lessons were planned for, twenty-five in English and twenty-five in Shona. This implies that each lesson planned in English had a corresponding plan in Shona. Effort was put to make sure that the lessons and progress check exercises are reliable and consistent.

3.6.5 Ensuring validity and reliability of research instruments and findings.

In order for research findings to be valid, the research instruments should not only be consistent but also reliable. A research study is valid only when it is able to effectively test what it was designed to test. In order to say that one's research is valid, a researcher should rule out other explanations for the cause and effect established.

A data gathering instrument is regarded as valid if it measures accurately what it is designed to measure. Best and Kahn (1993 : 208) explain validity as "... that quality of a data gathering instrument or procedure that enables it to measure what it is supposed to measure." Similarly, a research instrument is deemed reliable if it demonstrates a high degree of consistency in its use. The reliability of a test instrument can be improved by carefully designing instructions and directions for the administration of the tests with no variation from individual to individual or group to group. Furthermore, when a research instrument/method is reliable it yields the same result when used by a different researcher at the same time or by the same researcher at a later point in time.

In trying to ensure validity and reliability of the interview scheduled to be used in this study, effort will be made to construct sound interview schedules through consulting authorities on this matter. Brislin, Lonner and Thorndike (1973:63) raise eight important points to consider when constructing questions for an interview schedule. They say one should:

- Use sentences less than sixteen words long.
- Employ active rather than passive voice.
- Repeat nouns instead of pronouns.
- Avoid subjunctive mode e.g. the verb forms could/would.
- Avoid possessive form where possible.
- Use specific rather than general terms.
- Avoid vague words such as probably or frequently.
- Avoid adverbs and prepositions.

Warwick and Linger (1975) corroborate the views of Brislin et al quoted above. They say questions should:

- be simple, direct and familiar to respondents.
- be clear and specific.
- not cover more than one point within the same question.
- not be loaded and/or misleading.
- be applicable to respondents.
- be short and terse.
- not use emotionally charged words or threats to self esteem.
- read well.

The salient points raised by the above authors equally apply to question formulation during the construction of a questionnaire. In order to ensure validity and reliability of research instruments and subsequently the research findings, all interview schedules, questionnaires and lessons were pilot tested. Two heads of government departments (outside the eight chosen for research) were interviewed prior to the onset of research.

The pilot testing and the subsequent improvement of questionnaires helped ensure validity and reliability. The use of a “structured interview schedule” enhanced reliability of research instruments as deviations and ambiguities were limited.

The respondents were asked precisely the same questions, and all, in the same order. This resulted in consistency in data gathering, processing and comparison. The issue of a single interviewer also enhanced the reliability of the findings as the interviews were likely to be conducted in very similar manner, making the results easily comparable. Likewise, the move by the researcher to visit each school to explain the content and requirements of the questionnaires made the results comparable as respondents were likely to respond to questions in the same way.

With regard to the issue of lesson plans reliability, the researcher engaged the services of two specialists, one in English and one in Shona. The two studied the lesson plans, one in his area of specialization, and identify areas which lacked lexical and conceptual equivalence. Lesson one in English was compared with lesson one in Shona. After the specialist teachers’ assessment, corrections and improvements to the lesson plans will be effected.

The group matching that was supposed to be exercised in the compilation of the control and experimental classes (alluded to above) is meant to kill selection bias thus ensuring validity and reliability of the research finding envisaged. Further, in order to improve reliability of findings, the condition under which the control and experimental group learned were made as similar as possible. The classrooms used were in the same block only separated by two offices. The classrooms will be of the same size, similar plan and will have the same number of desks. The five learning groups per class comprised of seven pupils each, of which at least three girls will be in each group. The conducting of the lessons by a lone researcher ensures that extraneous factors, for example, the issue of competence was minimised. The results of teaching by one researcher was more comparable than the results of teaching by different researchers. Further, the progress check exercises were marked by a lone marker (the researcher) using a marking

scheme. The use of a lone marker and marking scheme ensures consistency, efficiency and reliability of results.

Finally, the choice of respondents in this study, namely heads of government departments, heads of schools, education inspectors and teachers ensures validity of results. The heads of government departments are the correct people to interview as they run the departments on a day to day basis. Being responsible for the departments' administration, they are the principal decision makers and spokespersons for the departments. They are therefore knowledgeable of government policy in their departments.

Their answers are appropriate and relevant to this study, making the findings valid. As for the heads of schools and education inspectors, they were the right people as they speak on behalf of their institutions, are government policy implementers day in day out and are in their positions due to the wide experience they have in teaching. Their views, judgments and opinions are relevant and valid. The same argument goes for the teachers, especially the qualified teachers who will be the key respondents in this study. The question on qualifications (on the questionnaire) helped the researcher check for and ascertain the status of the respondent before using the information given. This check will enhance validity of findings as it will weed out irrelevant information.

3.7 GATE KEEPING AND DATA COLLECTION

Before data collection starts there is need for the researcher to seek permission to conduct his study from all relevant authorities. In short, each data collection method should be preceded by the seeking of permission to do the research work. Technically speaking this is what gate keeping entails.

3.7.1 The interview schedule

The interview schedule was compiled, pilot tested and finalized in the second term of Zimbabwe's school calendar, that is between, May and August. In the same period,

most of the interviews were conducted and those outstanding were conducted in the third term of the school calendar that is between September and December 2011.

Before interviews are conducted the researcher visited each government department targeted to make an appointment. The researcher introduced himself in detail and then explains the purpose of his visit and the resultant research. The interview date and time will be agreed to and diarised. Before the interview date, the interviewer will remind the interviewee of the interview once more. This was done over the phone. On the day of the interview the researcher/interviewer was early by a few minutes with schedule, pen and pad on hand ready for business.

The interview started with a brief reminder of the impending business. The interview proceeded with the interviewer asking questions one by one chronologically from one to five as per schedule. As the interviewee responded the interviewer wrote down the detailed responses on a pad on which the interviewee and the government department's identity are coded. As the interview proceeded the interviewer probed any relevant issues. Allowing the interviewee chance to ask any questions they may had. After the interview, the interviewer thanked the respondent and left.

3.7.2 Teacher's questionnaires

The primary and secondary school teachers' questionnaires were compiled during the first term of Zimbabwe's 2011 school calendar. The real research questionnaires were sent out to respondents and collected during the second term. Pilot testing of the questionnaires was done towards the end of the first term. Improvements and corrections were done before the dispatch of the actual research questionnaires.

A formal introductory letter to the respective heads of schools and members of staff will be compiled (see appendix). The letter served to introduce the researcher to both the head of school and the teachers at particular stations. The letter formally requested permission to conduct research in the target schools as well as state the reason for conducting the research.

Finally, the letter addressed the issue of confidentiality of all information gathered as well as an assurance on the professional publication of research results. In addition, before the introductory letters and questionnaires were dispatched to schools, the researcher went all the way to talk to the individual heads of schools about the impending study. This was not difficult as the heads involved were his peers and therefore well known to the researcher. The preparatory talk focused on when it will be most appropriate to complete the questionnaires as well as how many questionnaires would be needed per station. On the day of dispatching the questionnaires, the researcher took them to the station and sought permission from the head of school to address the respondents/teachers. The researcher introduced himself, spelt out his aim, discussed the confidentiality of all information and went through the questionnaire with the respondents for standardization of responses and for completion and collection later on. Many offered to complete them forthwith and hand them over to the researcher soon after. Once filled the questionnaires were collected and safely kept for data processing and analysis.

3.7.3 Practical teaching experiment and progress check exercises.

Practical teaching was conducted across the three Zimbabwean school terms in 2010. Scheming and lesson planning was done during the first school term, that is, between January and February. The teaching trials over the five lessons were conducted in March. The teaching experiments were conducted over the second and third terms but gate keeping issues were dealt with first.

Permission to carryout research in schools was sought from the secretary for education. This was done in writing through the local district education office through the Provincial Education Director. Once granted, it was time to seek permission from the parents or guardians of the grade four pupils. Grade four pupils were too young to give consent to participating in research hence the move to consult their parents. A general meeting of parents concerned was called and permission was sought. The next phase involved talking to the grade four teachers involved. The issue of lesson timetabling was discussed and agreed upon. Finally the researcher talked to the grade four pupils about

the lessons he conducted. The two classes were addressed separately. The issue of results comparison was not divulged as it would have led to reaction by pupils, thus affecting the results.

In this study all the seventy grade four pupils took part. Thirty-five in class A learnt Science in English while the other thirty-five in class B learnt the same content in Shona. After each lesson has been taught all pupils in each class wrote a progress check exercise. This exercise is meant to find out how much pupils would have grasped in a particular lesson. In class A the progress check exercises were in English while in class B they were in Shona. After the pupils have finished writing the exercises, the researcher personally processed to mark the exercises using marking schemes. Pupils' performance per exercise was recorded on their answer scripts as raw scores e.g. 5 out of 9. All results were recorded on mark schedules for safe keeping and for processing later.

3.7 PLANS FOR DATA PRESENTATION AND ANALYSIS

The data collected in this study were presented in different forms. Part of the data was presented as raw scores, some as tables, some as column graphs and some as a narrative. The different data collected were then be looked at separately.

3.8.1 Data on government departments

Responses to each of the five questions asked to the eight government departments heads were recorded. The responses to questions 1 and 2a – e were tabulated per department with responses ticked as either English or Shona. The results for the eight departments were then be compared and contrasted. Responses to questions 3 through 5 were qualitative and therefore recorded normatively. Results for each individual department were analysed then compared with other departments. Conclusions were then be drawn.

3.8.2 Data collected from school heads and inspectors

The responses to each of the twelve questions on the interview schedule were discussed question by question. Where possible the responses to a particular question were presented as a percentage of the total responses from three inspectors and seven heads of schools. These responses were collated to a total of ten respondents as heads of schools and education inspectors are literally one professional grade. Responses were analysed, general trends noted and outstanding responses commented upon.

3.8.3 Data from teachers' questionnaires

First, the responses to questions on the two questionnaires were put into two categories namely those from female respondents and those from male respondents. The two categories were further be divided into infant (grades 1, 2 and 3) teachers' responses and junior (grade four through seven) teachers' responses. This implies that for each question responses were categorized and analysed as either, female or male as well as infant or junior. On the primary school teachers' questionnaire, responses to questions 1, 3, 5, 7, 10 and 12 were expressed as percentages of total respondents per questions on the questionnaire require primarily qualitative data. The data were collectively looked at question by question, highlighting the general trends noted in responses. Odd answers were spot lit. The same approach was applied to data collected from secondary school teachers. Questions 1, 3, 5, 7, 9 and 11 responses were discussed and described narratively and numerically as percentages of total responses per question. The remaining questions (on the questionnaire) whose responses are primarily qualitative were discussed and interesting trends were highlighted.

3.8.4 Data collected from progress check exercises

After pupils had written the progress check exercises the researcher marks the exercises and places the individual child's score on the answer script. The scores are than entered on a class mark schedule. The scores are then entered on a class mark schedule. The scores are ranked from top to bottom and tallies reflecting how many

pupils in the individual classes scored a specific mark were made, for example, how many pupils scored 5 out of 5, 4 out of 5, or 0 out of 5. The pass rates for individual progress check exercises were calculated.

A comparison of performance in the English and Shona progress exercises per lesson were made. The process will be repeated for all the twenty lessons taught. Similarly a twenty question evaluative exercise covering all twenty lessons were written by pupils, one in English and one in Shona. The pass rates were similarly compared.

With pass rates for each of the twenty English progress check exercises calculated, the mean pass rate for the English exercises was subsequently calculated. Likewise, pass rates for each of the twenty Shona progress check exercises were calculated and the mean pass rate for all the exercises were worked out. The mean pass rate for English exercises and that for the Shona exercises were then be compared. Any difference noted was tested to prove whether the difference should not be attributed to sampling error. The t test was used. If the difference is not due to sampling error then the hypothesis was proved true.

3.9 RESEARCH: ETHICS, LIMITATIONS AND CONSTRAINTS

The basic research ethics as well as the limitations and constrains in research were discussed.

3.9.1 Ethics

All research is grounded on issues of ethics. There are norms to be followed and expectations to be fulfilled by the researcher. Stanhope and Lancaster (1992) describe ethics as a client's rights and a researchers professional responsibility. It goes without saying that when conduction research the researcher has a code of behaviour to operate within. The American Psychological Association's (A.P.A.) code of ethics cited in Best and Kahn (1993: 45) cite five crucial points or areas of concern namely.

a) Informed consent

In this area of concern, subjects of research should be informed of the purpose of research. It is also the subjects' right to agree to partake in the research or decline. In cases where subjects are minors or are not competent to give informed consent, researchers should seek consent from the subjects' parents or guardians (see gate keeping above).

b) Inversion of privacy

In research, it is not ethical to observe intimate behaviour. In this research this concern falls away as it is irrelevant.

c) Confidentiality

Pertinent to this study is the point that it is ethical for researchers to hold all information that they may gather about subjects in strict confidence. The participants' identities should be disguised in all reports and record.

d) Freedom from physical and mental stress, harm or danger

In research, researchers should make sure subjects are not subjected to physical or mental stress and are not exposed to danger.

e) Knowledge of outcome

It is the right of participants to know the results of an investigation. The researcher may choose to explain the results verbally or to publish them. The research report to be written at the end of the study will take care of this point.

Other ethical issues include obligations that researchers have to their subjects, professional colleagues and the public. When conducting research, researchers should not discard unfavourable data that would falsify the results of their study. Scientific objectivity should be placed above personal gain. Further, researchers should avail data they collect to their professional peers to enable them to verify the accuracy of their results. Another concern of ethics is that of lies. Kiddler (1981) says it is unethical to lie

to your subject. He asserts that the ideal in the relationship between the researcher and subject should be that of openness and honesty. In this study, the researcher was open about the purposes and ideals of his research.

Finally, researchers should honour any promises they make to subjects and should give credit to those who have aided them in their enquiry. This should be done in the acknowledgements section as well as in the Bibliography accompanying the report.

3.9.2 Limitations and constraints anticipated

It is undisputed that all research has limitations and constraints. Burns and Grove (2005) see limitations as restrictions or problems that may decrease the generalisation of research findings. Any credible researcher should try to address anticipated limitations and constraints in order to enhance validity of research results. Mouton (2001) states that it is imperative that researchers state possible challenges or imitations that they will face in the course of their study. The main limitations that the researcher experienced, anticipated and feared for included limited time, limited finance, errors in the construction of questionnaires as well as errors in data collection.

3.9.2.1 *Financial and temporal limitations*

As the research was financed by the University of South Africa's bureau of students' aid it definitely had its own limitations. The bureau financed course fees, conference fees and a few administrative items. This meant that the researcher had to foot bills of travelling to conferences in South Africa as well as hotel bills while attending conferences. Further, all costs towards research in Zimbabwe had to be footed by the researcher hence the localization of research in a bid to cut costs without strangling the study. The research was conducted when Zimbabwean civil servants were going through hard times, earning clearly meager salaries. The researcher, who was head of a school, had serious time constraints as he was a full time administrator. Often his work place demands did not allow him time enough to pursue his study. Often he had to work

on his project after working hours and at night. The study time frame and targets were often derailed.

3.9.2.2 *Errors in questionnaire construction*

Questions may be vague or ambiguous. This shortcoming will be minimized by pre-testing questionnaires. By trying out questionnaires the researcher will note and rectify any ambiguities as well as semantic shortcomings after studying responses given. In order to reduce ambiguities Converse and Presser (1986: 31 – 3) suggest the use of specific questions rather than general ones – similarly, it has been noted that questionnaires that are too long tend to compromise the quality of responses. Likewise, double barreled questions should be avoided in a questionnaire. Double barreled questions are two or more questions combined in one. These tend to cluster and cluster responses compromising the quality of research findings. Babbie (1998: 51) advises researchers to “use short and simple questions” in order to overcome these constraints.

3.9.2.3 *Errors in data collection*

Five errors the researcher anticipated, feared and tried to minimise while collecting data were

- a) interviewer/researcher bias
- b) distortion of facts by the researcher
- c) non-response by respondents targeted
- d) social desirability effects and
- e) falsified answers.

The solution to interviewer bias is objectivity. The researcher was goal oriented in his inquiry. The researcher was vigilant against giving respondents clues, positive or negative reinforcement or any other overt or covert influences. Interview bias can also take the form of influence the researcher’s presence has on his subjects. The mere presence of an investigator or stranger in a classroom may distort the situation and produce unusual reactions from pupils.

The five pre-research warm up lessons were prepared to psyche and stabilize the pupils so that when the research commences almost nothing unusual prevailed Best and Khan (1993) record inconsistency as a challenge to researchers. They argue that nobody is consistent from one moment to another. The teaching of all lessons by one researcher helps establish and maintain consistency. Consistency was greatly compromised if two or more teachers were used. Be that as it may, the lone researcher will always have to strive for consistency in his teaching

Distorted or false information greatly compromises research results. In order to minimise the distortion of facts the researcher recorded the respondents'/participants' responses promptly and in enough detail. Delayed note taking/recording may result in mental lapses, mental losses and serious compromise of results. Further, the issue of non-response by respondents was solved by having face to face interviews as well as engaging the respondents' supervisors.

The authority that school heads have helped achieve a high response rate as no subordinate would like to be seen in bad light by his head of office. The issue of social desirability effects was minimised through a thorough discussion of the questionnaire by the researcher and respondents. Respondents were asked to write only their personal opinions not what society, school heads or the Ministry of Education expected of them. The question asking teachers to state the language of instruction that they use routinely when teaching is a good example. Teachers, as was explained, had to state what language they practically use, not what they are expected to use. Furthermore, the problem of giving false responses was dealt with by the clause of anonymity. Respondents were assured that results were held and published in confidence and professionally. Respondents did not write their names and so giving false information would not help either party.

Finally, the researcher dealt with extraneous problems like researcher competence, the academic ability of pupils, the pupils socio-economic level as well as experimental mortality. The move by the researcher to personally conduct the research deals with the

issue of competence. The academic ability of pupils is not an issue as the group matching put the two classes almost at par. The pupils' poor socio-economic background was not a problem as it is representative of most Zimbabwean children.

In research, it is impossible to eliminate all extraneous variables but sound experimental design will enable the researcher to largely neutralise their influence. It goes without saying that all research involves error and the basis of sound design is to try to minimise error as far as possible. The most essential requirement for dealing with error and bias is the need to be conscious and aware that it exists and therefore has to be countered and/or minimised.

3.10 CONCLUSION

The chapter has revealed and discussed the methodology that will be used in this research. The research design, a combination of qualitative and quantitative research methods has been discussed and elaborated upon. The choices of research subjects as well as the sampling procedures employed in their selection have also been discussed. The methods of collecting, processing and analyzing data as well as the research instruments to be used have been pointed out and expatiated on. Finally, the chapter has addressed limitations and constraints to the research process as well as research ethics espoused and observed. The next chapter focuses on data presentation, processing and analysis.

CHAPTER 4

DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

The chapter presents the data collected during the course of research. Data collected will be scanned, sifted, organized in various ways and summarized. The presentation of data makes use of various statistical tools like tables, figures, graphs and text as and when necessary. The data presented will then be discussed. Findings are interpreted and their implications highlighted.

4.2 RESULTS ON THE STATUS OF ENGLISH AND SHONA IN ZIMBABWE

English had a higher status than Shona before independence, at independence and soon after. The functions that are given to a language in society determine the status the language will subsequently have. The greater the functions, the higher the status. Ngara (1980) found out that in twelve domains he investigated, English was functional in all while Shona was only full functional in three namely religious worship, as a school subject and as home language. In addition, Shona also had limited functions in three other domains namely use in courts of law, use as language of instruction as well as use on radio and television. The domains in which English was fully functional but Shona was not included public administration, official documentation, parliamentary publications, international communication as well as use in scientific and technical spheres.

The interviews with the heads of government departments were revealing. The results of the interviews clearly show the role, position and status of English in general administration and government business.

The interview with the Agricultural Research and Extension (Arex) head of department yielded the following results. In his department English was the official language of business, was a prerequisite for recruitment and training, was the medium of instruction

during training and was the language used at certification as well as on graduation ceremonies, similarly, English was the official language of correspondence, report writing and records compilation. Staff meetings were conducted in English and any communication was supposed to be done in English as well. According to the interviewee Shona was only used when engaging farmers at grassroots level. Asked about the wisdom and feasibility of replacing English with Shona the interviewee responded, "Not now, maybe in the distant future." The reasons given for the maintenance of the use of English as the official language were that literature in the department was mainly in English and Shona was not developed enough to replace English in the department's functions and activities.

With regard to the District Development Fund (D.D.F.) mechanisation department similar results came out. English was the official language of business, was a requirement at recruitment, was used at training and certification and was the medium used when making reports as well as compiling records. Staff meetings were conducted in English although at times a mixture of Shona and English would be used. However, Shona was predominantly used when dealing with clients seeking D.D.F. services like tillage, discing, borehole on the replacement of English by Shona in departmental functions, the department's spokesperson felt that it was not feasible as Shona did not have the relevant terminology yet. Terms like hectare, litre, square metre and kilometer. It is however a known fact that where Shona does not have relevant words many have been loaned, adopted and adapted to fill in conceptual gaps.

The situation in the police force was not at all different. English was still the official language for departmental business. English was a requirement when recruitment was undertaken. During training, lectures were conducted in English and all content in the law section of policing studies was in English. Police reports were also written in English even though those reporting cases could and often did so in Shona. All police records were written in English. Although staff meetings had to be conducted in English, often the person chairing switched from English to Shona and vice versa. It was also pointed out that Shona was extensively used during investigations and interrogations. When asked for his opinion on the replacement of English with Shona in police work the

interviewee was clearly for English citing that Shona was not as precise as English when making reports.

The language situation in the Veterinary department was not much different either. English was the language to use officially in all activities of the department. Furthermore, without a pass in English at 'O' level one could not be accepted for training. Only ancillary staff like dip attendants were exempted from this requirement. During training, lectures were in English, assignments were in English and certification was done in English. Likewise all reports and records were to be in English. Official communication was done in English and similarly staff meetings were conducted and minuted in English. Shona was only used meaningfully at grassroots level when engaging clientele during dipping, vaccination and similar errands. Asked if it would be advantageous to use Shona instead of English in the departments work, the interviewee gave an emphatic "No" as his answer citing that most Veterinary Science literature was in English including the names of drugs and diseases. The interviewee actually stated that many animal diseases were better and easily known by their English names than Shona citing foot and mouth as well as anthrax as examples.

The results of the interview with the spokesperson for the Zimbabwe National Statistics Agency department (Zimstat) were somewhat similar. English was the official language as stipulated by government. English was also a requirement for acceptance into training and was also used in compiling records, writing reports as well as in certification and graduation ceremonies. All communication in the department was in English. This included staff meetings. All training was done in English. Shona was used when field officers interacted with the populace during the gathering of information during surveys. Be that as it may, it was pointed out that before field officers went out to gather information, they were trained to use the relevant instruments using English first then Shona later. Quizzed on the wisdom and feasibility of using Shona instead of English in the department's business, the head of department clearly stood for the continued use of English, citing that English was appropriate as a lingua franca as Zimstat field officers came from different linguistic backgrounds.

The situation in the department of Health was not a lot different. As in other government departments English was the official language. In order to train as a health technician or otherwise prospective students needed to have a pass in 'O' level English. Lectures were conducted in English, certification was also done in English. The interviewee felt that it did not make any sense to replace English with Shona in the department's activities as the day to day terminology used was in English.

The situation that prevailed in the magistrates' courts was no exception. The interviewee was lively and empathic and articulated issues clearly. He said that English was the official language of business. It was also a Ministry (of Justice) requirement that all prospective employees hold a pass in English at least at 'O' level. He further added that at training lectures were in English, certification was in English, graduation ceremonies were conducted mainly in English while all communication – including staff meetings – was to be in English. Asked whether Shona could replace English in court business, the interviewee's answer was an emphatic "No!" accompanied by a despising laugh. The reasons he gave were that all literature including law itself was in English, English facilitated law business across frontiers and that English law terms like mitigation, plaintiff, defendant and others did not have exact equivalents in Shona.

The last department to be investigated was that of the information ministry. The spokesperson revealed that English was the language prescribed by government for official use. Journalists and other personnel in the department all had passes in 'O' level English as it was prerequisite for training. All records were to be written in English. The same applied to correspondence, minutes of staff meetings as well as reports in general. Questioned about the prospect of replacing English with Shona in the department business the interviewee said that he did not have strong objections as his department had a strong inclination to client servicing.

From the interviews with heads of government departments, it is clear that the position of the Zimbabwe government is that of English as the official language. A pass in English at 'O' level is a requirement for recruitment in all the eight departments investigated. Furthermore, all training, certification, report writing, compilation of records

and official communication are done in English, it is also clear from the interviews that the local language Shona is most effective when dealing with clients at grassroots level. The government appeared to subtly realize the strength of the local languages in mass mobilization. With regard to the replacement of English by Shona in government departments business, 7 out of 8 respondents were in favour of the continued use of English reflecting a negative attitude towards Shona. Such attitudes are reminiscent of a colonial and elitist mind and the attitude bearers were clear beneficiaries of the remnants of the colonial system of government.

The major reasons given for the continued use and preference for English in government business included that:

- Shona was not as precise as English in expression.
- English is a lingua franca where linguistic backgrounds were different among workers.
- Literature in government work places and departments was mostly in English.
- Shona did not have equivalent words/terms for many English words.
- Government policy had to be followed.

These results clearly reveal that English still has a higher status than Shona in government business. English was the official language in Rhodesia and still is thirty years after independence. English still remains an elitist language of rulership. Ngara (1982) and Magwa (2009) observe the same: English was and still is the official language enjoying higher status than all indigenous Zimbabwean languages. There is clear need for policy change. Any talk about Zimbabwean sovereignty is empty if the country and its nationals continue to rule under the yoke of a foreign language.

4.3 THE RESULTS OF THE INTERVIEWS WITH HEADS OF SCHOOLS AND EDUCATION INSPECTORS

The question on the language policy prevailing in schools was interesting. Although all respondents appeared to know the policy in place none could cite the exact policy

circular number prescribing it. They lamented and blamed the non-availability of policy circulars in the previous five years due to socio-economic hardships and constraints. What was clear in the respondents' responses was that Ministry policy stipulated English as the language of instruction in the teaching of all subjects of the curriculum except Shona.

The third question focused on the Ministry of Education, Sport, Arts and Culture (MOESAC)'s position with regard to the use of Shona as language of teaching in schools. The three Education Inspectors agreed that either English or Shona could be used as language of teaching in grades one, two and three. The four primary school Heads were conversant with this policy. The three secondary school heads were not clear on the language of instruction at primary school but knew very well the requirement at secondary school : to teach all subjects of the curriculum (except Shona) in English.

In response to questions 4 and 5 on language of instruction in teaching grade one, two and three Science all Education Inspectors and primary school Heads were unanimous that the language of teaching could either be English or Shona. The interviewees were however in agreement that in real practice the teachers taught the three grades' Science lessons in English with a lesser dose of Shona. When asked why teachers taught Science lessons in English ignoring the pupils' mother tongue the respondents gave two reasons namely.

- Science examinations were set in English and so it was wise to teach it in English.
- It was suspected that teachers were not conversant with policy provision allowing for the use of the pupils' mother tongue, Shona.

On the question of the teachers' comfort and competence in using English when teaching, inspectors and Heads of schools, all (but one Inspector) agreed that qualified teachers used English competently. One Inspector cited those recruited without a pass in 'O' level English as the culprits who struggled putting across ideas in English.

With regard to the 2010 grade seven and 'O' level results the three Inspectors and school Heads agreed that the subject passed best at grade seven level was Shona. At 'O' level there was no agreement. At one school Shona had been passed best, at another it was Geography and at the third school it was Mathematics. The reason given for the outstanding passes in Shona at grade seven level was that pupils and students understand better questions in their mother tongue than those in English.

Asked if the Science pass rate would improve if Science were taught in Shona, all Heads of schools and Inspectors agreed that it probably would. On being further asked if teaching Science in Shona was really feasible, 70% of the respondents thought it was not feasible citing that it would call for serious lobbying as the government of Zimbabwe appeared unwilling to change the policy. Respondents however felt that Shona could be used to teach other subjects of the curriculum if the affirmative policy were to be put in place. One Education Inspector actually said that Shona could be effectively used to teach History, Religious Studies and Agriculture but doubted if it could be used to teach Maths effectively. One of the three interviewees who were not in favour of the choice of Shona as a language of instruction clearly stated his opinion, "If you want stagnation in national development, teach Maths and Science in Shona." When asked to justify his stance he argued that the country will be isolated as it will be doing its own thing. "Where would you market Science or Maths graduates taught in Shona?" What was interesting was that the number of Science and Maths graduates exported was far less than those needed to work at home. Exports are just excess manpower.

4.4 RESULTS FROM THE PRIMARY SCHOOL TEACHERS' QUESTIONNAIRE

4.4.1 Personal Details

a) Sex and age

The total respondents from the primary school sector were sixty, 37 females and 23 males. Respondents were of ages ranging from twenty to sixty with the majority being in the 30 -49 age group. Table 4.1 below profiles the respondents' age group by sex.

Table 4.1: Primary School Teachers' Age Profile

Age Group	No. of Females	No. of Males	Total
20 – 29	7	4	11
30 – 39	15	4	19
40 – 49	12	10	22
50+	3	5	8
Total	37	23	60

b) Experience

A further look at the respondents' profile reveals that eighteen (30%) were beginning teachers while forty-two (70%) were in the senior teacher grade. Table 4.2 below summarises these details.

Table 4.2: Primary School Teachers' Experience Profile

Experience in Years	No. of Females	No. of Males	Total
0 – 5	14	4	18
6 – 10	8	4	12
11 – 15	7	4	11
16 – 20	4	5	9
21 – 25	3	6	9
26 – 30	1	0	1
Total	37	23	60

c) Professional Qualifications

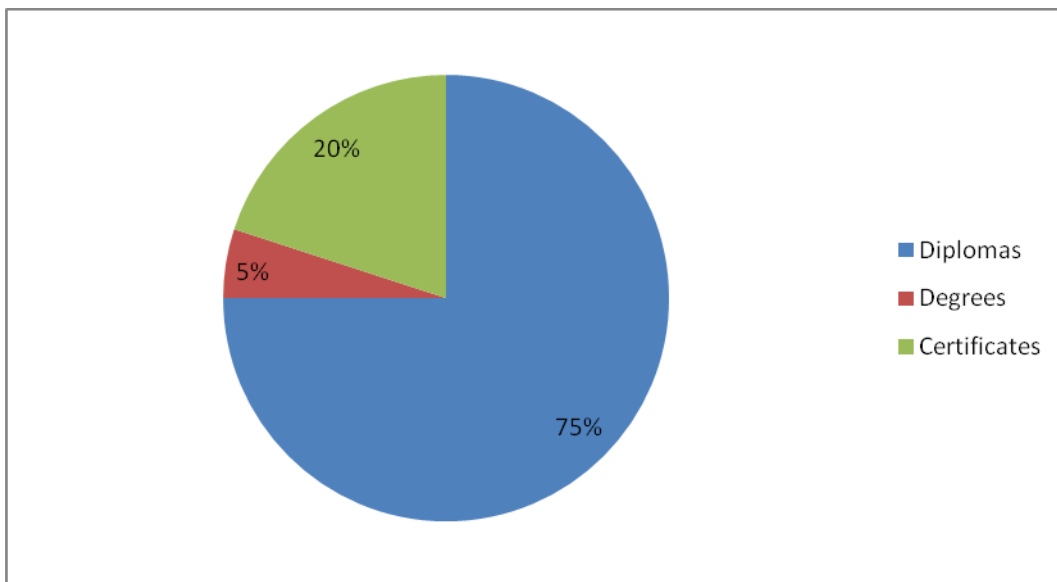
A look at the respondents' professional qualifications reveals that the majority of the teachers were holders of Diploma in Education (D.E.) while a few held Certificates in Education (C.E.). Only three teachers held degrees in education. Table 4.3 summaries the statistics.

Table 4.3: Primary School Teachers' Professional qualifications Profile

Sex	Holders of D.E.	Holders of C.E.	Degree Holders	Total
Female	31	5	1	37
Male	14	7	2	23
Total	45	12	3	60

From table 4.3 it can be deduced that holders of Diploma in Education constitute 75% of total respondents while holders of Certificate in education constituted 20% with degree holders constituting a paltry 5%. Portrayed pictorially the results are as show in the pie chart below, Figure 4.1.

Figure 4.1: Qualifications profile



4.4.2 Responses to Questions

Responses to the various questions in the questionnaire were both interesting and intriguing.

Questions 1 and 2

When respondents were asked to name the subject their class passed best in the previous term the majority responses pointed to Shona while other subjects featured less as depicted by Table 4.4 below.

Table 4.4: The subject passed best the previous term.

Subject	No. of Responses	Response %	Rank
English	7	11	3
Maths	12	20	2
Science	1	2	4
Shona	40	67	1
Total	60	100	

It would appear that there was a fundamental reason why about 67% of the classes passed Shona best. As an explanation for the classes' passes in Shona the reasons below, among others, were given.

- Pupils tend to understand Shona better than subjects taught in English (50% respondents.)
- Pupils are able to read and comprehend Shona better than English (20% of responses).
- Pupils express themselves better in Shona than in English (17,5% responses).
- Pupils like Shona (12,5% responses).

The first three responses were cited by 87,5% respondents while the last reason was cited by 12,5% respondents. The remaining 20 respondents cited other subjects and other reasons such as special effort put by the teachers.

Questions 3 and 4: The most difficult subjects and reasons why.

The third question required the respondent to cite three subjects in which their class faced most learning difficulties. The subjects were to be ranked beginning with the most difficult. The survey revealed that Science was the most difficult while Shona was the least. Table 4.5 sheds more light.

Table 4.5: Difficult subjects by Vote and Rank

Subject	Votes	Votes %	Rank
English	20	33.3	2
Maths	16	20.7	3
Science	22	36.7	1
Shona	2	3.3	4
Total	60	100	

It is interesting to note that although Science was regarded the most difficult by the majority respondents (36.7%) it piped English by just 3.4 percentage points. While Maths is regarded by many ordinary Zimbabweans as the most difficult subject, the respondents saw otherwise as Mathematics came a distant third with Shona ranked fourth being seen as the simplest.

Question 4 was a follow up to question 3 and sought to find out the reasons for the pupils' failure in the "difficult" subjects. Seventy-seven percent of the respondents cited the failure to read and understand the language of instruction and the language of examination as the main reason for failure. Eight out of sixty respondents (13%) felt that too much use of Shona by both teachers and learners in the teaching learning process was to blame. The remaining six out of sixty respondents (10%) cited other reasons like lack of examination preparation, negative attitudes to subjects and incompetent teaching by classroom practitioners. Two responses to question 3 are worth quoting and these are:

- Because the (failed) subjects are taught in English, pupils fail to understand them, so they (consequently) fail.
- The English language problem is affecting pupils' performance in learning Science as Science is taught and learned in English.

Question 5 and 6: The language used when teaching Science

Question 5 sought to find out the language teachers used when teaching Science. For convenience the results were analysed in two categories, namely results for grades 1 -3 (infant) teachers and those for grades 4 – 7 (junior) teachers. The question sought to test the teachers' knowledge and practice of the language policy prevailing in schools. Interestingly, most infant and most junior class teachers claimed that they conducted their lessons predominantly in English and added a sprinkling of Shona. Table 4.6 details these results.

Table 4.6: Language used by infant and junior classes when teaching Science

Language used	Infant Teachers	Junior Teachers	Total
English only	1	2	3
Mostly English and little Shona	12	19	31
English and Shona 50/50	8	3	11
Mostly Shona and a little English	6	8	14
Shona throughout	0	1	1
Total	27	33	60

Although government policy states that infants should be taught in the language they understand most, 3% of teachers taught Science in English only, while the majority, that is 44% taught their Science lesson mostly in English although with a little Shona. Thus 48% of the teachers (slightly less than 50%) appeared to be clearly violating government policy. Toeing government policy were only 6 out of 27 teachers who taught the infants in their home language (Shona) but added a little English. Of note, no teachers taught their classes using Shona only.

At grade four level, government policy changes and stipulates English as the medium of instruction. However the trend discernable with infant class teachers appears again with junior class teachers. Only 12% of the teachers taught their Science lessons exclusively in English while the majority 19 out of 33 teachers taught their lessons mostly in English but resorted to Shona here and there. Another 3 of the 33 teachers used English and Shona equally in their lessons while 8 out of 33 teachers taught their Science lessons mostly in Shona but with a little English. Interestingly, only one teacher used Shona only in executing his lessons. Overall, an interesting picture is discernible. Out of 60 teachers 57 executed their Science lessons using Shona to a great or to some extent. The teachers' resort to Shona implies that either English has a shortcoming as a language of instruction in teaching Science when used by teachers and pupils whose first language is not English.

Question 6 sought to find out the reasons for the use of the language of instruction indicated in question 5. The reasons given for the use of English were that:

- Teachers (except those for infant classes) were following government policy
- English has the appropriate scientific terminology.
- Scientific ideas were difficult to explain in Shona.
- Science was examined in English, so why teach in Shona?

The reasons given for the use of Shona in teaching Science were that:

- Shona ensured full understanding of data and concepts by pupils.
- Shona enhanced pupils' participation during the teaching learning process as there was no language barrier between pupils themselves, between the teacher and pupils or between the subject matter and the teacher or pupils.

Question 7

The question sought to find out the language in which teachers examine Science. The question intended to find out whether teachers follow government policy or not. All infant

teachers reported that they tested Science in English while all but one junior teachers also tested Science in English. The grade five teacher who indicated testing Science in Shona was the only exception. Table 4.7 summarises the statistics compiled.

Table 4.7: The language used to examine Science

Level	Votes for English	Votes for Shona
Infant	27/27	0
Juniors	32/33	1/33

Question 8: The advantages of teaching Science in English

The respondents cited a number of advantages of teaching Science in English. Among them were the following:

- As Science examinations were set in English, it was advantageous to teach the subject in the examination language.
- All Science textbooks used in Zimbabwe were in English, this eliminates translation costs.
- As English is an international language, pupils who learn Science in English open doors to international Scientific work.
- Some topics with taboo words, for example “Reproduction” would be taught easier.
- Science graduates will be marketable internationally.
- Science can be taught readily to people of different linguistic backgrounds.

Question 9: The disadvantages of teaching Science in English in Zimbabwe

A number of disadvantages were cited. Over 50% of the respondents argued that pupils will not fully understand what they learn as it will be taught in a language they did not fully understand. Most learning will be by rote. Other reasons given include the following:

- Pupils who do not understand English will not benefit anything from Science lessons taught in English.
- Infant pupils will find learning concepts in English quite challenging as they will be meeting English for the first time.
- Many pupils were likely to fail Science as reading, comprehending and articulating issues in English, let alone Science, will be a formidable challenge.
- Pupils will revere English and look down upon their own languages.

It is clear from the responses above that learning Science in English creates many teaching and learning challenges owing to the language barrier. One teacher summed it up in these words.

There are too many new English words, sentence patterns and scientific terms. It takes time for pupils to grasp the new language and then the Science concepts in the short learning time.

Question 10: Attitude to change in policy

The results of the survey reflect that the majority of respondents were not in favour of a policy change towards Shona as a language of instruction. Of the five teachers who majored in Shona at teachers' college, only one supported such change. Four opposed the change. Out of ten teachers who majored in Science, only four supported the change, while six opposed. Of the seven teachers who majored in other subjects only two supported the policy change with five opposing it. Overall, 15 out of 22 respondents, that is, 68.1% were not in favour of the change in policy with 22,9% in favour. The results reveal that the teachers' attitudes towards the use of Shona in teaching Science is clearly negative. Table 4.8 summarises these results.

Table 4.8: Support for policy change towards Shona

Subject Major	Respondents	Respondents in favour	Respondents opposed
Shona	5	1	4
Science	10	4	6
Others	7	2	5
Total	22	7	15

Support for policy change towards Shona as a language of instruction in teaching Science.

4.5 PRACTICAL TEACHING RESULTS

During research, the researcher interchangeably taught the lessons with the English lesson being taught before the one in Shona in Lesson 1 then starting with Shona and ending with that in English in Lesson 2. The sequence was followed to the last lesson, Lesson 20. All the grade four pupils wrote the progress check exercises but results processed and used were those of the first twenty-five pupils in each class. The control and experimental classes had been group matched using the classes performance in the end of year grade 3 examinations. The results of new-comers and those who were illiterate were not considered for this research. The class that was taught Science lessons in English was the control class while the class whose lessons were taught in Shona was the experimental class.

Lesson 1: Crop, Plants and Animals: Small creatures

The progress check exercises each had five questions. The questions reviewed the lesson taught. The lesson aimed at enabling pupils to identify and name small local creatures and to classify them according to their habitat among other variables.

Observations were that teaching the English lesson took three minutes longer than the Shona lesson. Results for the English lesson were 5 out of 5 for the best score and 0 out of 5 for the lowest score. The modal mark was 1 out of 5 although 13 out of 25 pupils, 52%, passed the exercise. Results for the Shona progress check exercise were 5 out of 5 for the highest score and 4 out of 5 for the lowest score. Incidentally the modal mark was also 5 out of 5 and a 100% pass rate was achieved. Pupils tended to be elaborate in their answers. Tables 4.9(a) and (b) summarise these results.

Table 4.9(a): Lesson 1 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
$\frac{5}{5}$	5	20	20	80
$\frac{4}{5}$	3	12	5	20
$\frac{3}{5}$	5	20		
-----	-----	-----	-----	-----
$\frac{2}{5}$	3			
$\frac{1}{5}$	8			
$\frac{0}{5}$	1			
Total	25	52	25	100

Table 4.9(b): Summary of Lesson 1 Results

Score	English	Shona
Highest mark	$\frac{5}{5}$	$\frac{5}{5}$
Modal mark	$\frac{3}{5}$	$\frac{5}{5}$
Class average	2.6	4.8
% Pass	52	100

The longer teaching time taken to teach English suggests that pupils understood easier and faster instruction in Shona. The experimental class performance in Shona is clearly much higher than that of the control class. This may imply better understanding of

concepts covered as well as the questions asked. In cases where pupils gave more than adequate and elaborate answers this may imply and reflect better understanding and mastery of issues by pupils.

Lesson 2: Crop, Plans and Animals: Small Animals

The experimental class was taught before the control class. The basic skills taught were identifying, naming and classifying. The progress check exercises had five questions each and at least five possible answers required. The time taken to teach the lessons was almost the same.

The results from the English lesson progress check test were interesting. Many pupils gave the correct answers but in wrong sentence structures. Two examples suffice.

- Question : How many legs does a bee have?
Answer : 6 many legs does a bee have.
- Question : Where does a wasp live?
Answer : Where does wasp live colony.

The results of the pupils' performance were that the highest score was 5 out of 5 whereas the lowest score was 0 out of 5. The modal mark was 2 out of 5, clearly below the pass mark. Only seven pupils scored more than 50% of the possible marks.

The results from the Shona lesson progress check exercise were equally intriguing. One response to a question follows.

- Question : *Ndekapi kapuka kanogara mumadhaka?*
: (Which small creature lives in mud?)
Answer : : *Wemusi* (instead of *nyongorosi*)
: (worm)

In the exercise written the highest mark scored was 5 out of 5 and the lowest mark was 2 out of 5. The modal mark was 4 out of 5, well above the 50% pass mark. A total 24 pupils out of 25 passed the progress check test. Tables 4.10(a) and 4.10(b) capture these results.

Table 4.10(a): Lesson 2 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
$\frac{5}{5}$	2	8	9	36
$\frac{4}{5}$	1	4	10	40
$\frac{3}{5}$	4	16	5	20
$\frac{2}{5}$	8			
$\frac{1}{5}$	5			
$\frac{0}{5}$	5			
Total	25	28	25	96

Table 4.10(b): Summary of Results for Lesson 2

Score	English	Shona
Highest mark	$\frac{5}{5}$	$\frac{5}{5}$
Lowest mark	$\frac{0}{5}$	$\frac{2}{5}$
Modal mark	$\frac{2}{5}$	$\frac{4}{5}$
Class average	1.8	4.0
% Pass	28	96

The results reveal that pupils performed much better in the Shona progress check exercise than in the one in English in almost all spheres. Although the highest mark attained was 5 out of 5 in both cases, Shona had nine scorers against two in English. The answers given in the English progress check exercises cited above clearly show the extent to which pupils struggle with the English language. The answer given in the

Shona progress check exercise cited above reveals how languages (in this cases Shona) borrowed and acclimatized/adapted the word worm to *wemusi* in Shona. Most pupils gave *wemusi* as the answer instead of *nyongorosi*. The lack of practice in using typical Shona words like *nyongorosi* militates against the preservation of the Shona language.

Lesson 3: Crop, Plants and Animals : Insects

The lesson basically wanted pupils to identify, draw and label parts of the body of any insect in general and a locust in particular. The exercise comprised five questions and five possible answers. The lessons took almost the same time to teach.

Observations were that the control class used Shona during group activity but when asked to articulate issues in English they often went dumb. In the English progress check exercise the highest score was 4 out of 5 and the lowest mark a paltry 0 out of 5. The results had bi-modal scores of 4 out of 5 and 2 out of 5. Eleven pupils out of twenty-five passed the test.

As for the Shona lesson, group discussions were lively and pupils participation was hinderance free and high. The highest mark scored was 5 out of 5 and attained by 14 of the 25 pupils. The lowest mark was 2 out of 5 scored by 2 of the 25 pupils. in all 23 out of 25 pupils passed the progress check exercise. Tables 4.11(a) and 4.11(b) shed more light on the results.

Table 4.11(a): Lesson 3 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
$\frac{5}{5}$	0	0	14	56
$\frac{4}{5}$	7	28	7	28
$\frac{3}{5}$	4	16	2	8
-----	-----	-----	-----	-----
$\frac{2}{5}$	7		2	
$\frac{1}{5}$	6			
$\frac{0}{5}$	1			
Total	25	44	25	92

Table 4.11(b): Summary of Results for Lesson 3

Score	English	Shona
Highest mark	$\frac{4}{5}$	$\frac{5}{5}$
Lowest mark	$\frac{0}{5}$	$\frac{2}{5}$
Modal mark	$\frac{4}{5}$ and $\frac{2}{5}$	$\frac{5}{5}$
Class average	2.4	4.3
% Pass	44	92

The results show that no pupil scored all marks in English yet fourteen pupils got everything correct in Shona. The percentage pass marks were 44 and 92 for English and Shona respectively. All other variables reflected above are in favour of Shona. All this information suggests a better understanding of the lesson taught in Shona than that taught in English.

Lesson 4: Crop, Plants and Animals: Comparing small animals

The progress check exercises had five questions each comprising of three data response questions, one open ended and one multiple choice question. The key skills

taught were identifying, comparing and deducing facts, the time taken to teach the two lessons was the same.

The results from the English, progress check exercise were that the highest score was 6 out of 6 and the lowest score 0 out of 6. The modal mark was 6 out of 6 with sixteen of the twenty-five scoring more than half the marks. The results from the Shona progress check were that the highest mark attained was 6 out of 6 and the lowest 3 out of 6. The modal mark was 6 out of 6 and was scored by 15 of the 25 pupils. It is pertinent to point out that all the 25 pupils passed the exercise. Tables 4.12(a) and 4.12(b) summarise and analyse these results.

Table 4.12(a): Lesson 4 results

Score	English (f)	English % pass	Shona (f)	Shona % pass
$\frac{6}{6}$	10	40	15	60
$\frac{5}{6}$	1	4	4	16
$\frac{4}{6}$	2	8	4	16
$\frac{3}{6}$	3	12	2	8
-----	-----	-----	-----	-----
$\frac{2}{6}$	5			
$\frac{1}{6}$	2			
$\frac{0}{6}$	2			
Total	25	64	25	100

Table 4.12(b): Summary of Results for Lesson 4

Score	English	Shona
Highest mark	$\frac{6}{6}$	$\frac{6}{6}$
Lowest mark	$\frac{0}{6}$	$\frac{3}{6}$
Modal mark	$\frac{6}{6}$	$\frac{6}{6}$
Class average	3.7	5.2
% Pass	64	100

The highest score in both lessons was 6 out of 6 but with 10 and 15 pupils passing English and Shona respectively. The lowest scores were 0 out of 6 and 3 out of 6 in favour of the experimental class. The overall pass rates of 64% for English and 100% for Shona confirm the dominant performance of pupils in the experimental class over the control class.

Lesson 5: Crop, Plants and Animals: The housefly

The lesson basically aimed at equipping pupils with knowledge the life cycle of a housefly. The progress check exercises had five questions each and a total nine answers. The English lesson took three minutes longer than the Shona lesson. In the English progress check exercise the highest score was 9 out of 9 and was attained by four pupils. The lowest score was 0 out of 9 and was attained by two pupils. Sixteen pupils out of twenty-five scored more than half the marks. The results for the Shona progress check exercise had a highest score of 9 out of 9 attained by ten pupils and a lowest score of 4 out of 9 attained by four pupils. In all 4 out of 25 pupils passed the exercise with at least 50% of the marks. Table 4.13(a) and 4.13(b) summarise and analyse the results. Interesting to note was the frequent borrowing of English terms in Shona answers. Viz “*Nhunzi inokandira mazai faifi handireti*” (A fly lays 500 eggs) instead of the Shona *mazana mashanu* (five hundred). Five hundred has been adopted and adapted to Shona. .

Table 4.13(a): Lesson 5 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
⁹ / ₉	4	16	10	40
⁸ / ₉	5	20	4	16
⁷ / ₉	2	8	1	4
⁶ / ₉	2	8	1	4
⁵ / ₉	3	12	8	32
-----	-----	-----	-----	-----
⁴ / ₉	1		1	
³ / ₉	2			
² / ₉	0			
¹ / ₉	3			
⁰ / ₉	3			
Total	25	64	25	96

Table 4.13(b): Summary of Results for Lesson 5

Score	English	Shona
Highest mark	⁹ / ₉	⁹ / ₉
Lowest mark	⁰ / ₉	⁴ / ₉
Modal mark	⁸ / ₉	⁹ / ₉
Class average	5.2	7.1
% Pass	64	96

The above results show how possible it is to develop the Shona language age by borrowing from English those terms that appear simpler and more functional. Further the dominance of the experimental class results in the five areas compared tends to suggest that pupils understand and learn better concepts in their mother tongue than in English.

Lesson 6: Crop, Plants and Animals: The mosquito

The lesson aimed at pupils knowing the life cycle of a mosquito. The progress check exercises had five questions each requiring an equivalent five answers. Teaching time was almost the same for the two lessons.

In the English progress check exercise ten pupils attained the highest mark of 5 out of 5 while two pupils got the least score of 0 out of 5. Overall fourteen pupils passed and eleven failed. The modal mark was 5 out of 5. In the Shona exercise ten pupils scored the highest mark of 5 out of 5 while the least score of 2 out of 5 was scored by one pupil only. Out of twenty-five pupils twenty-four passed. Tables 4.14(a) and 20(b) summarise and analyse these results.

Table 4.14(a): Lesson 6 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
$\frac{5}{5}$	10	40	10	40
$\frac{4}{5}$	2	8	9	36
$\frac{3}{5}$	2	8	5	20
-----	-----	-----	-----	-----
$\frac{2}{5}$	7		1	
$\frac{1}{5}$	2			
$\frac{0}{5}$	2			
Total	25	56	25	96

Table 4.14(b): Summary of Results for Lesson 6

Score	English	Shona
Highest mark	$\frac{5}{5}$	$\frac{5}{5}$
Lowest mark	$\frac{0}{5}$	$\frac{2}{5}$
Modal mark	$\frac{5}{5}$	$\frac{5}{5}$
Class average	3.2	4.12
% Pass	56	96

According to the results tables above the modal and highest mark for both lessons was the same 5 out of 5. It would appear the two languages were equally effectively utilized during instruction but alas, a look at the number of pupils passing the test tells a different story. The experimental class had a whopping 96% pass rate compared to the control class' meager 56%. The results apparently point to the great advantage there is in teaching using the pupils mother tongue (Shona) compared to teaching in English. The class average of 4.12 for Shona compared to 3.2 for English reinforce this supposition.

Lesson 7: Crop, Plants and Animals – Harmful creatures

The lesson focused on pupils developing knowledge of harmful creatures. All pupils involved in the study took part. The progress check exercises had six questions each. These were data response questions in entirety and required six answers.

It was observed that the lesson in English took five minutes more to teach than the lesson in Shona. The results for the lesson in English were the highest score of 6 out of 6 attained by one pupil and the lowest score of 0 out of 6 again attained by one pupil. Thirteen pupils failed the exercise while twelve passed. The modal mark, attained by seven pupils, was 4 out of 6. The class average mark was 2.44. Results for the lesson in Shona were the highest score of 6 out of 6 attained by fourteen pupils and a lowest score of 0 out of 6 scored by one pupil. Overall, twenty-two pupils passed the exercise while three failed. Fourteen pupils attained the modal mark of 6 out of 6 while the class average was 4.84. Tables 4.15(a) and 4.15(b) summarise and compare these results.

Table 4.15(a): Lesson 7 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
$\frac{6}{6}$	1	4	14	56
$\frac{5}{6}$	0	0	4	16
$\frac{4}{6}$	7	28	2	8
$\frac{3}{6}$	4	16	2	8
$\frac{2}{6}$	3		1	
$\frac{1}{6}$	9		1	
$\frac{0}{6}$	1		1	
Total	25	48	25	88

Table 4.15(b): Summary of Results for lesson 7

Score	English	Shona
Highest mark	$\frac{6}{6}$	$\frac{6}{6}$
Lowest mark	$\frac{0}{6}$	$\frac{0}{6}$
Modal mark	$\frac{4}{6}$	$\frac{6}{6}$
Class average	2.4	4.8
% Pass	48	88

The modal marks of 4 out of 6 for the lesson in English and 6 out of 6 for the one in Shona clearly reveal the edge that Shona has over English as a language of instruction. The same goes for the overall passes that is twelve (48%) for English and twenty-two (88%) for Shona. The class average for the lesson in Shona outclass that for the lesson in English. This dominance clearly corroborate the edge that Shona has over English as a medium of instruction.

Lesson 8: Crop, Plants and Animals: Useful creatures

The lesson focused on useful animals and insects locally. All pupils without exception took part in the lessons and progress check exercises. Progress check exercises comprised open-ended and data response questions. Each exercise had five questions requiring an equivalent five answers.

The teaching time for the control class was eight minutes longer than that taken with the experimental class. The highest score in the English progress check exercise was 5 out of 5 and the lowest score was 0 out of 5. Four pupils scored 5 out of 5. Twelve scored a dismal 0 out of 5. Incidentally 0 out of 5 was the modal mark while the class average was a paltry 1.72. Results from the progress check exercise in Shona included the highest score of 5 out of 5 and the lowest score of out of 5. Fourteen pupils got all answers correct and three scored nothing. The modal mark was 5 out of 5 and the class average was 3.64. Table 4.16 gives more information on the lessons' results.

Table 4.16(a): Lesson 8 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
$\frac{5}{5}$	4	16	14	56
$\frac{4}{5}$	2	8	3	12
$\frac{3}{5}$	1	4	1	4
-----	-----	-----	-----	-----
$\frac{2}{5}$	6		2	
$\frac{1}{5}$	0		2	
$\frac{0}{5}$	12		3	
Total	25	28	25	72

Table 4.16(b): Summary of Results for lesson 8

Score	English	Shona
Highest mark	$\frac{5}{5}$	$\frac{5}{5}$
Lowest mark	$\frac{0}{5}$	$\frac{0}{5}$
Modal mark	$\frac{0}{5}$	$\frac{5}{5}$
Class average	1.7	3.6
% Pass	28	72

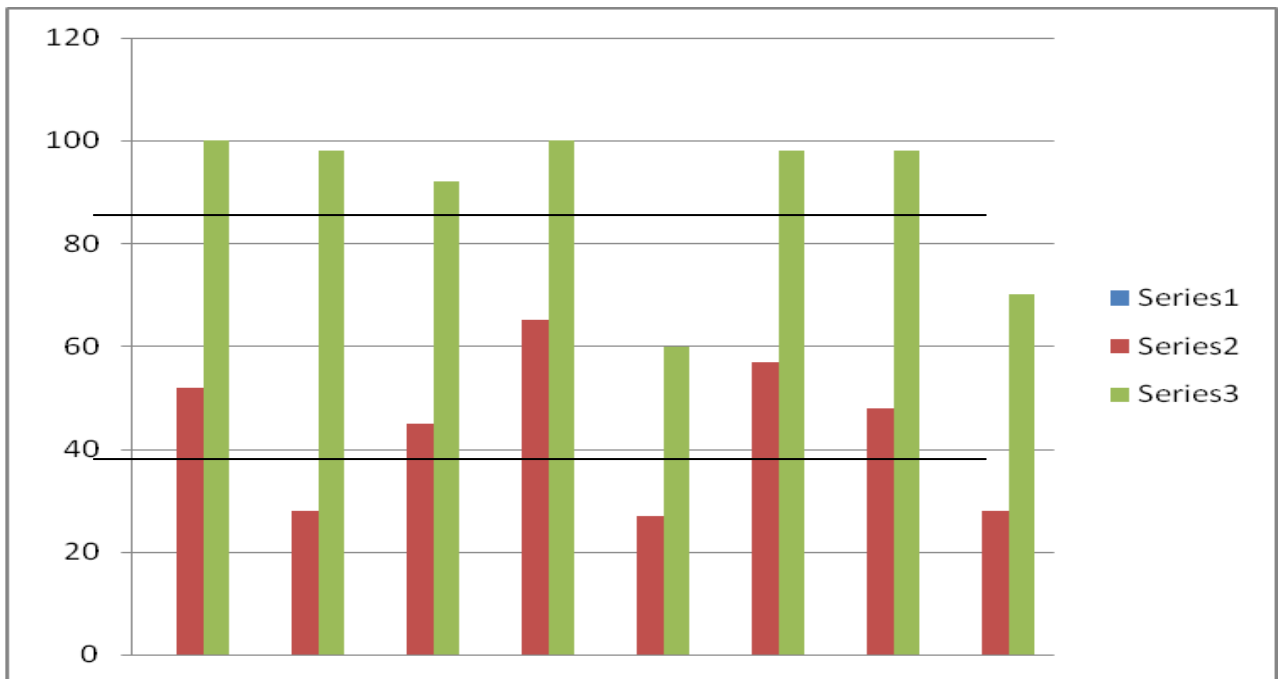
Although the highest and lowest marks scored in both exercises were the same it is prudent to point out that the Shona exercise had ten more pupils scoring everything than the exercise in English, while the exercise in English had nine more pupils scoring zero than those in the exercise in Shona. In addition the modal mark, the class average and the percentage pass rate were all in favour of the exercise in Shona. The (above) results clearly suggest the dominance in performance by pupils taught in Shona compared to those taught in English.

Lessons 1 – 8: Comparison of Performance

The column graph in figure 4.2 below gives a pictorial view of the difference in performance between the control class and the experimental class. In all the eight lessons performance in the lessons taught in Shona clearly outclassed that of those taught in English. The average pass rate for the lessons taught in English was 43.5% against 85% for those taught in Shona.

Average performance in the latter doubled performance in the former.

Figure 4.2: Lesson pass rates compared



Lesson 9: Health and Pollution: Digestion

All targeted pupils took part in the project. The progress check exercises had five questions each and five answers were expected. The lesson aimed at enabling pupils to explain digestion in the mouth.

In the progress check exercise in English only one pupil got everything correct, that is 5 out of 5 while nine pupils scored 0 out of 5. Overall nine pupils passed and sixteen failed. The modal mark was an agonizing 0 out of 5. In the same vein, the results for the progress check exercise in Shona were the highest score of 5 out of 5 attained by ten pupils and the lowest score of 0 out of 5 attained by four pupils. In all there were twenty passes and five failures. The modal mark was 5 out of 5. Tables 4.17(a) and 4.17(b) give the details of performance by the two classes as well as comparison of the results.

Table 4.17(a): Lesson 9 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
$\frac{5}{5}$	1	4	10	40
$\frac{4}{5}$	2	8	8	32
$\frac{3}{5}$	6	24	2	8
-----	-----	-----	-----	-----
$\frac{2}{5}$	2		0	
$\frac{1}{5}$	5		1	
$\frac{0}{5}$	9		4	
Total	25	36	25	80

Table 4.17(b): Summary of Results for lesson 9

Score	English	Shona
Highest mark	$\frac{5}{5}$	$\frac{5}{5}$
Lowest mark	$\frac{0}{5}$	$\frac{0}{5}$
Modal mark	$\frac{0}{5}$	$\frac{5}{5}$
Class average	1.6	3.5
% Pass	36	80

Although the highest mark in both progress exercises was 5 out of 5 and the lowest mark was 0 out of 5, further analysis and comparison of results reveals that performance in the lesson conducted in Shona was much better than in the lesson conducted in English. The modal mark for the lesson conducted in Shona; 5 out of 5, is miles ahead of the lesson conducted in English; 0 out of 5. Similarly, the class average performance mark of 3.5 against 1.6 and the class pass rate of 80% against 36% are clearly skewed in favour of the lesson conducted in Shona. The results of this lesson suggest Shona has an edge over English as a language of instruction in teaching Science.

Lesson 10: Health and Pollution: Structure of the gut

The lesson aimed at developing the pupils' ability to draw and label the digestive system correctly. The progress check exercises tested the pupils ability to label seven parts of the alimentary canal. The time taken to teach the two lessons were almost the same, thirty minutes each. The main challenge pupils faced was writing the parts of the gut with the correct English spelling.

In the Science lesson taught in English, the highest score was 7 out of 7 attained by seven pupils whilst the lowest score was 0 out of 7 and scored by two pupils. The mode was 7 out of 7. Fifteen pupils passed and ten failed. The results from the Science lesson taught in Shona progress check exercise were that nineteen pupils scored 7 out of 7 while the lowest score of 5 out of 7 was attained by two pupils. The modal mark was a district 7 out of 7 scored by nineteen pupils. Overall twenty-five pupils passed. Details of the pupils' performance are shown in tables 4.18(a) and 4.18(b).

Table 4.18(a): Lesson 10 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
$7/7$	7	28	19	76
$6/7$	2	8	4	16
$5/7$	3	12	2	8
$4/7$	3	12		
$3/7$	2			
$2/7$	3			
$1/7$	3			
$0/7$	2			
Total	25	60	25	100

Table 4.18(b): Summary of Results for lesson 10

Score	English	Shona
Highest mark	7/7	7/7
Lowest mark	0/7	5/7
Modal mark	7/7	7/7
Class average	4.1	6.6
% Pass	60	100

The highest mark obtained was 7 out of 7 in both lesson. The lowest scores of 0 out of 7 and 5 out of 7 for the lessons taught in English and Shona respectively proves that pupils understood better the lesson taught in Shona. The class average mark as well as the percentage pass rate are clearly in favour of the lesson taught in Shona. Overall the results apparently point to the fact that Shona has an edge over English in teaching Science in the setting of this research.

Lesson 11: Health and Pollution: Digestion

The focus of the lesson was to enable pupils to explain the process of digestion in the gut as well as state what happens at different points in the gut. All pupils took part in the investigation. The progress check exercises had seven questions each and seven answers were required. The lesson conducted in English took thirteen minutes longer than the one conducted in Shona. Explaining and understanding terms like absorption, digestion and others presented challenges to the researcher and pupils in the lesson taught in English.

As for the lesson conducted in English, the highest mark scored was 7 out 7 and the lowest mark was 1 out of 7. These marks were scored by two and one pupil respectively. The modal mark scored by nine pupils was 2 out of 7. Overall there were nine passes and sixteen failures. The results for the lesson taught in Shona were the highest mark of 7 out of 7 scored by sixteen pupils and the

Lowest mark of 3 out of 7 scored by one pupil. The highest score attained was incidentally the class mode. In all, twenty four passes and one failure were recorded. Tables 4.19(a) and 4.19(b) shed more light on these results.

Table 4.19(a): Lesson 11 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
7/7	2	8	16	64
6/7	0	0	2	8
5/7	3	12	2	8
4/7	4	16	4	16
3/7	6		1	
2/7	9			
1/7	1			
0/7	0			
Total	25	36	25	96

Table 4.19(b): Summary of Results for lesson 11

Score	English	Shona
Highest mark	7/7	7/7
Lowest mark	1/7	4/7
Modal mark	2/7	7/7
Class average	3.2	6.1
% Pass	36	96

The longer teaching time taken during the lesson taught in English foreboded trouble. It was an indicator of the trouble the teacher and the pupils experienced while learning Science in English. The results were therefore not surprising. Pupils performed better in the progress check conducted in Shona than in English. This probably indicated better

pupil understanding and articulation of issues when they learn in their mother tongue. The modal mark, class average and pass rate – skewed in favour of the lesson taught in Shona – all corroborate this view point.

Lesson 12: Weather: Zimbabwe's seasons

The lesson objective aimed at enabling pupils to name the four seasons in Zimbabwe as well as to describe the features of each season. Pupils were also supposed to write the duration of each season. All the pupils took part in the two lessons, the progress check exercises comprised six questions each but requiring nine answers.

Observations were that pupils were more conversant with the English names of months than the Shona ones resulting in many pupils giving answers in English to questions in Shona. One answer to question 4 in the Shona progress check exercise went thus:

- Question : *Ndeupi mwedzi unonyanyisa kutohora muZimbabwe?*
(Which is the coldest month in Zimbabwe?)
Answer : July (instead of *Chikunguru* in Shona.)

Results for the progress check exercise in English revealed that the highest score was 9 out of 9 and attained by one pupil while the lowest score was 0 out of 9 and attained by four pupils. The modal mark was 2 out of 9. Nine out of twenty-five pupils passed the exercise. The results for the progress check exercise in Shona revealed that the highest mark scored by pupils was 9 out of 9 and attained by nine pupils with the lowest mark being 3 out of 9 scored by two pupils. The modal mark was 9 out of 9. Twenty-two of the twenty-five pupils passed the test. Table 4.20(a) and 4.20(b) summarise and compare the results.

Table 4.20(a): Lesson 12 results

Score	English (f)	English % pass	Shona (f)	Shona % pass
$\frac{9}{9}$	1	4	9	36
$\frac{8}{9}$	3	12	5	20
$\frac{7}{9}$	2	8	4	16
$\frac{6}{9}$	0	0	3	12
$\frac{5}{9}$	3	12	1	4
-----	-----	-----	-----	-----
$\frac{4}{9}$	2		1	
$\frac{3}{9}$	1		2	
$\frac{2}{9}$	5			
$\frac{1}{9}$	4			
$\frac{0}{9}$	4			
Total	25	36	25	88

Table 4.20(b): Summary of Results for lesson 12

Score	English	Shona
Highest mark	$\frac{9}{9}$	$\frac{9}{9}$
Lowest mark	$\frac{0}{9}$	$\frac{3}{9}$
Modal mark	$\frac{2}{9}$	$\frac{8}{9}$
Class average	3.4	7.2
% Pass	36	88

From the comparison of results, it is clear that pupils who learned Science in Shona understood the content much better than those who learned the subject in English. The class average, the percentage pass rate as well as the modal mark are all in favour of instruction in the mother tongue. The use of English words to answer questions in Shona reveals that pupils were not using their mother tongue effectively to best

advantage. Relevant words were not being operationalised and risked becoming obsolete.

Lesson 13: Weather: The Thermometer

The lesson aimed at equipping children with knowledge of the use of a thermometer as well skills in drawing and labeling (parts of) a thermometer. The two lessons were conducted as scheduled and pupils participated satisfactorily. The progress check excises each had six questions that required nine answers. The lesson in English took five minutes longer than the lesson in Shona. While marking, the researcher, noted that pupils struggled a lot with spelling English words. Spellings like “*choub*” for tube, “*skel*” for scale and “*gilasi*” for glass were quite common yet on the contrary adopting and adapting words like mercury, thermometer and degree to Shona was not problematic.

The progress check exercise written in English produced the following results. The highest mark scored was 7 out of 9 and the lowest was 1 out of 9 attained by six and one pupil respectively. The mark scored by most pupils was 2 out of 9. Eleven pupils passed compared to fourteen failures. The lesson in Shona produced these results. Only one pupil got everything correct while three pupils scored the lowest mark of 2 out of 9. The mark scored by five pupils was 4 out of 9. Overall thirteen pupils passed. The results are summarized and compared in tables 4.21(a) and (b).

Table 4.21(a): Lesson 13 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
$\frac{9}{9}$	0	0	1	4
$\frac{8}{9}$	0	0	3	12
$\frac{7}{9}$	6	24	2	8
$\frac{6}{9}$	1	4	4	16
$\frac{5}{9}$	4	16	3	12
-----	-----	-----	-----	-----
$\frac{4}{9}$	3		5	
$\frac{3}{9}$	3		4	
$\frac{2}{9}$	7		3	
$\frac{1}{9}$	1			
$\frac{0}{9}$	0			
Total	25	44	25	52

Table 4.21(b): Summary of Results for lesson 13

Score	English	Shona
Highest mark	$\frac{7}{9}$	$\frac{9}{9}$
Lowest mark	$\frac{1}{9}$	$\frac{2}{9}$
Modal mark	$\frac{2}{9}$	$\frac{4}{9}$
Class average	4.1	4.9
% Pass	44	52

Looking at table 21(b) it is clear all results are in favour of pupils who learned Science in Shona. Although the pass rates are in this instance not far apart, the trend of skews prevails. The narrow difference in pass rate could be due to outside factors such as the fact that the concepts taught were unfamiliar with the pupils from which ever angle one would look at them.

Lesson 14: Materials and Technology: Tools and their use.

All seventy pupils took part in the project and wrote the progress check exercises in which they were required to identify ten tools as well as state the use of each tool. The lessons sought to enable pupils to identify and name tools on a given chart then state and demonstrate their uses.

Observations were that the lesson taught in English took four minutes longer than the one taught in Shona. It was interesting to note pupils fail to say the names of tools they appeared familiar with such as screw-driver and awl whose use they clearly knew. A further point of interest was the failure by pupils to give Shona names for tools like pliers and spade, pincers and shovel. They generalized names citing *foshoro* (shovel) for both spade and shovel and *pinjisi* (pincers) for both pliers and pincers

The results were as follows: the highest and lowest scores attained by one pupil each were 18 out of 20 and 0 out of 20 respectively for the lesson taught in English. The mode was 1 out of 20. There were fourteen passes and eleven failures. The lesson taught in Shona produced the following results. The highest score was 20 out of 20 and the lowest was 11 out of 20. One pupil scored highest while for scored lowest. The mode of 12 out of 20 was scored by seven pupils. Overall, all pupils passed the test. Tables 4.22(a) and 4.22(b) summarise and analyse these results.

Table 4.22(a): Lesson 14 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
20/20	0	0	1	4
19/20	0	0	1	4
18/20	1	4	1	4
17/20	1	4	1	4
16/20	1	4	0	0
15/20	1	4	5	20
14/20	2	8	2	8
13/20	2	8	3	12
12/20	1	4	7	28
11/20	3	12	4	16
10/20	2	8	0	0
9/20	1		1	
8/20	2			
7/20	1			
6/20	0			
5/20	0			
4/20	0			
3/20	2			
2/20	0			
1/20	4			
0/20	1			
Total	25	56	25	100

Table 4.22(b): Summary of Results for lesson 14

Score	English	Shona
Highest mark	$^{18}/_{20}$	$^{20}/_{20}$
Lowest mark	$^0/_{20}$	$^{11}/_{20}$
Modal mark	$^1/_{20}$	$^{11}/_{20}$
Class average	9.1	14.6
% Pass	56	100

In lesson 14 the highest score was attained in the Shona progress check exercise compared to the one in English. Similarly the lowest mark obtained in the Shona lesson exercise was higher than the lowest mark in the English progress check exercise. The class average was about five points higher in the Shona progress check exercise than that in English. Likewise the pass rate for the Science lesson in Shona was 100% compared to 56% for the lesson in English. A cursory look at table 4.23(a) shows an almost normal performance distribution for the lesson in English compared to a clearly positive skew for the lesson in Shona. These results suggest a better understanding and performance when pupils are taught in Shona compared to when they are taught in English.

Lesson 15: Materials and Technology: What are tools made of?

The lesson aimed at equipping pupils with knowledge of what tools are made of. All targeted pupils took part in the lessons and progress check exercises. Progress check exercises comprised seven questions each requiring an equivalent seven answers. Questions were mixed varying from data response, to item matching and open ended ones. The time taken to teach the two lessons was almost equal.

During the course of lesson, pupils acquired a lot of vocabulary such as “mirror” for looking glass. They also learned the Shona words *chionioni* and *chiringiro* for mirror. In the progress check exercise in English the highest score was 7 out of 7 and scored by two pupils while the lowest score of 0 out of 7 was attained by six pupils. Incidentally the

lowest score was also the mode. In all, six pupils passed and nineteen failed. As for the results for the lesson in Shona the highest mark was 7 out of 7 attained by ten pupils while the lowest score of 3 out of 7 was attained by only one pupil. The highest score in this exercise was also the mode. In all twenty four pupils passed with only one failing. Tables 4.23(a) and 4.23(b) summarise and analyse these results.

Table 4.23(a): Lesson 15 results

Score	English (f)	English % pass	Shona (f)	Shona % pass
$\frac{7}{7}$	2	8	10	40
$\frac{6}{6}$	0	0	6	24
$\frac{5}{7}$	3	12	4	16
$\frac{4}{7}$	1	4	4	16
-----	-----	-----	-----	-----
$\frac{3}{7}$	4		1	
$\frac{2}{7}$	5			
$\frac{1}{7}$	4			
$\frac{0}{7}$	6			
Total	25	24	25	96

Table 4.23(b): Summary of Results for lesson 15

Score	English	Shona
Highest mark	$\frac{7}{7}$	$\frac{7}{7}$
Lowest mark	$\frac{0}{7}$	$\frac{3}{7}$
Modal mark	$\frac{0}{7}$	$\frac{7}{7}$
Class average	2.3	5.8
% Pass	44	96

The summary table comparing results highlights shows better performance by pupils in the progress check exercise given in Shona. Although the highest mark scored is 7 out

of 7 in both exercises, eight more pupils scored this mark in Shona than English. Similarly, the lowest marks are 0 out of 7 in English and 3 out of 7 in Shona while the modal marks were 0 out of 7 and 7 out of 7 in Shona. These were clearly in favour of the lesson taught in Shona. The class average and the percentage pass rates are all clearly in favour of the lesson taught in Shona. A cursory look at the frequency table reveals that the results are positively skewed in the Shona progress check exercise. It may indeed show that with regard to teaching Science to grade four pupils whose first language is Shona, the mother tongue is a better medium of instruction than English, a second language to them.

Lesson 16: Materials and Technology: Tools belong to different groups

The lesson aimed at acquainting pupils with knowledge of different tools and enabling pupils to classify the tools appropriately and competently.

The progress check exercises administered had six questions each and each exercise required six answers. These exercises comprised data response and open ended questions. The time taken to teach the Science lesson in English took ten minutes longer than the lesson taught in Shona.

It was observed that more pupils passed data response questions than open ended questions in the progress check exercise in English. The results for the progress check exercise were the highest mark of 5 out of 6 attained by only one pupil and the lowest mark of 0 out of 6 attained by four pupils. The modal mark was 1 out of 6 attained by seven pupils. In all eleven pupils passed with fourteen failing. As for the results for the progress check exercise in Shona, six pupils scored everything correct, while only one pupil scored the lowest mark of 1 out of 6. The mode was 5 out of 6 and in all twenty-three pupils passed the exercise with only two failing. Tables 4.24(a) and 4.24(b) capture the full information on the pupils' performance in the progress check exercises analysing and comparing them in the process.

Table 4.24(a): Lesson 16 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
$\frac{6}{6}$	0	0	6	24
$\frac{5}{6}$	1	4	9	36
$\frac{4}{6}$	5	20	6	24
$\frac{3}{6}$	5	20	2	8
-----	-----	-----	-----	-----
$\frac{2}{6}$	3		1	
$\frac{1}{6}$	7		1	
$\frac{0}{6}$	4		0	
Total	25	44	25	92

Table 4.24(b): Summary of Results for lesson 16

Score	Shona	English
Highest mark	$\frac{5}{6}$	$\frac{6}{6}$
Lowest mark	$\frac{0}{6}$	$\frac{1}{6}$
Modal mark	$\frac{1}{6}$	$\frac{5}{6}$
Class average	2.1	4.5
% Pass	44	92

The results summary and comparison show higher and better scores for the progress check exercises administered in Shona than the one administered in English. The dominance in performance by the Shona exercise clearly suggests better pupil understanding and articulation of concepts when taught in their mother tongue.

Lesson 17: Materials and Technology: A plough

All pupils participated as expected. The lesson focused mainly on knowledge of the ox-drawn plough, its component parts and its uses. The progress check exercise was exclusively labeling seven parts of a plough.

The time taken to teach the lesson in English was almost the same with that taken to teach the one in Shona. From the teaching experience pupils seemed to be familiar with a plough but did not know the correct names for the component parts either in Shona or English.

Results for the progress check exercise done in English were the highest score of 7 out of 7 attained by nine pupils and the lowest score of 3 out of 7 attained by three pupils. Incidentally the highest score was the mark scored by most pupils. In all twenty-two pupils passed. The results for the progress check exercise conducted in Shona were not very different. Fifteen pupils scored all points while the lowest mark was 4 of 7 scored by two pupils. The modal mark was 7 out of 7 and all twenty-five pupils passed. Tables 4.25(a) and (b) summarise and compare these results.

Table 4.25(a): Lesson 17 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
$\frac{7}{7}$	9	36	15	60
$\frac{6}{7}$	6	24	5	20
$\frac{5}{7}$	4	16	3	12
$\frac{4}{7}$	3	12	2	8
-----	-----	-----	-----	-----
$\frac{3}{7}$	3			
$\frac{2}{7}$				
$\frac{1}{7}$				
$\frac{0}{7}$				
Total	25	88	25	100

Table 4.25(b): Summary of Results for lesson 17

Score	Shona	English
Highest mark	$\frac{7}{7}$	$\frac{7}{7}$
Lowest mark	$\frac{3}{7}$	$\frac{4}{7}$
Modal mark	$\frac{7}{7}$	$\frac{7}{7}$
Class average	5.6	6.3
% Pass	88	100

The comparison of results in the table above reflects that the highest mark scored for both exercises was 7 out of 7 and was incidentally the modal mark in both cases. The class average and percentage pass rate are skewed in favour of the progress check exercise conducted in Shona. The apparent small difference between class averages and percentage pass rates was probably due to the nature of the lesson and the progress check exercises. There was not much language work in English required it was just recalling the parts of the plough and identifying them.

Lesson 18: Landforms and Maps: Grid reference

The progress check exercise was based only on one concept: grid reference. Pupils were required to give the grid references of specific features on a map and to locate features whose grid references were given. The progress check exercises each had seven questions requiring seven answers.

The progress check exercise had only one instruction: Give the grid reference of ... The lesson content was mainly mechanical and mathematical. Some pupils reversed the order of the digits and a number found the concept difficult to grasp.

The results for the progress check exercise in English revealed that five pupils attained the highest possible mark of 7 out of 7. Four pupils scored zeros The modal mark was 1 out of 7 attained by nine pupils. In all, ten pupils passed and fifteen failed. On the other hand, the results for the progress check exercise in Shona were that the highest

possible score of 7 out of 7 was scored by fifteen pupils and was incidentally the modal mark. The lowest mark scored was 2 out of 7 and was attained by one pupil only. In all, nineteen passes and six failures were realized. Tables 4.26(a) and (b) summarise and analyse these results.

Table 4.26(a): Lesson 18 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
$7/7$	5	20	15	60
$6/7$	2	8	1	4
$5/7$	2	8	2	8
$4/7$	1	4	1	4
-----	-----	-----	-----	-----
$3/7$	0		5	
$2/7$	2		1	
$1/7$	9			
$0/7$	4			
Total	25	40	25	76

Table 4.26(b): Summary of Results for lesson 18

Score	Shona	English
Highest mark	$7/7$ (5)	$7/7$ (15)
Lowest mark	$0/7$	$2/7$
Modal mark	$1/7$	$7/7$
Class average	2.9	5.6
% Pass	40	76

The highest mark of 7 out of 7 obtained in both progress check exercises suggests that both languages, English and Shona, are effective as media of instruction. However, the

disparity in the number of pupils scoring 7 out of 7 is clearly in favour of pupils who learned the lesson in Shona. Likewise, the lowest mark of 2 out of 7 scored in the Shona progress check exercise is clearly higher than that scored in English. The modal mark, the class average and the percentage pass rate for the progress check exercise in Shona are markedly higher than those obtained in the English exercise suggesting better understanding of concepts taught in Shona than in English.

Lesson 19: Landforms and Maps: Maps and Grids

The focus of the lesson was to enable pupils to tell the grid references of given features on a real map. There was therefore less reading and comprehension work in the progress check exercises. All pupils took part. Seven answers were required. The teaching times were almost the same differing by less than two minutes.

Pupils who had problems learning the lesson content faced challenges telling the correct eastings and/or northings as well as the correct order when writing the grid references. They faced more mechanical than linguistic challenges.

The progress check exercises yielded the following results. The highest mark for the exercise in English was 7 out of 7 and attained by eight pupils. The lowest score was 0 out of 7 and attained by five pupils. The mode was also 7 out of 7. In all, thirteen pupils passed while twelve failed. Regarding the progress check exercise in Shona, the highest score attained was 7 out of 7 although scored by only two pupils. The modal mark was 5 out of 7. In all sixteen pupils passed while nine failed. Tables 4.27(a) and (b) reflect fully the results for lesson 19.

Table 4.27(a): Lesson 19 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
7/7	8	32	2	8
6/7	1	4	4	16
5/7	4	16	8	32
4/7	0		2	8
3/7	1		5	
2/7	5		3	
1/7	1		1	
0/7	5		0	
Total	25	52	25	64

Table 4.27(b): Summary of Results for lesson 19

Score	Shona	English
Highest mark	7/7	7/7
Lowest mark	0/7	1/7
Modal mark	7/7	5/7
Class average	3.8	4.3
% Pass	52	64

The above results reflect a clear skew in favour of performance by pupils who were in the experimental class. Only the modal mark was in favour of the control class. It was not clear why. Interesting though is the rather small differences between the control and experimental classes' average marks and percentage pass rates. The difference may be attributed to the type of progress check exercise administered. There was not much language work in the exercises written. Be that as it may the dominance of the experimental class' performance prevails.

Lesson 20: Landforms and Maps: Grid Reference

Seven tasks requiring pupils to name features represented by given grid references were set. They required seven answers. All pupils expected took part in the research.

The time taken to deliver the two lessons was almost the same. The challenges pupils faced appeared more mechanical than linguistic. The results for the progress check exercise in English indicated a highest mark of 7 out of 7 scored by four pupils and the lowest mark scored by three pupils being 0. The results were tri-modal with the scores 7 out of 7, 6 out of 7 and 5 out of 7 having a frequency of 4 apiece. In all thirteen pupils passed and twelve failed. The progress check exercise in Shona yielded these results: The highest mark scored was 7 out of 7 and was attained by eight pupils, the lowest score was 3 out of 7 scored by one pupil only. The highest mark attained was incidentally the modal mark. In all, twenty-four pupils passed with only one failing. Tables 4.28(a) and (b) summarise and compare the results of the lessons.

Table 4.28(a): Lesson 20 Results

Score	English (f)	English % pass	Shona (f)	Shona % pass
$7/7$	4	16	8	32
$6/7$	4	16	7	28
$5/7$	4	16	5	20
$4/7$	1	4	4	16
-----	-----	-----	-----	-----
$3/7$	3		1	
$2/7$	3			
$1/7$	3			
$0/7$	3			
Total	25	52	25	96

Table 4.28(b): Summary of Results for lesson 20

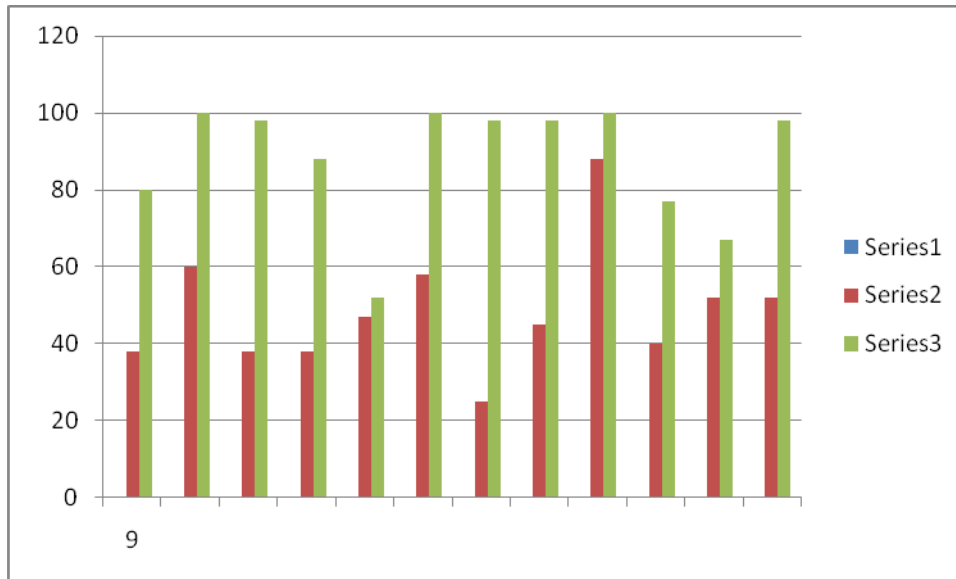
Score	Shona	English
Highest mark	$\frac{7}{7}$ (4)	$\frac{7}{7}$ (8)
Lowest mark	$\frac{0}{7}$	$\frac{3}{7}$
Modal mark	$\frac{7}{7}$ $\frac{6}{7}$ $\frac{5}{7}$	$\frac{7}{7}$
Class average	3.6	5.6
% Pass	52	96

Although the highest mark attained is the same in both lessons the Shona progress check exercise has four more pupils scoring the mark than in the English progress check exercise. The lowest mark scored is higher for the class that learned Science in Shona than the class that learned Science in English. The class average mark and the percentage pass rate are all skewed in favour of the class that learned Science in Shona suggesting better understanding of concepts instructed in the mother tongue. The rather improved pass rate for lesson 20 compared to lesson 18 and lesson 19 could be due to an improvement in understanding of concepts as lesson 20 content was built on the bedrock of lesson 18 and 19 concepts.

Lessons 9 – 20: Pass rates compared

Figure 3 shows the pass rates for lessons 9 to 20 compared. The topics covered include Health and Pollution, Weather, Materials and Technology as well as Landforms and Maps. The average pass mark for the class that learned Science in English was 47,6% marked/shown by the bottom line while that of the class that learned Science in Shona is shown by the top line averaging 89%. The results clearly show a definite pattern : pupils taught Science lessons in Shona performed a lot better than those taught the same lesson in English. The disparity in performance appears to support the premise that pupils taught in the mother tongue tend to understand and articulate issues and concepts better than those taught in English.

Figure 4.3: Lesson pass rates compared



Lesson 21: Overall progress check exercise

As a verification of the results of the twenty lessons taught in this research a twenty question progress check exercise was administered to both the control and experimental class in English and Shona respectively. The exercise administered after the twenty lessons was meant to check retention of concepts taught and compare the results with those of exercises given soon after teaching. In this post-experiment progress check exercise, the first five questions were the multiple choice type, questions 6 – 10 were data response type, questions 11 - 15 were open ended while questions 16 – 18 required pupils to label diagrams. Questions 19 and 20 required pupils to demonstrate knowledge of grid reference. Tables 29(a) and (b) show the results of the pupils' performance.

Table 4.29(a): Lesson 21 results

Score	English (f)	English % pass	Shona (f)	Shona % pass
20	0			
19	0		1	4
18	0		0	0
17	0		1	4
16	0		0	0
15	0		1	4
14	0		2	8
13	1	4	4	16
12	2	8	1	4
11	2	8	5	20
10	2	8	1	4
9	0	0	4	
8	1		1	
7	1		1	
6	2		3	
5	1			
4	5			
3	1			
2	6			
1	1			
0	0			
Total	25	28	25	64

Table 4.29(b): Summary of Results for lesson 21

Score	Shona	English
Highest mark	¹³ / ₂₀	¹⁹ / ₂₀
Lowest mark	¹ / ₂₀	⁶ / ₂₀
Modal mark	² / ₂₀	¹¹ / ₂₀
Class average	5.8	11.0
% Pass	28	64

The comparison of results in table 4.29(b) above clearly shows dominance in performance by the experimental class over the control class. These results tally with and reinforce the trend of results found in the twenty lessons in this study. The edge which Shona has over English as a language of instruction in teaching Science to grade four pupils can thus not be taken for granted, it appears quite real.

4.6 FURTHER DATA ANALYSIS

The basic purpose of research is the discovery of general principles which are themselves based on observed relationships between variables. In this research, if it were possible, all grade four classes in Zimbabwe would have been actively involved, but alas it could not be as the process would be never ending and prohibitively costly. The practical solution was therefore to select samples representative of the target population. It is through observations and analysis of the sample data that the researcher infers characteristics of the population.

4.6.1 Statistical Inference

The sample of grade four pupils used in this study was not a miniature carbon copy of the target population nor did it strictly have identical characteristics of the population. It was just a random sample. If similar groups of pupils were selected by various researchers the mean weight of the samples would not be identical but would cluster around the population mean with small differences. Some would be above the population mean and some would be due to sampling error. Sampling error, "...

describes the chance variations that are inevitable when a number of randomly selected sample means are compared write Best and Kahn (1997:322). The means of samples randomly selected from a population differ. This implies that the researcher has only one sample to use as a basis for generalizations about a population. Luckily, the sample means will be a representative and unbiased estimate of the population as it is itself a product of random selection. It is possible therefore, to estimate the variation sample means on a probability basis as the nature of the variations of random sample means is known.

4.6.2 Testing Statistical Significance

Arguably, the most satisfactory measure for characterising a group is the average or mean. A difference in groups' means indicate differences in performance. In this study, the difference in mean performance between the control group and the experimental group would imply a difference in performance between the two groups. Because the groups have been matched according to their academic endowment the differences in the groups' mean performances cannot be attributed to academic potential but to other factors, in this cases the language of instruction as the lesson plan, materials and the researcher were the same. Competent researchers therefore find it important to determine whether the difference between means of samples is significant. It must be pointed out that a simple quantitative superiority of the experimental group mean over that of the control group mean does not mean total proof of its superiority. The difference in group means could be attributed to chance or sampling error. If the difference is to be statistically significant then it should be bigger than that attributed to sampling error explanation usually done by applying the *t* test whose formula is

Figure 4.4: Formula for calculating t test

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{(N_1 - 1)S_1^2 + (N_2 - 1)S_2^2}{N_1 + N_2 - 2} \right) \left(\frac{1}{N_1} + \frac{1}{N_2} \right)}}$$

Where

- \bar{X}_1 = mean of experimental sample
- \bar{X}_2 = mean of control sample
- N_1 = number of cases in experimental sample
- N_2 = number of cases in control sample
- S_1^2 = variance of experimental sample
- S_2^2 = variance of control sample

If in this ratio the value of the numerator is not significantly greater than the denominator it is likely that sampling error, not the effect of treatment is indicated.

4.6.3 The Null Hypothesis

The position that a null hypothesis states is that there is no significant relationship between two or more parameters. In this research, the null hypothesis seeks to investigate and judge the nature of the relationship between the results of teaching Science in English and teaching it in Shona. It seeks to judge whether apparent differences are true differences of merely result from sampling error. If the mean achievement of the control group and that of the experimental group have a difference too great to attribute to fluctuations resulting from sampling error, the researcher may reject the null hypothesis saying that the difference is not a result of sampling error but that something has happened affecting the experimental group so that it behaves like a random sample from a different population.

4.6.4 The significance of the difference between the means of the two matched groups

As the mean of the sample is not likely to be the same as the population mean due to sampling error, the use of the number of degree of freedom tends to correct this underestimation of population variance. It is pertinent to note that when small samples are involved as is the case in this study, the *t*-table is used to determine statistical significance. This concept, the student test, was developed by William S. Gosset around 1915. According to Gosset, the *t* critical values required for rejection of a null hypothesis are higher for small samples and as the magnitude of the sample increases the *t* critical values required for the rejection of a null hypothesis become smaller.

Situations, as is the case in this study, dictate that we determine the significance of the difference between the means that are not randomly assigned. The situation obtaining in this research is that the control group and the experimental group were matched according to intellectual endowment and ability to read and write. The groups are therefore not strictly independent samples and it is therefore imperative that we calculate the coefficient of correlation between the past lesson scores or progress check exercise scores for the two groups. When we use the coefficient of correlation, the *t* test is best based on the following formula.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2 + S_2^2 - 2r \left(\frac{S_1}{\sqrt{N_1}} \right) \left(\frac{S_2}{\sqrt{N_2}} \right)}{N - 1}}}$$

where $r = \frac{\sum d^2}{N}$

The number of degrees of freedom would be $N - 1$ that is the number of lessons minus one. The *t* critical values can be calculated using the values below:

Control Group

$$N_1 = 20$$

$$S_1^2 = 5.40$$

1

$$\bar{X}_1 = 3.47$$

$$r = 0.72$$

Experimental Group

$$N_2 = 20$$

$$S_2^2 = 2.79$$

2

$$\bar{X}_2 = 5.69$$

$$df = 19$$

F test = Largest variance, that is, 5.40 = 1.93 variances are Smallest variance
2.79 homogeneous

Using the formula above as well as the above given values the t ratio is

$$t = \frac{2.22}{0.61}$$

$$0.61$$

According to Best and Khan (1997: 329), "If the value of the numerator in his ratio is not significantly greater than the denominator, it is likely that sampling error, and not effect of treatment or experimental variable – is indicated." But in this study, the numerator is almost four times the denominator, clearly indicating that the difference in performance between the control and experimental groups is not due to sampling error or chance but is most likely due to the experimental variable – teaching using the mother tongue. A result of further calculation reduces the t ratio to 3.63 thus:

$$t = \frac{2.22}{0.61} = 3.63$$

$$0.61$$

As the t value of 3.63 exceeds the t critical value of 2.093 for a two tailed test at the 0.5 level at 19 degrees of freedom, we may reject the study's null hypothesis.

There is no difference in performance between pupils taught Science in English and those taught in Shona.

If this experiment were replicated with random but matched samples from a population of grade four pupils the probability and implication is that a difference between mean performances as great as those observed in this research would result from sampling error in fewer than 5 out of 100 replications. In 95 out of 100 replications the results would stand indicating strong evidence that indeed Shona is a better language of instruction when teaching Science to grade fours than English provided the sample is made up of pupils whose first language is Shona.

4.7 CONCLUSION

The chapter has presented the data collected during the course of study. The status of English in Zimbabwe has been discussed. It has been discovered that English still dominates the linguistic scene enjoying the highest status of all languages in Zimbabwe. English continues to be the official language in all government business and departments investigated. The role of English in Science teaching and other activities in schools has also been extensively discussed. English was extensively used as a language of teaching in both primary and secondary school, even in cases where local languages like Shona were recommended by policy. Further, teachers' attitudes to the use of indigenous languages in teaching have also been discussed. The attitudes were grossly negative, preferring English instead. Finally, the chapter has discussed the results of the teaching experiment in which English and Shona were tried out in teaching grade four Science. Results greatly suggested Shona was more effective in teaching Science than English.

The next chapter presents a discussion of all tenets in this research.

CHAPTER 5

DISCUSSION

“Faced with a choice of choosing the language of instruction, local or foreign, one thing is certain: use the language of the children whenever possible (Young, 1979:56).

5.1 INTRODUCTION

The chapter presents the discussion on the findings of research. First, the chapter discusses matters on the status of English and Shona before and after Zimbabwe’s independence. Next, the attitude of the generality of Zimbabweans, and those involved in this research will be summed. Similarly, the attitude of teachers towards the use of English and Shona as languages of instruction across the curriculum in general and Science in particular will throughout be reviewed. Similarly, the chapter will discuss the attitude of school heads, education inspectors and some heads of government departments towards the use of Shona as the official language in conducting business at their work places. The views of parents (whose children were under investigation in this research) towards Shona as language of instruction are discussed as well as the implications of such attitudes.

The concomitant issue of language policy prevailing in government aided and private schools as well as the policy obtaining in government departments will also be discussed. Observations and lessons drawn from investigations in government departments are discussed next. Further, the chapter discusses the role universities should play when the policy of teaching Science using Shona is put in place and implemented. The chapter then discusses the effectiveness of Shona as a language of instruction in teaching Science, focusing on its merits and demerits. Discussions on which is a better language of instruction, English or Shona, in teaching Science then follows. The chapter then discusses the null hypothesis presented in chapter four. Finally the chapter gives a round off, of the issues discussed.

5.2 THE STATUS OF ENGLISH AND SHONA IN PRE AND POST INDEPENDENCE ZIMBABWE

In most African countries, before and especially so after independence, the majority people are denied full access to their (indigenous) languages. This is so because the regimes therein marginalize the languages to the point of political invisibility. Way after independence African countries remain prisoners of the past, with constraint reinforced by the argument that English is going to be needed for higher education, technology, science and industry (Bamgbose 1991:72). Resultantly, Heugh (2005) observes that the trend in Africa is that of moving away more and more from using indigenous languages as media of instruction to using colonial languages. She further notes that former British colonies have tended to whittle away at mother tongue instruction and have tended to either eliminate it or reduce it to three years.

In Zimbabwe, mother- tongue medium of education has been reduced to a paltry three years in the first three grades of primary school. It should be more. Suffice it to say, English, Portuguese and French take pride of place in the body politic of most states. As stated, Zimbabwe is no exception. English has firmly entrenched itself as the language of government business, the media, education, and training as well as the language of upward mobility and wider communication (Chimhundu, 1993:57).

5.2.1 The colonial era

The main purpose of colonialism was economic exploitation (Kembo Sure 2008:21). Language policy in colonial Africa was based on the European model. It reflected that back at the coloniser's home and was bent on exploiting and subjugating the indigenous people of Africa. Wa Thiongo (1981) says that the notion of exploitation is apparently so when we interrogate the processes by which some African languages were orthographed. During the colonial period, missionaries were at the forefront of the provision of education in most if not all African countries apart from Ethiopia.

The European missionaries and the colonial governments that they represented, aimed at three things only in the education of Africans, namely, deliverance from evil

superstition, knowledge of personal hygiene and to acquire rudimentary work skills (Vambe, 2008:21). Education was meant to train Africans for subservience not independence (Odinga, 1967:67). Later on, these mission school products joined the colonial administration as clerks, chiefs or interpreters who had total allegiance to the mission establishment. In this endeavour, missionaries tended to privilege some languages at the expense of others, but foremost their language was the de jure language of instruction in schools. Besides the colonial language, one or two other indigenous languages were selected for use in schools in basic education, church services and other domains. The chosen indigenous languages were usually the language of a powerful and socially dominant group. In many cases they were used to teach national literatures in African schools (Jansen and Andersen, 1993). As such, in any country, there was a dominant colonial high status language and a subservient low status indigenous language. This was the trend in almost all African countries, for example Mozambique, Uganda and Rhodesia. In Mozambique, for instance, indigenous languages were relegated to second or even third rank languages due to the assimilationist policy practiced by the colonizers (Vambe, 2008:82). Portuguese was the first rank official language and was exclusively used in education, science, administration and government business as well as in social interaction.

The situation was not different in Rhodesia. The Rhodesian education system regarded African languages as crude and uncivilized (Ngara 1982:23). English was the official language of government business administration, education, law, industry and commerce. Local languages were second rate and dubbed vernaculars. Some colonial government officials thought indigenous languages were not languages at all. These languages were therefore given a much lower status than English the language of the rulers. And so, in Rhodesia the British administration introduced English as the official language of government business, replacing indigenous African languages as the sole medium of education. Mazrui (1978:30) cites a parallel. What the British did in Rhodesia they also did in Uganda. They “introduced the art of reading and command of English as critical qualifications for attaining high official positions in the land such as clerks, chiefs, interpreters and messengers. Further, Mazrui (1978:289) observes that in most British colonies (Zimbabwe and Uganda included) indigenous languages were used as media

of instruction up to the third year of schooling. From the fourth year of education upwards, the medium of instruction was English. Mutasa (2006:61) adds on. He says that during colonial days, foreign ideologies were the core in acculturation and economic development on the continent. The result was that European languages namely English, French and Portuguese were imposed on the inhabitants of the countries that they colonized. Once a country was colonized, the colonizers would use their political, military and economic power to make English the official language of education, of trade and commerce, the judiciary and of politics in the colonies.

English was also linked to gainful employment in these colonies. Thus, this set up served to elevate English over indigenous African languages in the new colonies. This scenario forced Africans to have a strong desire and liking for English. In a B.B.C. Focus on Africa interview, Wa Thiongo (2006:57) sums up this unfortunate development. He says, "Our languages were associated with negativity and humiliation whereas English was associated with positive images of knowledge, intelligence, power, reward and applause.

Language policy in pre- independent Zimbabwe was therefore based on the European model. Education policies were coined along European lines in order to maintain European hegemony over Africans resulting in the marginalization of indigenous languages (Chivhanga, 2012:4). Programmes in these models were designed to impart in students conversational skills, writing tasks and some literature and not to prepare the students to learn Mathematics, Geography, Science or other subjects through the second language. These programmes were not based on an African setting and did not even consider the multi-lingual nature of African nations. Like in all other African countries they were based on exploiting and subjugating the black people of Zimbabwe. The policy clearly stipulated English as the official language. It was the language of the ruling class, the master and conqueror. Although spoken by a very small minority, it had status dominance, trivializing all indigenous African languages.

In the curriculum, English occupied the central position. All subjects were to be taught in English. This requirement furthered and entrenched the white rulers' domination of the

black majority. African languages had a peripheral role and were deliberately referred to as vernaculars: they were inferior and not languages at all according to the white man.

Before independence, English was clearly functional in most of the important social domains while indigenous languages were only functional in religious and other less important domains. English was therefore the high (H) status language and the indigenous languages the low (L) status languages. It goes without saying that English enjoyed status dominance from 1890 to Independence Day. Ngara (1980:20) aptly sums up the status of English in pre-independent Zimbabwe. He says, "As a language of the ruling class or race, English was given a status far above that of other languages and has enjoyed this status for almost one hundred years."

5.2.2 The post colonial era

The post colonial experiences of African countries were very similar. The status of colonial languages was clearly higher than that of indigenous languages. This is despite overwhelming evidence in favour of the raising of the status of indigenous languages to that of the colonial languages.

Many authorities concur that research carried the world over has proved that children learn better when taught in their mother tongue (Prah, 1993:15; Chessa 2001; Indakwa, 1978:60 and Batibo, 2000:18). The teaching of children in their mother tongue is in tandem with international conventions on the rights of children. Children's rights are dealt with in five international conventions dealing with the legal, cultural, political, social and economic rights. The 1989 Convention on the rights of the child was signed by 192 countries and effected in 1990. The right to the education of a child in its mother tongue should be exercised. As human rights are interrelated and interdependent, the employment of the right to education leads to the exercise of other rights, while its denial precludes the enjoyment of most if not all other rights. The 1980 Convention on the rights of the child state that:

In states in which ethnic, religious or linguistic minorities or persons of indigenous origin exist, a child belonging to such a minority shall not be denied the right to enjoy his/her own culture, to profess or practice his/her own religion or to use his/her own language.

Further, the 2006 African Union Language Plan of Action has clear objectives, one major one being ensuring the increased use of African languages as media of instruction at all educational levels. Primarily, the plan of action was a response to complaints that European languages have not succeeded in delivering the much hoped for techno-economic development, national unity and cultural development. The lobby by the African Union has not yielded much fruit as African countries continue to use European languages as media of instruction more than indigenous African languages. Many scholars are skeptical about and critical of this continuing trend. Some scholars like Marivate (1992: 98-102) are of the opinion that mother-tongue education was meant to reduce blacks to ordinary labourers while some progressive ones such as Owino (2002: 23) see the continued use of foreign languages in administration and politics as being tantamount to marginalization or exclusion of the broad masses. If this sorry state of affairs prevails, it would be most unfortunate for Africa. Sadly many Africans have come to accept the "superiority and dominance" of the indigenous languages by the colonial ones. Rodney (1989:30) observes that:

The people of Africa... have gone through a cultural and psychological crisis and have accepted the European vision of things (so much that) the African himself has doubts about his capacity to transform and develop his cultural environment.

Many Africans, as a result see status, intelligence and superiority in the mastery of European languages and culture. The unrecognized status of indigenous African languages prior to and during the colonial period is their number one enemy. African languages continue to have lower status than European languages in post colonial Africa.

According to the African Union's (2007-2008) plan for the second decade of education for Africa, seven key areas were identified. High on the priority list is an area key and pertinent to this study. It is the use of indigenous languages in the teaching of mathematics, science and technology. Likewise the teaching of mathematics, science and technology is a key objective of the Zimbabwean Ministry of Education according to the 1987 Education Act and its amendments. While the African Union's lobby on using indigenous languages in teaching mathematics, science and technology is loud and clear, African governments have dilly-dallied on implementation, citing many challenges that include non-availability of materials as well as financial constraints. Andersen and Jansen (1993) cite two major challenges to the implementation of the use of indigenous languages as media of instruction in education. These are:

- (a) the development of monolingual dictionaries in African languages that are also explained in the same languages.
- (b) persuading the ruling elite with close ties to foreign languages to institutionalize and operationalise the teaching of mathematics, science and technology in schools using indigenous languages.

The second challenge appears to be the most difficult to surmount as African governments appear reluctant to change policy despite the African Union's decades old lobby. Where there has been change of policy in Africa, it appears cosmetic and at times lip service. Implementation seems half-hearted.

Vambe (2008:13) observes that some African languages have become languages of education in various degrees and terms. He cites Hausa, Swahili, Kinyarwanda, Yoruba, Somali, Sesotho, Lingali and Ciluba as examples. Despite the assertion, Vambe is quick to point out that nowhere in Africa has one or another of these languages managed to acquire a status of equality with the European languages. They have not matched English for example, as languages for the transmission of modern knowledge, know-how and for social mobility. It is clear therefore that linguistic decolonization is still a strong must for Africa. In most cases African languages are used in basic education, thereafter they are mere disciplines learned as subjects. In most African countries there are no

clear intentions to use these languages as media of instruction at secondary school or tertiary education. For instance, in Kenya, in 1963 Kiswahili was declared official language but English took over, and in 1974 Kiswahili was once again declared national language but is taught only as a subject today. Kenyans still prefer English as the language of official communication. Those who can only communicate in Kiswahili and not in English are considered semi-literate (Vambe, 2008:169). What stands out clearly is that the declarations to national language of Kiswahili were half-hearted. Kiswahili in Tanzania however holds a stronger position. It is not used in elementary school only but throughout the primary school as language of instruction.

This is all attributed to the sterling efforts of Mwalimu Nyerere towards the use of the language across the whole primary school sector. In Uganda, both English and indigenous languages are stressed in the education system but Mbaabu (1996) says the mother tongues are not as successful as English. In short, in East Africa and other Anglophone states, English is the medium of instruction in the greater part of the education system. All important examinations are in English. Such a scenario leads to students putting greater effort towards learning English as opposed to African languages. The result is a denigration of African languages and exhortation of English. Thus, English continues to have higher status than indigenous African languages. Decades after independence, African countries are still stuck to English as language of instruction, saying it is going to be needed for higher education, technology, science and industry, (Bamgbose 1991:71). The situation in Zimbabwe is not different.

The Zimbabwean political leadership has allowed English, the colonial language to function as the official language in all domains including education,(Magwa 2008).This has had the effect of relegating indigenous languages like Shona to a status lower than that of English. Kamwendo (2006:56) concurs. He says, "The introduction of English has created a situation where indigenous languages are relocated to the confines of the informal sector." English has deeply entrenched itself as the language of government. It is also the language of education, the media and business, training and specialized information. Added to these, English is also the language of social mobility and wider communication within Zimbabwe and outside. On the other hand Chimhundu (1993:57)

notes that African languages became predominant in the relatively unimportant family, social and cultural domains yet continue to be denigrated and downgraded in the field of education.

The linguistic situation in which Zimbabwe finds itself is quite sad but not surprising. First, the Zimbabwean government seems to suffer from a lack of will to change the language policy they inherited from the British. Second, it appears the indecision is itself manifested in a lack of a clear language policy on the part of government. Magwa (2008) concludes that Zimbabwe is the only African country that lacks a piece of legislation or a defining instrument for the status and use of Zimbabwe's three main languages namely English, Shona and Ndebele. There is no clear or written comprehensive national language policy. The result is that language planning is unplanned. Chimhundu (1997:129) is of the opinion that the apparent neglect of language issues by Zimbabwean officials in post-colonial Zimbabwe is deliberate. The neglect could be explained in terms of elitist leadership and fear of the unknown. According to Chimhundu (1997:132), the national and official status accorded Shona and Ndebele is cosmetic. The status is "largely theoretical as very little if anything is being done to develop and promote them and to diversify their functions." The status of indigenous languages thus remains lower than that of English.

It is important to note that from birth, all socialization takes place through the mother tongue but upon entry into school this natural process of learning in the mother tongue is dislocated. Instead schools place emphasis on learning English, the language of social mobility and economic upliftment. The result is teaching and learning in the mother tongue is stifled. The inevitable happens: English is exalted and African languages despised. Thondlana (2005:33) notes that most Zimbabwean schools prefer using English as medium of instruction from the word go. This is to ensure that their students' command of English, so regarded as the language of power and economic well being, is guaranteed. Although Mutasa (2004:5) is of the opinion that the Zimbabwean government's pursuance of the colonial language policy was meant to maintain unity, keep track of global developments and to maintain contact with friends of Zimbabwe, the

reasons are far from convincing. The issue of elitist leadership and fear of the unknown alluded to above, holds sway hither.

Be that as it may, it is prudent to point out at this juncture, that the continued use of English as the medium of instruction in education in Zimbabwe, coupled with the use of Shona in less important domains, will surely guarantee one thing- a higher status for English and a correspondingly lower status for Shona. If this status dominance prevails, it is evident that “the use of African languages in education will continue to be a perplexity on the continent” (Mutasa, 2006:58). Africa will therefore remain the only continent where children will go to school and learn in languages other than their own. The post colonial status of languages on the Zimbabwean linguistic scene can be summarized thus:

At independence, the black majority government inherited two parallel systems of education, namely that for the white and ruling class which was clearly dominant, and that for the black majority that was subjugating and subservient. Thirty- two years after independence, we still sing the same old song , “English is our official language.”

The language of our colonizers remains the language of government; official and functional in all government business that includes educational instruction, general administration, industry and commerce, the mass media, the judiciary and legislature and even at conferences, political meetings and state functions. The declaration of Shona (and Ndebele) as national languages appears cosmetic and theoretical as the languages’ social functions are as limited as (ever) before. But even where there are positive tenets in a policy, there is no economic, political, cultural and psychological will to implement them.

It is to the European languages (like English) where all the will and resources are put. It is sad to note that the ruling elite and the African middle class are running away from their languages. English is still the high (H) status language whose mastery and speaking is aspired for by many black Zimbabweans including those high in the

echelons of power. Indigenous languages such as Shona and their ilk, have lower status and are not required or recognized for recruitment and training in the public or private sector. The colonial situation still prevails, nothing has changed. The situation is still as bad, dire and bleak. The ruling Zimbabwean elite are black in colour but white in tastes, aspirations and mindset. The colonizers greatly succeeded in domesticating and colonizing black Zimbabweans politically, economically, culturally and above all mentally and linguistically. That we still live in linguistic bondage thirty-two years after independence is very unfortunate and alienating. An article in the Daily news newspaper (17/04/12) titled *Still Living In Bondage 32 years on* illustrates this point. At a court appearance at Harare Magistrates' Court where a family was being tried for illegally occupying a piece of land, most of the family members could not understand the English language used in court and resultantly the proceedings. One co-accused elderly woman walked out of the courtroom and sat on a bench. When asked by a court official to join the rest of the co-accused in the courtroom, she responded:

Hapana chandiri kumbonzwa mukati umo. Regai ndigare zvangu pano panorowa mhepo.

(I have no idea what is happening inside that courtroom I will stay here where there is some fresh air (Daily news, 17/04/12.)

Interestingly, the three key court officials, the magistrate, the public prosecutor and the lawyer all conducted business in English even though they all spoke Shona as a first language. The important point however is that if those who are seeking justice cannot communicate in the language that is used to mete out justice then it is clear they are at a disadvantage. In the majority of countries and Zimbabwe in particular the official language is the medium for legal matters. In court it is the language in which the law is written that is used. The use of interpreters is not policy but just out of need. Even if interpreters are provided, listening to, or being involved in a trial in which one relies on translations is a lot different from one in which one's mother tongue is used. The interest generated differs. As such, language policy should address domains such as the media, education and the judicial system since these are areas that service the generality of the population in varied of ways. Indeed, without an understanding of the language used in

these sectors, people are at a great disadvantage. What African languages such as Shona need, is power sharing with colonial languages such as English or any other colonial languages for that matter, and should not turn our people into linguistic slaves and aliens in their own communities as just illustrated in the newspaper article above. The need to mould global citizens, so often quoted in defence of the emphasis on the acquisition of colonial languages, is neither here nor there. The global citizen is not an abstraction but a being who has deep roots in individual communities, countries and languages of the earth.

It is recommended that the Zimbabwe government takes the progressive step of raising the status of local languages to official languages so that the majority Zimbabweans can understand and articulate issues in their lives using their mother tongues.

In contrast and comparison, it goes without saying that the language policy situation in Rhodesia and Zimbabwe has hardly changed at all. Language policy in Rhodesia was based on the European model and in Zimbabwe today it is still based on the same model. English was the official language in Rhodesia and still is to date. It was the language of the ruling class and still is today. Compared with other Zimbabwean languages English was spoken by a small minority before independence and continues to be spoken by a similarly small minority after independence. Before, and after Zimbabwean independence, English occupied a central position in the curriculum. All subjects of the curriculum were and are still taught in English while indigenous languages are only taught as subjects. Generally, English is functional in most of the important domains in Zimbabwean socio-economic life. Indigenous languages continue to be relegated to less important social domains like religion. English, therefore, clearly has higher social status than any other Zimbabwean language.

5.3 ATTITUDES OF ZIMBABWEAN PEOPLE

The attitudes of Zimbabwean people are not peculiar to Zimbabwe alone but are just a chip from a whole block of similar attitudes across Africa. Attitudes are a disposition to favourably or unfavourably respond to a person, institution, object or event for that

matter. Kerlinger (1986:456) describes attitudes as “organizations of beliefs about things out there”, that predispose individuals to behave or respond in a specific way towards an object. Rwambiwa (1996), Gatawa (1998) and Gudhlanga (2005) attribute the negative attitude towards use of African languages to the current policies across Africa which requires children to learn in their mother tongue only in lower grades. It is however prudent to point out that African languages are languages which from time immemorial have been vital in day to day communication of the people of Africa. They have been the cornerstone of acculturation (Mutasa, 2006:58). Thus to have a negative attitude towards indigenous languages is tantamount to denying oneself.

The success of a mother tongue instruction policy therefore rests foremost on the people’s attitude towards the mother tongue. A negative attitude towards the mother tongue inevitably means the mother tongue will play second fiddle to the colonial language in that particular nation. From time immemorial African people did not have negative attitudes towards their languages. It was the coming of the Europeans, their languages and governments that hatched and nurtured this attitude. The colonial and post-colonial language and educational policies obviously provided a solid base for the explanation of attitudes towards African languages (Wa Thiongo, 1986; Bamgbose, 1991; and Roy-Campbell, 1996).

The negative attitudes towards African languages play a major role in their unpopularity across Africa. This is so because African languages are associated with poverty, inferiority and backwardness (Wa Thiongo, 1986:11). This is the situation in all Anglophone states. English is left to enjoy an unprecedented domination of indigenous languages. “In Kenya,” for example, “the people’s attitude is generally negative towards the African languages” (Ogutu and Nthiga, 2008:168). Similarly, Magwa (2009: 10) cites the views of three nationals, one Namibian, one Kenyan and the other Malawian. The views of the three were somewhat representative of the attitudes of people in their respective countries. They all had a negative attitude towards their mother tongues.

Furthermore, in Kenya, the selection of students to join teacher training is based on national examinations where a pass in English is a requirement (Mbaabu, 1996).

Competence in the mother tongue is not taken into account. As a result the generality of Kenyans want to learn English as they hold the view that English is the language of success, power and social prestige as well as an avenue to the global market economy (Brock-Utne, 2004 in Ogutu and Nthiga, 2008:175). What comes out clearly is that African languages are under siege in the home environment, at schools, tertiary institutions and the work place. This is not only in Kenya, but across the length and breadth of Africa. Consequently, "... there is a decline in registrations in African languages as the battle for English gets hot" (Moloko, 2005:3). In his paper, 'Death of a nation', Moloko reports that in one district, 6000 children were not learning African languages, let alone speaking them. It is unfortunate that "... many speakers of African languages view the knowledge of European languages as a sign of intelligence and a major achievement for the child. Such perceptions are difficult to change," laments Mutasa (2006:61).

Attitudes are very important, especially during the implementation of change processes. If attitudes are not considered, accommodated and interpreted correctly, they have dire consequences; especially when they have something to do with decisions affecting people's lives. Likewise, attitudes play a critical role when it comes to implementation of language policy. Currently, the full scale use of African languages will not be implemented and achieved owing to resistance from vested interests, hardened attitudes and the question of uncertainty or fear of the unknown. While Okombo (1999:591) agrees that there are many obstacles to the successful implementation of the use of African languages, he is convinced "... the most formidable obstacle is in our minds: our attitude." It goes without saying therefore, that it doesn't matter how much effort and commitment government and language planners put, the successful implementation of language policy will depend to a great extent on the people's perception of or attitude towards the selected language, -the acceptability of the language. Requisite materials may be developed and availed but without the people's willingness and right attitude, nothing will be achieved. It is clear that before the generality of people's attitude is changed, it is the governing elite's mindset and attitude to the use and importance of indigenous languages that needs to be changed.

The ruling elite are the people's model, people look up to them for good example and inspiration. Unfortunately, the elite in Africa in general, and in Zimbabwe in particular, shun local content, language and culture. They do not only often converse among themselves in European languages but also with their children. These ruling elite are notorious for sending their children to schools where European languages are the languages of learning and teaching. In Zimbabwe, the ruling elite send their children to former white only schools, private colleges or even to schools outside Zimbabwe in countries like the United Kingdom, Australia, Canada and others. It should be reiterated that if the ruling elite are to succeed in changing the people's attitudes towards the use of African languages, they should change their attitudes first.

They should start conversing in African languages in their homes as well as pay more attention to African languages by writing about and in them (Kembo, 2006). If this fails, as the elite prefer education in European languages, the languages they have acquired and were educated in, then counter measures will have to be instituted. Prah (1999:552) observes that the political will needed for the adoption of African languages in education will not be easily obtainable. He suggests that 'a counter-elite' be established to replace the dominance of values and basis of the colonial elite.

The review of literature above clearly demonstrated that most African people have a negative attitude towards their languages but greatly value colonial languages. Zimbabwean people in general, have a positive attitude towards English and a negative attitude towards indigenous languages observe Makanda (2008) and Magwa (2009). The community in which this research was carried out was no exception. During important social functions in the community, it was very common to hear speakers switching codes from Shona to English. Even at church, preachers often tried to impress Shona speaking congregants by preaching exclusively in English. During school functions, like Speech and Prize Giving days as well as Development days the researcher attended, poems or speeches in English were applauded and revered. This clearly showed how the local people valued English and western education. Those who can speak the queen's language are revered. Mkandawire in *Newsday* 24/04/12 aptly sums up this attitude. "In Africa (and Zimbabwe in particular) western education is

valued and celebrated. The educated one is viewed with a sense of respect, verging on awe in every village, town or city.” Thus, in this community, the learning and speaking of English was highly valued, encouraged and reinforced.

Most people switched to and spoke English in an effort to show their mates how educated and sophisticated they were. Many, especially those referred to as “*masalad*” (born and bred in town) spoke through the nose like whites, apparently failed to read or pronounce Shona words well. They often spoke broken Shona epitomized by sentences like “*Miti idzi dzakaoma,*” instead of “*Miti iyi yakaoma.*” (These trees are withered). These people need mental decolonization.

In short, it can be concluded that African languages, such as Shona, Ndebele and others are poor because Africans do not want to use them in important domains like education, administration, medicine and law. Africans in general; and Zimbabweans in particular have negative attitudes towards their own languages. Chimhundu (1997) suggests that it is wise and prudent to conduct scientific and technical discourse in national languages as cognitive preparation for the challenges of the twenty-first century. Triandis (1971) quoted by Okombo (1999:591) observes that while “we have the technical knowledge to change the world, we do not have the attitude to bring the change. With the right attitude we can achieve anything, people can change the language situation in educational and administrative domains with ease.” The use of African languages as languages of learning and teaching depend on the right attitude of government, their readiness to implement the policy as well as the willingness of the people targeted to accept the policy and its implementation.

5.3.1 The attitudes of teachers towards the use of English and Shona as languages of instruction in schools

The principal role of the teacher, is the effective functioning of the class he/she is entrusted with. The teacher achieves this through the execution of lessons. Lessons are delivered through a language medium. The teacher is expected to be proficient in this language in order to be effective. In this regard, “communication skills in the language of

instruction is one generic parameter that the teacher has to possess so as to reflect his/her capability" (Mutasa and Negota, 2008:219). The big question is, "Are our teachers competent enough to make children succeed in their learning?" If they are, how come pupils are always failing their examinations? The answer and solution to teacher effectiveness is that teachers need to develop native like proficiency in the second language to teach well in it (Savory, 1966). Judging by what the researcher, heads of schools and education inspectors observed during lesson supervision in schools, the teachers in Zimbabwean schools today have a command of English far from native like proficiency. The answer to this short coming would be to teach the pupils and subject matter in a language the teachers and pupils are proficient in. Retraining teachers is another option but costly in terms of finance and time.

The results from the study reveal that 61,7% of the primary school teachers surveyed were in favour of the use of English as the language of instruction in schools while 38,3% were in favour of Shona. In the same vein 68,1% of secondary teachers surveyed were in favour of the use of English as the language of instruction in schools while 31,9% were in favour of Shona. It was surprising and interesting to note that 80% of the teachers who majored in Shona at teachers' college were in favour of the use of English as the language of instruction in schools. The overall result was that 63,4% of both primary and secondary school teachers were in favour of the continued use of English as the medium of instruction in schools while 36,6% were in favour of Shona.

From the results, we can read and conclude certain issues. Most teachers, who were beneficiaries of the old and colonial system of education were in favour of retaining the status quo as they entered teacher training on the merit of passing English and were taught through the medium of this foreign language. These teachers, therefore internalized, appreciated and highly valued this system. It is clear from the research that the teachers' attitudes towards the use of Shona in teaching Science are clearly negative. If the teachers' attitude towards their own mother tongue is negative, what then should we expect the pupils' attitude to be? What of the parents? Zimbabwean people, parents and children alike, look up to the teacher for a model and inspiration. The teacher is educated, knowledgeable and wise. One parent had this to say: "*Kana*

tikasakopa vadzidzisi, ko muenzaniso wechakanaka wacho tinoutora kupi?" (If we don't emulate teachers, then whom should we?) questioned one parent. If the Zimbabwean government were to change its language policy to that of using Shona as the medium of instruction, there would be great need to decolonize these and such teachers' minds, then inculcate in them the correct mindset and attitude.

From another perspective, more interesting observations were made with regard to teachers' attitudes. In three of the seven primary schools investigated, pupils were highly encouraged to speak in English always. They were supposed to greet teachers and visitors in good English. In these schools the rule to speak in English was enforced and practiced in the respective classrooms. Pupils who breached this rule got reprimands in their classrooms. The reprimands ranged from carrying tags inscribed 'Shona speaker,' sweeping the classroom, cleaning the toilets and other disapprovals like booing. At one of the three schools, the issue of communicating in English was enforced more seriously. It was a requirement that once one set foot on the school premises they were supposed to speak in English. No pupil spoke to a member of staff in Shona and no member of staff spoke to a pupil in Shona. The school head took the lead. Teachers implemented the policy 'religiously.' During the researcher's visits, this was seen in practice but appeared so as long as a prefect or member of staff was in close proximity. Teachers were however free to converse in Shona amongst themselves.

At secondary school, the enforcement of speaking in English was not prevalent but at one high school a rule number 14 was instituted. It was the last rule on the list and all students knew it well, although it was not popular. It clearly stated that it was a breach of school rules to speak in Shona while on the premises. At first the rule was enforced, so said the students, but died a natural death when the number of Shona speakers became so overwhelming that it became tedious and futile to punish the large number of students who breached it. The negative attitude towards Shona revealed in these schools showed that the revalorisation of indigenous languages has a long way to go. If such die hard attitudes obtain in the institutions where revalorisation of African languages is supposed to begin, progress in this area is long coming. It is in the teachers that attitudes need to change first.

It is imperative that teachers take cognizance of the fact that the continued use of English as the language of instruction in schools will result in children having a negative attitude towards learning indigenous languages (Setati, 2005).

5.3.2 The attitudes of school heads, inspectors and heads of some government departments

Of the eight government departments heads interviewed 87,5% were in favour of the prevailing policy in which English was the official language of business in their departments while only 12,5% felt a change to Shona would be appropriate.

Likewise, 70% of the school heads and education inspectors in this study felt that English was the most appropriate language to use as medium of instruction. Only 30% felt that Shona would be ideal .One reason could be given for these attitudes: the interviewees were beneficiaries of the colonial system of education. What is clear from the short discussion on attitudes of Zimbabwean people in general, and primary and secondary school teachers in particular, is that they all have a positive attitude towards English and its continued use in educational instruction. In fact, the generality of the Zimbabwean people highly value western education especially the knowledge of and proficiency in speaking English.

With regard to the interviews the researcher had with school heads and education inspectors, exciting revelations came out. The two groups observed that teachers taught Science in English: be it in grade one, two or three or anywhere else in the school system. They said that they had always observed teachers teach Science in English. The reason given for the use of English by teachers was that it was government policy that Science should be taught in English. When asked about the existence of a policy that required teachers to teach Science in indigenous languages, both parties were agreed the policy was in place.

When further asked why as managers and policy implementation supervisors they did not insist on implementation of the policy they said that such an action was futile as

Science examinations would be set and written in English. It was therefore wise and advisable to teach the subject in the language that it would be examined in. Asked why they did not ask infant teachers to set infant examinations in Shona, they trashed the idea saying it was futile as all tests from grade four upwards will be set in English. The groups' responses revealed a negative attitude towards the use of Shona as a language of instruction, an attitude so negative that government policy was ignored.

Looking at the question of teacher competence in teaching Science, school heads and education inspectors were agreed that most teachers competently used English as language of instruction. On the other hand they also said a (very small) minority weren't competent enough to use English in lesson delivery. On probing the issue and in trying to establish why the minority teachers were not competent after having gone through the grill and mill of teacher training. Thirty percent of the respondents felt that it was the few teachers who joined training on the strength of a pass in Shona who weren't competent. These teachers had been recruited soon after independence when there was a boom in school enrolment and a concomitant dearth in prospective students. This was just an assumption as no study had been put in place to investigate the allegation. The researcher went on to ask if the so called 'competent' teachers had what Fafunwa (1989) calls "native like proficiency". All interviewees were agreed that native like proficiency was a bar too high for practicability. One education inspector had this to say, "A, zvingaite izvozvo? Munhu mutema angataure Chirungu sezveanoita Shona here? Hazviite." (Ah, is that possible? How can a black man speak English as he does his mother tongue, Shona? It's impossible.)

One primary school head pointed out that there were many competent and proficient speakers and teachers of English but that their proficiency could not match native speakers of English was beyond dispute. The reason given for incompetence in using English was hinged on attitude. One thing that the researcher noted was the constant code-switching that the respondents engaged in. They all appeared very keen to converse with the researcher in English. It was apparent to the researcher that subtly the interviewees wanted to show the researcher the good command of English that they had. Indeed, their command of English was plausible. One such inspector almost always

watered his mouth when articulating issues in English. He clearly showed the joy and pride he had when speaking the Queen's language. The researcher was left convinced that the respondents had a positive attitude towards English and a rather negative attitude towards Shona.

Looking at the question on the feasibility and practicability of teaching Science in Shona, it was interesting to note that 70% of heads of schools and education inspectors felt that it was not practicable. They argued that, not only was the Zimbabwean government not ready to institute that change but the Zimbabwean people were also not ready and willing to accept such a policy. One education inspector actually pointed out that Shona could be used to teach History, Religious Studies and Agriculture but doubted whether it could be used to effectively teach Mathematics and Science. "If you want stagnation in national development, teach Mathematics and Science in Shona." When asked why he thought so, he cited three reasons namely:

- (a) lack of competent teachers;
- (b) lack of resource material and
- (c) international isolation.

He retorted, "Where would you market Science graduates taught in Shona?" The questions and answers the respondents raised smacked of a negative attitude towards the development of Shona as a language of instruction.

The interviews with the eight heads of government departments yielded equally interesting results on attitude. Question 4 on the interview schedule sought to find out if the interviewee would welcome a change in policy in which Shona would replace English as language of government business at their work place.

Of the eight heads of government departments, 87,5% felt that it was not advisable to change the policy on English as language of government business. Fifty percent of the heads felt that most literature in their departments was in English. Translating the literature was not only expensive but also time consuming, why changing? The

departments were Arex, Veterinary Services, Health and Courts of Law. The government department heads also advanced the reason that Shona lacked appropriate terms for use in their departments. The Department of Agriculture cited the lack of equivalent Shona terms for words like hectare, square metre and other units of measure. As for D.D.F. the same reason was cited. There were no Shona terms for units of measure as cited by Arex. Similarly, Shona did not have equivalent terms for technical words like injector pipe, diaphragm and gear-box for parts of an engine. Equivalent Shona terms for parts of a borehole like cylinder, rod and U-bolt as well as those for artefacts used when working on boreholes like the tripod stand, the pull-tight and leather cups were not available.

As for the other government departments like the police and courts of law, the same argument- lack of appropriate terminology- was advanced. Words cited as having no equivalents in Shona included plaintiff, defendant and mitigation to cite a few. The departments of health and that of Veterinary Services also complained of lack of appropriate terms in Shona. Words said to have no equivalents in Shona include the names of diseases like trypanosomiasis, liver fluke, red water as well as the names of drugs like terramycin and others. Likewise, the department of statistics (Zimstat) complained of lack of Shona terms for statistical terms like the mean, percentile, deviation, the range and statistical correlation and association indices.

The third reason given for supporting the English for government business policy was that English was a neutral language which was ideal and handy when dealing with people from multilingual backgrounds .Departments that raised this concern included the police ,the courts Zimstat and veterinary services .The departments argued that because their recruitment and working areas cover the length and breadth of Zimbabwe, there was need to train the recruits from the different backgrounds in a language they all understood English.

This discussion has revealed that 87,5% heads of government departments were in favour of retaining English as the official language of government business in their departments. Only one out of eight that is 12,5% of the respondents had a positive

attitude towards the elevation and development of Shona as language of government business. Some of the reasons the heads of departments advanced included:

- (a) lack of relevant literature in Shona;
- (b) lack of appropriate registers and terms and
- (c) that English was a language of wider communication and a lingua franca where people of diverse linguistic backgrounds met or worked.

Such attitudes are lamentable especially when they are found among people in the echelons of power. If knowledgeable and important people in government so think, what of ordinary citizens? If the government elite have such negative attitudes who then will spearhead the crusade on revalorisation of indigenous African languages in Zimbabwe? If gold rusts what of iron? With the correct attitude and political will, all the reasons cited in support of English continuing as language of government business will wane. After all, all the interviewees were beneficiaries of the colonial power and language policy. They learned through the policy, internalised and valued it, succeeded through it and were richly rewarded by getting decision making or leadership posts through it. Can one bite the hand that feeds him?

5.3.3 Parent's views towards the use of Shona as language of instruction

The research has established that most parents of pupils in this investigation generally had negative attitudes towards Shona, their first language. They looked down upon it and despised it. Perhaps this was so because everybody was proficient in the language, not many people had peculiar or unique skills in language. On the contrary, English was brought into Zimbabwe from outside and was not common. This implied that those who could acquire and speak it were a cut above the rest. Similarly, because English was a language of power and privilege, it was revered and highly esteemed.

It was a cut above other languages. It is this background which motivated and spurred the positive attitude towards English and the negative attitude towards Shona as a language of instruction in education. From the interviews conducted, it was clear that

most of the respondents did not even know of the government policy on language of instruction. The attitudes parents reflected just developed through history. Mutasa and Negota (2008:221) observed that parents often do not know the prevailing language policy as well as the rationale on which it is based. Often parents read into life, draw their own conclusions, build attitudes in the process and finally act the way they feel.

Unfortunately parental attitudes appear to filter through to children. Negative attitudes have been found to affect children negatively while positive attitudes affect children in a positive way. In a study at a secondary school in eastern Johannesburg, Nondo (1990) found out that negative attitudes by parents towards African languages were passed onto children. What this means is, if a progressive policy to revalorise indigenous African languages is put in place, it is important that parents are apprised of the policy and its oncoming advantages. The policy can therefore be implemented with little coercion and few hiccups. Mutasa and Negota (2008:223) concur.

People need to be provided with information about the purpose of the use of African languages in education and other domains, their relative advantages and how adopting them is going to affect their lives.

Dissemination of such information can be done through mass media, political, personal, and mass presentations. These would serve to inform the populace and arouse new practices. Bandura (1986:160) sees a big advantage in this strategy. He says that these language awareness campaigns, whether through political rallies or the media, are important in changing the attitudes of parents and the elite. Bandura (1986:151) further observes that change that is marked by departures from the norm, usually goes through a history of initial rejection first, followed by qualified acceptance and eventually widespread adoption. These arguments clearly reveal that parents need to be convinced of the advantages of a new policy if it is to succeed. A language which the people have a negative attitude towards, will never be easy to learn through. Attitudes are difficult to change. With the right attitude, we can achieve anything including changing the language situation in our schools and administrative domains.

The negative attitude parents have towards Shona, go a long way in violating children's linguistic rights. The Asmara Declaration clearly spells out that all African children have the right to attend school and learn all there is to learn through their mother tongue. The positive reaction of parents to children's presentations in English at schools during Speech and Prize Giving Days (cited in chapter four) reveals the positive attitude towards English. On the contrary, the limited applause to presentations in Shona smacks of a less positive attitude. Such behavior clearly shows that African languages are under siege, be it at home, at school, at work place or in tertiary institutions (Mutasa and Negota, 2008:217). At home, many parents said that they encouraged their children to speak in English. This was the practice with a few 'educated' parents. What the parents failed to realize was that by denying a child the chance to learn and practice their mother tongue, the family was denying itself and losing its identity in the process.

The negative attitudes parents have towards African languages also manifest themselves in what they encourage or discourage their offspring to do. In this research, many parents were elated when their children spoke in English during Speech and Prize Giving Days. This attitude was noted at all levels of children's education, from crèche to secondary school. In local crèches, parents were keen to see their children learn English. The researcher noted the parents' eagerness during the numerous graduation ceremonies for early childhood development (E.C.D.) pupils which he attended. Where items of entertainment did not include poetry, song, dialogues or recitations in English, the researcher would hardly hear any ululations or thunderous applause. That crèche would be labeled flat and not educative enough. A number of parents were seen to avoid local crèches, only to send their children to crèches (far away) at the growth point, where they were convinced their children would receive 'good' education. Good education implied instruction in English. Growth point crèches were manned by young and better educated teachers, while most crèches in schools were manned by old ladies with grade seven qualifications. The crèche, has thus become synonymous with a place where children go to learn English and very little of African languages (Mutasa and Negota, 2008:338).

If the practice of shunning African languages is not arrested, then the African continent stands to lose a lot. The indisputable result is the slow and painful death of African languages. Skutnabb-Kangas (1998:6) observes the same. He writes that, "If children do not get the opportunity to learn their mother tongue and become as proficient as their parents, these languages are not going to survive." The sad thing about this practice is that it is not peculiar to Zimbabwe but has been noted elsewhere in Africa. In South Africa, according to a study by Pattanayak (1981:155); some children shun African languages, even if they are offered at their school. The study that was carried out east of Johannesburg, found out that 98% of the students preferred English as language of instruction while 5% of the 98% students communicated at home in English.

In another study, Rwambiwa (1993) found that pupils despised African language teachers often. They did so by expressing negative attitudes towards learning indigenous languages. Such negative attitudes were also found in the pupil's parents. It is undoubted that parents' attitudes filter through to their children and are discernible in their offspring. Children of parents with a negative attitude are likely to have negative attitudes themselves. In another study, Ndamba (2008:184) discovered that parents and children had a more positive attitude towards English than the mother tongue as language of instruction. Further, Roy-Campbell (1996) and Setate (2005) also found out that in general, Africans still resist mother- tongue education in favour of education delivered in English. It is however pertinent to point out at this juncture, that the continued use of a foreign language as language of instruction may result in children having a negative attitude towards their mother tongue.

The good thing that came out of this research was that the grade four pupils under investigation did not show any negative attitude towards learning Science in their mother tongue. They actually enjoyed lessons taught in Shona and always looked forward to them, prompting and reminding the researcher when he was due for the next lesson. A request by one pupil who had been involved in this research was testimony to how much pupils had enjoyed the Science lessons conducted in Shona. "Sir, *hamuchauyi kuzotidzidzisa Science ne Shona here gore rino?*" (Sir, are you not going to teach us Science in Shona anymore this year?) he begged. Such positive attitudes should be

exploited by the government and policy makers for the development of African languages. Pupils with positive attitudes need little motivation as they are ready to learn. Chances are that greater student participation in the teaching-learning process is likely.

More pupils are likely to succeed in their learning. Vawda (1999:557) sums up this view. He says that the justification of investments in local language education is greater student participation as well as improved student learning and success. He further says that research results abundantly point to improved learning achievement when instruction is in the mother tongue. Similarly, dropout rates in schools decline when mother tongue is instituted.

Finally, it is imperative to point out that attitudes play a crucial role in the crafting of a new language policy as well as its implementation and acceptance. Indigenous African languages lag behind colonial languages in their status and social functions. Those in the echelons of power need to change their mindset and attitudes in order to reverse the prevailing language policy crafted and modeled along European lines. That done, parents also need mental decolonization so that they accept and respect their own languages in as much as they accept and respect English. Once parents attitudes change, so will their children's. The moment the parents and children accept the new policy, then successful implementation will follow. The result is that African languages will then take their rightful place in the world like other revered languages.

Most parents interviewed (75%) were in favour of the use of English as a language of instruction in schools. Those who thought Shona was ideal, constituted a mere 10% while 15% did not mind which language was used. Parents in favour of the use of English clearly expressed their satisfaction with a pupil who has thoroughly learned the Queen's language. "*Ungati mwana akafunda chii kana asingagoni kana chirevo chimwe zvacho cheChingezi?*" quipped one parent. (How can one say one's child is educated if he/she cannot utter a single sentence in English?) Some parents expressed concern that they wouldn't like it if their offspring could not match their competence in English. They would not hear any nonsensical talk on the use of Shona. "*Ungataura nezve kudzidza neShona? Mutsauko wacho unozova papi, ndiani asingakwanise kutaura*

Shona?” (Talk about learning in Shona? How can the educated be distinguished from the uneducated? Who cannot communicate in Shona?)”

Most parents with such attitudes were those educated in the colonial era while the few who accepted the use of Shona had tertiary education and learned during the post-colonial era, it was noted.

5.3.4 Implications of the teachers and pupils language attitudes

The discussion on attitudes has clearly revealed that Zimbabwean people, teachers and pupils as well as heads of different government departments have negative attitudes towards Shona, their first language. This negative attitude works against the revalorisation of African languages. In order to develop an African language, the speakers need to value it and accept that it is as good as any other language in the world. The acceptance, denial or rejection of this fact is indicative of some attitude. A positive attitude means acceptance and a negative attitude rejection.

What all Zimbabweans with a negative attitude towards the use and development of their own language need to know and appreciate, is that no country has successfully developed politically, culturally, socially and economically on the basis of a foreign language (Prah, 2000; Mazrui, 2000; and Chimhundu, 2001). Mutasa (2006:61) sees things the same way. He says, “No country has ever ascended to first rank technological power by excessive dependence on a foreign language....” The implication of these observations is that Zimbabweans need to have a positive attitude towards their languages first, then use them in schools and in other crucial and key domains in their life. This move will give Zimbabwe impetus for scientific, technological and economic take off. Above all, it is the right of the African child to attend school and learn in their mother tongue (Asmara Declaration on African languages and Literature 2000). Effort should be made to develop African languages at all levels of education, be it primary, secondary or tertiary; formal or informal, for “... in the development of any society the use of indigenous languages is more efficient than foreign languages” (Rwambiwa, 1992:2).

From this research's results, it is imperative to note that the continued use of African languages in all domains of African life greatly stifles the socio-economic, scientific and technological development of African countries. A change in attitude and mindset is what is called for first. It is in the ruling elite that attitudes need to be changed first. A change in attitude should result in the crafting of the appropriate language policies. Such a policy should include scrapping English as a requirement for recruitment and training in the private and public sectors. With the correct policy in place the implementers of the policy should be convinced and sure of what they want to do and why. In the group of implementers are teachers. Their attitude needs to change. Next, it will be the attitude of the generality of Zimbabweans that will be targeted for change. The people's attitude should be changed through mobilization.

Mobilisation could be achieved through awareness campaigns launched through the mass media (electronic or print), as well as other means like rallies or mass lectures. If the generality of Zimbabwean parents begin to accept that their own languages are as good as English and accept them as languages of instruction in schools then the game is almost over. There will be little or no resistance from pupils as the positive attitudes the parents have will filter through to their children.

It can therefore be summed up that, in order for positive behavioural change to take place, the population targeted should have a positive attitude and understanding of the intended goal. They should appreciate the reasons for making that undertaking as well as the benefits that will be accrued after undergoing through the rigours of the intended programme. The implementation of a multilingual language policy in which an indigenous language such as Shona is the medium of instruction will certainly fail if the targeted pupils have a raw and negative attitude towards their mother tongue, as revealed in this research. What needs to be done is to mobilize the generality of the Zimbabwean people to accept and appreciate the importance of their own languages.

This could be done through the mass media and other channels that easily and readily reach out to the populace. That having been done, teacher training colleges will be the next port of call. The negative attitudes shown by the teachers in this research clearly

reveal that if policy were to change overnight and the teachers were asked to implement it, they would certainly do a bad job as their attitude was negative. It would be important and beneficial if the teachers were assisted to pick the right attitude first. It would be from this point then that they will be asked to implement the new policy with an anticipation of some chance of success. Thus, without a change of attitude and mindset in the teachers and pupils it would be futile to try and institute and implement a new language policy in which an indigenous language is used as a language of instruction. It will be resisted and it will fail.

5.4 LANGUAGE POLICY PREVAILING IN GOVERNMENT SCHOOLS AND DEPARTMENTS

As is the case in many African countries, “the Zimbabwean political leadership has allowed English, the former colonial language to function as the official language in all domains including education (Magwa 2008:249). In Anglophone Africa, many countries still have English as their official language. This is hangover from the colonial language policy that exhorted the dominance of English over indigenous African languages. The countries included Lesotho, Swaziland, Botswana, Zambia, Uganda, Tanzania, Kenya, Ghana and Nigeria, (Hugh- Hawes1990). In these countries, the language of instruction in the first three grades in the primary school is the child’s mother tongue. Instruction from grade four upwards is in English.

Exceptions are Sierra Leone where instruction in English starts in grade one up to university as well as Tanzania where instruction in the whole of primary school is in Kiswahili. At secondary school, instruction then changes to English. Further, in all the Anglophone countries cited, examinations are set and written in English. The only exceptions are the indigenous language examinations which are set in the indigenous language itself. These indigenous languages are taught as individual subjects. To make matters worse, in some African countries indigenous languages were and are still taught in English. Mguni, Furusa and Magosvongwe (2006) complain that African literature in African languages is taught using English, French and German and not in African languages.

Fortunately for Zimbabwe, Shona literature from primary school to secondary school is taught in Shona. The survey carried out in schools in this study reflects so. At university, however, literature is not taught exclusively in Shona but a mixture of both indigenous languages and English. The ideal thing is to teach African languages in African languages. The major challenge facing African governments however is, which language to declare official in Africa's multilingual setting. Wolff (2000) says that Kenya has 42 languages, Tanzania has about 100 and Nigeria has 397. Deciding on which language to pick as official can be problematic, but a good starting point would be to pick on languages spoken by significant numbers of people in a country's population. Kiswahili is a good example as it is spoken by 90% of the Kenyan population (Roy-Campbell, 1997:56). In the case of Zimbabwe, in addition to Shona and English there are at least 15 other indigenous languages (Hachipola, 1996). There are three major languages in Zimbabwe. Chimhundu (1983) says Shona is the mother tongue of about 75% of the population, Ndebele about 16,5%, English 1 % and the other minority languages about 7,5%. Basing on the number of indigenous language speakers; Shona and Ndebele would be good targets for national and official language status.

The practice of using indigenous languages as languages of instruction in the first three grades in the primary school as currently prevails in most African states is not the ideal thing. The use of the mother tongue for basic education is the ideal thing as it helps bridge the gap between school and home (Ogutu and Nthiga 2008:185). The most desirable thing however would be to use the mother tongue to as late a stage in school life as is possible. In Zimbabwe, the 1987 Education Act allows the use of the mother tongue as language of instruction in the first three grades in the primary school. Although government policy allowed it, practically this policy was not being implemented. Results on the ground were that pupils were being taught in English most of the time. It is recommended that government enforces this policy even though it doesn't go all the way as desired. As Ogutu and Nthiga (2008:176) argue,

We should not have policies that relegate African languages to languages of instruction in the early years of primary education only. Policies that de-emphasize African languages in favour of English ruin Africa's chances of being innovative in Science and technology.

The continued use of English as a language of instruction at primary and secondary school in general, and in the teaching of Science in particular, will not help Zimbabwe develop scientifically and technologically. For the past thirty –two years, Zimbabwe has nothing to show scientifically and technologically. It should be clear to Zimbabweans that children learn best when education is delivered in a language familiar to the learners, preferably a mother tongue, not one in which they are still struggling to learn, in most cases a foreign language (Cummins 2000).

The long and short of the argument is that the language policies prevailing in African schools in general, and Zimbabwean schools in particular, are not progressive. They allow colonial languages to dominate indigenous languages to an extent that indigenous people will despise their own language. Consequently, colonial languages will stifle the development and growth of indigenous African languages as languages of instruction and vehicles of socio-economic and technological development.

From the interviews conducted with heads of government departments, it was clear the language policy prevailing was that English was the official language of business, there were no two ways about it. English was a requirement during recruitment in all the eight departments. Official communication was in English. Training and certification was done in English. Examinations were also conducted in English. The situation was the same in schools.

The heads of schools as well as school inspectors were all knowledgeable about the language policy prevailing in schools. At primary school, all instruction was to be in English, starting from grade four to grade seven. This included the teaching of Science. Policy also stated that instruction from grade one to grade three was to be in the language the pupils understood best, that is their mother tongue, in this case, Shona.

Interestingly, only 22% of the infant teachers followed and practiced this policy. Heads of schools and education inspectors testified that teachers taught all subjects of the curriculum (except Shona) in English whenever they made class visits observing lessons. The practice was observed at all primary school levels, that are from grade one to grade seven. Interestingly, it was observed that from grade four through to grade seven, only 6% of the thirty-three teachers said that they taught all their lessons (except Shona) in English, as stipulated in policy. The majority, 94% violated ministry policy by teaching using both English and Shona. At secondary school, the English for all policy obtained. All subjects were to be taught in English, with the exception of Shona. Heads of schools testified witnessing the implementation of this policy by their teachers.

Finally, it should be pointed out that although policy stated that infant classes should be taught in their mother tongue, all the thirty-seven infant teachers indicated that their end of year tests including those for Science (excluding Shona) were set and written in English. Likewise, 98% of all primary school teachers said that they tested Science in English. The long and short of it, is that even though the policy is not pupil friendly, one positive and progressive aspect of the policy, that of the use of the mother tongue in infant classes, was not adhered to. There was need for government to enforce the full implementation of this policy.

5.4.1 Language policy in private schools

Private schools are institutions that are usually established outside the total control and jurisdiction of government and government agencies. These schools usually have some autonomy. They have room to operate in some ways different from the norm in government schools. Private schools have some leeway to charge fees they want although within the general parameters set by the state. School enrolments are not restricted to zones, pupils enroll at schools of their choice as long as they can afford the usually high fees and are happy with the administration. On the contrary, in public schools, a school cannot refuse to enroll a pupil who is within their catchment area. Teacher–pupil ratios in private schools are relaxed, whereas in government schools a minimum of 1 teacher to 40 pupils is the requirement in primary schools. Many private

primary schools have as low teacher-pupil ratios as 1:10 to 1:20. Secondary teacher-pupil ratios in public schools are as high as 1:26 yet much lower ratios are seen in private schools.

Regarding the curriculum in private schools, private schools offer a wider curriculum than the public schools. A wider curriculum is offered in private schools as they can afford it. Most private schools offer a number of foreign languages as languages of instruction or as subjects. Languages offered include English, French, Portuguese and of late Chinese. Shona is learned as a subject and even though, there are very few students who take it up for study. The reluctance and refusal of students to take up Shona (or other indigenous languages) for serious study reveals the parents' expectations and attitudes. Students' actions and choices are often in tandem with their parents, values and expectations. Baine (2005:3) observes that, "the economic systems of English are dominant to the point that one cannot conceive of life without English." As a result, parents insist on and strive hard to enroll their children in schools that use English as medium of instruction in education. The private schools board members are usually elitist and products of such schools. As a result, the language policies of these schools reflect the values of the board members. Parents of most pupils in private schools are also products of such schools, and consequently value English greatly. Not only are the parents of most private school pupils elitist, but they are also usually very successful socio-economically. The parents attribute their success to the education they received in such schools and would therefore prefer to have their children go through the same mill and enhance their chances of success in life.

As most private schools are usually in urban areas, in suburbs once dominated by Europeans, the student population is a rainbow comprising whites, Asians and well to do blacks. This means that there is no common mother tongue to the student population as it is not linguistically homogenous. The policy of mother- tongue education for children in the first three grades in the primary school automatically falls away. In order to cater for everybody, instruction in these schools will have to be done through a neutral language, English. As such proficiency in English is a requirement when teachers for these classes are recruited.

It is therefore clear from the discussion on language policy in schools that not only do private schools prefer English as a medium of instruction but the same situation prevails in public schools. The motivation is one, although circumstances differ slightly. Thondhlana (2005:33) in Chivhanga (2008:32) notes that,

In Zimbabwe, most schools prefer to use English as medium of instruction from the lowest level of formal education upwards, to ensure their students' proficiency in English which is considered the language of power and economic well-being.

It can therefore be summed up that language policy in private schools is no different from that in government schools although there is room for small digressions to basic policy. The medium of instruction is English. All subjects of the curriculum should be taught in English. Private schools however have room to introduce other subjects into the curriculum as well as other languages like Chinese, French or Portuguese. In private schools examinations are not the prerogative of the Zimbabwe School Examinations Council (ZIMSEC) but other examination boards including those from overseas like The University of London and The University of Cambridge can administer examinations in these private schools. The irony in it, is that while it is compulsory to offer Shona as a subject in these private schools, most of the students enrolled there do not take it and as a result the subject is not offered. These schools argue that there are no interested students. Similarly, there are a number of public schools that do not offer Shona at Advanced level arguing that no students were interested in the subject. The result is that private schools impede rather than promote the development of Shona as a language.

5.4.2 Lessons drawn from government departments and private companies

Interesting lessons were drawn from interviews conducted and visits made to different government departments. Although all department heads said that English was the official language of business in their department they acknowledged that in their day to day business with Shona first language speakers they used Shona almost consistently. This was so because they felt that the language presented them with the best medium

of communication, a language in which both host and client are comfortable and competent. More interesting was the revelation that in some government departments like Vet and District Development Fund (D.D.F.), there were many technical people who did their work competently even though they could not competently speak or write English. In the veterinary department, a pass in English was not prerequisite to the recruitment of dip attendants. They executed their work well without extensive knowledge and mastery of English. At the D.D.F. premises it was a marvel to watch personnel who did not have any 'O' level pass to talk about run machines and repair tractors. The conclusion that could be drawn was that it was not always necessary to have a pass in English at "O" level to be a competent machinist or technician.

On the contrary, many Zimbabwean companies are adamant that English is a requirement for anybody to undergo any formal training. There is abundant evidence in support of this policy. In the review of literature discussed above, cases were cited where government departments and private companies advertised training opportunities but required passes in English at "O" level. What this boils down to is that such departments and companies are in essence impeding efforts in promoting the status of Shona as an official language. Perhaps the government could be best advised to enforce compliance using a statutory instrument.

5.5 THE ROLE OF UNIVERSITIES IN TEACHING SCIENCE USING SHONA

In the spirit of African Renaissance, and revalorisation of African languages, universities have a critical role to play. "Universities should serve as role models in teaching African languages using African languages (Mutasa and Negota 2008:228). As universities are the highest institutions of learning, society looks up to them for ideas and role models to emulate. Mutasa (2006:103) notes that, most African universities did not offer degrees in African languages at their inception. These included the University of Rhodesia, now the University of Zimbabwe. In these African universities, African languages and literature were studied in metropolitan languages like English. The situation has slowly evolved and many universities, including those in Zimbabwe, are now offering degrees in African languages. In these universities, African languages are being used more and more, in

instruction. In a number of cases, for example, at the University of South Africa (Unisa), students are allowed to write their dissertations in local languages but with a requirement to translate all or part of them to English.

Nompuciko (2004) cites the University of Stellenbosch in South Africa, as one university that has taken the lead in the maximum utilization of African languages. Masters and Doctoral students at this university write their theses in African languages. Ogutu and Nthiga (2008:183) say that in Kenya a number of universities allow students to write their theses in Kiswahili. In the same vein, a first has been scored in Zimbabwe by Masvingo State University, in line with the revalorisation of African languages that is being lobbied for. At this university, all teaching in the African languages department is done in African languages. All assignments are also done in local languages (Mutasa and Negota, 2008:269).

In the campaign for the revalorisation of African languages, universities should help generate new knowledge in African languages rather than dwell on duplicating existing knowledge only. There is a lot of research needed and worth the effort in African languages. A case in point was the establishment of a university in Binga, Zimbabwe, aimed at studying and developing the Tonga language is a step in the right direction. A lot of information and knowledge about the Tonga language and the Tonga people's way of life was being found and gathered. Similar efforts should be made to resuscitate other minority languages dying because of neglect.

In general, universities should help coordinate the study of African languages between universities and government departments tasked with the development of African languages. Furthermore, universities should follow up the application of the results obtained from other institutions like national directories of literacy, universities and the departments of education and training (Mboup, 2008:61). "Universities should also help in the design of technical and scientific lexicons in Mathematics, journalism... and linguistics as well as the translation and development of texts" (Mboup, 2008:68). Likewise, universities should help in the lexical modernization of African languages. This can be done in three ways namely:

- (a) borrowing some concepts from other African languages or from foreign languages;
- (b) lexical derivation and composition in order to create new words and concepts that do not exist in the language targeted for development and
- (c) extending the semantic field of some targeted concepts by using words that already exist in the vocabulary of the targeted language (Mboup, 2008:119).

Where the target local language, in this research-Shona, does not have equivalent words to match those in a foreign language the words from the foreign language should be adopted and adapted into the local/indigenous language. The adaptation should be done following the phonological and morphological rules of the borrowing language. In this research several words have been cited as examples. These include words like *giridhi refurenzi* (grid reference). Where no words for a concept exist in the language to be developed, new words should be coined. Ogutu and Nthiga (2008) cite a typical case where Kiswahili scholars at Dar es Salaam University are continuously developing new terms to enable Kiswahili cope with modern technology. Terms like *bania pepe* (e-mail) and *simu ya husein* (mobile phone) have been cited. Locally, at Masvingo State University, many such terms have been developed. Examples include *dongoreragotsi* (flashback) and *dambiranyaya* (setting) to cite a few. In this research, a new term *chivhitivhiti* (television) has been coined. The challenge of terminology should therefore be addressed by training experts in the development of African languages.

These experts should then spearhead the development of the grammars and lexicons of the languages to be developed. First, the experts should work on the standardization of graphic systems of the main national languages especially those that will be lagging and underdeveloped. Experts should also spearhead the designing and development of technical and scientific lexicons. In conjunction with the department of education and training as well as the curriculum development unit, universities should design and develop teaching materials like textbooks, grammar books, glossaries and dictionaries. These educational materials should be written in the language to be developed, with the

appropriate registers and relevant vocabulary. Where new knowledge has not been generated, available literature should be translated. When literature is translated, it opens up numerous advantages. Jobs will be created as training opportunities for translators would open up. Translation also means information would get wider circulation benefitting individuals and the country at large. The issue of cost often cited by detractors of the policy on African languages development is not realistic. Cost should not stand in the way of the development of African languages. Brocke-Utne (2004) argues that, it is more costly to have millions of African children going to school and learn in a foreign language in which they don't understand a thing and will benefit very little than to educate children in their mother tongue. Resources will be wasted, both financial material and human.

Finally, universities should help by incentivizing African language teachers. These teachers could be given job assurances and financial rewards as motivation for any efforts made towards the development of African languages.

Universities can play a leading role in teaching Science using Shona. If Science is taught in Shona at these high institutions of learning, it will give everybody confidence in the strength and effectiveness of Shona. The negative attitude towards indigenous languages prevalent in Zimbabwean society will naturally melt and people will readily accept learning this important discipline in Shona. Besides attitude change, universities can play other important roles. Research on various scientific concepts can be conducted. Such research will build up knowledge based on local conditions and setting. Agricultural science research is a case in point. New seed varieties as well as farming methods will be tried out, thus generating new knowledge at the same time filling gaps in previous knowledge. Old knowledge is modified or replaced. Similarly research on relevant scientific vocabulary, registers and terminology can be conducted at university benefitting the nation at the end. In this drive to modernize Shona, new terms are coined to suit the situation prevailing in the world today. New terms like *mushamarani* (disc-jockey) and *chivhitivhiti* (television) have already been cited. In the course of modernization some indigenous terms are adapted to suit the contemporary political, environmental and technological set up.

Centres for such work can be established at universities. These centres can help with research in methodology that can be used in teaching Science through Shona, curriculum planning and development as well as in the production of materials like Science modules, textbooks and dictionaries in Shona. Such information will greatly assist the development of Shona as an effective language of teaching Science.

5.6 EFFECTIVENESS OF SHONA AS A LANGUAGE OF INSTRUCTION IN TEACHING SCIENCE IN ZIMBABWE

Shona belongs to the Bantu group of languages and is just as good as any other Bantu language. Bantu languages (like Kiswahili) have been used to teach at different levels of education up to grade seven. That Kiswahili has been used successfully to teach different subjects in the primary school up to grade seven level shows that an indigenous language can be used successfully as a language of instruction. Likewise, Shona has been used all along at different levels of education- formal and non-formal- as language of instruction. As discussed in the chapter on data presentation, both primary and secondary school teachers resorted to instruction in Shona when the official (English) failed to deliver. Before children go for formal schooling, they will have learned all they have to learn in their mother tongue. Fortunately, there was no stigma attached to the use of one's own language for any purpose (Mutasa, 2006:58). Mother-tongue education smoothens and bridges the gap between home and school. It is best as African children are more familiar with an African language spoken in their surroundings than with a colonial language which is heard most of the time in an incorrect form (Ogotu and Nthiga 2008:183). It is therefore psychologically sound to use it. Further, as the mother tongue is the shrine of our culture, it gives the pupils identity and as such it is the child's right to use it educationally. Phillipson (1992) agrees. He says that the mother tongue of a child is ideal and best educationally and psychologically. He also says that to use a foreign language in the education of a child is to deny a child its basic cultural right as prescribed in the 1989 Convention on the Rights of a Child.

In Tanzania, Kiswahili has been used to teach all the subjects in the primary school curriculum successfully. Kiswahili is a Bantu language just like Shona. The researcher

feels that Shona can be used equally effectively to teach all subjects of the curriculum. This research has demonstrated that Shona can be used to teach Science effectively. The use of the mother tongue in education has numerous advantages. During the teaching –learning process students are active learners for they participate more as they understand and articulate the issues at stake better and simpler. Research has indicated improved student learning and achievement, low dropout rates, better adjustments to school, cultural preservation and self confidence in children (Vawda, 1999:560). Students’ understanding of issues taught in the mother tongue is faster and simpler than understanding those taught in a foreign language. Despite the clear and numerous advantages Shona has as a language of instruction, it still faces a number of challenges like other African languages. Ogutu and Nthiga (2008:171) cite a few, namely:

- (a) inadequate learning and teaching materials,
- (b) African languages have not developed the necessary terminology for classroom operations,
- (c) lack of terminology to deal with aspects of modern life, science and technology,
- (d) lack of competent teachers to teach subjects of the curriculum in African languages and
- (e) policies which disadvantage African languages.

The challenges cited are not insurmountable. It only calls for the correct attitude and determination on the part of government to put everything right. This includes crafting progressive and appropriate policies, developing vocabulary, relevant registers and terminology, training teachers and providing appropriate and adequate materials for the targeted African language. Osaki (2005:47) notes that the lack of resources theory is a deception originating from history. He writes:

There is always the deception that the language of the colonized people is inferior and has not got sufficient words to explain scientific phenomena, coupled with the trick of imperialists that there may never be funding to print material in the vernaculars or train teachers to teach Science in Kiswahili, Kigogo, Kisukuma,...(or Shona).

Despite these challenges it is undisputed that mother-tongue education advantages far outweigh the shortcomings cited.

In this study, the researcher used school based schemes of work compiled by the control and experimental class teachers. These were written in English. Thus, the researcher only drew detailed lesson plans for the twenty lessons in the experiment. The lesson plans were identical: twenty in English and twenty in Shona. As the researcher was used to planning in English, the lesson plans in Shona were more demanding. They required more thought, time and effort especially with regard to ensuring equivalence between lessons and ascertaining *that* the best words were used to portray a concept or give an instruction. Some old words like *zvombo* (weapon) took new meanings. In lesson planning it came to stand for media/apparatus used to facilitate teaching and learning. Nonetheless, the researcher successfully planned the twenty Science lessons in Shona. These were then used with the experimental class. It goes without saying, that Shona can be used successfully to plan Science lessons.

During lesson delivery, the researcher was quite comfortable and enjoyed executing his tasks, Teaching and learning was fun and exciting for both researcher and the pupils. During group discussions, pupils were active and participation was high. Pupils were not at a loss with regards to what they were learning. As a result, there were not many silent moments, indicating hardships or misunderstanding. During lesson execution as well as at the end of the lessons, pupils generally and readily asked questions. These were meant to clarify any difficult or ambiguous points. Most interesting was that pupils often argued their cases and spoke their minds confidently and brilliantly. During these Science lessons in Shona, pupils acquired a lot of vocabulary. Some interesting words they picked included *betepeswa* (butterfly), *chionioni*, (mirror) and *mupedzazviyo* (anus) to cite a few. Many English scientific words were adopted and adapted. Among many such words were *temburicha* (temperature), *giridhi refurenzi* (grid reference) and *raifi saikoro* (life cycle). Languages have immense capacity for assimilating words, terms and expressions from other languages. As an illustration, Shona has many borrowed words now in relatively common use due to the influence of modern technology. The words include a few like *rura*, (ruler) *shuga*, (sugar) *kombiyuta* (computer) *redhiyo* (radio) and

bhiro (biro). In support of borrowing words from other languages Young (1979:57) writes, “Teach the English word if there is no word in the local language.”

Below is a brief summary of some words adopted and adapted from English as well as new words coined or evolved in an effort to keep Shona abreast with modernization. All the words came out during the course of this research in the topics- Health and Pollution; Crop, Plants and Animals; Materials and Technology; Landforms and Maps as well as Fuel and Energy. Blanks in the Shona word column imply that the artifact in question did not exist in Shona culture then.

Table 5.1: Shona word English word Adapted word New term coined/evolved

nyongorosi	earthworm	wemusisi
utunga	mosquito	mosikito
gonye remudumbu	gutworm	gatiwemu
network	netiweki	masaisai
zana	hundred	handireti
runhare	cellphone serofoni	mbozhanhare
	computer	kombiyuta
television	terevhizheni	chivhitivhiti
thermometer	semomita	mhimamudziya
mweya	oxygen	okisijeni

These are only but a few of the numerous words that came up during the course of research.

As for the progress check exercises written, pupils performed well and quite naturally. Results revealed high, mediocre and low performers just like in any other subject. The results were generally good and in all twenty lessons at least 50% of the pupils passed each progress test written. It was also notable that pupils’ answers in the progress check exercises were clear, explicit and elaborate. There were small and negligible

grammatical problems and a few challenges. The results were generally pleasing and plausible.

Overall, pupils involved in the study enjoyed the lessons. It is prudent to once more quote the views of one research subject. A grade five boy who had been in the experimental class the year before was courageous enough to ask the researcher, “Sir, *hamuchauyi kuzotidzidzisa Science here gore rino?*” (Sir, will you not teach us Science once more this year?) Such was the interest that teaching Science in Shona generated.

Despite the clear advantages mother-tongue education has, it still faces many obstacles in the classroom. Ogutu and Nthiga (2008:168) cite three namely:

- (a) policies which disadvantage African languages
- (b) lack of resources and
- (c) the multiplicity of languages.

It is recommended that affirmative action be taken to promote the use of African languages, the lame excuse of lack of resources be thrown out as resources can always be found if those who craft and supervise policy implementation have the right attitude and are willing. The multiplicity of languages is not an issue as a few languages can be picked and developed a time. Multiple languages are a big resource.

5.7 MOTHER TONGUE VERSUS ENGLISH IN TEACHING SCIENCE

All languages have the capacity to express whatever the speakers of that language need to say (Roy-Campbell undated: 10). We can thus say that Shona is as good as any other language be it Kiswahili, Chinese or English. However, when it comes to a language’s suitability and effectiveness as language of instruction in education, context will determine the conclusion drawn. English speaking first world countries have achieved scientific, technological and economic success through their mother tongue, English. Similarly, countries of the second world like Japan, Korea and China have achieved the same success through their indigenous languages. The same would do for

Africa. Africa will achieve the same economic results if they engage and utilize their own languages for scientific, technological and economic development. The sad story is that Africa is using the wrong tool for the task and challenge at hand. The motto should be: African languages and African solutions for Africa's problems and challenges.

A number of studies comparing the effectiveness of indigenous languages and colonial languages like English have been carried out. In a study in Magwa (2008:268) mother-tongue education scored better results than education through English. In the study, mother-tongue instruction was instituted for eight years and yielded a pass rate of 83,7%. When mother-tongue instruction was instituted for four years only, the pass rate accordingly reduced to a low of 44%. It is clear from the results that the longer mother-tongue education is practiced the better the results. In another study, Fishman (1971a:15) cites an experiment in the Phillipines in which the effectiveness of Hilligayon (an indigenous language) was tested and compared with that of English. The results were that the experimental group taught in the mother tongue performed much better than the one taught in English. Similarly, in The Six Year Primary Project in Nigeria, Bamgbose (1991) came up with similar results. The classes taught using the local Yoruba language performed much better than those taught in English. From the three experiments what comes out clear is that mother-tongue education ensures maximum performance in learners, (Mutasa 2004), and learners who learn through a second language are disadvantaged, (Ngara, 1982; MacNamara, 1973). Likewise, the results from this research reveal very high pass rates for pupils who were taught Science in Shona as compared to those taught in English.

To corroborate the findings just discussed a few experiments conducted elsewhere will suffice. The results from these experiments agree with some findings from this research namely that pupils' answers in the oral and written English work administered were not elaborate and that teaching time taken in the Science lessons taught in English was longer than that of Science lessons taught in Shona. In this study, the researcher noted that most control class pupils' answers were restricted to one word answers during both the oral and written phases of the lessons. According to Kembo-Sure (2008:45) one word answers can be attributed to two things namely:

- (a) the kind of questions the teacher asks (requiring just a word and no more) and
- (b) the linguistic factor, where pupils use the avoidance strategy by using one word to avoid making errors in their speech.

It is the linguistic factor where this researcher and writer found the pupils wanting. They could not soundly communicate and articulate issues throughout the lessons taught.

In a study investigating the relationship between the length of pupils' answers and subjects, Trappes-Lomax (2006:143) found out that in English, Mathematics and Science pupils gave more one word answers than two to three word answers. Hardly any four or more words answers were given. Instruction in the three subjects was given in English. The researcher also found out that what pupils said was far below what was expected of their ages although the pupils produced longer stretches of speech in their mother tongue. A similar phenomenon observed by this researcher was that pupils who learned Science in Shona produced longer and more elaborate answers than those who learnt Science in English.

Another finding from this research was that generally Science lessons taught in English took longer to teach than those taught in Shona. The difference often stretched to as long as five minutes. This discovery was not a first as MacNamara cited in Chiwome (1992:248) came up with a similar result. He established that learning in a foreign language takes longer than learning in the mother tongue. All the studies just cited are in favour of mother-tongue education and its advantages. Ogutu and Nthiga (2008:171) describe some of the advantages of mother-tongue instruction. They say that learning in the mother tongue promotes full understanding of content and concepts and reduces chances of rote learning, parroting, memorization and exam cheating. Chiwome and Thondhlana (1989:159) note some advantages of using the mother tongue in education. They single out the development of critical powers, effective communication (between teacher and pupil as well as pupil and content), deeper cultural understanding and increasing national consciousness. In short, the teaching of Science in national languages gives confidence to the common man, that Science itself is within his reach

and to teachers and pupils that the knowledge of English need not be a requisite for learning Science (Brock-Utne, 2000:153).

The question of which language to use when teaching Science is pertinent to the teaching of the subject in many developing countries. In support, Young (1979:55) observes that, "In many tropical schools, language is a problem in the teaching and learning of Science." The principal question is which language to use, local or foreign?

During and after this research many factors pointed to Shona being better than English when used as a language of teaching Science to grade four pupils whose first language is Shona. During the teaching learning process, 7 out of 20 lessons in English, that is 35%, took longer to teach than those in Shona. The remaining 65% took almost the same time. This clearly indicates the advantage Shona has over English as a language of instruction: it is easily used and understood by native speakers, both teacher and pupils. The researcher discovered that lessons in English took longer to teach than those in Shona because the lessons in English had more new words to teach and learn than those in Shona. The researcher had the double task of teaching the English language first and then the Science concepts second, all in one thirty minute lesson. This was a major challenge. During the teaching learning process there was more and free pupil-pupil interaction in lessons conducted in Shona than in English. Questions, issues, opinions and arguments were more freely and better articulated during the lesson in Shona than the one in English.

Regarding pupils' performance in the progress check exercises in English, a number of observations were made. Many pupils faced grammatical problems and challenges in expressing themselves effectively in their answers. One example will suffice.

Question: Where does a wasp live?

Answer : Where does a wasp live Colony?

Unlike answers in the progress check exercises in English, answers in the progress check exercises in Shona were generally elaborate, to the point and had little or no

grammatical problems. Similarly, answers in the progress check exercises in English were fraught with spelling errors such as “choub” for tube unlike in the progress check exercises in Shona. Thus, once more, Shona had an edge over English as a language of instruction.

Further, the results from the progress check exercises speak volumes about the edge that Shona has over English as a language of instruction. Where the highest score attained by the pupils was the same (100%) in English and Shona progress check exercises, Shona had more 100% scorers than English. This implies that Shona performed better as a language of instruction than English. Statistically, Shona had more 100% scorers than English in 80% of the lessons. English had more scorers in one lesson only. It was therefore clear that Shona was more effective than English as a language of instruction in teaching Science to the grade four classes chosen. Problems resulting from the continued use of foreign languages as media of instruction have been documented. Many of them relate to the poor performance of pupils in their school subjects as a result of using a language in which they lack proficiency.

There are numerous studies that clearly show the difficulties students in Africa meet when learning through the medium of English. In many African countries, a decline in performance in national examinations has been experienced not only in English but in other subjects too. This is often related to students' lack of competence and proficiency in English, the language of instruction. Pupils are introduced to instruction in English before they have even mastered the basics of the language they are to be instructed in. It goes without saying that in most circumstances pupils will learn and understand Science better if it is taught in their native language than in a language they don't fully understand and are not proficient in. One thing is therefore certain: faced with a choice of choosing the language to use when teaching Science we should use the local language whenever possible. Young (1979:56) says this is true for Science and other subjects too.

5.7 THE NULL HYPOTHESIS

From the discussion in chapter 4 above, the position of the null hypothesis is that there is no significant relationship between the performance of the experimental group and that of the control group. The null hypothesis seeks to judge whether apparent differences in performance merely result from sampling error. If the control group and experimental group mean achievements are too great to attribute to fluctuations resulting from sampling error, then the null hypothesis will be rejected arguing that the difference is not a result of sampling error but that something has happened, affecting the experimental group so that it behaves like a random sample from a different population.

In this study, the result of the t test conducted was $t = \frac{2,22}{0,61} = 3,63$ According to Khan (1997:329), if the value of the numerator in the ratio is not significantly greater than the denominator then it is likely that sampling error, not the effect of experimental variable is indicated. In this ratio, the numerator is however almost four times greater than the denominator, clearly indicating that the difference in performance between the control and experimental groups is not due to sampling error or chance but is due to the experimental variable; teaching using the mother tongue. Looking at the t value of 3,63 we note that it exceeds the t critical value of 2 093 for a two-tailed test at the 0,5 level at 19 degrees of freedom. For this reason we reject the null hypothesis that there is no difference in performance between pupils taught Science in English and those taught in Shona. Instead we then adopt the hypothesis that there is indeed a difference in performance between pupils taught Science in English and those taught in Shona.

The implication of the results of this research is that if this experiment were replicated with random but matched samples from a population of Shona first language speakers doing grade four similar results will be found in 95 out of 100 replications. The results assert that indeed Shona is a better language of instruction when teaching Science to grade four pupils when compared with English.

5.9 GENERAL OVERVIEW OF THE DISCUSSION AND POSSIBILITIES

The discussion has covered a number of issues relating to language status, people's attitudes, prevailing language policy in education, the perceived advantages and disadvantages of teaching Science in Shona and some key features of the study in general. These will now be summarized and some recommendations will be made.

5.9.1 Language status

Before independence, English was the official language. It was used in all the important social spheres and domains. It was the language of government, it was the language of the ruling white elite. Although English was spoken by less than 10% of Zimbabweans it enjoyed status dominance. Indigenous languages like Shona and Ndebele were given less functions in Zimbabwean social life, hence the low status. The even smaller languages like Tonga, Nambya, Shangani, Ndau, Hlengwe and others were worse off and hardly recognized. For this reason, these small and minority languages were referred to as vernaculars.

After independence, English remained the official language. It continued to enjoy the status it had in Rhodesia as it remained the official language in all the domains it was functional in, in Rhodesia. It was the official language of government, the language of the ruling black elite this time around. After independence the only significant change that occurred was that Shona and Ndebele were declared national languages but not official.

This research is lobbying and advocating the raising of the status of the two to official languages. Once their status is raised, it will allow the two languages to be used for the maximum benefit of all Zimbabweans as they will be used in the courts, parliament, in education as media of instruction and extensively in the print and electronic media to cite a few spheres. The scenario where day to day affairs of a population are conducted in a foreign and colonial language is unsavoury and unpalatable. It is also unsustainable. What use is it to administer in English and service your clientele in

indigenous languages as revealed by the inquiry in government departments? It is better, sound and economic to do everything in one language, an indigenous one for that matter.

Some of the advantages that will be accrued owing to the raising of the status of indigenous languages to official status include the following:

- the establishment of a clear national identity based on indigenous languages,
- the development by Zimbabwean people of a positive attitude towards their native languages and their heritage,
- the dependence on English as a way of developing a language and nation will be minimized,
- the significant growth of indigenous languages, literature and culture,
- the contribution by indigenous languages towards innovative, technological, scientific and national development,
- Zimbabwean students will learn and internalize concepts more easily as there will be proper understanding as opposed to rote learning during the teaching and learning process and
- the rights of indigenous language speakers towards their languages will be restored.

The lobby in this research cannot be over emphasized: Government should swiftly move ahead, raise the status of indigenous languages and use them more for the benefit of the entire nation. None the less, credit should be given to the majority government for recognizing and developing Zimbabwe's minority languages like Nambya, Venda and Tonga, which are in line for public examinations at grade seven level starting in 2012.

5.9.2 Attitudes

It has been clear from the discussion of research results in this study as well as those by other scholars Makanda (2008) and Magwa (2009) that indigenous Zimbabweans have a serious negative attitude towards their own languages. This is a result of the colonial

legacy inherited at independence. Such negative attitudes were and fostered by the colonial regimes. They gave English status dominance and trivialized the languages of the black majority such that black Zimbabweans came to accept English as the language to acquire, and to date continue to hold it in high esteem. Fortunately, the children in this research showed a positive attitude towards learning in their own language. At independence, instead of the black government reversing the colonial mindset, they perpetuated it.

This research therefore recommends that for any meaningful change in the Zimbabwean people's attitude, it will be prudent to start by changing the attitude of those in the reigns of power in government. It is only when the attitude of the ruling elite changes that it will be possible to change the attitude of the general populace. In order for the people's attitude to change, there will be need for them to see indigenous languages attain higher (official) status in society by being given more important functions. The government should then go on to scrap the requirement for English in public and private sector recruitment for job training. Instead people should be required to enter these institutions on the strength of a pass in an indigenous language. If that is done, there will be need to incentivize the use of Shona and other indigenous languages at work, at school and other institutions. With these measures in place, a full-scale crusade to mobilize people to change their attitudes can then be undertaken. As the struggle to change people's attitude can only be won by changing their mindset, it is recommended that clear and bold reforms be put in place so that written and oral mastery of some of our national languages becomes a criterion for election to some administrative functions, professional and social life. No Africans will ever be interested in learning their language, be it Xhosa, Kiswahili or Shona as long as the learning of a colonial language like Portuguese, English or French assures them of a well paid job in the private or public sector or a much sought after vacancy in training (Mboup 2008:115).

As this research has proved that grade four children have a positive attitude towards learning (Science) in their own language (as evidenced by their request to further learn Science in Shona one year after the research) the Zimbabwean government's challenge is that of changing the attitudes of the elders who have already developed hardened

negative attitudes towards their own languages. Once this is achieved, its game over as children's attitudes are still tender and in the formative stages. Positive attitudes in children can readily be moulded in classrooms and reinforced at home once their parents have developed the correct attitudes.

5.9.3 Prevailing language policy in education

This study has revealed that the Zimbabwean government's position and policy is that English be used as the language of instruction in education from grade four up to university while indigenous languages may be used as languages of instruction in the first three grades in the primary school depending on need and environment. On the ground, however, the situation is a lot different. In this research, the majority infant teachers were found to teach all subjects of the curriculum (except Shona) in English; thus clearly violating policy. The principal reason given was that all tests and examinations were in English, so why teach in Shona? When asked why they did not give their pupils tests in Shona; the answer remained the same- all examinations elsewhere in the system were in English. The study suggests that, to begin with, this trend in policy violation be investigated across the country and if confirmed, corrective orientation measures be instituted in order not to disadvantage the learners. After this correction, the correct African language friendly policy should then be crafted and implemented.

As this research has strongly revealed that instruction in the mother tongue as opposed to English helps pupils understand and perform better academically, clearly corroborating the results of the 6 Year Nigerian Project (cited in the literature review) in which performance by pupils taught in their mother tongue, Yoruba, was a lot better than performance by those taught in English, the research clearly advocates the adoption of policies that favour the use of African languages as languages of instruction for indigenous African children.

In the spirit of African Renaissance, this study recommends that policies that make African languages compulsory as subjects and as languages of learning and teaching

should be promulgated. Mutasa and Negota(2008) agree that we should give African languages value by making a working knowledge of an African language, for instance, Shona, a requirement for people working in the public sector. They say that this can be achieved by; linking African languages to viable careers and high status occupations,

- (a) disseminating crucial information in African languages,
- (b) ensuring that work interviews are conducted in African languages where participants speak an African language as their mother tongue and
- (c) dispelling dominance of English among the educated elite and its association with socio-economic mobility.

Mutasa (2002:244) further suggests that the best way to develop and prepare the African language for total and effective use in the contemporary world is to “scientificate” the languages. The languages can be scientificated by appropriating, transforming and integrating terminology from other languages. This can only be achieved by putting the language to be developed to full use in life. Thondhlana (1992) says language only develops when it is put to use. Scientificating a language will only succeed when the language is functional. The use of Shona in education will help it grow some new terms as these will be continually coined from the grassroots in tandem with the linguistic needs that arise. Mateene in Roy-Campbell (2001:192) concurs. He says:

African languages are underdeveloped in scientific and technical terms because they have not been used in these fields. It is only through active use of these languages in various spheres that they can become further developed. These languages are poor because we do not enrich them by using them in the spheres of language enrichment and development such as education and translation.

There is therefore need for the Zimbabwean government to change the language policy prevailing in schools to one that favours the use and development of Shona (and other indigenous languages) as languages of instruction in the teaching of subjects of the

curriculum like Science and others from the lowest level of education to the highest level possible. By giving African languages chance to function in society, they will be given room to develop. First, in an effort to correct current policy violation, it should be made mandatory that where the pupil's first language is not English, the pupil's home language should be used as the medium of instruction in school from grade zero to grade three. The government should then pick it from there and institute a policy that allows indigenous languages to be used as languages of instruction across the board in education.

5.9.4 Perceived disadvantages of teaching Science in Shona

The fear that critics of the use of Shona in teaching Science are obsessed with is the delusion that Shona is not good, wide and precise enough to be used in teaching Science. All languages are good enough to express whatever thought the speakers of the language need to express. Examples are Afrikaans and Kiswahili that were developed to function like English and Hebrew, a language that was resurrected and became a medium of modernisation in Israel. Today they are languages of Science and other subjects. The question is, why can we not develop and promote Shona in the same way? This fear manifests itself in governments which put in place retrogressive policies that promote foreign languages at the expense of indigenous African languages. Indigenous African languages should be given a chance as happened with Afrikaans and they will prove good enough.

One argument for the continued use of English is that Shona does not have equivalent words for those in English. Granted, equivalent words may not always be found but new words or terms can always be coined in order to communicate the new concepts. Young (1979:56) is of similar view. He says, "Languages develop words which are important to people who use the language". Savoury (1967) cites many invented words hitherto unknown in the English language. Words he cited include infra-red, ultra-violet, supersonic and catabolic to mention a few. As an illustration, words like 'pension' did not have equivalent words in Shona but today Shona has developed two words as equivalents that is *penjeni* an adaptation of the word pension as well as *mudyandigere*,

clearly a new term coined. A further example of a recently coined scientific and technological world is *chivhitivhiti* for television instead of the adopted and adapted *terevhizheni* for television. Consequently, the argument that a language is not good enough because it does not have equivalent words is neither here nor there. A language in general and Shona in particular only needs the chance and space to grow.

Another argument advanced is that Shona is not precise, English is. This is an unfortunate view point. No language was born wholly precise. Languages grow in response to needs in society. New terms are acquired or borrowed from other languages to fill conceptual voids in the borrowing language. English was not as rich and precise as it is today, four hundred years ago, (Broughton, 1980). It got richer through the acquisition of words and terms from other European languages. Shona a highly descriptive language is no exception with regard to precision. Given time and space, Shona can grow in vocabulary and resultantly in precision. This study noted many words that were adopted and adapted from English. These are referred to as loan words. Examples include *pinjisi* (pincers), *giridhi refurenzi* (grid reference), *wemusi* (worm) and many others. New words can thus be coined where borrowing may not be feasible or palatable. The compound word *chipimamudziya* aka *mhimamudziya* (thermometer) was found to be a good equivalent for thermometer as *semometa* appeared and sounded crude. That some languages are more expressive than others is just a value judgment placed on them. It does not hold water. Languages are not static, they develop and acquire terminologies as life progresses.

Further, the argument that English is international and therefore a language of wider communication is undisputed. If one learns Science in English, doors to international scientific work in English are opened as a world of scientific literature can be accessed. Similarly, Science graduates can be marketed internationally but the question that stands stark is: In a country of about thirteen million people, how many citizens have their livelihood directly hinged on the knowledge of Science and English? How many stand to benefit directly from these perceived advantages? Should every citizen be burdened with learning Science in English for these advantages?

Learning Science in English should be optional, while learning it in the mother tongue should be normative. Fafunwa (1990:103) sees things the same way. He asks, “Why impart knowledge and skills exclusively in a foreign language yet our people: farmers, craftsmen and others perform their daily exercises in indigenous languages (like Shona)? Why not help them improve their socio-economic and political activities in their mother tongue?” Research elsewhere has revealed that technological and scientific breakthroughs can only come about when Science is learned through the mother tongue. Olarenwaju (1986) asserts that a good grounding in Science is necessary for technological take off and the process of Science is made easy to understand when learned through the mother tongue. Stan (1992) notes that one of the world leaders in the production of electronic equipment- Japan, managed to achieve this feat through teaching Science in Japanese languages, not English. Bamgbose (1987) observes that similar technological breakthroughs have occurred in Taiwan, Brazil, China, Holland, India, Russia, France and Germany through the use of their own languages. These countries do not speak English as a national language.

5.9.5 The advantages of teaching Science in Shona

The principal advantage that comes with the use of Shona in teaching Science is that through its use the language is bound to expand and develop phenomenally. Relevant vocabulary and terms will inevitably be coined. Some new words and terms will be adopted from other languages that will have words and terminology for specific concepts. It goes without saying that if used in teaching Science, Shona will develop for, “... how can a language come up with new words to describe a computer programme or an internet browser if it is kept out of the main stream and confined to daily conversation (Brock-Utne, 2005 in Ogutu and Nthiga 2008:181)? The use of Shona in teaching Science will not only result in the development of appropriate registers and vocabulary but also Science dictionaries in Shona. This will enhance pupils’ understanding of Science concepts and subsequent rising of pass rates.

This research has also established the fact that teachers find Science the most difficult subject at primary school and the second most difficult at secondary school. Magwa

(2008:266) observes that Mathematics, Physics, Chemistry, Biology and Geography are some of the difficult subjects of the school curriculum. He says the subjects appear difficult due to the failure by learners to understand concepts as they are explained in English, a foreign language to most if not all students. Findings in this study bring to the fore the same reason why Science is the most difficult. The main reason advanced is that Science is made difficult by teaching it through one of the most difficult subjects of the school curriculum-English.

Teachers agreed that there was a clear language barrier between the subject content and the learner, between the subject content and the teacher as well as between the teacher and pupil. The teachers, themselves English second language speakers also struggled with the language. They did not have native like proficiency in the language. There were many chances of conceptual distortions due to translations and a general lack of proficiency in the language. The total and ultimate solution to these shortcomings was teaching the subject in the pupils and the teachers' mother tongue - Shona. The research has also established that pupils enjoyed learning Science, or any other subject for that matter, in a language they understand. As a result, pupil participation in such lessons is high. Pupils will derive maximum benefit as almost all pupils will at the least learn something unlike when Science is taught in English. During the study the researcher experienced many 0% scores and incidences of 'dumb' pupils during lessons. Similarly, learning Science in Shona is highly beneficial to pupils who will be entering formal school for the first time. It smoothens the transition between home and school. As for the generality of pupils learning Science in Shona, an opportunity for pupils to relate the subject to everyday life and make it functional and practicable will be created.

It was further established in this research that most teachers (83%) used both English and Shona in teaching Science. This practice implied either the inadequacy of the English language or the teacher's own limitations in effectively using English to teach Science to Shona first language speakers. Shona was used to fill in gaps where English was seen to be coming short.

Finally, the investigation came up with intriguing results. All the twenty Science lessons taught in Shona had over 50% pass rates averaging a staggering and convincing 89% against a paltry 47,6% for the lessons conducted in English..The results reflect a high conceptual grasp rate. Answers to questions in the progress check exercises were well formulated and expressed with minimal spelling and grammatical errors implying that pupils grasped the concepts, read and understood the questions well. In comparison, the results of the experimental class were about twice as good as those of the control class. Instruction in Shona therefore produced results a lot better than those from instruction in English. The results clearly show the advantage of teaching Science in Shona (the pupils' first language). Zimbabwe will do well with such a policy, for continuing to teach Science in English will make pupils revere English, shun and look down upon Shona, taking it as a second rate language.

This study therefore recommends that the Zimbabwe government adopts mother-tongue instruction as the panacea to the country's educational and socio-economic challenges. With mother- tongue education all learning becomes meaningful, enjoyable and relevant. Not only will learning become easier for pupils but teaching will also become simpler for teachers. Higher pass rates will also be realized as revealed by the study's results. Therefore, the only progressive way forward is to utilize what is our own: indigenous languages. *Muto wekupungurirwa haupedzi sadza.* (Gravy poured out by somebody else will not be enough to finish a plate of *sadza*.) By continuing to use English, we will not get as much as we need and deserve. Our scientific, technological and socio-economic woes will continue.

5.9.6 Children's linguistic rights

The fight for the right of children to be taught in their own language has been long drawn in Africa. Way back " In June 1976 something significant happened in Soweto, South Africa, as close to 15 000 school children took to the streets demanding to be taught in their own language," writes Mananawire in the Daily News newspaper of June 19 2012:4. African governments in general and the Zimbabwe government in particular should be proactive and not wait for demonstrations or protests demanding language

rights. The Zimbabwean government is still lagging in fulfilling the rights of Zimbabwean children. Yes, many schools have been opened, many (though not all) children are attending school, a high literacy rate by African standards has been achieved but Zimbabwean children still learn in a foreign language while their own languages lie idle and under-utilised. Government should address the issue of the people's language as a right before it's too late.

This research recommends that all pupils learn in their mother tongue as a matter of right and in tandem with several declarations of the United Nations. The Unesco (1953) recommendations clearly say:

On educational grounds we recommend that the use of the mother tongue be extended to as late a stage in education as possible.

Pupils begin their schooling through the medium of the mother tongue because they understand it best, and because to begin their school life in the mother tongue will make the break between home and the school as small as possible.

The recommendation is steeped in a learning theory that states that the most natural vehicle to early conceptual formation and growth is a child's first language. Further, the 1988 United Nations Declaration of Linguistic rights say that indigenous people have the right to develop, promote and sustain their own languages. They have a full right to use their languages for administrative, judicial, cultural and other purposes. The indigenous people's children further have a right to access education in their own languages.

This research therefore further advocates that all pupils from grade zero to grade seven learn Science (and other subjects) in Shona. The use of the mother tongue should be extended to ordinary level and beyond for the best effect. From grade one, as currently happens with Shona, English should be taught as a subject instead. At secondary school, Science should be taught in Shona and English alongside each other as was done by secondary school teachers interviewed in this research even though this was

not official but practical and helpful. In short, this research is advocating for an endoglossic trilingual model where children would be taught in:

- their mother tongue from grade zero to grade seven proceeding to form one through to form four,
- any two of the three current national and official languages namely Shona, English and Ndebele, from form five to six,
- English or Shona at the tertiary level of education.

After this base has been established, Science teaching at tertiary level using an indigenous African language like Shona will then be introduced although learning it in English will still be a choice depending on the student's needs. At the end of it all, it should be possible for a student to learn all they have to learn (including Science) in their mother tongue.

The switch from one language of instruction to another has been found to cause significant failures in students. Roy-Campbell (1997:54) observes that in Botswana, a Teacher Training Advisor in the Ministry of Education maintained that the switch from Setswana to English medium of instruction has contributed greatly to the failure rate in upper grades. Pupils generally found it very difficult to make the switch since subjects like Science and Mathematics required pupils to link new concepts to pre-cognition.

The Zimbabwean situation is no different as end of year results for infant pupils in this study had higher passes than pupils from grade four upwards for the same reason: instruction in English tends to intensify in the junior classes while the use of Shona is gradually and significantly decreased. Instruction in English is introduced too early in the pupils' academic life as they will not have mastered enough of their mother tongue yet, let alone English. To introduce instruction in English at this point is to defeat the pupils' academic endeavour in its infancy, resulting in poor performance.

According to research by Human Science Research Council (2005), most students who switch from mother-tongue education to another language by grade four are likely to

achieve only between 30% and 40% in their second language by grade 12 even though they appear to have greater exposure to this language. In contrast, pupils who learn in their mother tongue for at least six years, are likely to achieve 50% or more in the second language. Pupils who learn in their mother tongue for at least twelve years, plus the second language taught as a subject by a teacher who is proficient in the language are likely to achieve 60%.

In short, in spite of popular views, pupils will perform much better if they learn longer in their mother tongue and complement it with a well resourced second language as a subject.

The report also dismisses the view that mother tongue education is more expensive than second language education. Switching early to the second language is the most costly to resource, as it requires all teachers to develop native like proficiency in the second language in order to effectively teach using it. The scenario that is most economic, is that of teaching pupils long using their mother tongue at the same time teaching English as a second language using a corps of teachers trained to have a native like proficiency in English. For the best effect, the schools should be well resourced.

The language model advocated for tallies with that suggested by Benjamin (1994). In his three tier model, he says the first tier is that of basic education teaching using the child's mother tongue, the second tier is that of teaching using a national/regional language while the third tier is that instruction shall be through a language of wider communication. What this means in practice, is that a Shona speaking child for example will be educated in Shona, a Ndebele child in Ndebele and a Tonga child in Tonga from primary up to tertiary education. A language which warrants some flexibility at national level in order to facilitate linguistic integration will be learned as a subject from primary to secondary school. The language(s) will be chosen on the number of speakers at national level. For the purposes of international communication, transition towards a foreign European or Asian language should start at grade three. This language should be learned as a subject (Magwa 2009). In agreement with Magwa (2009) and

Benjamin's three tier model, what this research is advocating is an adaptation of Alexander's (1995) model shown below.

Medium of instruction Level Subjects taught

L1 Grade 0-7 All

L1 Form 1-4 All

L1 /L2 Form 5-6 Science& Maths

L1 & English Tertiary Science & Maths

L1 Form 5-6 & Tertiary Other subjects

The reason for the use of both Shona and English as media of instruction, is that until the first language is developed enough students will require at least a reading knowledge of English for them to access materials that are not in the indigenous languages even if English is not the medium of instruction anymore. This means that all basic instruction should be in the learner's first language. Children who begin their education in their mother tongue make a better start, demonstrate increased confidence and continue to perform better than those who start school in a foreign language (Chivhanga, 2012:3). This arrangement is not a first, as all European countries outside Britain use their own languages for education and other purposes, with English being learned in their schools as a subject. The same goes for the Asian countries like Malaysia, China and Japan that have made tremendous economic strides in recent times. It is advocated that local languages should be used for education and other purposes.

Once such a policy is in place, then orientation of language as a right will be operationalised. Scientific literature will have to be translated, new scientific knowledge will have to be written in indigenous languages, developing relevant dictionaries, technical terms and jargon at the same time. The issue of cost, is neither here nor there. It might appear costly in the short term but will not be so if the long term developmental

benefits to a country are taken into consideration. Japan is a case in point. Using local languages would be a great score as no attempt (in Zimbabwean history) has been made to use Shona (or any other indigenous language for that matter) for both educational and technological purposes, for example, in the writing of textbooks of subjects like Science and Mathematics. The root cause of this arrested growth of indigenous languages lie in the country's political history: colonialism and its language policies.

The use of the child's first language in teaching Science will have a double advantage. It will ascertain easier teaching and learning, better mastery of content, indigenisation of concepts as well as creating the chance for indigenous solutions to the country's economic and technological challenges. The study therefore recommends that teacher education and the scientific content taught in schools should be biased towards linguistic, cultural, mental and technological liberation. The continued use of English as a medium of instruction in teaching Science will not take Zimbabwe anywhere, for, since time immemorial, Zimbabweans have been learning Science by rote and there has been no scientific and technological development to show for all the effort at teaching and learning Science. It is time Zimbabwean Science is taught in indigenous languages. In order to make it relevant, Science should speak to Zimbabweans in an idiom they know well, an idiom which is native to them. It is only on this bedrock that any meaningful scientific and technological development can take place and benefit the technologically backward and poor Zimbabweans.

As a parting shot, it is pertinent to point out that, no matter how good and interesting language policies may be, they may not be successfully implemented if Zimbabwean people continue to have negative attitudes towards indigenous languages. It should be clear to the Zimbabwean government and all, that on their own, good policies on paper are not good enough to bring about change in attitudes. Lip service without material service is not good enough (Ngugi wa Thiongo, 2012). For Zimbabwe to reach scientific and technological take off, as well as achieve economic prosperity, the vehicle for change is mother tongue education in Science.

5.10 CONCLUSION

The chapter has discussed key tenets in the research. The attitude of grade four children were found to be positive towards learning Science in Shona. The request by pupils to have another shot at learning Science in Shona was clear testimony. It was the attitude of Zimbabwean adults that was found to be disasterously negative. The attitude of Zimbabwean people has been found to be skewed in favour of English both before and after independence. Similarly, the attitudes of both primary and secondary school teachers were mostly in favour of the use of English as a language of instruction in the teaching of Science. Heads of schools, education inspectors and heads of government departments mostly had positive attitudes towards using English as the official language compared to Shona.

There was need to change the attitude of these adults first before instituting mother-tongue education. In the discussion, it has been revealed that English is currently the official language of instruction in schools. It has been further revealed that Shona is an effective language in teaching Science and even scores better than English (as a language of teaching Science) when results are compared. Basing on the results of the teaching experiment conducted in this research the research clearly advocates the adoption of Shona as a language of instruction in teaching Science in Zimbabwe. Pupils who were taught Science in Shona clearly excelled and by far outclassed those taught in English. The next chapter concludes the research.

CHAPTER 6

CONCLUSION

6.1 INTRODUCTION

In this, the final chapter of the study, the researcher draws conclusions on the research findings based on the aims and objectives of the research as well as the concomitant research questions. Finally, the researcher will make recommendations based on the results of the research findings discussed in chapters five and six.

6.2 RESEARCH FINDINGS

From the outset, the study sought to establish and compare the status of English and Shona in colonial and independent Zimbabwe. It also sought to investigate and explore the feasibility of using Shona as a language of instruction in teaching Science in Zimbabwe, and if feasible, to compare the effectiveness of both English and Shona as languages of instruction in teaching Science.

First and foremost, the study has established that Zimbabwe has no clear language policy. The rag-tag policy that is in place, is enshrined in the 1987 Education Act and its amendments. The Act is itself not comprehensive, explicit and lucid enough in terms of what should be done and how much should be done in education using the indigenous languages. Regrettably, it has been established that the rag-tag policy alluded to, is based on the colonial framework, where English was not only the language of the rulers but also the official language of government business. The situation in Zimbabwe remains the same, English is today, not only the language of the black ruling elite but also the language of government business.

The study has also established that, as in Rhodesia, English remains the medium of instruction in schools, colleges and universities. It was and is still used to teach all subjects of the curriculum except indigenous languages. According to the 1987

Education Act, indigenous languages may be used as medium of instruction in the first three primary school grades but this research has established that this policy was being violated by most teachers as they taught Science in English most of the time.

Further, this research has established that statuswise, English has higher socio-economic status than Shona. This was the case in Rhodesia and remains so in present day Zimbabwe. English was used in the most important socio-economic domains such as the judiciary, legislature, education, media as well as in commerce and industry. The interviews with Heads of Government departments clearly revealed the higher status English has over Shona. It was established that English was required for recruitment and training purpose. It was also used during training, for record keeping, communication, graduation and certification. On the contrary, Shona is relegated to less important social functions like religious activities and home language.

Although the study established that English was required for recruitment and training in government departments, the interviews with the heads of government departments as well as the visits to these departments were eye openers. The visit to the District Development Fund (D.D.F.) demonstrated a crucial point: one did not need a pass in 'O' Level English to be fully functional in the workshop. Evidence was there for the researcher to see. The men who repaired and worked the machines in the workshop did not have passes in 'O' Level English. In fact, most of the technicians were seasoned and experienced old men who could hardly sustain a meaningful conversation in English. It was clear therefore that the insistence on having English in government work was wrongly placed. At work places one can fully function and be productive without much or any knowledge of the English language.

From the study it was clearly established that English and Shona did not and still do not have the same status in Zimbabwe. The higher social status English continues to have has resulted in positive attitude towards its use among Zimbabweans.

With regard to Zimbabwean people's attitude towards English, the research has established that grade four pupils have a positive attitude towards learning Science in

Shona. This was demonstrated by their request to further learn Science in Shona one year after the study. On the contrary, the attitude of grown-ups, namely teachers, Heads of Schools, Education Inspectors and Heads of Government Departments were found to be negative towards the use of Shona as the official language of government business and in education.

Zimbabweans continue to hold English in high esteem, and look down upon Shona, even though it is their very own language. They continue to see English as a language of power, prestige, social mobility and success. Code switching from Shona to English has become so common that people can hardly converse without it, young or old. Such a negative attitude towards Shona is also endemic among the intelligentsia, especially the teachers.

The study has concluded that primary and secondary school teachers have negative attitudes towards the use of Shona as a language of instruction, preferring English instead. Such attitudes are reminiscent of a colonial hangover. Similarly, the attitudes of Heads of Government Departments, Heads of Schools and Education Inspectors were also seen to be mostly negative towards the use of Shona as a language of instruction in education and as the official language of government business. Such attitudes are unfortunate. Once again, it is worth stressing that the children in this investigation had a very positive attitude towards learning Science in Shona. The future and success of any attempt to change the nation's attitude should very well start with children.

Looking at the question of the feasibility of using Shona as a language of instruction, the research has demonstrated that, indeed Shona can be effectively used as a language of instruction in teaching Science. The evidence was clear. All schemes of work and lesson plans were competently done in Shona; lessons for the experimental class were conducted in Shona while progress check exercises were also written in Shona. Several advantages of teaching Science in Shona were noted. Included, is the fact that pupils had sound understanding of the subject matter. Sound understanding of the subject matter resulted in Science becoming relevant, interesting and meaningful to pupils. Further, sound understanding of the subject resulted in enhanced pupil participation in

learning. Active learning inevitably resulted in higher pass rates. Lessons taught in Shona were full of vitality and vigour. In this study, most of the pupils who learned Science in Shona passed the progress check exercises with very high marks. Once achieved, high pass rates would motivate pupils into liking learning and continuing to excel in their performance. Better performance would help pupils dismiss one of the mythical findings in this research: that Science is a very difficult subject.

Some of the crucial facts this research established include the finding that, once given chance, a language can develop and adjust itself to the reality of modernisation by adopting and adapting words to fill conceptual gaps in itself. Similarly, the research has also established that a language can evolve new meanings to old words as it strives to keep abreast with modernisation and reality.

Finally, one of the research questions the study sought to answer was to find out if English was more effective than Shona in teaching Science. The results of the inquiry spoke for themselves: Shona can not only be used as a language of instruction in teaching Science but proved to be better and more effective. First, the lessons taught in Shona were more livelier than those taught in English. Group work done in the lessons taught in Shona was more productive while answers given in the resultant progress check exercises were articulate, more precise and had few grammatical mistakes. Above all, more pupils passed the Shona progress check exercises than those in English. Furthermore, the pass rates in Shona progress check exercises were all higher than those done in English. An average pass rate of 89% in Shona progress check exercises was realized against a paltry 47,6% in the progress check exercises in English. Performance in Science lessons conducted in Shona was almost twice better than that in the Science lessons conducted in English.

6.3 RECOMMENDATIONS

Owing to the magnitude of the research, it is important that at the end of this study, some suggestions and recommendations be made.

With regard to the high status that English continues to have over Shona, it is recommended that the Zimbabwean government makes a paradigm shift and goes for the use of indigenous languages (such as Shona) as official languages in all government business. A change in government position, philosophy and mindset on this issue, coupled with the crafting of/ putting in place of a relevant policy, will put everything on track. The first port of call is changing the mindset of the elite as they are known to shun local content, languages and culture. In short, there is a clear need for the Zimbabwean government to put in place a clearly defined language policy in which Shona is given similar and equal treatment to that given to English. The rather ambiguous, skewed and inadequate policy currently given through the Education Act (and its amendments) falls short of the majority people's expectations. Government should change the current language policy in schools. Instruction in Shona should not end at grade three levels but should proceed to grade four up to tertiary level. In short, government should promulgate policies that make the use of African languages compulsory as subjects and as languages of teaching and learning.

With the correct language policy in place, it is recommended that government institutes language awareness campaigns in which indigenous languages are extolled and exhorted. One strategy to change people's attitudes is to apply psychological approaches.

Before the new policy in education is implemented, people need to know or be made aware of the incoming policy. There will be need to provide the people with information about the purpose of the new practices, their advantages and how their adoption will affect their lives. A language people are averse to, will not be easy to use or learn through. These campaigns would be aimed at arresting and redressing the negative attitudes prevalent in Zimbabweans.

Attitudes play a critical role when it comes to language policy implementation. Even if a policy is in place and materials are provided, without the people's will and right attitude nothing can be achieved. No army general can win war if the soldiers are not willing to fight. As such, it should be pointed out that, implementation of the researcher's and

policy makers recommendations depends on the people's attitudes. Once attitude correction starts, it is recommended that full scale policy implementation is kick started in schools.

Resource materials, especially Science textbooks and literature in Shona, should be developed and adequately provided. The lame excuse that there are no materials in indigenous languages and that it is very expensive to produce such materials does not hold water. Study material can be developed through translating existing material from English to Shona. An adequately funded and vibrant translation service should be established to cater and provide for this need. In teacher- training colleges, programmes should be developed and instituted to train teachers in teaching Science in Shona.

Furthermore, as a matter of policy and principle, entry into universities and other tertiary institutions should be based on a pass in an African language as opposed to the current scenario where English is the requirement. It is also recommended that in all education institutions, African languages should be taught in African languages. Similarly, all discourse in African languages should also be in African languages. In the case of Science subjects, academic bodies to spearhead the development of vocabulary and terminology as well as the modernisation of the target languages should be set up. There is need therefore to compile technological dictionaries as well as expand the vocabulary of the target language in order to cater for new developments in Science and technology. In order to make the implementation of this policy a success, the government should incentivize institutions and/or individuals that work towards the promotion of indigenous languages

Finally, it is prudent to point out that this study has strongly established that it is very possible to teach Science using Shona. In fact, it has gone further to prove that Shona is even better than English when used as a language of instruction in teaching Science. The study recommends that further inquiry be made on the feasibility and effectiveness of using Shona as a language of instruction in teaching other subjects of the broad Zimbabwean curriculum especially those in the field of Science and technology.

It is time Zimbabweans rise to the occasion and wake up to the spirit of African Renaissance and begin to use what is their own: the Shona language, for their own scientific and technological development and as well as prosperity. Continuing to teach Science in English to Shona first language speakers tends to keep Science remote and distant. Consequently, Science would be learnt by rote and becomes meaningless and irrelevant to life. The effective and rapid development of Science and technology, as well as the eradication of poverty in Africa in general and Zimbabwe in particular will only and rightly come through the use of indigenous African languages.

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APPENDICES

APPENDIX A: APPLICATION FOR PERMISSION TO CARRY OUT RESEARCH

Ref. P. Nyaungwa, O.
Denzva Primary School
Private Bag 2021
Nyazura.
12 March, 2010.

The Secretary
Ministry of Education, Sport, Art and Culture
P.O.Box CY 121
Causeway, Harare.

Dear Sir,

RE: Application for permission to carry out a research

I hereby write to you asking for permission to carry out a research on the feasibility of using Shona as a medium of instruction in teaching Science in Zimbabwe. I am a PhD. Student with Unisa.

I would like to teach 20 lessons to two grade four classes at Denzva School during the second term in 2010. The 30 minute lessons will be taught after hours on Mondays and Wednesdays. One class will be taught Science lessons in Shona while the other will be taught the same lessons in English. The same assessment exercises will be given to the two classes in Shona and English respectively. The results will be analysed and compared. Conclusions will be drawn and recommendations will be made.

Permission is also sought to seek information on teacher and pupil attitudes towards the use of Shona in teaching Science. Questionnaires will be sent to schools within the Denzva school cluster. Attached is a supporting letter from Unisa.

I thank you.

Yours faithfully

Nyaungwa Oscar

APPENDIX B: REQUEST FOR ASSISTANCE WITH RESEARCH DATA

Denzva Primary School
Private Bag 2021
Nyazura.

10 May 2012

The Head (and Staff)

_____ School

Nyazura.

Dear Sir,

RE: Request for assistance with research data, Nyaungwa O.St. No. 3115-280-5.

The purpose of this letter is to introduce myself and ask you to allow me to collect research data within your school system. I am a Unisa student conducting post graduate research on exploring the feasibility of teaching Science using Shona.

I kindly request you and your staff to help by completing the questionnaire enclosed. There is no need to indicate one's name unless one personally feels like. All individuals involved and information gathered in this study will remain anonymous. Consequently, the complete research report will be published only in a professional way. I thank you for your valuable time and consideration in this matter. This will help me learn more about the teaching of Science. If you have any questions feel free to contact me on (025-83) 2915 or cell +263 773 753 484.

Yours truly

Nyaungwa O.

APPENDIX C: INTERVIEW QUESTIONS FOR USE IN GOVERNMENT DEPARTMENTS

1. What is the official language of business in your department?

2. What part does English play in the
 - (a) Recruitment of personnel?
 - (b) Training and certification of personnel?
 - (c) Writing of reports?
 - (d) Compilation of records?
 - (e) Official communication system?

3. Does Shona play any part in the domains a-e in question 2 above?

4. If Shona were to replace English as the official language of business in your Work, would you welcome the change?

5. Why?

APPENDIX D: INTERVIEW QUESTIONS FOR SCHOOL HEADS AND INSPECTORS

1. Which language policy circular is currently in force in schools?
2. Which is the language of instruction in schools?
3. When is Shona supposed to be used as a language of teaching in classrooms?
4. In what language is Science supposed to be taught in in grades 1-3?
5. Practically, in what language have you seen teachers teach grade 1-3 Science?
6. From your supervision, are teachers competent in using English when teaching?
7. Do you think its feasible to teach Science in Shona?
8. What advantages would accrue from such a policy and practice?
9. If Science were to be taught in Shona, what disadvantages could be encountered?
10. Would you support the teaching of other subjects of the curriculum using Shona?
Why?

APPENDIX E: PRIMARY SCHOOL TEACHERS QUESTIONNAIRE

Please Sir/Madam may you honestly and truthfully complete this questionnaire writing only your personal view

Personal details

(Sex Male/Female)

Age

Subjects/Class taught

Teaching experience in years

Subject specialized in

Academic Qualifications ('O'L, 'A'L,B.A; etc

Prof. Qualifications e.g.C.E; D.E; B.Ed; etc.

Research Information

1. Tick the box next to the subject in which your class performed best last term.

Maths Science Shona English

2. Explain why your class performed better in the subject you ticked in question 1 than in other subject areas.

3. In which three subjects does your class face the most learning difficulties? List them 1,2,3...beginning with the most difficult.

Maths Science Shona English

4. Explain why your pupils perform badly in the subjects that you ranked 1, 2 and 3 in question 3 above.

5. When teaching Science which language do you use? Tick your response.

English only	<input type="checkbox"/>
Mostly English and a little Shona	<input type="checkbox"/>
English and Shona (50/50)	<input type="checkbox"/>
Mostly Shona and a little English	<input type="checkbox"/>
Shona throughout	<input type="checkbox"/>

6. Please explain clearly why you use the language(s) that you ticked in question 5 above.

7. In which language do you test/examine your class? Tick your response.

Maths Science Shona English

8. State the advantages of teaching and learning Science in English.

9. What disadvantages arise from the teaching and learning of Science in English?

10. If government policy were to change and stipulate Shona as the language of teaching Science, how would you react? Tick your response.

Support the policy Oppose the policy

11. If Science were to be taught in Shona what

(a) advantages would this bring to the teaching/learning process?

(c) disadvantages would this bring to the teaching/learning process?

11. In your opinion, which language would make the teaching and learning of Science easier and more effective? Tick your response.

English Shona

I thank you

APPENDIX F: SECONDARY SCHOOL SCIENCE/SHONA TEACHERS' QUESTIONNAIRE

Please Sir/Madam may you honestly and truthfully complete this questionnaire writing only your personal views

(Sex Male/Female)	<input type="text"/>
Age	<input type="text"/>
Main subject(s) taught (Science/Shona)	<input type="text"/>
Form(s) taught	<input type="text"/>
Teaching experience in years	<input type="text"/>
Academic Qualifications ('O'L, 'A'L, B.A; etc	<input type="text"/>
Prof. Qualifications e.g. C.E; D.E; B.Ed; etc.	<input type="text"/>

Research Information

1. Tick the subject in which 'O' Level students at your school performed best in 2010.

Maths Science Shona English

2. Explain why your class performed better in the subject you ticked in question 1 than in other subject areas.

3. From the subjects listed below, tick the three least passed at your school.

Maths Science Shona English

4. What problems does the language of instruction (i.e. English) present in the teaching and learning of the subjects that you ticked in question 3 above?

5. The language I use when teaching my main subject is

English only

Mostly English and a little Shona

English and Shona (50/50)

Mostly Shona and a little English

Shona throughout

6. Please explain clearly why you use the language(s) that you ticked in question 5 above.

7. In which language do you test/examine Shona at your school? Tick your response.

Maths

Science

Shona

English

8.

(a) State the advantages of teaching and learning Science in English.

(c) State the disadvantages of teaching and learning Science in English.

9. If government policy were to change and stipulate Shona as the language of teaching Science, how would you react? Tick your response.

Support the policy Oppose the policy

10. If Science were to be taught in Shona what

(a) advantages would this bring to the teaching/learning process?

(b) disadvantages would this bring to the teaching/learning process?

11. In your opinion, which language would make the teaching and learning of Science easier and more effective? Tick your response.

English Shona

I thank you.

APPENDIX G: LESSONS

GRADE 4 SCIENCE: LESSON 1

Topic: Crop, Plants and Animals

Subtopic: Small creatures

Objectives:

Pupils will

- (a) Identify and name local creatures that are smaller than a mouse
- (b) Group creatures that fly, live in water and those found in homes.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 10-12. Step in Science P.B. p 31.

Environmental Science Explorers p 50-1.

Media

Pictures/drawings of small animals. Small live creatures.

Introduction

Naming large and small animals, focusing on small animals.

Development

Step 1

Outdoors, teacher and pupils look for/collect creatures that are smaller than mice.

Step 2

Indoors, teacher and pupils discuss their findings and collections.

Step 3

Teacher assists class group creatures collected into the three categories in objective (b).

Step 4

Class discusses more creatures shown on a chart, putting them into three categories in step 3 above.

Conclusion

Revising key concepts in the lesson: names of unfamiliar creatures and categorizing them into the three classes.

PROGRESS CHECK EXERCISE

- 1 A _____ lives in water. (crab, wasp, scorpion)
- 2 A _____ stings. (snail, tick, bee, beetle)
- 3 Name one creature found in the home.
- 4 From the chart write one creature people eat.
- 5 From the chart name one creature which flies.

GRADE 4 SCIENCE: LESSON 2

Topic: Crop, Plants and Animals

Subtopic: Small Animals/creatures

Objectives:

Pupils will

- (a) identify and name more local creatures smaller than a mouse
- (b) group identified creatures into three: those with tails, that live near/in the soil and those with three pairs of legs.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 10-12. Step in Science P.B. p 31.

Environmental Science Explorers p 50-1.

Media

Pictures/drawings of small animals. Small live creatures.

Introduction

Pupils name small creatures learned in the previous lesson and place the three categories learned.

Development

Step 1

Using a chart on small creatures pupils pick and name creatures that fly, live in water and around the home.

Step 2

Using a chart on small animals pupils name creatures that live in/near the soil, have three pairs of legs and those with tails.

Step 3

From their own experience, pupils add on creatures to the categories in step 2 above.

Conclusion

Discussing and finding out creatures that fall into more than one category and why.

PROGRESS CHECK EXERCISE

- 1 A_____ has eight legs. (snail, centipede, spider)
- 2 An_____ lives in muddy soil.
- 3 How many legs does a bee have?
- 4 Name one creature that has a tail.
- 5 Where does a wasp live?

GRADE 4 SCIENCE: LESSON 3

Topic: Crop, Plants and Animals

Subtopic: Insects

Objectives:

Pupils will tell the parts of the body of an insect in general and a locust in particular.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 10-12. Step in Science P.B. p 33.

Environmental Science Explorers p 50-5.

Media

Drawings of insects, including wasp, beetles, dragon flies and locusts. Live locusts.

Introduction

Reading and discussing the word insect. Explaining what an insect is.

Development

Step 1

Teacher and class discuss the parts of the body of a wasp using a diagram.

Step 2

Teacher and class discuss the parts of the body of a locust- using a diagram and live locusts.

Step 3

Using live insects, teacher and class the different parts of the insect's bodies.

Conclusion

Revising the three parts of the body of all insects covered in the lesson.

PROGRESS CHECK EXERCISE

- 1 How many parts is the body of an insect divided into?
- 2 An insect has _____ legs.
- 3 Name one part on the head of a locust.
- 4 A locust breathes through _____.
- 5 How many wings does a locust have?
- 6 On which part do the legs of an insect grow?

GRADE 4 SCIENCE: LESSON 4

Topic: Crop, Plants and Animals

Subtopic: Comparing small animals

Objectives:

Pupils will adequately compare a millipede and a mosquito.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 10-12. Step in Science P.B. p 32.

Environmental Science Explorers p 50-5.

Media

30 cm rulers Drawings of millipedes and mosquitoes Millipedes and Mosquitoes

Introduction

Pupils estimate the lengths of millipedes and mosquitoes (assisted by the Teacher).

Development

Step 1

Identifying mosquitoes and millipedes from pictures on a chart

Step 2

Teacher and pupils discuss movements by mosquitoes and millipedes- walking, crawling, flying, e.t.c.

Step 3

Teacher introduces the notion of size. Pupils observe and describe the sizes of mosquitoes and millipedes, comparing them in the process.

Step 4

Teacher and class discuss body properties of the creatures in study-hard/soft; easy/hard to pick; the different colours; long/short...

Step 5

Identifying places where mosquitoes and millipedes are commonly found.

Conclusion

Highlighting differences and similarities between mosquitoes and millipedes.

PROGRESS CHECK EXERCISE

- 1 A_____ is very active at night. (millipede, mosquito, fly)
- 2 A millipede is about _____ centimeters long.
- 3 How many legs has a mosquito?
- 4 How many legs has a millipede?
- 5 A mosquito flies but a millipede _____.
- 6 What colour are most millipedes?

GRADE 4 SCIENCE : LESSON 5

Topic: Crop, Plants and Animals

Subtopic: The life cycle of a house fly

Objectives:

Pupils will correctly answer questions on the house fly.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 10-12. Step in Science P.B. p 35-36.

Environmental Science Explorers p 53.

Media

Chart on the life cycle of a house fly Real house flies

Introduction

Teacher introduces the notion of cycle in life, citing that in man and in fowls.

Development

Step 1

Discussing the egg stage in the house fly life cycle.

Step 2

Discussing the larva stage in the cycle of the house fly.

Step 3

Discussing the pupa and adult stage in the house fly life cycle.

Conclusion

Revising the four stages and the whole cycle of the house fly.

PROGRESS CHECK EXERCISE

- 1 Name the stages in the life cycle of the house fly.
- 2 In warm weather the life cycle of a house fly takes _____ days.
- 3 Where does the house fly lay its eggs?
- 4 The house fly larva breathes through _____.
- 5 Which is the resting stage in the life cycle of a house fly?

GRADE 4 SCIENCE: LESSON 6

Topic: Crop, Plants and Animals

Subtopic: The life cycle of a mosquito

Objectives:

Pupils will correctly answer questions on the mosquito.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 10-12. Step in Science P.B. p 35-36.

Environmental Science Explorers p 53.

Media

Chart on the life cycle of a mosquito Live mosquitoes

Introduction

Revisiting the life cycle of a house fly.

Development

Step 1

Teacher and class discuss the first/egg stage in the mosquito cycle.

Step 2

Discussing the larva stage in the life cycle of a mosquito.

Step 3

Teacher and class discuss the pupa and adult stages in the mosquito life cycle.

Conclusion

Revising the mosquito life cycle, stage by stage.

PROGRESS CHECK EXERCISE

- 1 The eggs of a mosquito are laid in _____.
- 2 Mosquito eggs hatch into _____.
- 3 How do mosquito larvae breathe ?
- 4 How many stages are in the life cycle of a mosquito?
- 5 What disease do adult mosquitoes spread?

GRADE 4 SCIENCE : LESSON 7

Topic: Crop, Plants and Animals

Subtopic: Animals and insects may be harmful.

Objectives:

Pupils will name many harmful creatures e.g. house fly, mosquitoes, ticks, weevils, bees, fleas and scorpions.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 10-12. Step in Science P.B. p 39-41.

Environmental Science Explorers p 60-2.

Media

Chart on small animals/creatures- scorpions, aphids, fleas, cutworms, e.t.c.

Introduction

Pupils name many small creatures as teacher lists them on the board.

Development

Step 1

From the chalk board list teacher and class separate animals from insects.

Step 2

Teacher explains harmful creatures. Class cites harmful insects, explaining their danger to people.

Step 3

From the chalk board list pupils pick harmful animals and explain their danger to people.

Conclusion

Pupils make a comprehensive list of harmful insects and animals.

PROGRESS CHECK EXERCISE

- 1 A flea feeds on _____. vegetables
- 2 Mosquitoes spread _____. Blood
- 3 Weevils feed on our _____. fly
- 4 A _____ spreads cholera. tick
- 5 A _____ feeds on cattle blood. malaria
- 6 Aphids suck juices from our _____. crops

GRADE 4 SCIENCE : LESSON 8

Topic: Crop, Plants and Animals

Subtopic: Animals and insects may be useful.

Objectives:

Pupils will name many useful creatures e.g. bees and describe their usefulness.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 10-12. Step in Science P.B. p 39-42.

Environmental Science Explorers p 58-9.

Media

Drawings/pictures of locusts, bees, stink bugs, spiders and termites.

Introduction

Pupils name harmful creatures they learned in lesson 7.

Development

Step 1

From a chalk board list teacher and class separate animals from insects.

Step 2

Teacher explains the notion 'useful creature.' Pupils cite useful animals explaining their benefits to people.

Step 3

Teacher cites a useful insect, explaining its usefulness. Pupils name useful insects, explaining why they are deemed useful.

Conclusion

Class revises useful creatures learned categorizing them into insects and non-insects.

PROGRESS CHECK EXERCISE

- 1 A bee makes _____.
- 2 Which of these creatures do people eat? (spiders, locusts, bees)
- 3 spiders help us kill _____.
- 4 _____ help us mix the soil.
- 5 When is a bee harmful?

GRADE 4 SCIENCE: LESSON 9

Topic: Health and Pollution

Subtopic: Digestion

Objectives:

Pupils will explain food digestion in the mouth.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 10-12. Step in Science P.B. p 48.

Environmental Science Explorers p 66-8.

Media

Drawings/pictures of the head and mouth.

Introduction

Pupils discuss what happens to the food they eat and where it goes from the mouth.

Development

Step 1

Establishing the role of teeth and lips in digestion.

Step 2

Teacher and class discuss the role of the tongue and salivary glands in digestion.

Step 3

Teacher and class discuss the role of the side and back teeth in digestion.

Conclusion

Revising the structure of the mouth as well as the role of teeth and tongue in digestion.

PROGRESS CHECK EXERCISE

- 1 I _____ food with my front teeth.
- 2 Digestion starts in the _____.
- 3 In the mouth saliva is _____ with food.
- 4 The _____ mixes food with saliva.
- 5 When food is swallowed it goes onto the _____.

GRADE 4 SCIENCE : LESSON 10

Topic: Health and Pollution

Subtopic: Structure of the gut

Objectives:

Pupils will draw and label the digestive system/gut correctly.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 13-14. Step in Science P.B. p 48.

Environmental Science Explorers p 66-8.

Media

Drawings/pictures of the digestive system.

Introduction

Pupils revise digestion in the mouth as well as parts of the digestive system.

Development

Step 1

Teacher and class explore the gut, from the lips to the stomach.

Step 2

Teacher and class further explore the gut, from the stomach to the anus.

Step 3

Class draws and labels the alimentary canal/gut.

Conclusion

Revising parts of the gut.

PROGRESS CHECK EXERCISE- Step 3 above

GRADE 4 SCIENCE : LESSON 11

Topic: Health and Pollution

Subtopic: The process of digestion

Objectives:

Pupils will explain what happens to food in the gut.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 13-14. Step in Science P.B. p 50.

Environmental Science Explorers p 69-73.

Media

Drawings/pictures of the digestive system. Balloons filled with water.

Introduction

Pupils revise digestion in the mouth.

Development

Step 1

Teacher and class discuss what happens to food in the stomach.

Step 2

Teacher and class discuss digestion in the small intestine.

Step 3

Discussion of what happens to food in the large intestine.

Conclusion

Revising the whole process of digestion

PROGRESS CHECK EXERCISE

- 1 Food digestion starts in the _____.
- 2 In the mouth, food is mixed with ____.
- 3 The ____ takes food to the stomach.
- 4 In the stomach digestion _____ .
- 5 Food particles are absorbed in the ____ .
- 6 What is absorbed in the large intestine?
- 7 Where does waste food leave the body?

GRADE 4 SCIENCE: LESSON 12

Topic: Weather

Subtopic: Zimbabwe has four seasons

Objectives:

Pupils will name and describe the features and length of Zimbabwe's four seasons.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 17-18. Step in Science P.B. p 65.

Environmental Science Explorers p 86-7.

Media

Calendars

Introduction

Pupils name and recite the twelve months in the year.

Development

Step 1

Teacher and class discuss Zimbabwe's 4 seasons and write them on the board.

Step 2

Teacher and class discuss the duration of each individual season and write notes.

Step 3

Teacher and class discuss the characteristic features of each season e.g. rainy, cold, hot, e.t.c.

Conclusion

Highlighting the key ideas in the lesson.

PROGRESS CHECK EXERCISE

- 1 Zimbabwe has _____ seasons.
- 2 The seasons are _____, _____, _____ and _____ .
- 3 The rainy season is called _____ .
- 4 The coldest month in Zimbabwe is _____.
- 5 The winter season is _____ (rainy, cold, hot)
- 6 Which season begins in March and ends in May?

GRADE 4 SCIENCE: LESSON 13

Topic: Weather

Subtopic: Measuring air temperature- the structure of a thermometer.

Objectives:

Pupils will tell the use of and draw and label a thermometer.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 17-18. Step in Science P.B. p 71.

Environmental Science Explorers p 96-7.

Media

Drawings of a thermometer. A glass pen.

Introduction

Reading relevant words: mercury, thermometer, temperature, poison, bulb and degree Celcius.

Development

Step 1

Teacher and class discuss the use of a thermometer, focusing on clinics, tobacco barns and other spheres.

Step 2

Teacher and class discuss the structure of a thermometer as well as its calibrations.

Step 3

Reading temperatures from the board as well as from a thermometer.

Conclusion

Revising the structure, parts and use of a thermometer.

PROGRESS CHECK EXERCISE

- 1 Drawing and labeling a thermometer, indicating the bulb, scale, mercury, glass tube and Oc.
- 2 A thermometer measures _____.
- 3 What is found in the bulb?
- 4 Temperature is measured in _____.
- 5 Our body temperature is _____ .

GRADE 4 SCIENCE: LESSON 14

Topic: Materials and Technology

Subtopic: Tools and their use.

Objectives:

Pupils will name and identify many tools as well as state the use of specified tools.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 19-20. Step in Science P.B. p 79.

Media

Real tools as well as pictures/drawings of tools

Introduction

Pupils name common tools at home and list them.

Development

Step 1

Teacher and class discuss the uses of tools mentioned in the introduction.

Step 2

Teacher and class discuss the tools numbered 1-10 in the picture as well as stating their use.

Step 3

Teacher and class discuss the tools numbered 11-20 in the picture as well as their use.

Conclusion

Revising the names and uses of most of the tools learnt in the lesson.

PROGRESS CHECK EXERCISE

Tool No. Name Use

1

2

3

4

5

7

9

14

15 and 20

GRADE 4 SCIENCE: LESSON 15

Topic: Materials and Technology

Subtopic: Tools are made of different materials

Objectives:

Pupils will name and identify many tools as well as describe the properties of specified tool material.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 19-20. Step in Science P.B. p 80-1.

Media

Real tools as well as pictures/drawings of tools

Scissors, dressmakers' tape, hammer, mirror, shoe lace, e.t.c.

Introduction

Pupils name common tools at home and those shown on a chart.

Development

Step 1

Identifying and naming tools. Telling the material from which they are made.

Step 2

Teacher and class discuss the properties of metal, plastic, glass, cloth and wood.

Step 3

Teacher and class discuss why specific tools are made of specific material. Compare the whisk and awl.

Conclusion

Revising the names of different tools and the material they are made of, giving reasons.

PROGRESS CHECK EXERCISE

- 1 A dressmaker's tape is made of _____ .
- 2 A pair of scissors is made of _____ .
- 3 A mirror is made of _____ .

Match the material with the property.

Material Property

- 4 plastic breaks easily and cuts readily
- 5 glass is heavy and rusts
- 6 metal is very light and waterproof
- 7 Why are shoe laces not made of wire?

GRADE 4 SCIENCE: LESSON 16

Topic: Materials and Technology

Subtopic: Tools belong to different groups

Objectives:

Pupils will name and identify many tools as well as group them systematically.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 19-20. Step in Science P.B. p 81.

Environmental Explorers p 102-04.

Media

Real tools as well as pictures/drawings of tools

Scissors, dressmakers' tape, hammer, mirror, shoe lace, e.t.c.

Introduction

Pupils name common tools at home and from a chart.

Development

Step 1

Teacher names a tool with shiny polishable parts. Pupils find out tools with similar properties.

Step 2

Teacher introduces tools with teeth. Pupils find out and name similar tools. e.g. saw, fork, ...

Step 3

Teacher introduces sharp pointed tools, e.g. an awl. Pupils find out and name similar tools.

Step 4

Teacher introduces metal tools with wooden handles. Pupils find out and name similar tools.

Conclusion

Revising and exemplifying tools in the four categories.

PROGRESS CHECK EXERCISE

- 1 Which tool has a sharp point?
- 2 Which tool has a wooden handle?
- 3 A _____ has teeth.
- 4 A _____ is shiny and can be polished.
- 5 What tool has teeth and is used in the garden?
- 6 Which tool has a sharp point and is used when sewing?

GRADE 4 SCIENCE: LESSON 17

Topic: Materials and Technology

Subtopic: Tools today- the plough.

Objectives:

Pupils will describe ploughs yesterday and today.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 19-20. Step in Science P.B. p 84-5.

Media

Real plough as well as pictures/drawings of ancient and modern ploughs.

Introduction

Pupils and teacher discuss how people ploughed long ago.

Development

Step 1

Teacher and class discuss technological developments in transport and communication as well as day to day life artifacts.

Step 2

Teacher and class discuss ancient and modern tools- needles, axes, hoes and others.

Step 3

Class discusses ancient and modern ploughs. Identifying and naming parts of a plough.

Conclusion

Revising parts of a plough and key concepts taught.

PROGRESS CHECK EXERCISE

Drawing and labeling a modern plough.

GRADE 4 SCIENCE: LESSON 18

Topic: Landforms and Maps

Subtopic: Maps and Grids

Objectives:

Pupils will give the grid reference of particular squares.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 20. Step in Science P.B. p 88.

Environmental Explorers p 106-110

Media

40 photocopied grids

Introduction

Pupils and teacher read new words: grid; grid reference; horizontal and vertical lines.

Development

Step 1

Teacher and class discuss the grid on the board, establish the notion grid Reference and give the grid references of given squares.

Step 2

Teacher and class discuss the grids photocopied on paper, then attempt to give the grid references of given letters.

Step 3

Class discusses letters/features identified by given grid references

Conclusion

Revising giving grid references of given features and naming features whose grid references have been given.

PROGRESS CHECK EXERCISE

- 1 Write the grid references for the letters Q, O, S, and P in the diagram.
- 2 Write the features represented by the following grid references: 2 2 and 4 1.

GRADE 4 SCIENCE: LESSON 19

Topic: Landforms and Maps

Subtopic: Maps and Grids

Objectives:

Pupils will find the grid references for places on a map.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 20. Step in Science P.B. p 89.

Environmental Explorers p 106-110

Media

40 photocopied maps

Introduction

Pupils and teacher revise the concept of grid reference learned in the previous lesson.

Development

Step 1

Teacher introduces the key to the map. Pupils and teacher discuss the key in detail.

Step 2

Teacher helps the class identify features on the map using the key.

Step 3

Class discusses the concept grid reference then pupils give the grid references of landforms on the map.

Conclusion

Revising challenging grid references.

PROGRESS CHECK EXERCISE

1 Write the grid references for the features listed below and shown on the map.

- (a) the store
- (b) the school
- (b) the clinic
- (c) the bridge
- (d) the football field
- (e) the kopje
- (f) the big rocks

GRADE 4 SCIENCE: LESSON 20

Topic: Landforms and Maps

Subtopic: Maps and Grids

Objectives:

Pupils will find the features represented by given grid references on a map.

Source of Matter (S.O.M.)

Grade 4 Science Syllabus p 20. Step in Science P.B. p 89-91.

Environmental Explorers p 106-110

Media

40 photocopied maps

Introduction

Pupils and teacher revise the concept of grid reference learned in the previous lesson.

Development

Step 1

Identifying features/landforms on given maps. Stating the grid references in pairs/threes.

Step 2

Teacher identifies two features on a map. Pupils in pairs/threes tell the grid references.

Step 3

Teacher gives a grid reference and pupils identify the square, stating the Landform represented.

Step 4

Teacher gives more grid references and pupils identify the squares and tell the features represented.

Conclusion

Revising challenging work in step 4 and the lesson in general.

PROGRESS CHECK EXERCISE

Name the landforms found in squares with the following grid references.

- (a) 1 4
- (b) 3 4
- (c) 4 1
- (d) 2 2
- (e) 3 3
- (f) 4 4.

APPENDIX H: CURRICULUM VITAE OF OSCAR NYAUNGWA

Name : Nyaungwa Oscar
Sex : Male
D.O.B : 23/10/1961
Nationality : Zimbabwean
Address : House No. N .E. 306 Vengere, Rusape, Zimbabwe.
I.D. No. : 63-234344G42
Cell : 263773753484
Email : Oscarnyaungwa@gmail.com
Qualifications : C.E. (U.Z) Mary Mount College, Mutare.1986
B.A. (Unisa) 1999.
Hons B.A. (Unisa) 2001
M.A. (Unisa) 2009

CAREER

Teacher : 1986
Senior Teacher : 1990
Substantive Deputy Head: 1995 Mbiriri and Mahere Scools
Substantive School Head: 2006. Chigudu and Denzva Schools

HOBBIES

Worship and Prayer
Watching Soccer
Wide Reading
Academic Research

REFEREES

PROF. D.E. MUTASA
UNISA (DEPT OF AFRICAN LANGUAGES)
P.O.BOX 392
PRETORIA
Email : mutasde@unisa.ac.za

DR M.L. MOJAPELO
UNISA
P.O.BOX 392
PRETORIA

MR. A JIJI (D.E.O. MAKONI)
MINISTRY OF EDUCATION, SPORT, ART AND CULTURE
P.O.BOX 232
RUSAPE, ZIMBABWE.